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1 {York Stenographic Services, Inc.}

2 HIF349.160

3 LEGISLATIVE HEARING ON H.R. 3125, THE RADIO SPECTRUM

4 INVENTORY ACT, AND H.R. 3019, THE SPECTRUM RELOCATION

5 IMPROVEMENT ACT OF 2009

6 TUESDAY, DECEMBER 15, 2009

7 House of Representatives,

8 Subcommittee on Communications, Technology, and the Internet

9 Committee on Energy and Commerce

10 Washington, D.C.

11 The subcommittee met, pursuant to call, at 9:35 a.m., in

12 Room 2123 of the Rayburn House Office Building, Hon. Rick

13 Boucher [Chairman of the Subcommittee] presiding.

14 Members present: Representatives Boucher, Markey,

15 Stupak, Doyle, Inslee, Matsui, Christensen, Castor, Space,

16 McNerney, Dingell, Waxman (ex officio), Stearns, Upton,

17 Shimkus, Buyer, Bono Mack, Walden, Terry and Blackburn.

18 Staff present: Roger Sherman, Chief Counsel; Tim

19 Powderly, Counsel; Amy Levine, Counsel; Shawn Chang, Counsel;
20 Greg Guice, Counsel; Pat Delgado, Chief of Staff (Waxman);
21 Sarah Fisher, Counsel; Neil Fried, Republican Counsel; Will
22 Carty, Republican Professional Staff; and Garrett Golding,
23 Republican Legislative Analyst.

|
24 Mr. {Boucher.} The subcommittee will come to order.

25 This morning the subcommittee convenes a legislative
26 hearing on two measures related to the availability of the
27 wireless spectrum, which is essential to meeting our future
28 needs for mobile communications services.

29 The movement of personal communications to mobile
30 services is both dramatic and accelerating. Earlier this
31 year it was announced that for the first time, the number of
32 homes having only a cell phone and no landline service now
33 exceeds the number of homes having only a landline and no
34 cellular service. At the end of 2008, there were
35 approximately 270 million wireless subscribers in the Nation
36 including an estimated 40 million active users of mobile
37 Internet services. Daily, new attractive and useful
38 applications are added to wireless services and data rates
39 continue to increase as consumers require faster access to
40 mobile communications. As more and more Americans use data-
41 intensive smart phones and as services like mobile video
42 emerge, the demand for spectrum to support these applications
43 and devices will continue to grow dramatically.

44 Today, the subcommittee continues its examination of
45 possible ways in which federal telecommunications policy can
46 be altered in order to meet these challenges with the goal of

47 enhancing the consumer experience and facilitating the future
48 growth of mobile services.

49 In July, I was pleased to join with Chairman Waxman,
50 full Committee Ranking Member Barton and Subcommittee Ranking
51 Member Stearns in introducing H.R. 3125, the Radio Spectrum
52 Inventory Act. That measure, now before the subcommittee,
53 would direct the NTIA and the FCC to undertake a
54 comprehensive survey of the Nation's spectrum and develop an
55 inventory of each spectrum band in the U.S. table of
56 frequency allocations between 225 megahertz and 10 gigahertz.
57 The inventory would include the identity of both federal and
58 non-federal users of spectrum and the types of services they
59 offer in each spectrum band as well as the amount of use in
60 each band on a geographic basis. When the inventory is
61 completed, the NTIA and the FCC would create a website in
62 order to make the information gleaned from the inventory
63 available to the public. They would report the results of
64 the inventory to the Congress and that report would include a
65 description of information that could not be made publicly
66 available for national security reasons. It would also
67 include a recommendation of which, if any, of the least
68 utilized blocks of spectrum should be reallocated for
69 commercial uses. The creation of the inventory is an
70 essential step in making available more spectrum for

71 commercial and wireless services and meeting the
72 extraordinary spectrum demands that our Nation will soon
73 face.

74 I have also joined our colleagues Jay Inslee and Fred
75 Upton in introducing the Spectrum Relocation Improvement Act.
76 This measure would address an urgent need which was brought
77 to light after the FCC auctioned the advanced wireless
78 spectrum, the AWS spectrum, in 2006. While that spectrum was
79 auctioned more than 3 years ago, the winners of the
80 commercial licenses still do not have full access to the
81 spectrum because it has not been fully cleared by the
82 government users. The bill that we have jointly introduced
83 would hasten the process of clearing federal users from
84 spectrum that the government has reallocated for commercial
85 purposes. It would require the NTIA to publish the
86 transition plan of each federal entity to be relocated after
87 a spectrum auction and it would clarify the steps that
88 federal spectrum users must take in order to receive payment
89 for their relocation cost from the Spectrum Relocation Fund
90 including a requirement that the spectrum fully be
91 reallocated and vacated by the federal users within one year.

92 My goal is to have both the inventory legislation and
93 the bill speeding the reallocation of previously auctioned
94 government spectrum through the committee and through the

95 House at the earliest possible time.

96 I want to thank our witnesses for joining us this
97 morning. We look forward to your testimony and your views on
98 the future demand for wireless spectrum and the ways in which
99 we can take constructive steps in order to meet those
100 challenges.

101 [The prepared statement of Mr. Boucher follows:]

102 ***** COMMITTEE INSERT *****

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103 Mr. {Boucher.} That concludes my opening statement. I
104 am pleased now to recognize the ranking Republican member of
105 our subcommittee, the gentleman from Florida, Mr. Stearns.

106 Mr. {Stearns.} Good morning, and thank you, Mr.
107 Chairman. You mentioned both of these bills and you have
108 talked about what they do, so we are very pleased to have
109 this hearing. I am a cosponsor of both of these bills,
110 original cosponsor.

111 It is very clear that the United States will need
112 additional spectrum to meet the growing demand for wireless
113 broadband. In fact, we may be victims of our own success
114 here. The United States currently leads the world in
115 wireless. Wireless providers have used spectrum to provide
116 U.S. consumers with innovative voice and data services. The
117 number of mobile voice customers in the United States has
118 surpassed the number of wireline customers and the number of
119 mobile broadband customers has increased exponentially over
120 the past several years. As customers increase the amount of
121 time they spend on their mobile devices talking, e-mailing
122 and surfing the Internet, cell sites become constrained for
123 capacity. As a result, providers need more spectrum,
124 especially in order to increase the speed of mobile broadband
125 services. We are facing, in the words of the FCC chairman, a

126 looming spectrum crisis.

127 For example, a voice call requires approximately 10,000
128 bits per second while uploading and downloading video
129 requires millions of bits per second. Countries will need
130 1.3 or 1,300,000 megahertz of spectrum dedicated for
131 commercial use by the year 2015, according to the
132 International Telecommunications Union. Yet the United
133 States currently has only 500 megahertz allocated and only 50
134 megahertz in the auction pipeline.

135 So in order to increase the amount of spectrum available
136 for commercial mobile services, the Administration and the
137 FCC need to inventory the current uses of spectrum bands,
138 especially those below 3 gigahertz that are ideal for mobile
139 services. The bottom line is that we need to know who uses
140 which spectrum bands and the purposes for which they use such
141 bands. Once we have the answers to these questions, the
142 government needs to decide whether to reallocate spectrum for
143 commercial mobile users.

144 If the government is requiring existing spectrum users
145 to vacate reallocated bands, the government also needs to
146 establish a meaningful process for reallocating incumbent
147 users. The process needs to begin sooner rather than later.
148 Inventory reallocation and reallocation all take time and
149 commercial mobile demand for spectrum is increasing, as I

150 mentioned, exponentially.

151 Furthermore, one way to make more spectrum available for
152 commercial purposes is to use government spectrum more
153 efficiently and simply reallocate the spectrum saved. That
154 was the idea behind the Commercial Spectrum Enhancement Act,
155 which was enacted in 2004. The law is designed to provide
156 funding to upgrade the wireless resources of government
157 agencies while clearing additional spectrum for commercial
158 use while the CSEA government frequencies identified for
159 reallocation are auctioned to commercial licensees and the
160 proceeds are used to improve the relocating agencies of
161 wireless facilities. Pursuant to the CSEA, the FCC held the
162 advance wireless service one auction in 2006. Of the 13.7
163 billion raised by the AWS auction, approximately \$1 billion
164 has been spent to reallocate the wireless operations of 12
165 federal agencies. The reallocation procedures outlined in
166 the CSEA worked well in most cases but some problems have
167 cropped up.

168 For example, T Mobile paid \$4.2 billion to build a 3G
169 network. The Department of Defense and the Drug Enforcement
170 Agency are behind schedule in clearing some of the spectrum.
171 However, because of unforeseen costs and complexities in
172 their moves which have been compounded by the confidential
173 nature of some of the agencies' activities, problems like

174 these have prevented the bidders from fully realizing the
175 benefits of their investment in the time frames originally
176 promised and may discourage participation in future
177 reallocation auctions.

178 H.R. 3019 will make the process more efficient. The
179 goal is to better coordinate reallocation so that perspective
180 commercial bidders have increased confidence to bid on the
181 cleared spectrum. This not only helps the commercial bidders
182 but also the reallocating agencies since they will have
183 increased revenue from the auction and a better planned
184 transition.

185 Thank you, Mr. Chairman, for holding this important. I
186 look forward to hearing from the witnesses.

187 [The prepared statement of Mr. Stearns follows:]

188 ***** COMMITTEE INSERT *****

|
189 Mr. {Boucher.} Thank you very much, Mr. Stearns.

190 The chairman of the full committee, the gentleman from
191 California, Mr. Waxman, is recognized for 5 minutes.

192 The {Chairman.} Thank you, Mr. Chairman. I want to
193 thank you for holding this important legislative on two bills
194 that if adopted will create incentives for efficient spectrum
195 utilization and enhance our ability to develop forward-
196 looking spectrum policies. Ongoing developments in wireless
197 broadband technology along with increased consumer demand
198 have raised questions about the sufficiency of current
199 spectrum allocations for wireless communication service.
200 Some experts estimate that the wireless industry in the
201 United States needs an additional 150 megahertz of spectrum
202 to simply keep up with the explosion in wireless data usage
203 and to remain competitive with other nations.

204 Before we can start identifying bands of spectrum that
205 might be made available for these new services, however, we
206 need to understand how existing spectrum is allocated and
207 utilized. In simple terms, we need better information about
208 spectrum usage by federal and non-federal entities.

209 Accordingly, in July of this year, a bipartisan group of
210 18 Energy and Commerce Committee members introduced H.R.
211 3125, the Radio Spectrum Inventory Act. This legislation

212 represents a critical first step in developing a forward-
213 looking spectrum policy. H.R. 3125 is simply about making
214 spectrum use and allocation transparent. It would direct the
215 National Telecommunications Information Administration and
216 the Federal Communications Commission to develop a publicly
217 available inventory of users and usage in the most valuable
218 spectrum bands.

219 The bill also directs the agencies to examine whether
220 there is underutilized spectrum that might be reallocated for
221 more efficient uses. Of course, any comprehensive look at
222 spectrum must be sensitive to military uses and the need to
223 protect information about such uses. The bill therefore
224 establishes a procedure by which information pertaining to
225 national security will continue to be safeguarded. The
226 committee will continue to work with the Department of
227 Defense to make sure that we are sensitive to any concerns
228 regarding our national defense.

229 I would also like to express my general support for H.R.
230 3019, the Spectrum Relocation Improvement Act of 2009. I
231 commend Representatives Inslee and Upton for introducing this
232 thoughtful legislation to improve the current spectrum
233 relocation process by increasing the flow of information and
234 resources as well as enhancing transparency.

235 Thank you again, Mr. Chairman, for holding this hearing.

236 I look forward to working with you as we move these important
237 bills forward.

238 [The prepared statement of Mr. Waxman follows:]

239 ***** COMMITTEE INSERT *****

|
240 Mr. {Boucher.} Thank you very much, Chairman Waxman.

241 The gentleman from Illinois, Mr. Shimkus, is recognized
242 for 2 minutes.

243 Mr. {Shimkus.} Thank you, Mr. Chairman, and I
244 appreciate the hearing.

245 I would say that we need to be working on D block, D
246 block, D block. If we can't get the D block right, how in
247 the heck are we going to do other allocations of other
248 spectrums? And my focus on the D block is, as everyone
249 knows, being involved with the E-911 caucus, is emergency
250 services and communication, and hopefully my colleague Anna
251 will show and even Jane Harman and we will say shame on us if
252 we have a next disaster and we are not ready to communicate
253 effectively. Shame on us if we have another 9/11. Shame on
254 us if we have another Katrina and we have sheriff departments
255 not talking to firefighters, we have firefighters not talking
256 to the National Guard.

257 So I appreciate this focus, and we all understand the
258 importance of having an inventory but if we can't get the D
259 block right in a timely manner, who are we kidding ourselves?
260 So I would hope, Mr. Chairman, and the full committee
261 chairman that we would really work on the parameters to push
262 for appropriate and proper auction in which we get all the

263 benefits, we bring in additional revenue but we also develop
264 the revenue streams which will allow us to provide grants and
265 money to our first-line responders to get this one important
266 aspect of our homeland security issues and debates in line,
267 and I yield back my time.

268 [The prepared statement of Mr. Shimkus follows:]

269 ***** COMMITTEE INSERT *****

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270 Mr. {Boucher.} Thank you very much, Mr. Shimkus.

271 The chairman emeritus of the full Energy and Commerce
272 Committee, the gentleman from Michigan, Mr. Dingell, is
273 recognized for 5 minutes.

274 Mr. {Dingell.} Thank you, Mr. Chairman, and thank you
275 for convening today's hearing on H.R. 3125, the Radio
276 Spectrum Inventory Act, and H.R. 3019, the Spectrum
277 Relocation Improvement Act of 2009. These two bills, of
278 which I am an original cosponsor, will aid the federal
279 Administration's allocation of spectrum, a commodity of
280 increasing importance, especially given recent advances in
281 mobile broadband services. Like all the rest of us, I am
282 concerned about the allocation about the future and also
283 about what we have done so far and whether it has contributed
284 to the proper use of the spectrum for the future and for all
285 of our people.

286 These two pieces of legislation are complementary to the
287 Federal Communications Commission's duty to present to the
288 Congress a national broadband plan as mandated under the
289 American Recovery and Reinvestment Act. To be certain, the
290 success of the development of such a plan and the
291 implementation of its recommendations will be facilitated in
292 no mean degree by a clear and better understanding of the

293 spectrum available for use and a better and a more efficient
294 process by which to allocate it for commercial use. This I
295 believe will be accomplished in large part by enactment of
296 the bills pending for the committee's consideration today.

297 With this in mind, I welcome our witnesses and look
298 forward to hearing their views on the legislation before us.
299 In particular, I hope they will engage in a frank discussion
300 about the relationship between H.R. 3125, H.R. 3019 and
301 proposals currently circulating in the FCC to reallocate
302 spectrum from over-the-air television broadcasters to mobile
303 communication providers as a part of the national broadband
304 plan.

305 Thank you for your courtesy, Mr. Chairman, and I commend
306 you again for this hearing and the foresight that you are
307 showing with it. I yield back the balance of my time.

