Recommendations for Removing Obsolete or Unnecessary Technical Rules

Chairs: Russ Gyurek, Cisco
John Barnhill, Genband

FCC Liaisons: Walter Johnston, Matthew Pearl, Jeffrey Neumann, Zachary Ross, Henning Schulzrinne, John Kiefer

Date: Jun 8, 2017

2017 Working Group Team Members

- Mark Bayliss, Visualink
- Nomi Bergman, Advance
- Marty Cooper, Array Comm
- Brian Daly, AT&T
- John Dobbins, Windstream
- Dick Green, Liberty Global
- Lisa Guess, Juniper
- Dale Hatfield, Silicon Flatirons
- Stephen Hayes, Ericsson
- Greg Lapin, AARL
- Tim Kagele, Comcast
- Brian Markwalter, CTA
- Tom McGarry, Neustar
- Lynn Merrill, NTCA
- Jack Nasielski, Qualcomm
- Kevin Sparks, Nokia
- David Tennenhouse, VMware
- David Young, Verizon

Recommendations for Removing Obsolete or Unnecessary Technical Rules Charter Part 1

The rapid pace of technology evolution often makes rules that were adopted years ago unnecessary or irrelevant. This work group is tasked to review the FCC technical rules to identify and prioritize those that should be eliminated. In making recommendations the work group is to consider the benefits and costs of doing so, particularly relative to any potential risks of detrimental impact or unintended consequences to existing stakeholders and how those risks can be mitigated.

Eliminate, change, improve regulations that impede business development and or restricts innovation

Recommendations for Removing Obsolete or Unnecessary Technical Rules Charter Part 2

The work group is also tasked with identifying alternative processes for streamlining the introduction of new technologies as an alternative to the Commission's traditional approach of considering technical matters through rule making. The Commission has largely left it to industry to develop standards for new technologies. Would it be feasible to use standards bodies for development of standards for such things as transmitter power limits and out of band emissions? Are there processes that exist or can be developed that bring stakeholders together to develop consensus recommendations on technical matters, including whether it is necessary to embody specific elements in regulations?

Simplified Working Group Mission

- Goal: Reduce the friction of working with the FCC
  - Reduce the regulatory burden and identify defects in current processes
  - Seek recommendations from multi-stakeholder groups
  - Seek FCC staff input on areas to improve process and leverage industry input
  - Identify list of relevant standards bodies and multi-stakeholder groups
  - Balance industry impacts from new or changed rule implementations
  - Develop realistic timelines that recognize impacts and costs to small, medium, and large industry segments as new rules or rules changes are adopted

Fundamental Question for Telecommunications Industry

- How should the commission deal with the sunset of legacy technologies (Pay Phones, Alarms, etc).
  - Do you have to wait until the final user drops the service before it can be sunset?
  - Who turns off the lights?
- Should regulations have a sunset clause? (TTL)
  - There is inherent obsolescence in any rule
  - Create categories with built in TTL (eg. 7yrs, 14yrs, 20yrs)
- What principles should guide decision making through these transitions?

“Enduring Values” of FCC Technical Transitions

Technology Transitions, GN Docket No. 13-5

- **Public safety**
  - Public safety communications must be available no matter the technology
- **Universal access**
  - All Americans must have access to affordable communications services
- **Competition**
  - Competition in the marketplace provides choice for consumers and businesses
- **Consumer protection**

\+ **Protecting the commons (shared resources)**
  - spectrum usage, utilization, sharing

How do we achieve these principles while promoting innovation and growth?

Work Group Activities to Date

- Began review of current commission proceedings
- Initiated Industry stakeholder engagements
  - NCTA/ Rural Broadband Association
  - INCOMPAS
  - Bureau update
  - Securing input from other groups
- Next Gen Policy
  - Exploring multi-stakeholder input
  - Discussed how to leverage standard bodies
  - Policy time limits to match technology speed
  - Reduced/automated reporting

Initial Findings and Feedback

- Commission actively seeking to reduce the regulatory burden
- Industry moving much faster than regulation/rules, but the Commission can facilitate successful transitions
  - Digital TV is a example of FCC successfully promoting a new technology
- Areas of concern to stakeholders include:
  - Archaic rules, burdensome reporting requirements
  - Lack of clarity on requirements and rule interpretations
  - Pole attachment rules, building/ conduit Access
  - Retransmission/ content acquisition/ programming rules

Current Commission Actions

- Commission actively seeking input on simplification and removal of investment barriers in multiple actions
- Example: *FCC Biennial Review – November 2016*
  CG Docket No. 16-124, EB Docket No. 16-120, IB Docket No. 16-131, ET
  - Section 11 of the Communications Act requires the Commission to
    - review biennially its regulations "that apply to the operations or activities of any provider of telecommunications service,"
    - "determine whether any such regulation is no longer necessary in the public interest as the result of meaningful economic competition between providers of such service."

