



# The Need for Modernizing Communications Law for American Consumers

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# Outline

## The Need for Modernizing Communications Law

- I. The most modern part of the economy suffers from the most obsolete technology law
- II. Severe legal obsolescence spawns increasingly serious national problems & unintended consequences
- III. America's most valuable communications resource, spectrum, is the most-wasted & worst-managed

## Appendices:

- Thinking & Starting Anew: Modernizing Communications Law for American Consumers: *American consumers, not technology, should be the organizing principle and top priority in modernizing communications law*; NetCompetition White Paper 4-4-14
- A Modern Vision for the FCC: *How the FCC Can Modernize its Policy Approaches For the 21<sup>st</sup> Century*; NetCompetition White Paper 11-4-13:
- *Modern Beats Obsolete In Spurring Economic Growth & Innovation: Modernize Obsolete Communications Law & Spectrum Management*; NetCompetition White Paper 11-15-12:

# The most modern part of the economy suffers from the most obsolete technology law

- **Obsolete Technology Assumptions:** The foundation of FCC communications law remains predicated on analog technology assumptions of 1934-era copper wire telephony and broadcast radio, and remains largely unchanged by the technological innovations of digital computing, the Internet, or broadband.
- **Obsolete Economic Assumptions:** 1934 technology law still assumes a nationwide AT&T voice monopoly that hasn't existed for 30 years; 1992 technology law still assumes permanent cable monopolies that haven't existed for well over a decade. Much of the law wrongly assumes market competition can't exist.
- **1996 Act Incomplete Transition to Competition:** The core limitation of the 1996 Telecommunications Act -- that changed U.S. policy from monopoly to competition -- was that it was transitional. It never prepared for the broader deregulation warranted by the end of telephone or cable monopolies and the advent of dynamic facilities/platform-based, Internet ecosystem competition. At core, the law is at war with itself.
- **Historical Anomaly:** Congress has repealed 19<sup>th</sup> century common carrier regulation of every other American technology/industry: railroads in 1976; trucking and bus-lines in 1980; and airlines in 1984.

# Severe legal obsolescence spawns increasingly serious national problems & unintended consequences

- **The Forgotten Consumer:** Current FCC technology-based law, in contrast to FTC consumer-centric law, means consumers can't know what protections apply to what technologies. Gaps in current law do not reliably protect consumers universally with 911 emergency services, privacy, security, or disability access.
- **Anti-Innovation Bias:** FCC permission-based, 1934 technology law assumes telecom technologies are problems with consumer harms, not solutions with consumer benefits. Rigid law ensured the telephone changed little from 1934-1984. Despite Bell Labs invention of mobile phones in 1947, the FCC did not approve commercial mobile use until 1982. And despite Bell Labs invention of the computer modem in mid-1950s, they weren't broadly commercialized for consumers until the mid-1990s.
- **Uncertain and Eroding FCC Regulatory Authority:** FCC attempts to assert Internet regulatory authorities have twice been overturned legally: *Comcast v. FCC in 2010*; and *Verizon v. FCC in 2014*. It will take another 3-5 years to learn if the FCC's third attempt at asserting authority will survive legal challenge.
- **Legal Barriers to Unforeseen Competition:** The 1996 Act only allows telephone and cable companies full access to pole attachments and local rights of way, which impedes competition from new unforeseen entrants like Google Fiber. The law also does not envision or facilitate Over-the-Top (OTT) video, raising uncertainty about legal competitive access to programming and the applicability of local franchise rules.
- **PSTN Decay:** 80% of Americans have abandoned the old monopoly legacy Public-Switched Telephone Network (PSTN) for wireless, the Internet and competitors, so only 20% of Americans are using a public network designed to be paid by everyone. It is a cost sinkhole and a big drag on network modernization.

# America's most valuable communications resource, spectrum, is the most-wasted & worst-managed

## 1G Government Spectrum Management in 4G World:

- Government departments and agencies control the vast majority of America's radio spectrum.
- There is no coherent Federal policy that spectrum is a valuable scarce resource that needs to be conserved, well-managed and put to its highest and best use for the Nation and the American taxpayer.
- There is no formal spectrum budget process in the executive or legislative branch, where dominant government spectrum holders have to justify their continued use of the spectrum, defend why they can't share their spectrum with other bureaucracies, or why they can't clear it for public auction.
- There is no accountability process to ensure government spectrum isn't wasted.

# APPENDICES



**Thinking & Starting Anew:  
Modernizing Communications Law for American Consumers**  
*American consumers, not technology, should be the organizing  
principle and top priority in modernizing communications law*

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# Outline

- Introduction: Foundational Concepts
- Problem: Technology-based Communications Law
- Solution: Consumer-centric Communications Law
- Consumer Harms from Technology-based Law
- Historical Examples of Major Consumer Harm
- Conclusion: So What? Why Modernize?



# Introduction: The Foundations of a Modern Communications Law for American Consumers

- Central Idea:
  - American consumers, not technology, should be the organizing principle and top priority in modernizing communications law
- Problem:
  - **Technology-based communications law** naturally obsolesces increasingly harming American consumers, innovation, competition and growth.
- Solution:
  - **Consumer-centric communications law** advances enduring consumer values and the modern dynamism of innovation, competition and growth.
- Foundation:
  - Build modern law on enduring consumer communication values/principles -- like competition, consumer protection, universal connectivity, and public safety -- not temporary technology or market assessments that obsolesce.
  - Modernize communications law to remain dynamic, not static, in order to promote innovation, competition and growth benefits for consumers.