308 [The prepared statement of Mr. Dingell follows:]

309 ***** COMMITTEE INSERT *****

|
310 Mr. {Boucher.} Thank you very much, Chairman Dingell.

311 The gentleman from Oregon, Mr. Walden, is recognized for
312 2 minutes.

313 Mr. {Walden.} Thank you very much, Mr. Chairman.

314 First of all, thank you for holding a legislative
315 hearing on these two bills. I think that is really important
316 in the improvement of our process to have this oversight
317 before we mark it up.

318 I want to welcome my Senator, Gordon Smith, who has
319 taken over the reins at the National Association of
320 Broadcasters. I am still his Congressman, even if he is not
321 now my Senator, but we have been friends and colleagues in
322 the legislative arena in Oregon and here for many years and
323 we welcome you at the NAB, and now that I have sold our
324 broadcast stations and you have gone to the broadcasters, I
325 am going to go into pea packing.

326 I want to point out a couple of things. First of all, I
327 concur with my colleague from Illinois, Mr. Shimkus, on the D
328 block issue. We need to resolve that. But I also want to
329 point out another issue that has come up related to public
330 safety and I am not sure it is going to get spoken to today,
331 and that is use of the band by amateur radio operators as
332 well. As we evaluate the value of spectrum, understand that

333 when 9/11 happened, when Katrina happened, when other
334 communication systems failed and even any day when there is a
335 hurricane or a disaster anywhere in the world, it is
336 frequently the amateur radio operators who step to the fore
337 with their own equipment and provide the emergency
338 communication when everything else fails. It is hard to put
339 a value on that unless you can put a value on that unless you
340 can put a value on saving lives and helping our law
341 enforcement community and our rescue community get through
342 really difficult times, so they are there when needed all the
343 time and so that needs to be a part of what we consider.

344 Regarding the FCC's notice, I am very concerned about
345 what I am reading regarding Professor Benjamin's comments and
346 his paper. He is now a very top advisor to the chairman of
347 the FCC. I hope this committee will look at some of the
348 things he has had to say including how every dollar of
349 additional cost for broadcasters is one less dollar for
350 profit and thus reduces the attractiveness of over-the-air
351 broadcasting as a business model but regulation would attend
352 to entrench broadcasting in place on the spectrum. Then the
353 regulation will not help free up spectrum and should be
354 avoided. In other words, he is calling for the death of
355 over-the-air free broadcasting, which I think is a real
356 abomination, and we will get into that more.

357 I know my time is expired, Mr. Chairman, and I look
358 forward to hearing from our witnesses.

359 The prepared statement of Mr. Walden follows:]

360 ***** COMMITTEE INSERT *****

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361 Mr. {Boucher.} Thank you very much, Mr. Walden.

362 And the Chair now recognizes the gentleman from
363 Pennsylvania, Mr. Doyle, for two minutes.

364 Mr. {Doyle.} Thank you, Mr. Chairman, for holding this
365 important hearing. I am going to waive opening statement and
366 look forward to hearing from the witnesses.

367 The prepared statement of Mr. Doyle follows:]

368 ***** COMMITTEE INSERT *****

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369 Mr. {Boucher.} Thank you, Mr. Doyle. We will add 2
370 minutes to your questioning time for our panel of witnesses.

371 The gentleman from Washington State, Mr. Inslee, is
372 recognized for 2 minutes.

373 Mr. {Inslee.} Thank you, Mr. Chair, and thank you for
374 holding this hearing. We know how important this is.

375 In my State, as we speak, I have got hundreds if not
376 thousands of constituents designing these new Internet and
377 broadband services of the next generation. It is very
378 important to a lot of my neighbors, people I represent. It
379 is important to the country as a whole for its job creation
380 possibilities. President Obama has recognized broadband
381 infrastructure investment has tremendous job potential but we
382 know we are going to have to have additional allocation of
383 spectrum for commercial use to really reach the fruition of
384 the tremendous promise here. And in order to first identify
385 that spectrum, I want to commend Chairman Waxman for his
386 inventory bill, which is a first step. I am proud to be an
387 original cosponsor and look forward to getting that done as a
388 first step.

389 But once the spectrum is identified and ready for
390 auction, we really have to assure that procedures are in
391 place this time to adequately guide the auction process. In

392 the 2007 advance wireless services auction, the process and
393 reporting requirements were insufficient to appraise the
394 length, complexity and size of federal relocation efforts.
395 They also failed to ensure a timely transition of spectrum by
396 federal agencies and business planning by commercial bidders.
397 It is this very problem that the bill that I am prime
398 sponsoring seeks to address.

399 Fundamentally, our bill will do two things. First, it
400 increases the amount and quality of information available to
401 potential bidders before an auction occurs, and second, it
402 expedites the flow of auction proceeds to the relocating
403 agency to keep the relocation process on track. I am
404 convinced that this more complete information about the
405 effective federal agency systems, the relocation cost
406 estimates and schedules will reduce the risk for potential
407 bidders, will ensure timely relocation payment and movement
408 by federal agencies and will ensure that the next generation
409 of consumer-demanded services are delivered. It will not
410 cure the common cold. Otherwise it sounds pretty good.

411 I want to thank my colleagues, Mr. Upton and Chairman
412 Boucher, for their work on advancing this and I look forward
413 to moving this so that we can really fulfill the promise of
414 our brilliant constituents. Thank you.

415 The prepared statement of Mr. Inslee follows:]

416 ***** COMMITTEE INSERT *****

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417 Mr. {Boucher.} Thank you very much, Mr. Inslee.

418 The gentleman from Nebraska, Mr. Terry, is recognized
419 for 2 minutes.

420 Mr. {Terry.} Thank you, Mr. Chairman, for holding this
421 legislative hearing and I look forward to hearing our
422 witnesses. We have to make sure that we do this right and in
423 balance with the spectrum that is used in the military. I
424 have the pleasure of representing the 55th Wing, which is an
425 electronic warfare and information operation out of Offutt
426 Air Force Base right outside of Omaha in Bellevue, and I have
427 a letter from the Association of Old Crows that set out some
428 of the issues that we may have discussing here with the
429 spectrum and I would like to offer that letter into the
430 record, Mr. Chairman.

431 [The information follows:]

432 ***** COMMITTEE INSERT *****

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433 Mr. {Boucher.} Without objection.

434 Mr. {Terry.} Then last, in our committee memorandum, it
435 starts off with the introduction criticizing the Universal
436 Service Fund and calling it ineffective, and then the second
437 paragraph also starts off with Universal Service Fund. So
438 somehow Universal Service Fund is important in this
439 discussion and I look forward to your comments on how
440 Universal Service Fund affects the spectrum and your usage of
441 it. I yield back.

442 The prepared statement of Mr. Terry follows:]

443 ***** COMMITTEE INSERT *****

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444 Mr. {Boucher.} Thank you very much, Mr. Terry.

445 The gentlelady from California, Ms. Matsui, is
446 recognized for 2 minutes.

447 Ms. {Matsui.} Thank you, Mr. Chairman. Thank you for
448 calling this important hearing today. I would also like to
449 thank today's witnesses for being with us today.

450 We are here today to discuss how we can promote greater
451 transparency on spectrum issues for expediting the process in
452 which we can allocate additional spectrum in the marketplace.
453 According to recent estimates, there are approximately 270
454 million wireless subscribers in the United States but that
455 number is growing. According to recent reports, the current
456 economic recession has increased the number of consumers
457 opting for only cell phones over traditional landlines.
458 There is concern that the current allocation of spectrum for
459 mobile broadband services is inadequate to meet the rapidly
460 growing demand. In fact, the FCC recently warned of a
461 potential spectrum crisis that could threaten the expansion
462 of broadband services. While the DTV transition helped free
463 up more spectrum, the need for commercial spectrum capacity
464 will only expand as broadband continues to be delivered to
465 more areas.

466 To ensure transparency and help ensure we meet demand,

467 Chairmen Waxman and Boucher have introduced the Radio
468 Spectrum Inventory Act, and Congressmen Inslee and Upton have
469 introduced the Spectrum Relocation Improvement Act. I am a
470 cosponsor of both pieces of legislation. Moving forward,
471 spectrum availability will be key to ensuring competition,
472 improved public safety, meeting growing demand for wireless
473 services and any proposal going forward should ensure
474 underserved urban communities are properly considered.

475 I thank you, Mr. Chairman, for holding this important
476 hearing today and I yield back the balance of my time.

477 [The prepared statement of Ms. Matsui follows:]

478 ***** COMMITTEE INSERT *****

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479 Mr. {Boucher.} Thank you, Ms. Matsui.

480 The gentlelady from Tennessee, Ms. Blackburn, is
481 recognized for 2 minutes.

482 Mrs. {Blackburn.} Thank you, Mr. Chairman.

483 I want to welcome the panel that is before us today. We
484 are delighted that you are here, and I am also delighted, Mr.
485 Chairman, that we are talking about legislation that actually
486 represents what is a balanced give and take, and that is not
487 something we often do in this Congress. All too often we are
488 talking about taking from the American taxpayer and giving to
489 big business, but today we are going to be talking about
490 raising money from big business through an equal exchange of
491 value for a commodity, and this represents good policy and
492 good government and I am pleased we are having the hearing.

493 As we plot a strategy on how we move forward on
494 broadband and how to best utilize the spectrum, I am one of
495 many on this committee, as you have heard, who have long
496 advocated for an effective and efficient inventory and
497 assessment of what is available and how we best use it and
498 how we best allocate it. I think it is important. Mr.
499 Shimkus mentioned D block and some of the work that needs to
500 be done as we learn some lessons from that approach. We know
501 that this is a robust industry. We know that well over 80

502 percent of consumers are happy with their wireless service,
503 according to a recent GAO study. That is pretty good.
504 Eighty percent of people like the product that is there and
505 that is available. There is ample motivation to get as much
506 information as possible on spectrum availability and evaluate
507 all of our options for relocation, so I am pleased we are
508 bringing many different parts of this discussion together
509 today, and I yield back the balance of my time.

510 [The prepared statement of Mrs. Blackburn follows:]

511 ***** COMMITTEE INSERT *****

|
512 Mr. {Boucher.} Thank you, Ms. Blackburn.

513 The gentleman from California, Mr. McNerney, is
514 recognized for 2 minutes.

515 Mr. {McNerney.} Well, thank you, Mr. Chairman, for
516 convening today's hearing on two bipartisan bills that are
517 intended to help our country make better use of our spectrum.
518 H.R. 3125, the Radio Spectrum Inventory Act, will provide for
519 the gathering of information about spectrum use to increase
520 transparency and help us understand exactly how the spectrum
521 is now utilized.

522 This is no small task but it is absolutely essential to
523 make informed decisions on allocating spectrum to meet the
524 ever-increasing demand for wireless broadband spectrum. It
525 has been reported that the U.S. allocation of spectrum
526 compares poorly with OECD nations and is inadequate to meet
527 the growing demand. We can't let that happen. We are going
528 to do the best we can to help industry take the lead and make
529 our Nation lead the world in broadband.

530 H.R. 3019, the Spectrum Relocation Improvement Act,
531 streamlines the spectrum auction process and will reduce the
532 time required to reallocate federal spectrum cleared for
533 commercial use, allowing licensees to utilize their spectrum
534 without unnecessary delay. As a cosponsor of both of these

535 bills, I recognize the importance of properly managing
536 available spectrum. I also understand that the sponsors of
537 H.R. 3125 are working with the Department of Defense to
538 ensure that the bill also protects ongoing military uses of
539 spectrum and I look forward to working with my colleagues to
540 improve this legislation.

541 I thank the witnesses for taking time to share their
542 perspective on this legislation and I yield back the balance
543 of my time.

544 [The prepared statement of Mr. McNerney follows:]

545 ***** COMMITTEE INSERT *****

|
546 Mr. {Boucher.} Thank you, Mr. McNerney.

547 The gentleman from Michigan, Mr. Upton, is recognized
548 for 2 minutes. Oh, not here. The gentleman from Indiana,
549 Mr. Buyer, is recognized for 2 minutes.

550 Mr. {Buyer.} Mr. Chairman, I would ask that my time be
551 placed upon questions, and I welcome my friends, Steve
552 Largent and Gordon Smith.

553 [The prepared statement of Mr. Buyer follows:]

554 ***** COMMITTEE INSERT *****

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555 Mr. {Boucher.} The gentleman will have added time for
556 questions.

557 The gentlelady from the Virgin Islands, Ms. Christensen,
558 is recognized for 2 minutes.

559 Mrs. {Christensen.} Thank you, Mr. Chairman. I am
560 going to also waive my opening statement and put it into the
561 record. I would like to welcome the witnesses, especially
562 Senator Smith, who I believe is here for the first time.
563 Thank you. I yield back.

564 [The prepared statement of Mrs. Christensen follows:]

565 ***** COMMITTEE INSERT *****

|
566 Mr. {Boucher.} Thank you, Ms. Christensen.

567 The gentleman from Massachusetts, Mr. Markey, is
568 recognized for 2 minutes.

569 Mr. {Markey.} Thank you, Mr. Chairman, and thank you so
570 much for having this hearing.

571 Back in 1993, we were in a world where there were two
572 cell phone companies. They each charged about 50 cents a
573 minute, and it was analog, but in 1993 this committee moved
574 over 200 megahertz of spectrum and we created the third,
575 fourth, fifth and sixth cell phone licenses. They all went
576 digital. And by 1996, the price had dropped to under 10
577 cents a minute. The first two companies had moved to digital
578 as well and we had a revolution that was ongoing, and it was
579 so successful that right now there are people sitting out
580 here in the audience checking their BlackBerry rather than
581 listening to my opening statement, and that is a tribute to
582 what our committee made possible. And now we are on to the
583 next stage of this revolution where we know that the Hulu,
584 Google, eBay, Amazon revolution is something that continues
585 on. This committee should be very proud of it. And by
586 reallocating even more spectrum will make it possible for the
587 entrepreneurs, will make it possible for these technology
588 geniuses to once again brand a revolution made in America.

589 We have to stay ahead of this curve. We have to make sure
590 that it is something that is American. We did that in the
591 1900s. We have a chance to do it again.

592 I congratulate, Mr. Chairman, for your work on this
593 issue. It was bipartisan then. It should be bipartisan
594 again. We are into a wealth creation. That is what this is
595 all about, and the more effectively that we can think this
596 issue through, which is what you are doing, is the more
597 likely that we will create the greatest amount of wealth that
598 will help our country become more prosperous, and I thank you
599 for doing that.

600 The prepared statement of Mr. Markey follows:]

601 ***** COMMITTEE INSERT *****

|
602 Mr. {Boucher.} Thank you very much, Mr. Markey.

603 The gentlelady from Florida, Ms. Castor, is recognized
604 for 2 minutes.

605 Ms. {Castor.} Because it is impossible, Mr. Chairman,
606 to follow Mr. Markey, I am going to submit my statement for
607 the record and yield back my time. Thank you for holding the
608 hearing.