Biennial Review Respondents

Industry Associations	Public Interest	Service Providers
American Cable Association	Common Cause	BT Americas, Inc.
Competitive Carriers Association	New America's Open Technology Institute	CenturyLink
CTIA	Next Century Cities	Cincinnati Bell
INCOMPAS	Public Knowledge	Frontier Communications
NCTA - The Internet & Television Assoc.	Schools Health & Libraries Broadband Coalition	Granite Telecommunications
United States Telecom Association		Hughes Network Systems, LLC
Wireless Internet Service Providers Assoc.		Sprint
	Think Tank	T-Mobile USA, Inc.
	The Free State Foundation	TelePacific
		United Utilities, Inc.
		Verizon
		Windstream

Example: Burdensome Reporting Requirements: NTCA Survey

National Broadband Research Agenda, Docket No. 160831803-6803-01, NTIA & NSF

	Mean (hrs.)
Form 502: Numbering Resource Utilization/ Forecast (Jan.)	5
Interstate Revenue Projections (Feb.)	39
Form 477 – Local Competition and Broadband Reporting (March)	38
ICC/CAF Data Collection (March)	24
Advance Services Data Request (April)	12
Rate of Return Carrier CAF ICC Support (June)	12
USF 16-1 High Loop Cost Data Collection (July)	19
Interstate Separations Cost Study (July)	239
Annual ETC Reporting and Form 481 (July)	60
Form 502 – Numbering Resource Utilization/ Forecast (August)	5
Mandatory Customer Services Questionnaire (Aug.)	12
Form 477 – Location Competition and Broadband Reporting (Sept.)	38
Universal Support Use Certification (Oct.)	4
Lifeline Customer Recertification (Dec.)	55
Other (Selected by Respondents:	
Telecommunications Reporting Worksheet, Form 499Q & 499A (n = 29)	25
TOTAL ANNUAL REPORTING BURDEN	**587**

- NTCA represents ~850 rural rate-of-return regulated service providers
- Serve <5% of US population but cover approximately 37% of its landmass in 46 states

- **The average annual reporting burden is 587 hours, or more than 73 workdays per year.**

Next Steps for TAC Team

- Continue to seek input from stakeholder organizations
  - Evaluate actions currently under consideration
- Issue a Public Notice for additional input (June)
- Create a framework proposal of how to leverage 3rd parties in policy creation: Standards, Panels, etc
  - Ensure that the public interest is considered in all processes
- Create top 3 list of regulation as areas of focus

Industry Engagements: Stakeholder Organizations

- *US Telecom*
- ~~*NTCA*~~
- ~~*Incompas*~~
- *ATIS*
- *NTA*
- *ACA*
- *CTIA*
- *ARRL*
- *NAB*
- *TIA*
- *NCTA*
- *WISPA*
- *APTS*
- *Public Knowledge*
- *SIA*
- *WTA*

Going Forward: Questions for Industry Organizations

- "If you had 2 things to request from the FCC/ Congress to improve your business, what would they be?"
- Is there a more effective way to engage the FCC on issues?
  - Bring in Industry, set up industry panels
- Would your members see a value in leveraging standards bodies and consortia/ multi-stakeholder organizations (IEEE, ATIS etc) as part of the rulemaking process?
- Are there areas where the Commission should step aside?
- Are there aspects of policy the commission should outsource?
- Are there operational domains within the commission that need improvement?

Going Forward: Questions for Industry Organizations- Continued

- Are there critical services that should be opened up to competitive or commercial models? (NG911)
- As new communications services emerge and gain broad adoption (Whatsapp, Facebook, etc), is there a role for the enduring values to be maintained?
  - Don't block new entrants in offering services
- Where are the implications of open internet policy?
- How can the commission spur innovation, encourage faster adoption of new technologies and enable new business models?

THANK YOU!

Broadband Deployment Technology Challenges Working Group

Chairs: Nomi Bergman and Adam Drobot
FCC Liaison: James Miller and Walter Johnston

8-June-2017 Washington, DC

BDTC Working Group Charter for 2017

Broadband Deployment Technological Challenges: This group would bring together technical experts from a broad cross section of the communications industry – including among others: wireline, mobile, cable, satellite, and broadcast, – to study and provide information on available technologies, their limitations, and any technical rules or policies that impede broadband deployment. This group's work may also provide a ready resource for technical support for the FCC's Broadband Deployment Advisory Committee (BDAC).