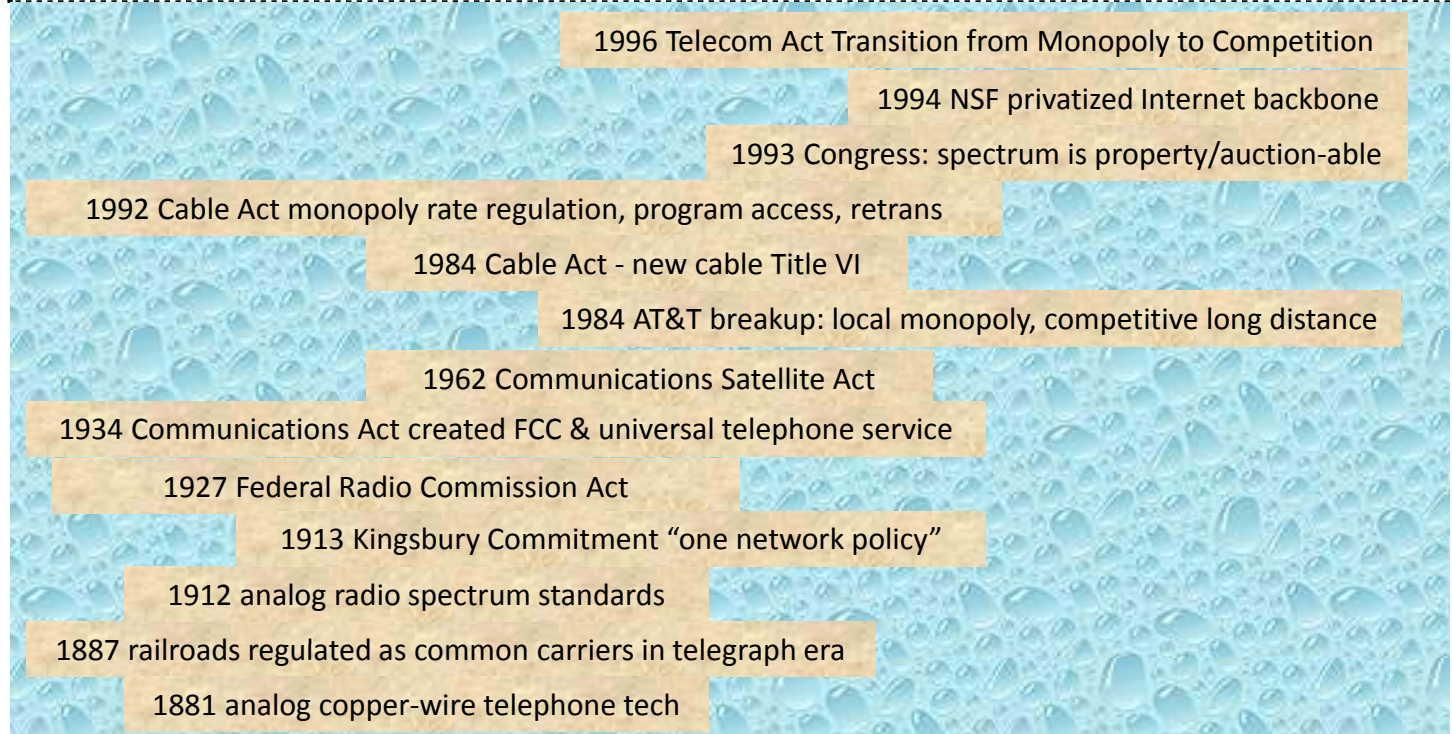
# Modern Problem:

Technology-based communications law naturally obsolesces, increasingly harming consumers, innovation, competition and growth.

*The  
Dysfunction of  
Obsolescence*

**Unstable Uncertain Unreliable Inefficient Inert  
Incoherent Confusing Complex Arbitrary Factional  
Delaying Distorting Wasteful Counter-productive**

*Temporary  
shifting  
obsolete  
foundational  
layers  
based on static  
tech/market  
assumptions*



## Modern Solution:

Consumer-centric communications law based on enduring consumer values and the dynamism of innovation, competition and growth

*Dynamism*

**Innovation Competition Growth**

*A lasting  
foundation  
of enduring  
American  
consumer  
values*

**Competition**

**Consumer  
Protection**

**Universal  
Connectivity**

**Public Safety**

# Consumer Harms from Technology-based Communications Law

- **Inconsistent consumer protections expose arbitrary, confusing, & harmful gaps**
  - Overall consumers can't know what protections, if any, protect them on which communications technology
  - Current day communications suffer from a piecemeal analog mess and jumble of consumer protections
- **Consumer protection obsolesces with technology but isn't replaced like technology**
  - Communication technologies unanticipated by technology law drafters have no consumer protection.
- **Non-universal 911/e911 emergency response is unsafe**
  - In an emergency, a consumer needs to immediately reach public safety; it should not matter what communications technology they use.
  - For example, legacy telephone technology law discourages Google Fiber from offering voice/911 services
- **Non-universal security and privacy protections leave consumers vulnerable to harm**
  - Consumers expect their personal information and communications to have the same security and privacy regardless of the entity communicating it, or the technology, medium or format used.
- **Non-universal consumer protections for the disabled, leave the disabled behind**
  - As legacy technologies obsolesce, the ongoing consumer protection needs of the disabled too frequently are overlooked and left behind.
- **Consumer benefits are long delayed unnecessarily by technology-based law because:**
  - Technology is viewed in the law as a consumer problem with consumer harms, not a consumer solution with consumer benefits;
  - Makes government the de facto approver of new innovations, not consumers in the marketplace; and
  - Forces companies/innovators to compete for approval from Government not for consumers' business

# Historical Examples of Major Consumer Harm from technology-based communications law obstructing, impeding and delaying consumer benefits of innovation

- **Wireless consumer benefits were held back from American consumers for decades.**
  - Bell Labs invented mobile phones in 1947; and AT&T requested mobile spectrum from the FCC in 1947 & 1968.
  - The FCC didn't approve consumer commercial mobile use until 1982, three years after Japan first commercialized American-developed mobile technology in 1979.
  - Then in 1984, then monopoly telephone provider AT&T chose to jettison the nascent wireless business to the Baby Bells in the 1984 breakup of AT&T, based on a infamous McKinsey & Co. estimate that there would be only one million mobile consumers by 2000, a monopoly estimate that turned out to be wrong by a factor of 100.
- **Internet consumer benefits were held back from American consumers for at least a decade or more.**
  - U.S. Government researchers invented the original Internet, ARPANET, in 1969, and used it for two decades within the government and academic community.
  - The revolutionary Internet Protocol packet-switching technology was not commercialized for the American consumers' use and benefit until the early 1990s.
- **Dial-up, & broadband service, consumer benefits were held back from American consumers for decades, and roughly a decade, respectively.**
  - Bell Labs invented the computer modem for the U.S. military in the mid-1950s.
  - The broad consumer commercialization of:
    - 56k dial-up modems were delayed until the late-1990s; and
    - Faster broadband modems were delayed until after 2000.

# Conclusion: So What?

## What's the problem with obsolete technology law? Why modernize?

- **The most modern part of U.S. economy is burdened with most obsolete law/obligations**
  - Limits user benefits, savings & productivity by discouraging adoption & commercialization of *existing* network innovations; and discourages *new* network innovations that could solve niche user wants & needs; and
  - Strangles, distorts, and rations investment, economic growth & job creation by incorrectly assuming networks are monopolies and by forcing network innovation 'round pegs' into obsolete network 'square holes'
- **Anti-technology law perversely harms consumers and innovation**
  - Technology is viewed perversely in law as a consumer problem/harm, not a consumer solution/benefit; &
  - Inconsistent consumer protection exposes consumers to arbitrary, confusing and harmful gaps in 911/e911 service, basic security and privacy protections, essential services for the disabled, etc.
- **Increasing uncertainty/contention/inefficiency over what's legal & the FCC's authority**
  - This dead weight loss ill-serves consumers, industry, and the Nation; it only benefits lawyers & lobbyists.
- **The Public Switched Telephone Network (PSTN) is a dying national albatross**
  - Telephones changed little 1934-84; monopoly regulations discourage legacy network innovation/investment
  - 75% of Americans have abandoned legacy telephone service for wireless, the Internet, and competitors, so only 25% of people are paying only for an obsolescing telephone infrastructure designed to be paid for by everyone.
  - It's so obsolete there no longer are spare parts available to fix it or enough trained engineers to maintain it.
  - It is a cost sinkhole, a nonsensical waste of resources that are an unnecessary drag on modernizing networks
- **Growth cap on mobile revolution; spectrum is Nation's worst-managed/most-wasted critical resource**
  - Consumer demand and taxpayer interests come last under current law because there is no modern management of this critical natural resource, which is the essential fuel necessary to continue powering the mobile technology revolution of smart phones, tablets, video streaming, and the Internet of things.