609 The prepared statement of Ms. Castor follows:]

610 ***** COMMITTEE INSERT *****

|

611 Mr. {Boucher.} Thank you, Ms. Castor.

612 The gentleman from Ohio, Mr. Space, is recognized for 2

613 minutes.

614 Mr. {Space.} Thank you, Mr. Chairman, and I welcome our

615 witnesses. I too would waive my opening.

616 [The prepared statement of Mr. Space follows:]

617 ***** COMMITTEE INSERT *****

|
618 Mr. {Boucher.} Thank you very much, Mr. Space.

619 That concludes opening statements from members of the
620 subcommittee, and we now welcome our panel of witnesses this
621 morning. We are pleased to have each of you with us today
622 and we very much look forward to your testimony.

623 Just a brief word of introduction about each of our
624 witnesses. Dr. Dale Hatfield is an adjunct professor with
625 the Interdisciplinary Telecommunications Program at the
626 University of Colorado. Steve Largent, former Member of the
627 House of Representatives and former member of this committee,
628 is the president and chief executive officer of the Cellular
629 Telecommunications Industry Association, the Wireless
630 Association. Mr. Michael Calabrese is vice president and
631 director of the Wireless Future Program at the New America
632 Foundation. Former Senator Gordon Smith, we welcome to this
633 committee for the first time in his new role as president of
634 the National Association of Broadcasters, and we look forward
635 to a long and successful partnership with you. Dr. Ray
636 Johnson is the senior vice president and chief technology
637 officer of the Lockheed Martin Corporation, and Mr. Thomas
638 Stroup is the chief executive officer of Shared Spectrum
639 Company. We welcome each of you.

640 Without objection, your prepared written statement will

641 be made a part of the record, and we would ask that you keep
642 your oral summaries to approximately 5 minutes.

643 Mr. Hatfield, we will be happy to begin with you.

|
644 ^STATEMENTS OF DALE HATFIELD, ADJUNCT PROFESSOR,
645 INTERDISCIPLINARY TELECOMMUNICATIONS PROGRAM, UNIVERSITY OF
646 COLORADO AT BOULDER; STEVE LARGENT, PRESIDENT AND CEO, CTIA-
647 THE WIRELESS ASSOCIATION; MICHAEL CALABRESE, VICE PRESIDENT
648 AND DIRECTOR, WIRELESS FUTURE PROGRAM, NEW AMERICA
649 FOUNDATION; HON. GORDON H. SMITH, PRESIDENT AND CEO, NATIONAL
650 ASSOCIATION OF BROADCASTERS; RAY O. JOHNSON, PH.D., SENIOR
651 VICE PRESIDENT AND CHIEF TECHNOLOGY OFFICER, LOCKHEED MARTIN
652 CORPORATION; AND THOMAS STROUP, CHIEF EXECUTIVE OFFICER,
653 SHARED SPECTRUM COMPANY

|
654 ^STATEMENT OF DALE HATFIELD

655 } Mr. {Hatfield.} Thank you, Mr. Chairman, Chairman
656 Boucher, Ranking Member Stearns and members of the
657 subcommittee. I am very pleased and honored to appear before
658 you today to testify on the topic of radio spectrum
659 management, and in particular on the issues raised by H.R.
660 3125 and by H.R. 3019.

661 My name is Dale Hatfield. In addition to the position
662 that you just mentioned, I am also the executive director of
663 the Silicon Flat Iron Center for Law, Technology and
664 Entrepreneurship at the University of Colorado at Boulder. I

665 should note in the past that I have engaged in independent
666 consulting activities including for some members that are
667 represented on the panel today. As I detailed in my prepared
668 testimony, I have other affiliations but today I am
669 testifying entirely on my own behalf as a private citizen.

670 Now, in my written testimony, I present some background
671 on spectrum management and then focus on five overarching
672 themes or points. It is those five points that I will
673 briefly summarize now.

674 First, I have been involved in spectrum management
675 issues for over 4 decades and it is very clear to me that we
676 are now at an unprecedented period of demand for access to
677 spectrum in the critical frequency range of roughly 300
678 megahertz to 3 gigahertz. This increase in demand for
679 spectrum is propelled by increases in the number of uses of
680 the resource and the number of users and the amount of
681 bandwidth or capacity consumed per user per use. While the
682 exponential growth in commercial cellular bandwidth
683 requirements is perhaps the most visible, there are a host of
684 other increasing demands for spectrum in this range as well
685 including important ones that support public safety, homeland
686 security and national defense priorities. Thus, in my
687 opinion, the spectrum scarcity issue that the legislation
688 sets out to address is very real.

689 Second, in my written testimony I review five
690 traditional techniques that we have used in the past to
691 accommodate growth and demand for the resource: one, going
692 higher in frequency; two, improving the technical efficiency
693 of spectrum utilization; three, reallocating existing
694 spectrum from use to another; four, increasing the amount of
695 spectrum sharing; and five, reusing spectrum more intensely
696 in the geographic dimension. I conclude that for technical
697 reasons, going higher in frequency will be of limited utility
698 in solving the current spectrum crisis associated with
699 wireless mobile data applications, and that while further
700 improvements in technical efficiency can help, they are apt
701 to be inadequate in solving the problems associated with the
702 orders of magnitude increases in spectrum demand. That
703 leaves relocation, increased sharing and more intense
704 frequency reuse at least in some services as potential
705 solutions, albeit ones with unique challenges of their own.

706 Third, setting aside spectrum relocation for the moment,
707 I next focused on increasing sharing and in more intense
708 frequency reuse. With regard to the former, I comment
709 favorably on past steps that the FCC has taken to encourage
710 voluntary sharing of the resource through secondary markets.
711 I go on to conclude that a combination of increased
712 incentives or mandates for spectrum sharing coupled with more

713 decentralized, more opportunistic and more technologically
714 sophisticated techniques for accessing spectrum can be a
715 significant helping in avoiding the looming crisis. In terms
716 of increased frequency reuse, I first note that it is not
717 always possible because of the nature of some services. In
718 other words, some services like radar require very high power
719 operating over long distances and therefore you can't reuse
720 the spectrum on a geographic basis as easily. I also wanted
721 to note that spectrum reuse may be constrained by the
722 availability of suitable antenna locations and economic
723 backhaul facilities.

724 Fourth, I comment that I am a strong supporter of
725 conducting the spectrum inventory called out in H.R. 3125 and
726 hence for the legislation itself because I am a strong
727 believer in that old adage, you can't manage what you don't
728 measure. It is that simple. I go on to conclude that a
729 comprehensive and ongoing inventory is necessary to support
730 two of the most promising of the three ways of averting a
731 spectrum crisis, that is, relocation and increased sharing.

732 Fifth, I observe that while I am a strong supporter of
733 conducting spectrum inventories, I also note based on many
734 years of experience that there are potential shortcomings
735 associated with a paper study, at least in some services.
736 Therefore, I conclude that the inventory mandated in the

737 proposed legislation should be augmented by selected field
738 measurements to gain additional information on actual usage
739 in those bands identified as being the most promising for
740 relocation or increased sharing.

741 That concludes my oral testimony, Mr. Chairman, and I
742 would be happy to respond to any questions that you or the
743 rest of the subcommittee might have.

744 [The prepared statement of Mr. Hatfield follows:]

745 ***** INSERT 1 *****

|

746 Mr. {Boucher.} Thank you very much, Mr. Hatfield.

747 Mr. Largent, we will be happy to hear from you.

|
748 ^STATEMENT OF STEVE LARGENT

749 } Mr. {Largent.} Thank you, Mr. Chairman, and I want to
750 thank you and the ranking member and say to all the members,
751 hope you have a Merry Christmas, Happy New Year, hope you get
752 there.

753 I want to thank you for the opportunity also to share
754 the wireless industry's views on the Radio Spectrum Inventory
755 Act and the Spectrum Relocation Improvement Act. These bills
756 are much needed bookends for a process that will enable
757 additional spectrum to be made available for the wireless
758 broadband initiative and other services.

759 Today the United States is the world leader in wireless
760 broadband. While having less than 7 percent of the global
761 wireless subscribers, the United States is home to more than
762 20 percent of global 3G subscribers. Our 112 million 3G
763 subscribers are more than any other country and more than the
764 third, fourth, fifth and sixth countries combined.
765 Additionally, the most advanced wireless devices which are
766 manufactured by global companies and could be launched
767 anywhere in the world routinely debut in the U.S.
768 marketplace. As a pair of former NTIA administrators
769 recently noted, the convergence of mobile wireless services

770 and high-speed Internet access and the evolution of handsets
771 from telephones to powerful handheld computers promises to
772 transform the way we work, learn, deliver health care, manage
773 energy consumption and enhance public safety.

774 The key to translating this promise into reality is
775 access to more spectrum. CTIA believes there is an urgent
776 need to identify additional spectrum that can be made
777 available for wireless broadband and other advanced wireless
778 services. By providing for a comprehensive and timely
779 inventory of spectrum below 10 gigahertz, enactment of H.R.
780 3125 would represent an important step towards meeting
781 rapidly accelerating demand and maintaining U.S. leadership
782 in the global wireless marketplace

783 How much spectrum do we need? The ITU projects that by
784 2015, developed countries will need at least 1,300 megahertz
785 of spectrum for commercial wireless operations. Since the
786 United States currently has less than 500 megahertz of
787 spectrum available for commercial wireless services, we have
788 asked the FCC to identify additional spectrum that can be
789 reallocated to help us meet the ITU's benchmark.

790 Many of our trading partners are taking steps towards
791 this goal and the United States needs to keep up if we are to
792 stay ahead. A properly constructed inventory effort is a
793 sound place to start. The inventory is only the first step,

794 however. Once the inventory is complete, policymakers must
795 use it to reallocate spectrum for advanced wireless services.

796 History demonstrates that it can take a decade or more
797 to reallocate spectrum for commercial use and put such
798 spectrum in the hands of providers of commercial mobile
799 services, more than a decade. Given the exploding demand for
800 mobile broadband, we must move more quickly than was the case
801 with either AWS or 700 megahertz efforts. We simply can't
802 wait until 2020 or beyond.

803 We recognize there will be critics of the effort to move
804 forward with an inventory and relocation of spectrum. They
805 will claim that carriers should be more efficient with the
806 spectrum already available, that we can build out way out of
807 the problem or that we have already seen an expansion in the
808 amount of spectrum available for commercial services through
809 the recent AWS and 700 megahertz auctions. There are sound
810 reasons why the subcommittee should dismiss these criticisms,
811 and I have discussed these in my written statement.

812 Finally, once an inventory is complete and spectrum is
813 identified for relocation and auction, the improvements to
814 the spectrum relocation process proposed by H.R. 3019 will
815 ensure that the relocation process works smoothly for all
816 parties.

817 Thank you for the opportunity to discuss these matters

818 with the subcommittee. We look forward to working with you
819 to ensure that the U.S. wireless industry continues to serve
820 as an engine for jobs, economic growth and the American
821 competitive advantage. Thank you, Mr. Chairman.

822 [The prepared statement of Mr. Largent follows:]

823 ***** INSERT 2 *****

|

824 Mr. {Boucher.} Thank you, Mr. Largent.

825 Mr. Calabrese.

|
826 ^STATEMENT OF MICHAEL CALABRESE

827 } Mr. {Calabrese.} Good morning. First I would like to
828 thank the committee's leadership for taking up these two very
829 complementary and important pieces of legislation on a
830 notably bipartisan basis. A national goal of not merely
831 affordable broadband access but of seamless mobile
832 connectivity anywhere and anytime will require an enormous
833 increase in available spectrum capacity.

834 The Apple iPhone has proven to be the canary in the
835 proverbial spectrum coalmine. Advanced smart phones consume
836 hundreds of times the bandwidth of ordinary cell phones.
837 With sufficient spectrum, pervasive connectivity will rapidly
838 become integrated as well in applications for sensing
839 networks, mobile health monitoring, energy conservation,
840 education and more. This exploding demand and the continued
841 focus on exclusive licensing by auction has served to
842 reinforce the conventional wisdom that spectrum is scarce.
843 In reality, the only scarcity is government permission to use
844 spectrum, that is, licensing. Spectrum capacity itself is
845 very abundant. Even in the most valuable beachfront
846 frequencies below 3 gigahertz, actual spectrum use
847 measurements show that the vast majority of frequency bands

848 are not being used in most locations and at most times. This
849 gross underutilization of the Nation's spectrum resource
850 should be an urgent concern.

851 Spectrum is not only an immensely valuable and publicly
852 owned resources but it is one that is infinitely renewable
853 every millisecond. That is why New America and the Broader
854 Public Interest Spectrum Coalition that we work with strongly
855 support enactment of H.R. 3125, the Radio Spectrum Inventory
856 Act. We agree that the more comprehensive inventory
857 described in the House bill is needed. A more granular and
858 comprehensive description of spectrum use in each market will
859 assist policymakers, entrepreneurs and technologists to
860 propose new ways to enhance both access and efficiency. We
861 also agree it is important to extend the inventory up to 10
862 gigahertz, as the House bill provides.

863 Spectrum mapping would help facilitate expanded access
864 to broadband in at least three ways. First, by improving the
865 functioning of secondary markets for license transfers and
866 leasing; second, it will provide information on what it would
867 take to clear some very underutilized bands for new uses, and
868 third, and perhaps more important, it will reveal the far
869 greater number of frequency bands that can be made available
870 for shared access in discrete geographic areas at certain
871 times of the day or year or at certain altitudes or power

872 levels. We expect rural areas to be the most likely and
873 immediate beneficiaries of this mapping.

874 The one shortcoming of H.R. 3125, in our view, is that
875 an inventory of spectrum assignments should be augmented by
876 actual spectrum use measurements as Dale just mentioned.
877 Measurements and eventually a system of spectrum use
878 monitoring can provide a more nuanced window into how, when,
879 where and to what extent bands are actually in use. We
880 realize that measurements add a budgetary cost. Fortunately,
881 we believe appropriated funds are available over the next 4
882 years for a very robust implementation of the inventory act.
883 As part of the Recovery Act, Congress appropriated \$350
884 million for a ``comprehensive nationwide inventory map of the
885 Nation's existing broadband capabilities.'' Since NTIA will
886 award less than half the available funding to the States for
887 broadband mapping, Congress could clarify that a portion of
888 the remainder be used to inventory the airwaves as well.

889 We also strongly support H.R. 3019, the Spectrum
890 Relocation Improvement Act. Nowhere is spectrum
891 underutilization more evident than in many of the bands
892 reserved for use by the federal government itself. While we
893 support H.R. 3019, we also believe the legislation should be
894 broadened to take advantage of a critical opportunity to free
895 up far greater spectrum capacity. H.R. 3019 would continue

896 to limit eligibility for radio system modernization to
897 agencies actually clearing off a set of frequencies. While
898 only a tiny fraction of federal spectrum could be cleared and
899 auctioned in the near future, a far greater number of bands
900 could be shared more intensively by taking advantage of
901 advances in smart radio technologies. Federal spectrum
902 incumbents need the resources to take affirmative steps to
903 enable more intensive access and band sharing by other users.
904 This could be a real win-win for the military. New and
905 upgraded federal systems could be designed and procured with
906 the broader public interest and spectrum access in mind and
907 not only in the very limited case of a band being cleared for
908 auction.