# **A Modern Vision for the FCC**

## ***How the FCC Can Modernize its Policy Approaches For the 21<sup>st</sup> Century***

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# Outline

## I. Defining Modern & Nostalgist FCC Visions

## II. Problems

- A. America's Biggest 21<sup>st</sup> Century Communications Problems
- B. The FCC's Biggest 21<sup>st</sup> Century Problems
- C. The FCC's Worst Nostalgist Tendencies
- D. The FCC's Obsolete Public Interest Test

## III. Solutions

- A. A Modern Competition Policy
- B. A Modern Public Interest Test

## IV. Recommendation: A Modern FCC Policy Agenda

### Appendices:

- Bio
- NetCompetition White Paper 11-15-12: *Modern Beats Obsolete In Spurring Economic Growth & Innovation: Modernize Obsolete Communications Law & Spectrum Management*



# Defining Modern & Nostalgist FCC Visions

## A Modern FCC Vision

New, contemporary, up-to-date

1. Forward-looking, progress-driven
2. Predicated on current facts and realities
3. Increasingly efficient/practical/productive
4. Current with societal expectations/needs
5. Worthy of continuing and building upon
6. Responsive, flexible, adaptable to change
7. Computer, digital, software-driven
8. Mobile/wireless, independent-of-location
9. Converged, integrated-services/functionality
10. Internet, distribution-technology-agnostic
11. Consumers pick winners and technologies
12. Consumer/market/economics-driven
13. Market economic: attracting investment
14. Competitive information services
15. Competition policy, light-touch regulation
16. Voluntary, competitive peering arrangements

## A Nostalgist FCC Vision

Old, outdated, obsolete

1. Backward-looking, status-quo-driven
2. Predicated on past facts and realities
3. Decreasingly efficient/practical/productive
4. Falling behind societal expectations/needs
5. Unworthy of continuing or building upon
6. Rigid, slow, limited ability to adapt to change
7. Electrical, analog, hardware-driven
8. Stationary/wired, location-dependent
9. Silo-ed, single-service/functionality
10. Technology-specific distribution focus
11. Regulators pick winners and technologies
12. Government regulation/subsidy-driven
13. Govt. uneconomics: disinvestment and decay
14. Monopoly telecom or cable services
15. Insinuates cable monopoly/wireless duopoly
16. Compulsory, regulated interconnection

# America's Biggest 21<sup>st</sup> Century Communications Problems

1. Obsolete U.S. communications law and policy:
  - Incorrectly assumes telephone/cable monopolies and no competition or Internet;
  - Limits user benefits, savings & productivity; discourages *new* innovations for users; slows technological, Internet and commercial progress; burdens investment and economic growth; renders infrastructure and property less valuable and attractive; and undermines American competitiveness.
2. The interests of the obsolescing FCC are diverging from public's interests:
  - The public's interests in progress, innovation, competitive choice, & modern infrastructure are increasingly at odds with the FCC's self interest in applying obsolete law and self-creating new authority to remain relevant in the 21<sup>st</sup> century.
3. Government's waste , hoarding & archaic management of radio spectrum:
  - Creates unnecessary artificial spectrum scarcity & business/investment uncertainty;
  - Will starve mobile revolution of smart-phones, tablets and the Internet of things of the most essential natural resource, spectrum, that they need to compete, grow, innovate & operate wireless broadband networks that can meet exploding demand.
4. FCC barriers to the IP transition and more broadband competition:
  - Rather than facilitating the IP transition, the FCC is impeding it by slow-rolling pilot tests that could quickly identify and address potential transition problems.

# The FCC's Biggest 21<sup>st</sup> Century Problems

1. 1G government in 4G world; FCC's at risk of being more of a problem than a solution.
  - The speed of the marketplace continues to lap the FCC's speed of government. The FCC continues to cling to the past and is falling further behind as others regularly modernize.
  - Inexplicably, the FCC has ~same number of staff that it did before competition & deregulation in 1996.
2. FCC is ignoring that technology & competition can disrupt & obsolete govt. agencies too.
  - The FCC imagines they are independent from Congress and that they don't have to ask Congress to update their core authority, mission, and public interest definition; or to reorganize or modernize to stay current.
3. FCC is in denial that its core authority is obsolescing from tech and competitive change.
  - FCC imagines monopoly approaches based on 1887 railroad regulation, & 1912/1934 tech & economic assumptions, are still applicable to 21<sup>st</sup> century technology & market competition.
  - Congress has already sunset-ted all other common carrier regulators: ICC in 1980, and CAB in 1984.
4. FCC imagines it doesn't need Congress/new legislation to remain legal and relevant.
  - Courts blocked the FCC's sweeping UNE-P rewrite of 96 Telecom Act; blocked the FCC's presumption of net neutrality enforcement authority in *Comcast v. FCC*; & may block FCC application of common carrier obligations on info services in *Verizon v. FCC*. The FCC is near strike-three in trying to bypass Congress.
5. FCC often views modernization as antithetical to the FCC's self-interest.
  - The FCC's 1934 authority created a powerful FCC-centric regulator of monopoly telephone service and regulated radio broadcast service of government-owned spectrum.
  - Thus the FCC often views facilitation of the IP transition towards unregulated information services and recognition that competition policy has succeeded as bad developments for the FCC.

**Simply, the FCC's interests appear to be diverging from America's real public interests.**

# The FCC's Worst Nostalgist Tendencies

1. Viewing successful competition as a threat to the FCC's traditional monopoly-era powers.
2. Coercing industry compliance by threatening stock-crushing reclassification of broadband as a Title II monopoly, common-carrier telephone service.
3. Sabotaging competition policy by:
  - Ignoring telephone and cable are no longer monopolies, but competitive markets.
  - Denying that wireless-wired competitive substitution is real and obvious, in order to ignore that wireless, video, and special access are competitive services.
  - Not pushing the Executive Branch to stop hoarding and wasting spectrum that consumers, competitors and the economy need to meet exploding broadband data demand and grow; and that competition needs to remain vibrant.
4. Imagining that technological changes of video, computers, Internet, broadband, smart-phones, and a law/policy change from monopoly regulation to competition de-regulation, has no effect on the applicability of FCC's original 1934 general and public interest authorities.
5. Viewing the FCC's 19<sup>th</sup> century-based, amorphous Public Interest Test (PIT) as carte blanche power to do whatever three FCC commissioners want to do to the companies involved while maintaining the public fiction that PIT merger conditions are "voluntary."
6. Maintaining that the FCC's legacy monopoly-era Section 214 authority to require prior approval of changes in infrastructure should continue to apply even when the underlying service is no longer a monopoly and no longer warrants monopoly regulation and oversight.

# The FCC's Obsolete Public Interest Test

The FCC's Public Interest Test (PIT) is:

- *Obsolete*: The PIT was originally an 1880s railroad regulation concept that Govt. applied to radio broadcast licenses in the 1920s, and then automatically to all wireless licenses since.
  - The 1880's PIT incorrectly assumes innovation cannot create competitive alternatives (when cars, trucks & planes became railroad alternatives; & TVs, computers & Internet became radio alternatives.)
  - The 1880's PIT incorrectly assumes new technologies are monopolies requiring regulation, and that facilities-based competition isn't possible (when cell phones, cable, & VoIP became competitors to voice, and when cable, fiber, wireless, and satellite became competitors to dial-up Internet service.)
  - The 1880's PIT assumes spectrum is government property, but Congress changed the law so wireless licenses are private property that private owners can buy and sell.
- *Arbitrary & unpredictable*: After 80 years, there are still no objective PIT guidelines or binding precedents, so the PIT routinely degenerates into an unpredictable ad-hoc, political-free-for-all that begs capricious manipulation by special interests and competitors seeking advantages.
- *Discriminatory*: PIT review is unfair: it only applies to transactions, not to similar situations. It only applies to licensed spectrum, not those who do the same thing via unlicensed spectrum.
- *Extortionate*: Special interest groups and competitors routinely ambush companies because they know the PIT turns companies into proverbial "sitting ducks." It provides leverage to extort regulatory concessions that could never be achieved under due process/rule of law.

# A Solution: A Modern FCC Competition Policy

- Find that market competition policy is not the rival or enemy of the FCC, but is the law and congressional policy; and it works and has greatly benefited consumers.
- Remember the 1996 Telecom Act's new purpose for the FCC was "*to promote competition and reduce regulation,*" not reduce-competition-to-promote-regulation as many want the FCC to do now.
- Learn from the FCC's worst "competition" mistakes of the past, that imposed **uneconomic** price/term conditions on the marketplace, which predictably proved to be economically unsustainable and unworkable.
  - Remember FCC 1994 cable rate regulation crushed investment, and FCC 1996 CLEC/reciprocal compensation policies bankrupted the CLEC & fiber backbone industries, which delayed cable and telco broadband modernization for years.
- **Understand competition works when its market-based, because markets require sustainable economics.**
- **Define competition with market-based, not FCC-based, costs, prices, terms and conditions.**
  - Measure its success/failure with market-based measures: customer-switching, pricing rivalry and trajectory, increasing consumer value, levels of investment, and amount of competitive differentiation, innovation, etc., not just market share.
- Appreciate FCC can promulgate anti-competition regulations, just like companies can act anti-competitively.
- **Make it FCC official competition policy that if the Government has any coercive power over private broadband network providers, it would be improper, unfair, and anti-competitive for the Government to build or operate public broadband networks to compete with private broadband network providers.**
- **Conclude:**
  - **Wireless and wired services are technological and competitive substitutes.**
  - **Telephone & cable are no longer monopolies, but competitive markets.**
  - **Copper-based business broadband access is no longer a monopoly service, so legacy special access subsidies & regulations promote-regulation-and-reduce-competition & are anti-competitive & discourage innovation.**
  - **Internet convergence increasingly creates highly-disruptive new vertical competition.**
  - Regulations that impose uneconomic mandates – i.e. subsidies or picking market winners and losers -- are anti-competition and anti-competitive.
  - Internet peering is incompatible with legacy interconnection.
- If the FCC finds anti-competitive behavior in competitive communications markets, refer them to the DOJ Antitrust Division for investigation.

# A Solution: A Modern Public Interest Test

- Define the public interest as a current, contemporary, and up-to-date, public interest, based on today's facts/realities, not out-of-date, obsolete assumptions.
  - How can it be in the 21<sup>st</sup> century public interest to ignore: the Internet; vibrant market competition; that all distribution technologies are not monopolies; and that there is no longer government ownership, but private ownership of spectrum?
- Create formal guidelines that describe what the public interest is based on: i.e. fair, generally-applicable principles; much like the DOJ has done in antitrust law with its Horizontal Merger Guidelines.
- In merger review, determine what unique competition expertise the FCC adds, if any, to the merger review, to ensure that it is not redundant of the DOJ's review, and then focus solely on that unique FCC incremental area of expertise.
- *Important Note:* Communications companies are the only companies in America to be subject to unnecessary duplicative, or repetitive merger reviews by the DOJ, FCC and State PUCs/local franchise authorities.
  - That special case is no longer legitimate because that redundant merger review is predicated on obsolete law that inaccurately assumes monopolies and not competitive markets, and government-owned spectrum and not private-property spectrum.

# Recommendation: A Modern FCC Policy Agenda

1. Pursue modern policies that are best for America not that are best for the FCC.
2. Determine what FCC authorities/policies are now obsolete by innovation and/or market competition, and forbear. Ask Congress to sunset obsolete laws and modernize what remains.
3. Determine what principle-based authority the FCC needs to protect consumers and the public safety in the 21<sup>st</sup> century and formally ask Congress for that authority.
4. Ask Congress to require fiscal accountability for government-used spectrum, to ensure sufficient spectrum below 3GHz is available for auction to meet market demand, and to ensure sufficient spectrum above 3GHz is available for unlicensed use to meet demand.
5. Facilitate, do not impede, market-driven transitions like the IP transition and the spectrum transition from predominantly government use to predominantly public use.
6. Modernize FCC competition policy to be based on market economics and facts, not subsidies and special rules designed to pick winners and losers; recognize wireless and video are competitive and substitutes; and recognize telephone and cable are no longer monopolies.
7. Modernize the public interest test from 1880's implicit market assumptions to be applicable to the 21<sup>st</sup> century Internet and competitive market realities.
8. Declare it improper & unfair for Government (with coercive regulatory, law enforcement, and tax power) to build/operate government networks that compete with private networks.
9. Future-proof. Only regulate real provable harms based on principles, not technologies that naturally obsolesce, markets that disappear, or companies that can go bankrupt.