909 I will stop there. Thank you very much, and I will be
910 pleased to take any questions.

911 [The prepared statement of Mr. Calabrese follows:]

912 ***** INSERT 3 *****

|

913 Mr. {Boucher.} Thank you, Mr. Calabrese.

914 Mr. Smith.

|
915 ^STATEMENT OF HON. GORDON H. SMITH

916 } Mr. {Smith.} Mr. Chairman, Ranking Member Stearns,
917 members of this honorable committee, it is indeed a pleasure
918 and a privilege for me to be before you to speak a few
919 thoughts about spectrum on behalf of the National Association
920 of Broadcasters.

921 First, NAB believes that any inventory spectrum should
922 be comprehensive. Let us look at all the bands and all the
923 services including the federal government bands and let us
924 view how each service is using its existing spectrum.
925 Second, our national priorities should recognize the value
926 that free over-the-air broadcasting brings to every American.
927 Broadcasting and broadband are not either/or propositions, as
928 some suggest. I believe that is a false choice. Third, we
929 should challenge all services to be efficient and innovative
930 users of spectrum.

931 Through our recent transition to digital, broadcasting
932 has become more efficient. With your help, the transition
933 was a resounding success and the benefits are remarkable. In
934 a digital world, viewers receive many new programming streams
935 and a wide variety of content and local news in high
936 definition. It would be shortsighted to stunt that growth

937 and dampen what is an even brighter future for broadcasting.
938 If broadcasting is limited or eliminated, consumer investment
939 and expectations in DTV receivers would be stranded.
940 Consumers spent an estimated \$25 billion in HDTV receivers in
941 2009 alone. Millions of other Americans invested time,
942 effort and funds on converter boxes, and the U.S. government
943 spent \$2 billion to help them with this. The broadcasters
944 spent an additional \$10 billion to make the transition.

945 For years, consumers have been promised that the digital
946 upgrade would usher in a new era of high-quality television
947 with new and more diverse programming, more channels and a
948 host of new services all for free and over the air. If, as
949 some advocate, that this all be done away with, consumers
950 would realize none of these benefits. Through the DTV
951 transition, broadcasters gave back 108 megahertz of spectrum.
952 Broadcast television is the first wireless service to ever
953 substantially reduce its spectrum use while providing an
954 increase in services.

955 Then there is mobile DTV. This year, the television
956 industry adopted a new mobile digital television standard,
957 turning on the green light for manufacturing and
958 implementation, and the results are nothing short of
959 stunning. Members of the committee, this is a mobile TV.
960 Right now it is playing a program from NBC. There are seven

961 channels in the Washington, D.C., metropolitan area that are
962 doing this. It is also a cell phone. And this combination
963 of technologies is, I believe, the future of mobile wireless
964 communications. It is not an exaggeration to say that you
965 will soon be able to receive broadcast television signals on
966 almost any device. This is an example. Soon your BlackBerry
967 will be a TV. Your iPhone could be a TV. You name it, we
968 are on the cusp of it, and to short-circuit it now it seems
969 to me would be very unwise.

970 Broadcasting's ability--and this is very important to
971 understand. Broadcasting's ability to serve one to many in
972 small-bandwidth segments is unique among all services. At
973 moments of national significance or tragedy when millions of
974 Americans are seeking information, broadcasting is the most
975 efficient delivery system. With each new viewers,
976 broadcasters' use of spectrum becomes more efficient without
977 any additional burden on spectrum. By contrast, with
978 wireless broadband, each stream of content to every
979 individual places an additional strain on the wireless
980 network, clogging up the bandwidth, and there is more. For
981 example, a company called Sesmi is working with broadcasters
982 to provide a blended broadcast/broadband system. If you
983 haven't seen this, Members, I urge you to do it. That system
984 is more affordable, high quality and an alternative, a more

985 affordable alternative to cable and satellite.

986 A comprehensive objective examination of spectrum
987 allocation and usage is a worthwhile endeavor. Such an
988 analysis if done forthrightly and without bias will
989 demonstrate that broadcasters continue to be the effective
990 custodians of our Nation's airwaves.

991 Many broadcast services have not been and cannot be
992 efficiently replicated by broadband services. Broadcasters,
993 for example, help to save lives through timely coverage of
994 natural disasters and other emergencies, and by coordinating
995 with local law enforcement officials via Amber Alerts,
996 broadcasters have participated in the recovery of 492
997 abducted children.

998 Mr. {Boucher.} Mr. Smith, if you could wrap up, you are
999 a bit beyond your time here.

1000 Mr. {Smith.} Let us not forget the concerns we all
1001 shared during the DTV transition. We spent a lot of time to
1002 get it right and we did it so that economically
1003 disadvantaged, the elderly, rural and ethnic minorities are
1004 not left out with access to critical news and information.

1005 And finally, Mr. Chairman, if my statement is in the
1006 record, I think it is important that when you consider
1007 highest and best use and you put all of these public values
1008 in, the value of broadcasting is self-evident. Thank you,

1009 sir.

1010 [The prepared statement of Mr. Smith follows:]

1011 ***** INSERT 4 *****

|

1012 Mr. {Boucher.} Thank you very much, Mr. Smith.

1013 Dr. Johnson.

|
1014 ^STATEMENT OF RAY O. JOHNSON

1015 } Mr. {Johnson.} Chairman Boucher, Ranking Member Stearns
1016 and members of this subcommittee, good morning and thank you
1017 for inviting Lockheed Martin Corporation to participate in
1018 today's hearing on the Radio Spectrum Inventory Act. My name
1019 is Dr. Ray Johnson and I serve as Lockheed Martin's senior
1020 vice president and chief technology officer. My role in the
1021 corporation provides me with a broad perspective of important
1022 spectrum issues relevant to the discussion today. I
1023 appreciate the opportunity to contribute and I am honored to
1024 offer input that may help inform your consideration of these
1025 important policy matters.

1026 Lockheed Martin is a global security company that
1027 employees approximately 140,000 people in all 50 States. We
1028 are principally engaged in the research, design, development,
1029 manufacturing, integration and sustainment of advanced
1030 technology systems, products and services and most of these
1031 systems and solutions depend on access to the spectrum that
1032 we are discussing. Our customers include a broad array of
1033 agencies both military and civil for whom we support diverse
1034 critical security missions both at home and abroad. At any
1035 given time, Lockheed Martin Corporation holds approximately

1036 400 FCC authorizations for a variety of uses including
1037 experimental licenses that enable the testing of new
1038 technologies as well as new applications being applied to
1039 existing technologies.

1040 As a general matter, spectrum scarcity is not a problem
1041 that is unique to FCC licensees. Based on our understanding,
1042 federal government users are experiencing the same pressure
1043 as they are required to meet increasing demands of their
1044 critical roles and missions. Therefore, it is an important
1045 balance that H.R. 3125 achieves by requiring an inventory of
1046 both federal and non-federal spectrum resources to be
1047 conducted by the FCC and the NTIA. Although through our own
1048 activities in developing advanced systems and solutions to
1049 meet many federal government needs, we see growth in
1050 requirements in terms of access to bandwidth-intensive
1051 applications whether that is video streaming from an unmanned
1052 vehicle or surveillance from a high-altitude airship.

1053 Lockheed Martin endorses the enactment of H.R. 3125, the
1054 Radio Spectrum Inventory Act. We do, however, have some
1055 concerns with the bill as it was introduced and respectfully
1056 suggest that the bill be modified to reflect the following
1057 issues.

1058 First, I note that the stated purpose of H.R. 3125 is to
1059 promote spectrum efficiency. While the bill does not

1060 explicitly require that NTIA and FCC conduct an efficiency
1061 analysis of spectral usage, the proposed section 119(a)(1)(E)
1062 as added by the bill steers the agencies in that direction.
1063 However, there is no single metric that spans all
1064 communications and non-communications uses of the spectrum,
1065 which can be used for point of comparison. The intensity-of-
1066 use metric is not correlated with effectiveness or efficiency
1067 for many spectral users. Moreover, efficiency improvements
1068 should not be equated to the reduction in bandwidth utilized.
1069 Measuring spectrum efficiency using as a proxy the price
1070 entities are willing to pay for a license is also
1071 inappropriate. Many critical spectrum users deliver
1072 tremendous value to our country most importantly to our
1073 national and homeland security but do not directly generate
1074 revenues.

1075 Second, we are concerned that the bill would
1076 inadvertently require FCC and the NTIA to disclose sensitive
1077 information that should not be disclosed. This disclosure
1078 does not only impact the federal government but also impacts
1079 some FCC licensees like Lockheed Martin. We agree with the
1080 Administration's stated concern and note that from any
1081 inventory security perspective, it is very important to
1082 recognize that the release of individual unclassified data
1083 points can result in sensitive information being improperly

1084 disclosed when viewed more as an aggregate.

1085 Third, I would like to raise a concern to the
1086 subcommittee regarding the possible misinterpretation of the
1087 legislation in two ways. One is the potential inadvertent
1088 message that it sends to our allies in the international
1089 community given the scope of the frequencies being
1090 inventoried and the provision requiring recommendations for
1091 relocation. The Department of Defense and the defense
1092 industry have worked hard to achieve an international
1093 spectrum harmonization to support allied interoperability.
1094 The other concern is the requirement for annual review of
1095 spectrum. This review can create an impression of volatility
1096 and instability in spectrum allocations, thus impacting long-
1097 term research and development, acquisition and the deployment
1098 of new systems and solutions. Suggestions of instability in
1099 spectrum access could result in a chilling effect in the
1100 long-term technology investments.

1101 Finally, we have identified a few technical issues with
1102 the drafting of the bill that we will submit separately to
1103 the staff.

1104 While I am here today to address H.R. 3125, I would like
1105 to note that we do have some concerns with H.R. 3019 as well
1106 and we would be happy to offer a follow-up discussion with
1107 the subcommittee.

1108 Mr. Chairman, I appreciate having the opportunity to
1109 testify. H.R. 3125 is a good start and Lockheed Martin
1110 commends you and the other cosponsors for identifying the
1111 need for spectrum inventory and for taking the initiative to
1112 draft legislation to address this issue. We hope that you
1113 will agree with our suggestions to improve the bill and we
1114 look forward to working with you and the committee staff
1115 throughout the legislation process. I am happy to answer any
1116 questions that you may have.

1117 [The prepared statement of Mr. Johnson follows:]

1118 ***** INSERT 5 *****

|
1119 Mr. {Boucher.} Thank you very much, Dr. Johnson.
1120 Mr. Stroup.

|
1121 ^STATEMENT OF THOMAS STROUP

1122 } Mr. {Stroup.} Good morning, Mr. Chairman and members of
1123 the subcommittee. Thank you for this opportunity to testify
1124 on the pending spectrum inventory and relocation bills. My
1125 testimony this morning will focus on two main points.

1126 First, to determine how and if spectrum resources are
1127 being used efficiently, a spectrum inventory and spectrum
1128 database must include data on actual spectrum utilization.
1129 Second, until a database is compiled and analyzed, we caution
1130 against jumping to any conclusions as to what is next for
1131 particular frequency bands because new technology presents
1132 spectrum access alternatives that have not existed until now.

1133 I have been involved in the wireless industry for over
1134 25 years. In the early 1990s, I was president of the
1135 Personal Communications Industry Association, which helped
1136 the nascent wireless industry win the reallocation of fixed
1137 microwave spectrum for new personal communications services
1138 which were the source of competition and innovation that were
1139 referenced by Congressman Markey. Then I founded and ran a
1140 company called Columbia Spectrum Management to facilitate and
1141 negotiate the relocation of fixed microwave incumbents in FCS
1142 bands for the auction winners.

1143 Since March of this year, I have been the CEO of Shared
1144 Spectrum Company. Shared Spectrum is a small technology
1145 company located in Vienna, Virginia. Since the founding of
1146 the company in 2000, Dr. Mark McHenry has been conducting
1147 spectrum occupancy studies to document the untapped potential
1148 of many unused frequency bands. Attached to my written
1149 testimony is a list of our public studies to date. The video
1150 monitors in the room are also displaying some sample results
1151 of our measurements. These studies include measurements from
1152 New York City, Chicago and Washington, D.C., during periods
1153 of anticipated high radio traffic. They indicate that less
1154 than a third of the allocated radio spectrum was being used
1155 at any given time.

1156 To take advantage of this empty spectrum capacity, SSC
1157 pioneered dynamic spectrum access, or DSA, technology. DSA
1158 takes advantage of the empty spectrum capacity by adapting to
1159 the spectral environment and changing transmission or
1160 reception parameters. This allows for more-efficient
1161 wireless communications without interfering or requiring the
1162 dislocation of legacy systems using the same bands. The
1163 company developed DSA over the past 9 years for several
1164 military projects, and this technology is now being
1165 implemented in several military radio systems. We are also
1166 exploring several commercial applications including new cost-

1167 effective rural wireless broadband systems that can access
1168 preferred lower frequencies.

1169 As has been pointed out throughout the hearing, the
1170 demand for spectrum across all sectors and markets is
1171 substantially increasing. We agree that the necessary first
1172 step in confronting the spectrum dilemma is to conduct a
1173 comprehensive study of the Nation's spectrum resources. We
1174 are therefore pleased to support the Radio Spectrum Inventory
1175 Act. The bill would provide guidance to the FCC and NTIA to
1176 work together to create a database of spectrum allocations
1177 and assignments. However, it is also important to supplement
1178 this data with information regarding the actual use of the
1179 airwaves. Virtually every service to which spectrum is
1180 allocated can show a legitimate need for the spectrum, and
1181 most incumbents will argue that they make effective use of
1182 their allocations. Thus, compiling a database of spectrum
1183 assignments will be interesting but that alone will fail to
1184 show how much or even if the spectrum is actually being
1185 utilized.

1186 Until such a database is compiled and available, we
1187 caution against any presupposition as to what is next for a
1188 particular radio band. To assume that the next step
1189 following the initial inventory would be a traditional
1190 reallocation proceeding would amount to a plan for years and

1191 years of fighting among entrenched interests that have no
1192 notion or incentive to have their existing spectrum rights
1193 diminished no matter how little they are utilized. This is
1194 based on my personal experience where it took 6 years for the
1195 PCS spectrum to be reallocated and that looked like the fast
1196 track compared to more reallocation efforts that typically
1197 have dragged for more than 10 years.

1198 As the subcommittee moves forward, we believe that it is
1199 also important to recognize that new technologies like DSA
1200 enable more-efficient use of existing spectrum allocations
1201 and can create new opportunities for sharing spectrum with
1202 the existing services in underutilized bands. The interest
1203 in finding additional spectrum for wireless broadband
1204 services is more likely to be accommodated in a timely manner
1205 if a flexible access framework is established that includes
1206 DSA-enabled sharing with government and non-government
1207 incumbents. Such a framework would focus on multipurposing
1208 legacy bands with flexible overlay rights and
1209 responsibilities. Approaches that involve repurposing
1210 certain bands and relocating incumbents would be too
1211 difficult, too costly, too time consuming, and in light of
1212 new technology, unnecessary.