## Appendix: NetCompetition, Precursor LLC, & Scott Cleland

- **NetCompetition®** is a pro-competition e-forum supported by broadband interests that promotes competitive Internet choices for consumers. See: [www.NetCompetition.org](http://www.NetCompetition.org)
- **Precursor® LLC** is a proven thought leader and industry research consultancy for Fortune 500 companies specializing in the future of: Internet competition, property rights, privacy, cyber-security and cyber-ideology; algorithmic markets; and communications competition and de-regulation. See: [www.Precursor.com](http://www.Precursor.com)
- **Scott Cleland** is a precursor: a proven thought leader with a long track record of industry firsts. Cleland is President of Precursor LLC and Chairman of NetCompetition. He authors the widely-read PrecursorBlog.com. Cleland served as Deputy United States Coordinator for Communications and Information Policy in the George H. W. Bush Administration. Eight Congressional subcommittees have sought Cleland's expert testimony. *Institutional Investor* twice ranked him the #1 independent analyst in his field. Scott Cleland has been profiled in *Fortune*, *National Journal*, *Barrons*, *WSJ's Smart Money*, and *Investors Business Daily*. Ten publications have featured his op-eds. See: [www.ScottCleland.com](http://www.ScottCleland.com)



# **Modern Beats Obsolete**

## **In Spurring Economic Growth & Innovation**

*Modernize Obsolete Communications Law & Spectrum Management*

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# Outline

## Obsolete Law & Regulation

- What Makes it Obsolete?
- FCC Regulation Is an Historical Anomaly
- How Did This Anomaly Happen?
- Law Ignores Five Technology Changes
- Five Ways Law Has Held America Back
- From Monopoly to Competitive Economics
- What's The Harm From Obsolete Law?

## Obsolete Spectrum Management

- Spectrum Management Is an Historical Anomaly
- Spectrum Is a Resource Management Outlier
- Spectrum is the Worst Managed Resource
- Obvious Waste of Government Spectrum
- How Did This Anomaly Happen?
- Why Is U.S. Spectrum Management Dysfunctional?

## Conclusions

## Recommendations

# What Makes Law Obsolete?

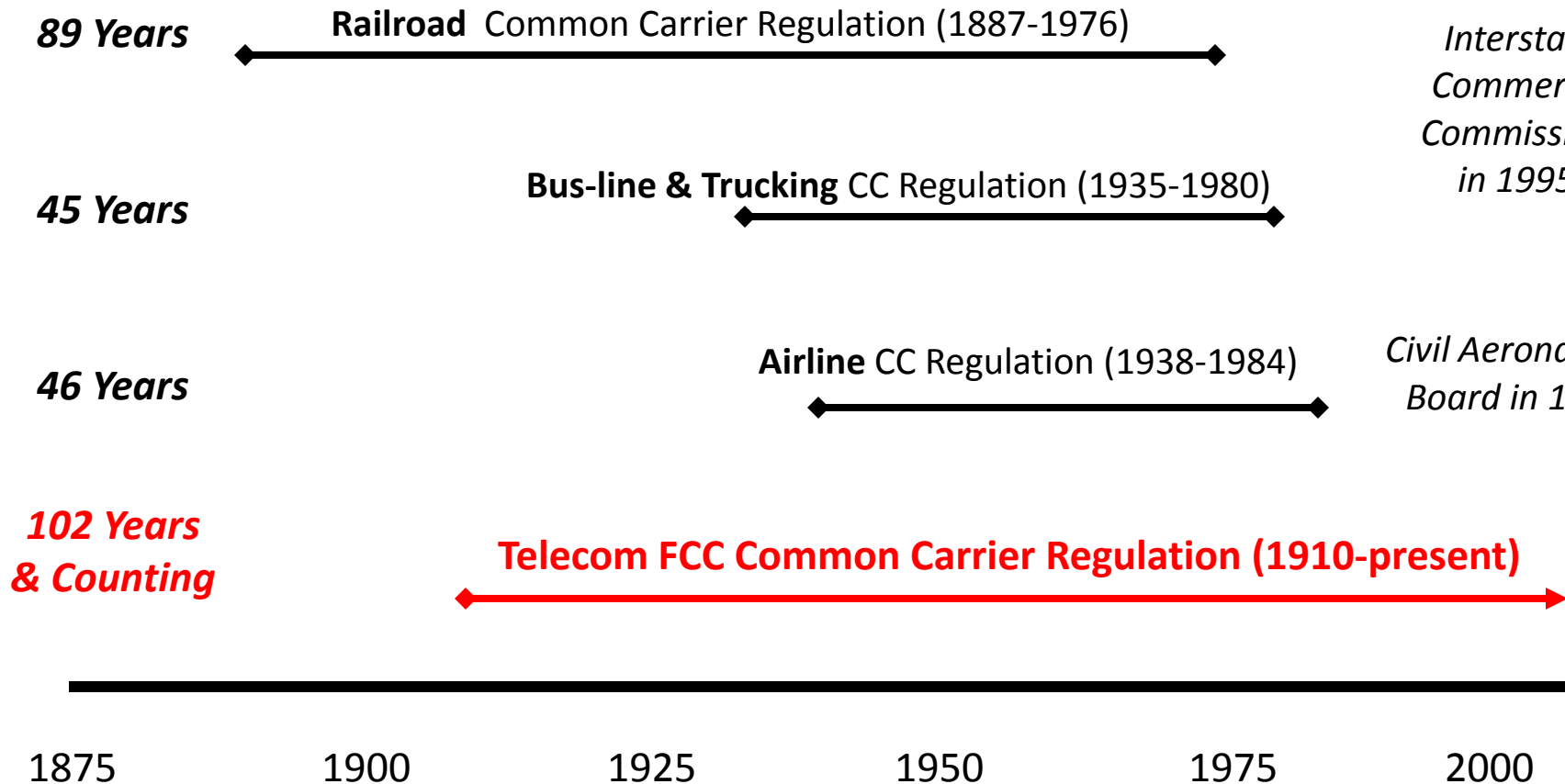
- **1881 analog telephone, and 1912 radio, technological presumptions,**
  - Despite their obsolescence with the advent of the TV, transistors, satellites, microchips, computers, fiber optics, cellular, Internet, smart-phones, etc.
- **1887 railroad common carrier regulation presumption,**
  - Despite the ending of such regulation for railroads 36 years ago;
- **1934 telephone subsidy system presumption,**
  - Despite achieving the goal of universal service ~20 years ago;
- **1940's antiquated management of national resources,**
  - Despite 20 years of obvious, ever-increasing commercial demand for more spectrum auctions of the Federal government's spectrum hoard;
- **1984 AT&T break-up presumption,**
  - That local and long distance voice services were separate, despite voice being an "app" and long distance being a free integrated feature in the broadband IP all-distance world for several years;
- **1992 cable monopoly presumption,**
  - Made obsolete by the 40% share loss to DBS & Telco video-competition; &
- **1996 un-bundling-competition law**
  - Made obsolete by the mass CLEC bankruptcies, a trillion dollar fiber bubble, and the loss of two-thirds of monopoly voice PSTN customers to cable, wireless and Internet competition.

# FCC Common Carrier Regulation Is an Historical Anomaly

*Congress  
Abolished:*

*Interstate  
Commerce  
Commission  
in 1995*

*Civil Aeronautics  
Board in 1984*



Sources: FCC, U.S. Govt.