1213 Instead, a better policy would build upon the approach
1214 taken when the PCS bands were made available in 1995. The

1215 licenses that were auctioned were subject to a non-
1216 interference requirement with the existing microwave
1217 incumbents. While most of those licensees ultimately were
1218 relocated to new systems on other frequencies, the advances
1219 made in DSA and cognitive radio technology now provide the
1220 ability to coexist with legacy systems that was not available
1221 at that time.

1222 Thank you again for this opportunity to testify. I look
1223 forward to your questions.

1224 [The prepared statement of Mr. Stroup follows:]

1225 ***** INSERT 6 *****

|

1226 Mr. {Boucher.} Well, thank you, Mr. Stroup, and thanks
1227 to all of our witnesses for your informative remarks here
1228 this morning. I particularly appreciate the broad consensus
1229 that is evident from your testimony about the need to move
1230 forward with both of the bills that are the subject of our
1231 legislative hearing this morning, particularly the need for
1232 an inventory of spectrum that could be reallocated for
1233 commercial purposes. A number of you, most recently Mr.
1234 Stroup, just mentioned the potential of spectrum sharing as a
1235 way to accommodate new commercial services within our
1236 spectrum constraints. Could you talk a little bit about the
1237 state of the technology with regard to spectrum sharing and
1238 what potential really does it hold and what limitations does
1239 it face? And who would like to begin? Mr. Hatfield.

1240 Mr. {Hatfield.} Yes. Thank you. I think that sharing,
1241 you can look at it in two ways. It is important to look at
1242 it in two ways. We have always shared a lot of the existing
1243 spectrum and we call that static sharing. For example, an
1244 antenna pointed at a satellite and antennas pointing on the
1245 ground are pointing in different directions and that provides
1246 sufficient isolation that a satellite system can share with a
1247 terrestrial system, and that static sort of sharing has been
1248 with us for quite some time and used effectively. I think

1249 the key here is combining the concepts that Tom talked about
1250 is that a lot of spectrum is not being used all the time
1251 today and look at more dynamic forms of sharing. In other
1252 words, for example, here in town today in D.C., a particular
1253 channel might not be used by some private microwave,
1254 something like that, and that spectrum could be shared on a
1255 dynamic basis. So I think the key going forward--

1256 Mr. {Boucher.} So you are not talking about technology
1257 in that example that would use the same spectrum
1258 simultaneously by various users but simply with a phased use
1259 of a spectrum by various users, each using it fully within
1260 that allotted time?

1261 Mr. {Hatfield.} Yes, where they are using it but not
1262 all the time, or as we can say, there may be directionality
1263 or something that can be employed that would allow dynamic
1264 sharing.

1265 Mr. {Boucher.} Given that opportunity, talk a little
1266 bit if you would about the state of technology development
1267 for actual simultaneous sharing of the same spectrum.

1268 Mr. {Hatfield.} I am not--

1269 Mr. {Stroup.} I will be more than happy to field that
1270 one.

1271 Mr. {Boucher.} All right, Mr. Stroup.

1272 Mr. {Stroup.} We have tested this on multiple occasions

1273 with members of the military and members of the public
1274 present. We are currently porting it over to several
1275 different radio systems. Our expectation is that those
1276 radios are going to be ready for testing next year and
1277 deployed into the field no later than the year 2012.

1278 Mr. {Boucher.} So there is nothing commercially
1279 available today that would enable simultaneous use of the
1280 spectrum by multiple users but you are saying this technology
1281 is under development and ready for testing essentially next
1282 year?

1283 Mr. {Stroup.} I would suggest that it is beyond the
1284 level of testing and is now being deployed into radio systems
1285 or being developed into radio systems. Within the commercial
1286 sector, we have initial licensing agreements with two
1287 different companies to use it within the TV white spaces.
1288 Our expectation is that upon conclusion of that rulemaking
1289 proceeding, the development of those rules, that sometime
1290 within the next 18 months that it will be deployed.

1291 Mr. {Boucher.} Any other comments, Mr. Calabrese?

1292 Mr. {Calabrese.} Yes. You know, as you have heard from
1293 three of us, there seems to be a far greater opportunity in
1294 terms of quantities of spectrum to open it up on a shared or
1295 opportunistic basis, and there are a couple of important
1296 precedents at least to build upon. You know, one, I think

1297 you are aware is of course the military already allows shared
1298 use of certain radar bands so, you know, thanks in part to
1299 the jump-start broadband act that was over on the Senate side
1300 some years ago, the military agreed to open up the 5
1301 gigahertz band based on the technology that uses, you know,
1302 dynamic frequency selection. In other words, the devices
1303 sense before they transmit, and if they don't detect anything
1304 like radar, then they operate there and they keep checking,
1305 checking, checking and they can get off real quick. The
1306 other even more important technological I think precedent
1307 here to build on is the order last year from the FCC on
1308 opening the TV white space for unlicensed sharing because
1309 what the Commission has required is a geolocation database so
1310 the smart devices will need to have GPS and Internet access.
1311 They look up and they get a list of available channels with
1312 conditions attached. And so we can build on that database
1313 that the Commission is about to create and add a lot of other
1314 frequencies over time that would have conditions attached to
1315 them.

1316 Mr. {Boucher.} That is very encouraging to hear. I
1317 would just note that the first commercial application of the
1318 white space technology is now occurring in my Congressional
1319 district.

1320 Mr. {Calabrese.} Right.

1321 Mr. {Boucher.} One other question, my time is expired,
1322 but I will ask if you have any brief comments about this.
1323 Are there shortcomings at the present time in the licensing
1324 and spectrum management processes that are employed by both
1325 NTIA and the FCC, and if you detect that there are any, do
1326 you have recommendations for how those processes could be
1327 improved? Anyone want to answer? Mr. Largent.

1328 Mr. {Largent.} I would just repeat some of the problems
1329 that have taken place in the AWS spectrum with some of our
1330 members as being a shortcoming that I think are addressed in
1331 both of these bills and I think are a definite step in the
1332 right direction.

1333 Mr. {Boucher.} All right. Thank you very much. Anyone
1334 else want to briefly comment on that? Mr. Hatfield.

1335 Mr. {Hatfield.} I would add that the Commission has
1336 done things in the past to encourage a secondary market so
1337 that--one of the problems with the existing system, it is
1338 centrally controlled and therefore there are a lot of
1339 rigidities built into it. The Commission to its credit has
1340 gone to the use of secondary markets where companies and so
1341 forth can lease spectrum, and that has not worked out quite
1342 as well as some of us would have hoped, so I think there is
1343 possibilities to continue to encourage the secondary market
1344 to reduce some of the rigidities associated with trying to

1345 centrally manage the resources.

1346 Mr. {Boucher.} Thank you, Mr. Hatfield.

1347 My time is expired. The gentleman from Florida, Mr.

1348 Stearns, is recognized for 5 minutes.

1349 Mr. {Stearns.} Thank you, Mr. Chairman.

1350 Mr. Largent, one of my questions for us is, when we had

1351 the auction and the DTV transition and we raised about \$19

1352 billion, the bill that Mr. Barton sponsored and I was

1353 cosponsor, I think it became the backbone of the fourth-

1354 generation wireless service. Now, that was one approach.

1355 Now, the other approach appears to be the stimulus package.

1356 They put in \$7 billion to provide grants, and I guess the

1357 question would be, the auctioning of the spectrum it appears

1358 to be would be a more efficient way to do it than just giving

1359 out the stimulus package. You might comment on the two

1360 approaches here and which one you think is more advisable.

1361 Mr. {Largent.} Well, let me just say this. The bottom

1362 line is, we need to have additional spectrum in the wireless

1363 space in order to meet not only the demands but the promise,

1364 the hope of the broadband world and so however you get to

1365 that point, that is subject to debate and can even become

1366 partisan, but the bottom line is, more spectrum is needed and

1367 sooner rather than later. The fact is, the last two tranches

1368 of spectrum that were allocated for wireless use, the AWS

1369 auction, 700 megahertz auction, both of those auctions took
1370 over 10 years to come to fruition. One was about 12 years,
1371 the other was 16 years to get it to come to fruition, and our
1372 thought is, is this is really a process that we are in the
1373 process of developing today that should have begun years ago
1374 if it still going to take somewhere between 12 and 16 years.
1375 So I guess the bottom line is, is that there is different
1376 ways to get to the bottom line but the important thing is to
1377 get to the bottom line and that is additional spectrum for
1378 the wireless industry.

1379 Mr. {Stearns.} The members of your association, are
1380 they going to benefit from this \$7 billion in the stimulus
1381 package? I mean, I understand it is going to all go to
1382 develop the wirelines but do your companies see it as a
1383 positive?

1384 Mr. {Largent.} I would say that the majority of the
1385 money that has been allocated is not going to the companies
1386 that are in our association.

1387 Mr. {Stearns.} You mentioned just briefly, the chairman
1388 talked about T Mobile and then the spectrum reallocation you
1389 sort of indicated the problem in the transition, and I
1390 mentioned in my opening statement. I would think if we want
1391 other commercial carriers to compete and get involved, this
1392 would be a flag to them that if it is going to take too long

1393 they have got this investment I think of over \$4 billion. I
1394 mean, how long can they continue to deal with that
1395 procrastination? So I mean, you might give us some ideas on
1396 what can be done to improve this reallocation timeframe and
1397 perhaps what we in Congress should be aware of.

1398 Mr. {Largent.} Well, actually, the second bill that we
1399 are talking about today, 3019, actually goes to that subject,
1400 that once the spectrum is identified, the spectrum is
1401 auctioned, then getting the people that are on the spectrum
1402 off the spectrum more expeditiously is really helped by this
1403 particular bill that we are talking about today. So, you
1404 know, my hat is off to you. I think Congress has--

1405 Mr. {Stearns.} So you think that will do it?

1406 Mr. {Largent.} --gone forward, made mistakes,
1407 recognized those mistakes and is now trying to correct them,
1408 and that is a real positive movement.

1409 Mr. {Stearns.} And you feel pretty comfortable that
1410 will solve the problem?

1411 Mr. {Largent.} No, I am not positive it solves all the
1412 problems that are involved but it solves the problems that we
1413 know of with the auction process that took place 2 years ago.

1414 Mr. {Stearns.} Mr. Hatfield, what steps can be taken to
1415 make more efficient use of commercial and government spectrum
1416 that is already deployed?

1417 Mr. {Hatfield.} In my written statement, I go through
1418 the list of sort of five techniques that can be used, and the
1419 two probably that haven't been talked about as much here is,
1420 one, more technical efficiency. It is like getting more
1421 miles per gallon on your car. I mean, there are sort of two
1422 ways we can improve our transportation efficiency. One is by
1423 more miles per gallon or by carpooling, for example, and
1424 sharing that we have talked about here is the carpool analogy
1425 but we also need to look at ways of more efficiently using
1426 the spectrum, getting more bits per second per hertz, as I
1427 would say in technical terms. And there are a couple ways of
1428 doing that. One is through compression, reducing the number
1429 of bits that have to be sent. The other is using more
1430 efficient modulation techniques. What scares me as an
1431 engineer is those techniques only look like they can provide
1432 us with incremental improvements, and I am not saying we
1433 shouldn't do it, we absolutely should because it is crucial,
1434 and they are happening, but the difficulty is, they are
1435 probably not going to be adequate. So that leads us then to
1436 the need for more sharing or reallocation.

1437 The other way, just to complete the thought, is through
1438 more intense reuse of the spectrum. For example, with your
1439 cell phone, the tower may be 2 miles away and therefore you
1440 are taking up an area with a 2-mile radius. If you shrink

1441 the cell down, then you can reuse that same channel more and
1442 more times in a city like D.C., so you can use the same
1443 channel several hundred times. And so you can see the
1444 cellular carriers have made enormous investments in more cell
1445 towers. That helps a lot. As you can keep getting the cell
1446 smaller, of course, then you have to get that information in
1447 the cell tower back to some central location and that is
1448 where I believe your broadband policy of getting fiber out
1449 there intersects with the wireless industry because the
1450 wireless industry needs to get the wireless data back to
1451 their central point and that requires broadband facilities.
1452 So I think there is a real link here between what is being
1453 done in the broadband policy and the wireless industry.

1454 Mr. {Stearns.} Mr. Chairman, I don't have any further
1455 questions but I thought Dr. Johnson might want to comment if
1456 he wanted to on the same question.

1457 Mr. {Johnson.} The commercial receiver standards, the
1458 military already has these standards for radars but none of
1459 those standards exist for commercial systems so there may be
1460 opportunities to take advantage of some of those standards
1461 that have been developed.

1462 Mr. {Boucher.} Thank you very much, Mr. Stearns.

1463 The gentleman from Michigan, Chairman Dingell, is
1464 recognized for 5 minutes.

1465 Mr. {Dingell.} Mr. Chairman, thank you.

1466 I would like to welcome our panel, particularly Mr.
1467 Largent, our former colleague and friend. Welcome back.

1468 I have some questions. Since there are so many, I have
1469 to do all this with yes or no's. Mr. Largent, yes or no, has
1470 CTIA or anyone else conducted usage studies which measure
1471 actual traffic to see if the spectrum is being used?

1472 Mr. {Largent.} Are you talking about the spectrum that
1473 has been allocated for commercial mobile wireless?

1474 Mr. {Dingell.} Just have spectrum studies been
1475 completed to tell us whether the spectrum is being used.

1476 Mr. {Largent.} I am not sure I understand the question,
1477 sir.

1478 Mr. {Dingell.} Has anybody made any studies to find out
1479 if the spectrum is properly being used? CITE, FCC, anybody?

1480 Mr. {Largent.} Well, what I can tell you is, that the
1481 commercial mobile wireless spectrum that we have available to
1482 this industry today is used more efficiently than any other
1483 country of the world.

1484 Mr. {Dingell.} I am going to take that as a no and I
1485 thank you for that. Now, do all CTIA carriers operate at
1486 full capacity on their allotted spectrum today?

1487 Mr. {Largent.} No, sir.

1488 Mr. {Dingell.} Has FCC conducted any usage studies

1489 which examine whether the spectrum either by your members or
1490 anybody else is being properly and adequately used with
1491 regard to that spectrum which is assigned to them?

1492 Mr. {Largent.} I am not aware of any.

1493 Mr. {Dingell.} So the argument seems to be here I think
1494 that you have enough spectrum for now but will need it 10
1495 years from now or at some future time. Is that correct?

1496 Mr. {Largent.} We have enough spectrum for right now
1497 but we will need spectrum before 10 years.

1498 Mr. {Dingell.} And I thoroughly agree with you. Our
1499 problem here is to see how we are going to get that spectrum
1500 efficiently allocated, because as you will remember from your
1501 time on this committee, we had a serious problem with regard
1502 to the fact that the spectrum was just thrown out by the FCC
1503 and by the government to be sold for budgetary reasons as
1504 opposed to addressing the proper use of the spectrum.

1505 Now, to all witnesses starting on your right and my
1506 left, how do you view H.R. 3125 and H.R. 3019? Do you view
1507 it as complementary to the FCC's work to develop a national
1508 broadband plan, yes or no? Starting on your far right, if
1509 you please, sir.

1510 Mr. {Hatfield.} A simple yes or no answer? Yes.

1511 Mr. {Dingell.} Mr. Largent?

1512 Mr. {Largent.} Yes.

1513 Mr. {Dingell.} Sir?

1514 Mr. {Calabrese.} Yes, very much.

1515 Mr. {Dingell.} Sir?

1516 Mr. {Smith.} The answer is yes but I believe it could
1517 be expanded.

1518 Mr. {Dingell.} Next witness, please, sir.

1519 Mr. {Johnson.} No.

1520 Mr. {Dingell.} No? And the last witness?

1521 Mr. {Stroup.} Yes.

1522 Mr. {Dingell.} Now, if the completion of national
1523 broadband should be delayed pending enactment of H.R. 3125
1524 and H.R. 3019, how long should such delay be, starting again
1525 on your far right and my far left. How long could or should
1526 that delay be?

1527 Mr. {Hatfield.} I think the requirement is so great
1528 that we do not want to wait pending taking some of these
1529 steps pending the inventory.

1530 Mr. {Dingell.} Mr. Largent?

1531 Mr. {Largent.} And I would agree with that. The sooner
1532 the better.

1533 Mr. {Dingell.} Next witness, please.

1534 Mr. {Calabrese.} Yes. Likewise, there are bands and
1535 things--

1536 Mr. {Dingell.} How long should the delay be while we

1537 wait for those studies to be completed, next witness?

1538 Mr. {Smith.} Chairman Dingell, the answer is, delay is
1539 not good but delay is frankly better if you don't have the
1540 right information, so if you need the right information,
1541 delay may be necessary.

1542 Mr. {Dingell.} Yes, I am no special pleader for delay.
1543 My concern is that if we do this, we do it well, and I am not
1544 satisfied that up until this time we have been doing these
1545 things well and I am very much troubled that we will expand
1546 that bad history by again doing things poorly--

1547 Mr. {Johnson.} We agree with that.

1548 Mr. {Dingell.} --and winding up with a mess on our
1549 hands because we have built upon a faulty edifice. Next
1550 witness, sir.

1551 Mr. {Stroup.} We would recommend moving forward with
1552 the spectrum inventory including the actual measurements,
1553 which will help identify bands that are particularly useful
1554 for spectrum sharing.

1555 Mr. {Dingell.} All right. Mr. Chairman, I note I am 4
1556 seconds over my time and I yield back with thanks to you.

1557 Mr. {Boucher.} Thank you very much, Chairman Dingell.

1558 The gentleman from Oregon, Mr. Walden, is recognized for
1559 5 minutes.

1560 Mr. {Walden.} Thank you very much, Mr. Chairman.

1561 Again, thank you for this hearing. I want to thank the
1562 witnesses for your testimony as well, all of you, and
1563 especially Dr. Johnson. I appreciated your technical counsel
1564 on the legislation as well.

1565 Senator Smith, I want to go to you regarding this notion
1566 put forth by the distinguished scholar in residence at the
1567 FCC for First Amendment and spectrum, Dr. Benjamin. In his
1568 paper, and this is just from May of this year, he writes,
1569 ``The most obvious desirable regulations are probably those
1570 that are pure dead weight loss, regulations that cost
1571 broadcasters significant amounts of money but have no impact
1572 on their behavior. This category would include onerous
1573 record-keeping requirements, ascertainment requirements, et
1574 cetera. These are unlikely to have any impact on programming
1575 and thus will likely be pure cost.'' His thesis is in this
1576 paper which I will ask unanimous consent to put in the record
1577 called ``Roasting the Pig to Burn Down the House: A Modest
1578 Proposal,'' is to make it so costly on broadcasters that they
1579 surrender their spectrum, and I find it an abomination, I
1580 find it offensive. I don't quite understand why he is now in
1581 this position at the FCC, and I will follow up on that. But
1582 given the fact that we just went through a \$2 billion DTV
1583 conversion and you are on the cusp of a digital television
1584 technology that is mobile and you make the argument in your

1585 statement about how every new subscriber to that free over-
1586 the-air digital mobile service makes that even more efficient
1587 because you are not adding to the stream. If we follow
1588 Professor Benjamin's counsel or the FCC does, aren't we just
1589 throwing that \$2 billion into a paper shredder?

1590 Mr. {Smith.} Congressman, yes, you are throwing \$2
1591 billion of U.S. taxpayer money away. You are throwing away
1592 potentially untold billions that the U.S. citizens have spent
1593 in detrimental reliance upon the Congressional urging of the
1594 digital transition. Suffice it to say, my phone has been
1595 ringing off the hook ever since this gentleman's work has
1596 been revealed. That said, I think what he does is simply try
1597 to monetize highest and best use in pure dollar terms,
1598 disregarding all the other public values that are served
1599 through localism, local news, local sports, local weather.
1600 These are things that I think, you know, particularly when it
1601 comes to emergency information, Amber Alerts, how do you
1602 monetize that? And I am hesitant to say it, but when it
1603 comes to broadcasting and the broadcast airwaves, they have
1604 always been a public option to make sure that everybody gets
1605 served, and he seems to be suggesting that that maybe should
1606 be yesterday.

1607 Mr. {Walden.} Dr. Johnson, I raised the issue in my
1608 opening statement about the amateur radio broadcast service,

1609 and I failed to disclose that Mr. Ross and I are the two
1610 licensed amateur radio operators which gives us license to
1611 be real hams and politicians, and I am just curious as you
1612 look at the spectrum from a technical perspective, what
1613 should amateur radio licensees be concerned about and what
1614 threats and value do you see in that spectrum?

1615 Mr. {Johnson.} I won't be able to give you a full
1616 detailed answer because I have not looked at that particular
1617 issue in detail. I would support, however--and I also am a
1618 ham radio operator.

1619 Mr. {Walden.} Oh, very good.

1620 Mr. {Johnson.} I would support, however, your thesis
1621 that the ham bands have been an important backup system for
1622 the Nation's security and I think they are also a valuable
1623 resource for citizens who have an interest in that kind of
1624 technology, and although there are other avenues to address
1625 those same issues now outside of the ham bands, I think they
1626 are still important and we would be happy to look at the
1627 technical details of the challenges to that particular band.

1628 Mr. {Walden.} Mr. Hatfield, do you have any comment on
1629 the amateur radio band? And tell me you are a ham radio
1630 operator too, would you?

1631 Mr. {Hatfield.} You know, I think my license just
1632 expired but the way I got into this business was starting as

1633 a ham. I think I was 13 or 14 years old, something like
1634 that. I think the problem that the amateur radio community
1635 has is that they do provide a very, very vital final sort of
1636 backup communication network that is just absolutely--it is
1637 totally decentralized so there is nothing central that can
1638 fail, and that is really critical. The problem is, if you
1639 tune across the band so often they are idle, and if somebody
1640 was really clever, maybe we could figure out ways that we
1641 could do a little bit of sharing there that would not
1642 diminish the amateur opportunity at all for use in
1643 emergencies but in non-emergency times might be used for some
1644 other vital public interest purposes as well.

1645 Mr. {Walden.} Mr. Chairman, I know my time is expired
1646 and I am going to excuse myself. Mr. Buyer is going to take
1647 over for our side. We have a classified briefing with the
1648 Secretary of State and Secretary of Defense on Afghanistan
1649 and Pakistan that I am going to go to. So again, I thank you
1650 for your testimony and look forward to working with all of
1651 you and others on this issue as we move forward in a
1652 thoughtful and constructive way on appropriate use of
1653 spectrum. Thank you, Mr. Chairman.

1654 Mr. {Boucher.} Thank you very much, Mr. Walden.

1655 The gentleman from Indiana, Mr. Buyer, is recognized for
1656 7 minutes. Oh, I am sorry, Mr. Buyer, if you can withhold, I

1657 need to go in order here. The gentleman from California, Mr.
1658 McNerney, is recognized for 5 minutes.

1659 Mr. {McNerney.} Thank you, Mr. Chairman. I will try to
1660 be brief here.

1661 First of all, I want to thank the panel. I found the
1662 testimony very informative, and I didn't hear anyone say
1663 well, no, I don't like this legislation. I think Dr. Johnson
1664 had a little reservation about some of the definitions so I
1665 appreciate that, and I am going to ask you in a minute to
1666 expand on that. But first I want to say, expanding the range
1667 to 10 gigahertz, there would seem to be a disagreement
1668 between Mr. Calabrese and Mr. Hatfield on that, and I am not
1669 sure exactly why you would think that going up to 10
1670 gigahertz isn't that useful, Mr. Hatfield. Is it Dr.
1671 Hatfield or Mr. Hatfield?

1672 Mr. {Hatfield.} My doctor is honorary, so--

1673 Mr. {McNerney.} Okay. Well, that is good enough for
1674 me. Dr. Hatfield.

1675 Mr. {Hatfield.} I think the answer is, there may be
1676 some confusion. It is the range up to roughly 3 gigahertz
1677 that is really critical to people like the cellular industry,
1678 so that is the most critical. On the other hand, if some of
1679 the services we might want to relocate could go higher, it
1680 would still work okay if they went higher in frequency so

1681 therefore I think you can make an argument that we ought to
1682 look all the way up to 10 to see if there is any
1683 opportunities, for example, that some could be reallocated
1684 from below.

1685 Mr. {McNerney.} So there are physical limitations after
1686 3, say line of sight and so on?

1687 Mr. {Hatfield.} Yes, that is correct for mobile
1688 applications. Now, for certain radar applications, for
1689 example, being up there where you have line of sight, it
1690 might work perfectly fine. So that is what I think is
1691 perhaps the basis for the difference. I would support going
1692 up higher for that purpose but we mustn't kid ourselves.
1693 There are technical limitations that would prevent it from
1694 being used for certain applications.

1695 Mr. {McNerney.} Thank you.

1696 Dr. Johnson, you did mention the idea that there is no
1697 single metric for efficiency. Is there anyone out there that
1698 you are aware of or that would be useful or sort of a set of
1699 definitions?

1700 Mr. {Johnson.} We think that a single definition like
1701 intensity of use is not appropriate. We propose using a
1702 variety of metrics that correspond to the critical parameters
1703 related to the particular system and application that is
1704 being used. For example, metrics for communications systems

1705 would be different than those for radar systems.

1706 Mr. {McNerney.} So are you going to supply the
1707 committee with that information?

1708 Mr. {Johnson.} We would be pleased to work with the
1709 committee to develop those metrics, absolutely.

1710 Mr. {McNerney.} I will be interested to work with the
1711 committee on examining that metric definition.

1712 The last thing I have is the notion that the paper
1713 inventory isn't going to be adequate, and I didn't quite
1714 appreciate that. You know, I come from a technical
1715 background and I was a test engineer and a field tester, but
1716 when Mr. Stroup showed the graphs with all those blank
1717 spaces, people that own spectrum are going to say well, jeez,
1718 we use all of it, we don't need to reallocate and so we are
1719 going to need to actually do quite a bit of testing to
1720 validate, and it seems to me like a fairly--just on the basis
1721 of what was spoken here this morning, a fairly big task to
1722 really judge how much spectrum is available out there. Could
1723 you comment on that?

1724 Mr. {Stroup.} Yes, Congressman. We submitted some
1725 suggestions in our written testimony as to some short-term
1726 approaches as well as longer-term approaches. We would
1727 recommend approximately 10 to 20 stations supplemented by
1728 mobile testing and an overall longer period of time and a

1729 larger number perhaps in conjunction with universities and
1730 other organizations to be able to compile an ongoing
1731 inventory of how the spectrum is actually being used.

1732 Mr. {McNerney.} That is going to take a lot of
1733 resources, a lot of time and a lot of money. Even what you
1734 have called a shortcut seems like a fairly big undertaking.

1735 Mr. {Stroup.} I believe that the NTIA and other
1736 organizations, the National Science Foundation are already
1737 compiling this information so some of it is there. Our
1738 studies or many of our studies are already available publicly
1739 and can be integrated into this database, so it is not as
1740 large an undertaking as it may seem but I do agree that
1741 overall long term there is a great deal of data that will be
1742 compiled. The Illinois Institute of Technology is actually
1743 conducting ongoing studies in Chicago. They have over 2
1744 terabytes of information that has already been collected from
1745 that location.

1746 Mr. {McNerney.} Mr. Calabrese?

1747 Mr. {Calabrese.} I mentioned in my written statement
1748 that the costs are really coming down for doing this so, for
1749 example, Offcom, which is, you know, the British telecom
1750 regulator, recently completed a nationwide drive test of
1751 their airwaves. They mount measuring devices just on the
1752 rooftop of a national vehicle fleet, which we could do with

1753 the Postal Service or whatever, and then, you know, that gets
1754 downloaded over wi-fi. There are also very inexpensive
1755 devices now to have a monitoring network. That is being
1756 field tested in the D.C. area fairly soon by a company. We
1757 are hoping to have one on the roof of our building downtown.

1758 Mr. {McNerney.} My time is expired. Mr. Hatfield, do
1759 you have a very quick response?

1760 Mr. {Hatfield.} Just as I say in my written testimony,
1761 I said one of the things we can do is focus on those bands
1762 which look the most promising so do the measurement first on
1763 the most promising. Second--well, why don't I just stop
1764 there.

1765 Mr. {McNerney.} I guess it comes down to one of our
1766 favorite Presidents saying ``trust and verify.'' Thank you,
1767 Mr. Chairman.

1768 Mr. {Boucher.} Thank you very much, Mr. McNerney.

1769 The gentleman from Indiana, Mr. Buyer, is recognized for
1770 7 minutes.

1771 Mr. {Buyer.} Thank you.

1772 Mr. Largent, are you familiar with this latest GAO
1773 report that came out titled ``FCC Needs to Improve Oversight
1774 of Wireless Phone Service''?

1775 Mr. {Largent.} I have not read the entire thing but I
1776 am aware of it.

1777 Mr. {Buyer.} Are you aware of the recommendations of
1778 GAO? GAO recommended that the FCC, number one, improve its
1779 outreach to consumers about its complaint process, related
1780 performance goals and measures and monitoring complaints;
1781 number two, develop guidance on federal and State oversight
1782 roles; and three, develop policies for communicating with
1783 States. Are you familiar with the three recommendations?

1784 Mr. {Largent.} Well, I am more familiar with the facts
1785 that they uncovered first that was in that report that showed
1786 that 84 percent of--

1787 Mr. {Buyer.} That is where I am going. You are getting
1788 ahead of me.

1789 Mr. {Largent.} Oh, sorry.

1790 Mr. {Buyer.} Let us just go right there. I mean, what
1791 I am asking is, they have these recommendations based on, and
1792 so I want to ask you to comment about what they are based on.
1793 I mean, my gosh, when we look at all the choices that
1794 consumers have here going into the Christmas shopping season
1795 and the levels of satisfaction, would you please comment on
1796 the basis and the facts that they relied on for these
1797 recommendations?