# How Did This Anomaly Happen?

- Politically, telecom was treated differently than other common “carrier” technologies: railroads, trucks, buses and airlines.
  - In the 1913 “Kingsbury Commitment” the U.S. government politically decided to approve of a *national* monopoly with rate-of-return, common-carrier regulation, in return for a business commitment to deliver subsidized universal phone service at reasonable rates.
  - The 1934 Communications Act then codified this 1913 political agreement to legally sanction a national monopoly in return for subsidized ubiquitous telephone service.
- In contrast the Government did not grant railroads, trucking, bus-lines or airlines *national* monopolies in return for serving every American.
  - The Government also recognized new technologies made common carrier regulation obsolete;
  - Thus they de-regulated: railroads in 1976, trucking and bus-lines in 1980, and airlines in 1984; and abolished the Civil Aeronautics Board in 1984 and the Interstate Commerce Commission in 1995.
- When other common carrier industries were de-regulated in the 1970s because of competition, the Government-sanctioned monopoly was embroiled in an antitrust suit;
  - The Government’s unique political grant of a national monopoly for telephone eventually created barriers for technology-enabled competition and fostered AT&T’s inherent anti-competitive behavior.
  - New microwave communications technology, created long distance competition to AT&T, but to enable it, the DOJ had to sue and breakup AT&T into a long distance company, an equipment company, and seven local phone “Bells.”
- When Congress passed the 1996 Telecom Act, the government’s political grant of a national telephone monopoly ended and telecom competition was the new law of the land.
- Resultant facilities-based voice competition from cable, wireless, and Internet has led to a two-thirds loss in market share and created the predicate for ending common carrier regulation of voice like the Government ended common carrier regulation for railroads, trucking, buses and airlines.

# The Law Ignores Five Technology Changes

1. The sea change from inefficient **analog** to ever-increasingly-efficient **digital** computer/Internet technologies;
2. The virtuous [Moore's Law](#) ~50 year trend of microchip performance doubling every ~18 months;
3. The virtuous [Cooper's Law](#) ~104 year trend of radio transmission efficiency doubling every ~30 months;
4. The virtuous steady efficiency gains in **digital compression innovation** that enable the same wire line or wireless spectrum to transmit increasingly more throughput or effective bandwidth over time; and
5. **Internet convergence** from *single*-service technology silos (telecom, broadcast, cable, satellite, & wireless) to *converged* voice/data/video services Internet technology platforms and facilities.

# Five Ways the Law Has Held America Back

- 1. Telephone service** changed little in 50 years;
  - (1934-1984);
- 2. Cell phone** took 33 years to get to market;
  - (1949-1982);
- 3. Internet packet-switching** took 25 years to commercialize;
  - (1969-1994);
- 4. PC modem** took 25 years to be broadly commercialized;
  - (1977- 2002); &
- 5. Broadband service** took 17 years to be broadly commercialized;
  - (1988-2005).



# From Monopoly to Competitive Economics

- *Legacy* law assumes an analog electrical *continuous* voltage function technology.
  - For telecom that means dedicated continuous end-to-end telephone circuits between locations;
  - While very durable, the analog PSTN is highly-inefficient relative to digital networks.
- *Legacy* law does not explicitly recognize today's digital technology, which is the opposite of analog in being the *discrete/discontinuous* voltage technology function of computers;
  - A discrete, discontinuous technology is an infinitely interchangeable building-block technology;
  - Digital allows near infinite functional integration of data/voice/video and every info type;
  - Digital is orders of magnitude more efficient and functional than analog technology:
    - Digital harnesses Moore's Law doubling of chip performance every ~18 months, which creates a virtuous ever-increasing capability to get more efficiency/capacity out of the same wire/cable or radio spectrum over time.
- At bottom, with every Moore's Law cycle, digital tech has gotten at least twice as efficient as analog technology. To put this in perspective digital technology has gotten *at least*:
  - ~1,000 times more efficient since the 1996 Telecom Act;
  - ~8,000 times more efficient since the 1992 Cable Act, and
  - ~256,000 times more efficient since the 1984 breakup of AT&T and the 1984 Cable Act.
- Simply, the transition from analog continuous to digital discontinuous technology is a transition from analog monopoly economics to digital competitive economics because:
  - A national ~\$200b analog continuous PSTN network worked most efficiently as a monopoly network because it was extremely complicated for regulators to unbundle competitively;
  - Whereas digital discontinuous Internet protocol technology enables engineers to easily and quickly configure devices, transmission technologies, and networks, increasingly efficiently over time.
  - **Digital technology enables robust facilities-based communications competition.**

# What's the Harm from Obsolete Law?

1. Limits **user** benefits, savings & productivity
  - By discouraging adoption and commercialization of *existing* innovations;
2. Discourages *new* innovations for **users**
  - That could solve niche user wants, needs, and means with one-size-fits-all limits;
3. Slows technological, Internet and commercial progress
  - By forcing bandwidth performance to lag computing and storage performance;
4. Burdens investment and economic growth
  - By assuming analog monopolies and not digital competitive communications;
5. Renders infrastructure and property less valuable and attractive
  - As its usefulness can't stay current and competitive; and
6. Disadvantages American competitiveness
  - When foreign competitors aren't burdened with the same drag of obsolete law.

# Spectrum Management Is an Historical Anomaly

To manage and conserve natural resources and Federal lands, Congress created the **Department of Interior** in 1849.

## LAND

To more efficiently manage the Federal workforce, Congress created the **Civil Service Commission** in 1883 and modernized it in 1979 as the **Office of Personnel Management**

## PERSONNEL

To efficiently manage costs and operations of Federal buildings, offices, and vehicles, Congress created the **General Services Administration (GSA)** in 1949.

## BUILDINGS

To efficiently manage Government communications costs, the GSA created the **Federal Telecom Service** in 1960

## TELECOM

To efficiently and effectively manage the nation's resources (except radio spectrum), Congress created the **Office of Management and Budget (OMB)** in the Executive Office of the President in 1970