1798 Mr. {Largent.} Well, I think it is not the way I would
1799 have written the report based upon the statistics that they
1800 found in the study. Knowing this industry as I have for the

1801 last 6 years and seeing the consumer complaints decline every
1802 year and the consumer satisfaction go up every year, we feel
1803 like that that is a movement in the right direction. Eighty-
1804 four percent approval by our consumers is not good enough for
1805 us. We continue to want to raise that even more but it is a
1806 heck of a positive mark for the industry and I hope to be
1807 able to sit before you in a year or two and be able to talk
1808 about how we are no longer 84 percent, we are even higher
1809 today. But, you know, I think that the report did highlight
1810 some things that the FCC can be about that would improve
1811 their service but the bottom line is, is that I think it is a
1812 star for the wireless industry to show the improvement of our
1813 service for our customers.

1814 Mr. {Buyer.} Regarding your member companies when they
1815 make strategic judgments in competition, wouldn't consumer
1816 satisfaction be one of those important elements?

1817 Mr. {Largent.} Absolutely. It is the key statistic
1818 that they look at all the time.

1819 Mr. {Buyer.} You know, I get excited when I listen to
1820 my good friend Mr. Markey share his excitement about
1821 competition in the marketplace, and so I would share with my
1822 good friend Mr. Markey when you rejoice in competition in the
1823 marketplace and what it is bringing consumers relative to
1824 choice, do not be so eager to get more government control if

1825 in fact the marketplace is driving consumer satisfaction.

1826 The other point I would like to, if I had a little
1827 latitude, Mr. Chairman, because I am also cosponsor of this
1828 legislation, I would like to kind of shift gears and turn to
1829 Mr. Smith and ask a particular question, and matter of fact,
1830 it may drive, Mr. Chairman. I think we should take a really
1831 good look here at Comcast and NBC. So I am going to ask a
1832 question about Comcast and NBC, Mr. Smith. I have got some
1833 concerns about your member companies out there. I have got
1834 concerns about consolidation in the marketplace. I have got
1835 concerns about what type of new business model does this
1836 bring, what is its impact and how does it drive a new model
1837 for advertising. You held up your phone and you talked about
1838 this as a multimedia platform. As we have a marketplace as
1839 you try to judge into the future, it is all about
1840 individualizing of advertising, and I can almost see if we
1841 are going to permit the marketplace to begin to mine and
1842 profile people that pretty soon even advertising how it is
1843 even driven not only upon a web, you could almost have
1844 individualized advertising occurring upon TV. So as I try to
1845 think about in the future and how a vertical integration is
1846 this kind of deal when you have this many eyes of Comcast and
1847 being able to control content, it almost turns our present
1848 business model inside out, upside down. I welcome your

1849 comments on mine.

1850 Mr. {Smith.} Congressman, some of my members are for
1851 it, some of them are very concerned about it, and I am with
1852 my friends.

1853 Mr. {Buyer.} Very good, Senator.

1854 Mr. {Smith.} The NAB has not taken a position on this
1855 at this juncture. We are simply going to watch and see what
1856 kind of conditions develop but we are very attuned to the
1857 issue and the problems that you just cited.

1858 Mr. {Buyer.} You know, the Supreme Court long ago
1859 talked about the importance of having diversity out there
1860 among our media, and that was back in the 1940s, with regard
1861 to ideas. I mean, if I were one of your member companies and
1862 I am a small company and I have a couple of NBC affiliates
1863 and maybe a CBS affiliate, can't you relate to their concerns
1864 even about retransmission rights and fees and what impact is
1865 that going to have or upon others whereby is there going to
1866 be cost shifting because of this vertical integration?

1867 Mr. {Smith.} Well, obviously I am more than interested.
1868 I answer their phone calls because, yes, they are concerned
1869 with the very issues that you identify, but I assume that the
1870 FTC, the FCC and the Department of Justice will look at all
1871 of these things and propose conditions if this is to go
1872 forward at all. And at this juncture, it is the feeling of

1873 the association that we should allow the process to work.

1874 Mr. {Buyer.} One of the concerns I have, Mr. Chairman,
1875 and why I would encourage to place your eyes and
1876 considerations on this issue is defined by the silence. When
1877 there is silence in the marketplace because of this type of
1878 deal, that tells me that there is great concern in the
1879 marketplace and fear that if in fact a company were to come
1880 out and come against this type of merger, what type of
1881 repercussions in the marketplace would in fact occur. So the
1882 fact that there is silence out there is beginning to bother
1883 me, Mr. Smith, that a lot of your member companies while they
1884 may confide in that phone call with you that there is a
1885 reason that they are not coming out publicly because they
1886 don't want to get jammed in their negotiations. Am I close
1887 here?

1888 Mr. {Smith.} Well, I think they are very interested
1889 observers of this process and they share the concerns you
1890 have expressed. Again, we have networks, we have affiliates.
1891 They are have most issues in common but this is one where
1892 there needs to be an accommodation, an understanding and a
1893 legal structure put in place that allows both to survive.

1894 Mr. {Buyer.} Mr. Chairman, I would just encourage us to
1895 put our eyes to have a better understanding so that we can
1896 try to see over the horizon the impact that this type of

1897 merger is going to have on a multimedia platform and
1898 advertising model.

1899 Mr. {Boucher.} Thank you very much, Mr. Buyer. Let me
1900 assure the gentleman that our subcommittee will conduct at
1901 least one hearing on the Comcast NBC acquisition at the
1902 appropriate time next year. That announcement has already
1903 been made, and the gentleman is quite right in expressing the
1904 need for us to focus on this very carefully. It is certainly
1905 our intent to do so.

1906 The gentleman from Michigan, Mr. Stupak, is recognized
1907 for 5 minutes.

1908 Mr. {Stupak.} Thank you, Mr. Chairman. I apologize to
1909 our witnesses for not being able to hear their testimony. I
1910 was in with constituents and had to take a couple of other
1911 meetings.

1912 Mr. Largent, I have a question for you. Recognizing the
1913 challenges that Congress and the FCC will face in trying to
1914 relocate as much spectrum as possible, are companies within
1915 the CTIA exploring the possibility that a dynamic spectrum
1916 access that Mr. Hatfield suggested as a possible solution?

1917 Mr. {Largent.} I would say our companies are at a point
1918 where they are exploring every opportunity, every option that
1919 is available to them including how to utilize their own
1920 spectrum that they currently have, use it more efficiently

1921 and look at every other avenue that is available to them in
1922 the years ahead to access more spectrum.

1923 Mr. {Stupak.} Are any of the companies within your
1924 organization using the dynamic spectrum access? I mean, are
1925 any of them trying to borrow, if you will, during a peak time
1926 surrounding system? Is that going on now?

1927 Mr. {Largent.} I am sure they are looking, as I said,
1928 at every option that is available to them.

1929 Mr. {Stupak.} Mr. Smith, good to see you and thanks for
1930 being here. Let me ask you this one. I think it is
1931 important that we look for or search for a solution to the
1932 spectrum crisis that preserves free over-the-air broadcasting
1933 while fostering wireless broadband deployment. In your
1934 testimony, you cite how the use of white space spectrum in
1935 rural America is a way to support both of these public
1936 interest goals. Is this solution workable in urban centers
1937 as well?

1938 Mr. {Smith.} It may well be. However, we do have a
1939 concern about interference and want to make sure that we
1940 don't degrade other signals.

1941 Mr. {Stupak.} Let me ask you this. Has NAB conducted
1942 any studies that show how much spectrum is needed to fulfill
1943 future business plans of mobile TV, multicasting and HD
1944 television? Have you done some studies?

1945 Mr. {Smith.} We are doing a study right now on that
1946 very question because we understand the importance of this
1947 issue and want to have the best information possible.

1948 Mr. {Stupak.} Any idea when that study may be done?

1949 Mr. {Smith.} I don't have a date but I will get that to
1950 you, Congressman.

1951 Mr. {Stupak.} Okay. Thanks.

1952 Mr. Hatfield, we talked a little bit about the spectrum
1953 crisis. Do we only have to worry about that for the high
1954 population centers or is this a national issue? I mean, in
1955 my rural area, we have a lot of places where we don't have
1956 anything, so--

1957 Mr. {Hatfield.} Exactly. It is primarily a large urban
1958 area issue, and even within that urban area there are some
1959 real hotspots. An example would be a football stadium on
1960 Sunday afternoon. Having said that, I think I tend to divide
1961 the problem into two parts, and that is the urban problem and
1962 the more rural problem, and we need these more dynamic ways
1963 to be able to use the spectrum in the rural areas that is not
1964 needed because of the lack of population density.

1965 Mr. {Stupak.} Well, let me ask you this. Is more
1966 access to spectrum the only issue the FCC and this committee
1967 should be focused on or are there other efficiency gains that
1968 can be explored with next-generation smart phones?

1969 Mr. {Hatfield.} As I indicated in my written testimony,
1970 I don't hold out an awful lot of hope for some of the
1971 traditional solutions for the major urban areas, but there
1972 are certainly the examples that I gave like compression and
1973 so forth that we should be pursuing. I don't think those
1974 technical solutions solve the problem completely.

1975 Mr. {Stupak.} Well, if we start using these smart
1976 phones, wouldn't the manufacturers sort of help alleviate
1977 some of these problems we are going to see with trying to
1978 free up more spectrum? Can that be a solution? Can we find
1979 it more in manufacturing as opposed to the FCC and
1980 government?

1981 Mr. {Hatfield.} I don't see how the handsets by
1982 themselves can do an awful lot to improve with the exception
1983 of the sort of dynamic spectrum access where the handset is
1984 smart enough that is looking around to see what other
1985 spectrum might be available and moving to it so we can use
1986 the intelligence in the handset to find additional spectrum.
1987 I am not sure how intelligence in a handset will improve the
1988 efficiency of existing spectrum use beyond sort of
1989 incremental improvements.

1990 Mr. {Stupak.} Mr. Calabrese, did you want to add
1991 something on that?

1992 Mr. {Calabrese.} Yes. You know, I talk in my written

1993 statement about the importance of encouraging hybrid networks
1994 because, you know, as Dale said, we are reaching the limits,
1995 the technical efficiency limits. We are also reaching limits
1996 in terms of how close the carriers can bring cell sites and
1997 backhaul to the consumer so you need to shrink the cell size,
1998 get more refuse, and one way to do that is, right now we
1999 have, you know, pending at the FCC are rules to extend the
2000 cutter phone device choice to wireless, and when consumers
2001 have the choice of any device, the devices increasingly will
2002 be of a type that they will decide on the fly what is my most
2003 economical path, and in most cases that will be, like in a
2004 place like this, at home, in offices and public spaces, it
2005 will be over unlicensed spectrum into local backhaul, into
2006 consumer-provided backhaul, and that will offload a lot of
2007 traffic from carriers.

2008 Mr. {Stupak.} Thank you, and thank you, Mr. Chairman.

2009 Mr. {Boucher.} Thank you very much, Mr. Stupak.

2010 The gentleman from Massachusetts, Mr. Markey, is
2011 recognized for 5 minutes.

2012 Mr. {Markey.} Thank you, Mr. Chairman, very much.

2013 Mr. Hatfield, you are talking here about capacity for
2014 dynamic sharing of a spectrum so that we can make more
2015 efficient use of currently allocated spectrum. What
2016 percentage of our spectrum needs do you think can be

2017 satisfied just by use of dynamic sharing?

2018 Mr. {Hatfield.} I have not looked at it, candidly, in
2019 that sort of quantitative way but I think--well, I am not
2020 going to answer you very satisfactorily. But I think it is
2021 sufficient enough that it would be a significant help. I
2022 don't think it gets us all the way there.

2023 Mr. {Markey.} So what you are talking about here is
2024 something which is supplemental to what the needs are going
2025 to be in the future but not a substitute for transfer of
2026 spectrum in order to deal with the issue. Is that right?

2027 Mr. {Hatfield.} I guess I would put it slightly
2028 different. I think we are probably going to need to use all
2029 of these different techniques.

2030 Mr. {Markey.} Well, yes. I use polysyllabic words and
2031 you put it in very simple English. We will have to use
2032 everything.

2033 Do you agree with that, Mr. Largent? This reminds me al
2034 little bit of a discussion of CAFE standards, you know,
2035 improvement of efficiency of vehicles or appliance efficiency
2036 where we are saying can we use new technology here to get
2037 better efficiency out of these automobiles or out of the
2038 appliances which we use but at the same time you also want to
2039 do the research on all new technologies, you know, all
2040 electric vehicles, whatever to move out of the old

2041 technologies, and that is kind of what of we are talking
2042 about here: how do we get the additional spectrum but also
2043 squeeze out the maximum efficiency out of the old technology.
2044 So how do you view it, Mr. Largent?

2045 Mr. {Largent.} Well, I would say I have a chart here
2046 that I will submit for the record and give to you if you
2047 would like to look at it but it basically talks about how
2048 efficient different countries utilize the spectrum available
2049 to them, and in the United States we have 270 million
2050 consumers and we use per megahertz 660,000 consumers per
2051 megahertz of spectrum used, and that is the most efficient by
2052 a factor of at least two of any other country save Mexico
2053 actually. They have 79 million users there. But we
2054 absolutely are using our spectrum available to us in the most
2055 efficient way possible and sometimes by a magnitude of two.

2056 Mr. {Markey.} Mr. Smith?

2057 Mr. {Smith.} Your question to us about--

2058 Mr. {Markey.} About this balance between squeezing
2059 efficiencies out of the old technology as opposed to moving
2060 over a spectrum to augment what we now have allocated so that
2061 we can maximize the wealth-generating opportunities.

2062 Mr. {Smith.} I think it is one of the miracles we have
2063 before us is how much more efficiently we are using the
2064 spectrum now and certainly broadcasting has invested billions

2065 to achieve that efficiency. I do believe because we have
2066 seen the explosion you spoke of at the beginning of the
2067 hearing, Congressman, that there are going to be compression
2068 technologies that will provide some of the answer here so
2069 that we can preserve the broadband and the broadcast values
2070 that the committee seeks to serve.

2071 Mr. {Markey.} Thank you.

2072 Dr. Johnson?

2073 Mr. {Johnson.} Yes, Congressman, I would like to make a
2074 couple comments. First of all, the Department of Defense,
2075 one of our principal customers, is driven toward increasing
2076 efficiency. We mentioned briefly in my testimony the use of
2077 unmanned aerial systems and streaming video and the
2078 intelligence, surveillance and reconnaissance needs in Iraq
2079 and Afghanistan that are driving that efficiency as they are
2080 with the commercial market. Lockheed Martin has developed
2081 spectrum management tools that are being used by our
2082 customers to increase that efficiency but I would also like
2083 to point out that in the federal, non-federal kind of binary
2084 view of things, it is really not that. It is not a binary
2085 view at all because it is important to realize the Department
2086 is a major consumer of commercial equipment and using
2087 commercial systems both terrestrial and space so they have to
2088 balance that accommodation between commercial and federal

2089 needs.