## BUDGET

**Still NO modern management of radio SPECTRUM In 2012**

1850

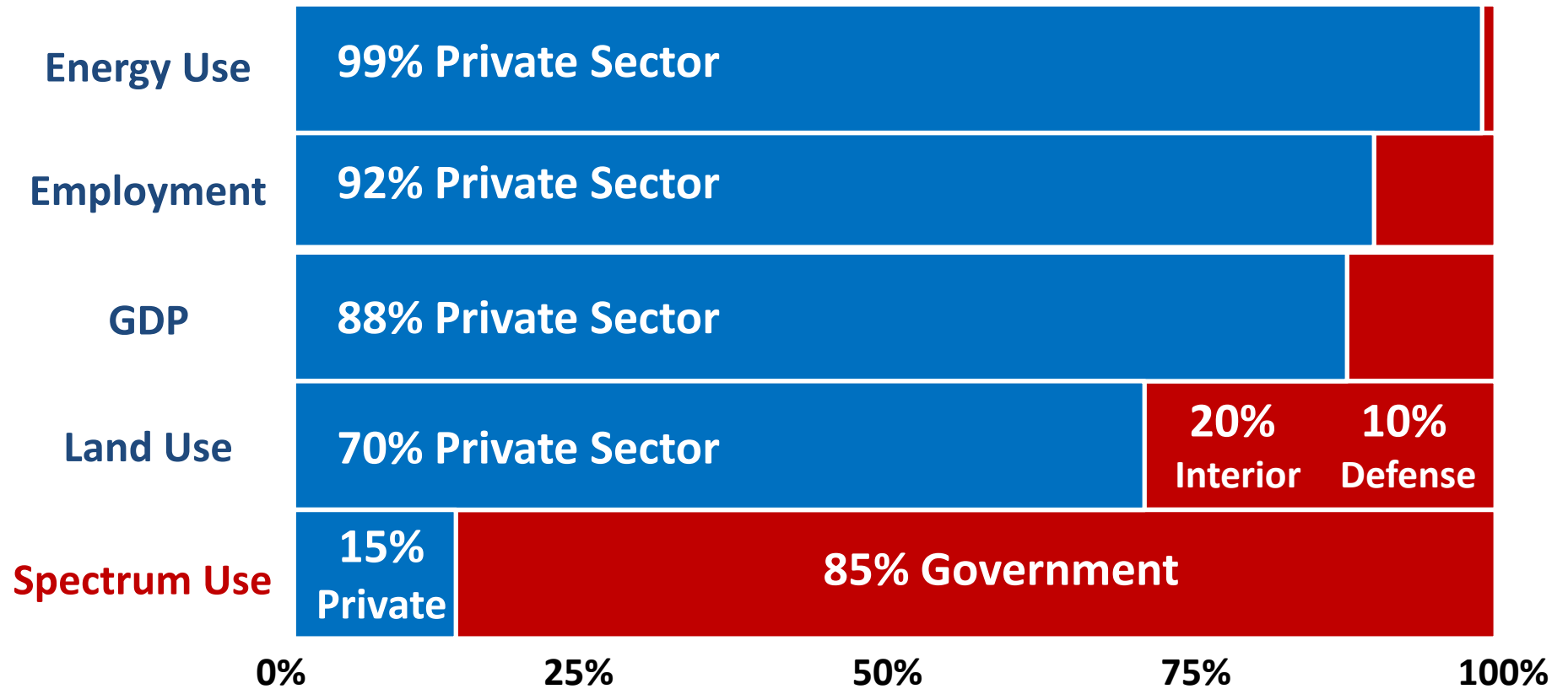
1900

1950

2000

Sources: NTIA,  
U.S. Govt.

# Spectrum Is a Resource Management Outlier



**Private vs. Government Share**

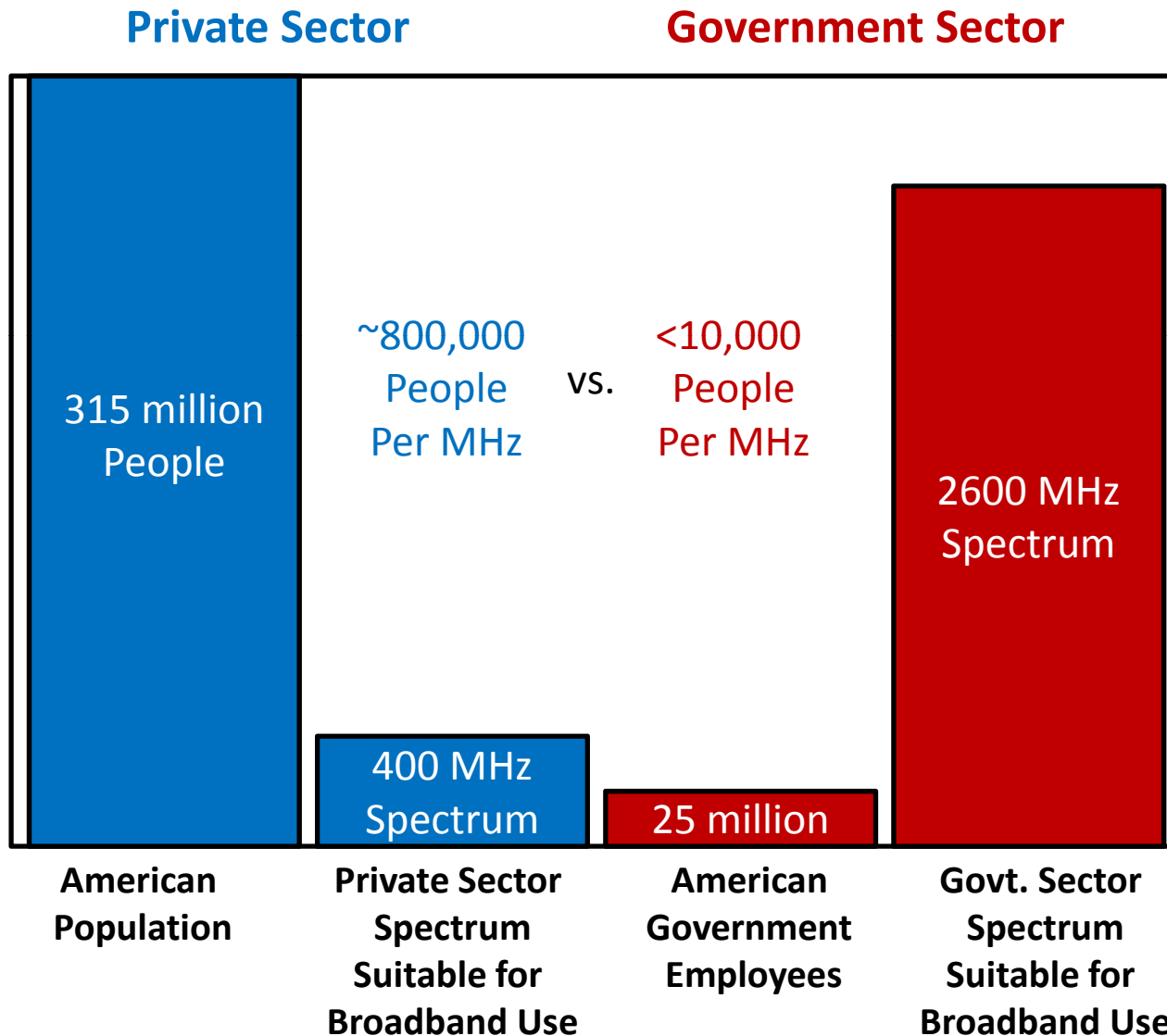
*Sources: DOE, CEA, Interior, & NTIA*

# Spectrum Is the Worst-Managed Resource

- Shockingly in 2012, there remains no accountable Federal manager of radio spectrum,
  - Despite spectrum being the 21<sup>st</sup> century's most valuable natural resource and the essential fuel of the private sector mobile technology revolution of smart phones, tablets and the Internet of things.
- Equally shocking is that the Federal Government's spectrum inventory management system hasn't changed materially since 1992, despite:
  - American wireless subscribers [growing](#) 3,000% from 11 million connections to 331 million;
  - Congress revolutionizing the economics of spectrum by mandating public auction of spectrum to the highest bidder; and
  - The exponential explosion of demand for wireless driven by: the Internet, smart phones, tablets, and video streaming technology.
- Most shocking of all is that a national resource that can enable a ~trillion dollars plus in economic activity is so wasted and backwardly-managed as if it is not important to America's future.

# Obvious Waste of Government Spectrum

Private Sector Spectrum Utilization is >80 Times Higher Than Government Sector



*Note:  
Over 100 years,  
30 Government  
agencies  
incrementally  
received 3,000  
spectrum  
allocations  
with minimal  
accountability  
or oversight*

*Sources:  
U.S. Census  
Bureau,  
CEA, & NTIA*

# How Did This Anomaly Happen?

- The basic legal authority for the Federal Government to manage the inventory of radio spectrum and assign who can use what radio frequencies for what use is obsolete. It hasn't substantively [changed](#) since 1934, despite the:
  - Advent of the TV, radar, microwave communications, satellites, cell-phones, the Internet, smart phones or tablets; and
  - Fact that these technology changes have created vastly more private sector demand for radio spectrum than there is supply for private sector use.
- The current Federal steward of radio frequency assignment authority is the low-level [Office of Spectrum Management](#) buried in the Office of the Assistant Secretary of Commerce for Communications and Information.
  - While ostensibly it has the responsibility for "managing" the Federal spectrum inventory and assignments, it has minimal legal or delegated authority, power, or clout to actually efficiently or effectively manage the Nation's spectrum for the benefit of the Nation or the U.S. taxpaying public.
  - In reality, they are a caretaker/bookkeeper of the nation's spectrum, not a manager of it; no one is.
- Since virtually all broadband-suitable frequencies have already been assigned to a government bureaucracy for free, the current ad hoc [committee process](#) of managing spectrum is dysfunctional, because it has those who already use the spectrum effectively deciding whether or not they have to give it up.
  - Not surprisingly, any government entity that was assigned a valuable frequency for free in the past -- long before spectrum became so valuable and scarce -- is loathe to give it up.
  - Moreover, they also appreciate that there is seldom anyone paying attention in the Executive Branch or Congress, which has the power to get it reassigned to a higher or better use.

# Why is U.S. Spectrum Management Dysfunctional?

- There is no modern management of this resource or process.
  - No coherent Federal policy that spectrum is a valuable scarce resource that needs to be conserved, well-managed and put to its highest and best use for the Nation and the American taxpayer.
  - No OMB-level review -- independent of the departments and agencies that control the spectrum -- to verify that it is being responsibly managed.
  - No formal annual spectrum budget process in the executive or legislative branch, where Government spectrum holders have to justify their continued use of the spectrum, defend why they can't share their spectrum with other bureaucracies, or why they can't clear it for public auction.
  - No regular audit or official accountability process to ensure that this valuable spectrum is being efficiently-used, fully-utilized and not wasted.
  - No required economic opportunity-cost analysis or cost-benefit analysis of Federal spectrum use.
- As long as there is no requirement for Government bureaucracies to pay annually for the value enjoyed from their spectrum use, like they have to pay for the energy, personnel and other resources that they use, spectrum will be managed in a dysfunctional manner and bureaucracies will not understand or appreciate the alternative value this scarce resource has to the private sector.
  - Simply, if a valuable scarce resource is perpetually free to use by a lucky select few, it will be wasted and hoarded.



# Conclusion

- Obsolete law/regulation/spectrum management increasingly is a:
  - **Dead end** with no future; it mandates that communications live in past;
  - **Unnecessary drag** slowing investment & innovation, as it forces innovation 'round pegs' into obsolete 'square holes';
  - **Nonsensical waste** of precious time and resources, as it generates uncertainty, busy work, and red tape;
  - **Cost sinkhole** as it mandates subsidized obsolete service availability everywhere when demand is collapsing rapidly;
  - **Counter-productive** "government may I?" burden on too much communications-driven economic activity; and
  - **Absurdly dysfunctional** part of an otherwise efficient and free market Internet ecosystem.
- The status quo of U.S. communications policy has become an increasingly absurd "[Rube Goldberg machine](#)"
  - Of complex rules, regulations and red tape that make simple technological and business tasks unnecessarily convoluted and inefficient.
- **Bottom Line: U.S. Communications policy is in obvious and urgent need of modernization for the 21<sup>st</sup> Century Internet and mobile economy.**

# Recommendations

## Modernize Obsolete Law & Regulation

1. Modernize communications law/regulation to be consumer-centric and technology-neutral.
  - Don't premise future laws or regulations on *static technology-specific assumptions or policy* that will become obsolete with tech change, but on *dynamic technology-neutral assumptions or policy* that are unaffected by technology change.
  - If there is a need for a transitional technology-specific law/regulation it should be temporary and have a hard sunset date.
2. Proactively cull out legacy law and regulations that are a barrier to or impede the IP transition and competition; and ensure they are both sunset-ed and not applied to the Internet ecosystem.

## Modernize Obsolete Government Spectrum Management

1. Get much more Government spectrum to private sector auction soonest.
  - The Government should reclaim **an additional 1650 MHz** of spectrum suitable for broadband use for private sector use by 2032 -- to transition from controlling 85% of the Nation's spectrum today to <30% by 2032.
2. By law or executive order establish that:
  - Spectrum is a valuable resource to be utilized efficiently and put to its highest and best use for the Nation;
  - OMB manages government spectrum allocations, finds under-utilized spectrum for auction to lower the deficit;
  - OMB accords a monetary value to spectrum and requires those using it to pay market rates for the value received from their spectrum use, like they pay for other resources they use like energy, personnel, etc.
  - Ensures that all Government spectrum users annually justify their continued use of the spectrum, defend why they can't share it with other government entities, or why they can't clear it for public auction.
  - Guards against spectrum waste via a process that ensures that this valuable spectrum is being efficiently-used, fully-utilized and not wasted via: audits, economic opportunity-cost analysis & cost-benefit analysis.

# Appendix: NetCompetition, Precursor LLC, & Scott Cleland

- **NetCompetition** is a pro-competition e-forum supported by broadband interests that promotes competitive Internet choices for consumers.
  - See: [www.NetCompetition.org](http://www.NetCompetition.org) ;
- **Precursor LLC** is an industry research consultancy for Fortune 500 companies specializing in the future of Internet: competition, privacy, security, property rights, innovation and algorithmic markets.
  - See: [www.Precursor.com](http://www.Precursor.com) ;
- **Scott Cleland** is a precursor: a research analyst with a track record of industry firsts. He is Chairman of NetCompetition, President of Precursor<sup>®</sup> LLC, and author of the widely-read PrecursorBlog. During the George H. W. Bush Administration, he served as Deputy United States Coordinator for Communications and Information Policy at the U.S. Department of State. Eight Congressional subcommittees have sought Cleland's expert testimony and *Institutional Investor* twice ranked him the #1 independent telecom analyst. Scott Cleland has been profiled in *Fortune*, *National Journal*, *Barrons*, *WSJ's Smart Money*, and *Investors Business Daily*.
  - See: [www.ScottCleland.com](http://www.ScottCleland.com)