2090 Mr. {Markey.} Mr. Stroup?

2091 Mr. {Stroup.} Yes, I would emphasize that the military
2092 is deploying dynamic spectrum access. It is being built into
2093 several military radio systems.

2094 Going back to the question about utilization,
2095 emphasizing the point that you made regarding the PCS
2096 allocation proceeding, that spectrum was encumbered by over
2097 1,500 microwave apps which ultimately the PCS licensees
2098 received that via auction with the understanding that they
2099 could not interfere with them and we are recommending
2100 building on that model, being able to utilize the
2101 technologies available today where they may not actually have
2102 to be relocated but actually could share the spectrum.

2103 Mr. {Markey.} Yes, I think we have to be inflexible in
2104 terms of the goal which we are trying to reach here but
2105 flexible in terms of what the final combination looks like,
2106 but I think it will involve obviously substantial portions of
2107 both, increased efficiency and more spectrum as well, and we
2108 have to ensure that we encourage both to be maximized so that
2109 we do make ourselves as competitive as a Nation as we can
2110 looking over our shoulders at number two and three in the
2111 world, as you said, Steve, so we maintain this lead. So we
2112 thank you all very much.

2113 I thank you, Mr. Chairman.

2114 Mr. {Boucher.} Thank you very much, Mr. Markey.

2115 The gentleman from Pennsylvania, Mr. Doyle, is
2116 recognized for 7 minutes.

2117 Mr. {Doyle.} Thank you, Mr. Chairman.

2118 I just want to start by thanking all the witnesses but
2119 especially I want to thank Dale Hatfield for his years of
2120 dedicated public service and his assistance to policymakers
2121 and helping people across the country to better understand
2122 the technologies behind these issues. I never had a chance
2123 to tell him that personally and he is here and I want him to
2124 know that, so thank you, Mr. Hatfield.

2125 Mr. Largent, Mr. Smith, you both talk a lot about mobile
2126 video broadcasting, and I am curious, do you think people
2127 want to watch a limited number of channels at a set schedule
2128 on a device about this big or do you think they want to watch
2129 their choice of programs when they want to watch them, and
2130 should that consumer preference drive spectrum decisions?

2131 Mr. {Largent.} Well, I would say that from my personal
2132 experience, the older I get, the harder it is to watch
2133 television on a handset, but, you know, we are serving closer
2134 probably now 280 million customers in this country will
2135 probably be the statistic at the end of this year and I would
2136 say that there probably is consumer uptake of that particular

2137 service as it becomes available and it is available now.

2138 Mr. {Doyle.} Mr. Smith?

2139 Mr. {Smith.} Congressman Doyle, I don't believe they
2140 should be regarded as exclusive. I think we can do both.
2141 And I know young people are highly interested in mobile TV
2142 and I suspect many who don't have to wear these are as well.
2143 That said, I think it is very important that these new
2144 inventions like Hulu coming along are using broadcast
2145 content, it won't be many years until your laptop will have a
2146 broadcast signal too, and so it is not either/or. It is
2147 both.

2148 Mr. {Doyle.} But it seems to me--and I agree, I think
2149 it is young people because I couldn't watch TV on this
2150 either. But it seems to me those same people are the ones
2151 that don't want a set schedule. They want to watch their
2152 show when they want to watch their show, and that being the
2153 case, you know, as we talk about where is the best place to
2154 allocate spectrum, it just--I just saw a note here, ``I want
2155 to watch the Steelers beat the Seahawks in real time.''
2156 Right now the Steelers aren't beating anyone. Eddie, were
2157 you responsible for that?

2158 Mr. {Smith.} And Congressman, to that point, I hear
2159 your point but I also hear Congressman Markey's point. I
2160 hear people say no, I want to watch it when it is really

2161 happening and it just part of being the American tradition,
2162 particularly when it comes to sports. People are very
2163 anxious to see it live in real time.

2164 Mr. {Doyle.} Mr. Hatfield?

2165 Mr. {Hatfield.} First of all, I want to thank you for
2166 your kind remarks earlier but I think as an academic stepping
2167 back from this, you have asked a very, very fundamental
2168 question. If people want to watch content simultaneously,
2169 than that old broadcast model is a very efficient way of
2170 doing it. If people want to watch individual things, then
2171 the more cellularized approach is more efficient. So here
2172 your decision or our decision is how that balance should be
2173 made, and of course on the broadcast side we probably have
2174 this additional public interest benefit that may sway the
2175 decision but I think from an engineering standpoint, that is
2176 the fundamental question, how much of it is individual choice
2177 and what time you want to watch it and how much of it do you
2178 want to watch simultaneously with other people in the
2179 country.

2180 Mr. {Doyle.} Does anyone else want to chime in on that?

2181 Okay.

2182 I just have one other question. Mr. Smith, in the
2183 Pittsburgh area, roughly about 8 percent of the people in my
2184 region get their broadcast with rabbit ears, you know, over-

2185 the-air broadcasting, and I was just curious if you have any
2186 numbers on how many people--yes, 8 percent watch with rabbit
2187 ears. How many people--do you have any numbers on how many
2188 people watch HDTV over the air with, you know, the rabbit
2189 ears versus relying on standard def? Is there any kind of
2190 figures like that?

2191 Mr. {Smith.} I have heard the range from 8 percent to
2192 20 percent but I think there are a couple of other factors
2193 that are important depending on your Congressional district.
2194 For example, Mr. Barton's district, it may go as high as 40
2195 percent, and over the air tends to be about people who are
2196 rural, who are poor, who are elderly, who have also invested
2197 in the digital transition.

2198 Mr. {Doyle.} Do you think they have HDTVs?

2199 Mr. {Smith.} I believe the figure of \$25 billion, which
2200 is an estimate of what people have spent in the digital
2201 transition, I think many of them do now and they really like
2202 high definition and they don't want to see it degraded and
2203 they are beginning to really value the multicasting so that
2204 they get a religious channel, a weather channel, a Hispanic
2205 channel, a Korean channel. This is the miracle that is now
2206 made possible because we all did this and it is a very
2207 exciting future that I hate to see clouded by ill-considered
2208 ideas that pit broadband against broadcast. I do think in

2209 the fullness of time there will be technologies that will
2210 provide for both.

2211 Mr. {Doyle.} Thank you.

2212 Mr. Chairman, I have no more questions. I will yield
2213 back.

2214 Mr. {Boucher.} Thank you very much, Mr. Doyle.

2215 The gentleman from Washington State, Mr. Inslee, is
2216 recognized for 5 minutes.

2217 Mr. {Inslee.} Thank you.

2218 Mr. Largent, we know Americans are going to be looking
2219 at their cell phone much more frequently and on an hourly
2220 basis. I just wonder what suggestion you could give us on
2221 things we could do here or FCC to promote investment in the
2222 networks that are really going to be necessary. Just give
2223 your general thoughts about that.

2224 Mr. {Largent.} Well, number one, I would applaud what
2225 the FCC did in November by approving the tower siting
2226 initiative. We have been fighting this battle for a long
2227 time, giving local jurisdiction, States the ability to object
2228 to tower siting proposals but doing it in a timely fashion,
2229 and that goes a long way to helping this industry provide
2230 more service to this country, so I really applaud the FCC for
2231 their action on the tower siting. The two bills that we are
2232 looking at today are kind of the beginning of the process,

2233 the end of the process. The spectrum inventory bill looks at
2234 the possible spectrum that is out there, how it is being used
2235 and what spectrum could be identified for higher and better
2236 use perhaps. And then your bill comes in at the end of the
2237 process and says here is a more orderly fashion to move the
2238 current spectrum holders to their new spectrum and do it in a
2239 more efficient, effective way and do it faster, so both of
2240 these bills are good bills and go a long way to improving a
2241 process of acquiring additional spectrum which the wireless
2242 industry is sorely going to need in the years to come.

2243 Mr. {Inslee.} I want to make sure I didn't miss anyone.
2244 I didn't hear any good or even not-so-good constructive
2245 criticism of our bill, and I want to make sure I hadn't
2246 missed any. Does anyone have any suggestions on the bill I
2247 am working with Mr. Upton on that you would suggest to
2248 improve the product? We are always looking for good
2249 suggestions. This might be the first hearing in American
2250 history where there isn't any constructive criticism, so this
2251 is quite an achievement.

2252 Mr. Calabrese, you have suggested broadening the purpose
2253 of the spectrum relocation fund to support modernizing
2254 federal systems and allowing for a greater degree of band
2255 sharing. Could you give us any sense what you would be
2256 suggestive of as far as cost and what type of approach?

2257 Mr. {Calabrese.} It is very difficult to know the exact
2258 cost. In fact, I would assume probably, you know, first of
2259 all that the agencies that would be proposing to modernize
2260 their system to free up spectrum for sharing that they would
2261 be in a sense second in line. You know, there would first
2262 from that spectrum relocation fund the priority for those
2263 agencies that needed to migrate off a band so that it could
2264 be cleared for licensing as we did with AWS, you know, the
2265 fundamental purpose of your bill. But then secondarily, you
2266 know, like now we have remaining funds and then I think they
2267 should--agencies should be able to apply to the technical
2268 panel that you propose in the bill setting up which would
2269 then recommend to OMB which of those, you know, on a
2270 competitive basis which of those would have the greatest
2271 impact in terms of freeing up spectrum for the commercial
2272 sector or for spectrum efficiency, and it is really a great
2273 benefit because it would make those agencies more effective
2274 with more modern communication while also freeing up
2275 spectrum.

2276 Mr. {Inslee.} Thank you, Mr. Chairman.

2277 Mr. {Boucher.} Thank you very much, Mr. Inslee.

2278 I am going to ask unanimous consent on behalf of the
2279 gentleman from Nebraska, Mr. Terry, to insert in the record a
2280 letter concerning the subject matter before us of the

2281 Electronic Warfare and Information Operations Association.

2282 Without objection, that will be made a part of the record.

2283 The information follows:]

2284 ***** COMMITTEE INSERT *****

|
2285 Mr. {Boucher.} And the gentlelady from California, Ms.
2286 Bono Mack, is recognized for 5 minutes.

2287 Mrs. {Bono Mack.} I thank the Chair.

2288 I would like to ask a question of Dr. Johnson. In your
2289 testimony, you indicated that future government spectrum
2290 needs will be focused on high-bandwidth uses such as video
2291 for UAVs or high-altitude surveillance aircraft. Is that
2292 correct?

2293 Mr. {Johnson.} Yes, that is correct.

2294 Mrs. {Bono Mack.} Can you please provide an estimate of
2295 the percentage of the DOD's high-bandwidth video capacity
2296 used by UAVs and other surveillance aircraft that is
2297 currently provided by commercial satellite systems using
2298 spectrum above 10 gigahertz?

2299 Mr. {Johnson.} No, I can't provide that but we can
2300 provide that after the hearing.

2301 Mrs. {Bono Mack.} Thank you. And do you believe that
2302 most of the future high-bandwidth video capacity for the UAVs
2303 also will use spectrum above 10 gigahertz?

2304 Mr. {Johnson.} I don't know the answer to that.

2305 Mrs. {Bono Mack.} Okay. Thank you. If I can get the
2306 answers in writing after the hearing, that would be great.

2307 At this point I would like to yield the balance of my

2308 time to my colleague, Steve Buyer.

2309 Mr. {Buyer.} Thank you very much. The question I have-
2310 -and I thank you for yielding--is about the delays in the
2311 delivery of spectrum and its impact on delivering commercial
2312 systems. So when you look back even back in 2006 when T
2313 Mobile paid a lot of money out there, \$4.2 billion, for
2314 spectrum, you know, we are 5 years down range now and we
2315 still don't have systems being delivered, and so when we lay
2316 out these timelines for the delivery and they are not met, so
2317 I look at this legislation before us and I am interested in
2318 your opinions if I were to offer an amendment, and Mr. Markey
2319 talks about giving encouragement. What about if I were to
2320 offer an amendment that has a penalty clause so that if a
2321 government department or agency does not deliver the
2322 relocation at the timeline that is specified whether it is
2323 classified or unclassified, then that department or agency is
2324 to pay interest on the monies relative to where that spectrum
2325 is located? So you can figure out what the economic impact
2326 would be, so if DOD says well, it is too difficult for us to
2327 deliver the spectrum from Mobile, Pensacola, to Jacksonville
2328 because we have our classified issues. Well, deal with it
2329 then. Tell us what they are. You said you could delivery o
2330 a particular date, then deal with it. And so I am interested
2331 if I were to offer such an amendment as an incentive, because

2332 if we ask for these companies to put billions of dollars--you
2333 are asking for the next auction. We do the next auction.
2334 Government takes the money and we use the money yet aren't
2335 delivering when we said we would.

2336 And so in the end, Mr. Smith, you talked about public
2337 values. Public values are based upon virtues. If you are
2338 going to have a deal, you can't have a deal without fidelity
2339 and fidelity requires two people, and so if government is not
2340 upholding its fidelity, then maybe we should have an
2341 encouragement clause called a penalty clause. What are your
2342 ideas, your thoughts, Mr. Largent?

2343 Mr. {Largent.} Well, I like your thinking going into
2344 this but I would prefer--I mean, I am just thinking about
2345 this freewheeling right now so I wasn't prepared for the
2346 question, but as I think about it, I think perhaps you could
2347 build incentives for the people that are moving off the
2348 spectrum to get off so that you give them the spectrum
2349 relocation money. You would give them, you know, some amount
2350 of money if they are off in a year and you give something
2351 less than that amount if they are off in 2 years, so you give
2352 them more money to relocate the faster they are able to
2353 relocate as opposed to the same amount of money whenever they
2354 relocate.

2355 Mr. {Buyer.} Well, we can incentivize and penalize,

2356 right?

2357 Mr. {Largent.} We like incentives.

2358 Mr. {Buyer.} I understand.

2359 Mr. Smith?

2360 Mr. {Smith.} Congressman, NAB really doesn't have a dog
2361 in the fight, so to say, but having said that, I applaud the
2362 way you are thinking because I think it would have the effect
2363 of incentivizing more interest in spectrum auctions if they
2364 knew that there was a two-way street and they would be
2365 treated fairly.

2366 Mr. {Buyer.} Thank you. I would like to explore this
2367 idea with not only my colleagues but with you on how we can
2368 build this into this piece of legislation. Thank you. I
2369 yield back.

2370 Mr. {Stupak.} [Presiding] I would have to put a second
2371 degree amendment on your amendment and we would have to
2372 punish all Members of Congress who spend that spectrum money
2373 five times over.

2374 Mr. {Buyer.} I agree with you.

2375 Mr. {Stupak.} And with that, I think we will close this
2376 happy hearing. Thank you to all of our witnesses. Have a
2377 good holiday and thank you for being here.

2378 [Whereupon, at 12:00 p.m., the Subcommittee was
2379 adjourned.]