Working Group Members

- WG Chairs: Nomi Bergman, Advance Newhouse
  Adam Drobot, OpenTechWorks
- SWG Chairs: Lynn Merrill, NCTA
  Marvin Sirbu, CMU
  David Young, Verizon
- FCC Liaison: James Miller and Walter Johnston
- Members:

Shahid Ahmed - SME
John Barnhill - Genband
Mark Bayliss - Visuallink
Nomi Bergman - Advance Newhouse
KC Claffy - CAIDA UCSD
Brian Daly - ATT
Adam Drobot - OpenTechWorks
Russ Gyurek - Cisco
Dick Green - Liberty Global
Dale N. Hatfield - Silicon Flatirons

Working Group Members Cont'd

Mark Hess - Comcast
Jason Livingood - Comcast
Tom McGarry - Neustar
Milo Medin - Google
Lynn Merrill - NTCA
Jack Nasielski - Qualcomm
Chuck Powers - Motorola Solutions
Dennis Roberson – IIT
Mark Richer - ATSC
Marvin Sirbu - Carnegie Mellon University

Paul Steinberg - Motorola Solutions
Michael Tseytlin - Facebook
David Young - Verizon

Paul D'Ari - FCC
Walter Johnston - FCC
Padma Krishnaswamy - FCC
James Miller - FCC
Zach Ross - FCC
Henning Schulzrinne - FCC

SME Presentations and Discussions

May 26th Stagg Newman – Discussion Current Broadband Issues
June 2nd Blair Levin – Lessons learned from the Broadband Plan and Broadband Futures

Broadband Deployment Technological Challenges SWGs

- **Universal Access** dealing with coverage in rural, sparsely populated, and underserved areas
  - Lynn Merrill Chair
- **Broadband Technology Roadmap** to guide future investments
  - Marvin Sirbu Chair
- **Critical Policies and Regulations Review** to encourage Broadband Deployment
  - David Young Chair

Universal Access SWG
Lynn Merrill

Universal Access SWG

- **Statement of the problem:**
  - Broadband is an important service for communities and individuals to access to participate in and build economic activity. A focus for the SWG is to rethink the approaches for accelerating the penetration of broadband in rural, sparsely populated, and underserved areas. There is no single cause as to why broadband is less prevalent in the rural and sparsely populated area versus suburban/urban counter parts. The common thread breaks with density**,** though other factors such as technology, SPs' goals, community involvement, funding opportunities/available support – these factors play significant and important roles.
  - Universal Access SWG in conjunction with serving as a technical resource to the BDAC**,** will examine how technology, processes, implementation and applications affect BB deployments in rural and sparsely populated areas

Universal Access SWG

- **Approach:**
  - Provide liaison to the BDAC for any technical questions
  - Understand historical approach for service and funding
  - Look at alternate business models
  - Identify approaches where the implementations can be self sustaining
  - Gather data to analyze if universal access build-outs and uptake is improving
  - Propose metrics to track progress and typical performance in access deployment for rural areas

Universal Access SWG

- **Expected Work Product and Value:**
  - Technology:
    - Examine how new or changes in technologies create a reduction in overall capital expenditure or increase rural coverage
  - Processes:
    - Bases on density, review alternative business models, capital investment strategies, support and long-term economic values for BB implementation
  - Implementations:
    - Determine key metrics needed to identify breakpoints in technology and where improved coverage in rural areas is taking place. Are these collected today and publicly available
  - Applications:
    - Unique uses in the sparsely populated areas which add revenue or value (Agriculture, Tele-Health, Entertainment, IoT)

Universal Access SWG

- **Nature of actionable recommendations:**
  - Provide liaison to BDAC for technical support
  - List current + 5 year technologies used to service select HH densities
  - Identify proven business models by HH density and FCC actions which can further enhance developments
  - List break points for rural density by served or underserved
  - Identify gaps in current BB data collection to track buildout adoption

Broadband Technology Roadmap SWG

Marvin Sirbu

Broadband Technology Roadmap SWG

Statement of the problem:

Broadband technologies are evolving rapidly. At the same time economically viable Broadband solutions (from Network design, to implementations, to Business Models) that fit a given locale vary significantly. Roadmaps are a way of capturing vetted information that is useful in investment decision in selecting solutions.

Approach:

Provide liaison to the BDAC for any technical questions related to technology options

Review and gather material on Technologies for Broadband, usage patterns, experiences and metrics, and likely evolution paths for existing and emerging technologies.

Critical Policies and Regulation Review SWG

David Young

Critical Policies and Regulation Review SWG

- **Statement of the problem:**
  - Existing policies, laws and regulations at the federal, state and local level – often established for purposes having nothing to do with broadband - may act as impediments to broadband infrastructure deployment.
- **Approach:**
  - Provide liaison to the BDAC for any technical questions
  - Examine law, regulation or policies that may directly or indirectly inhibit broadband infrastructure deployment and adoption

Critical Policies and Regulation Review SWG

- **Nature of actionable recommendations:**
  - Provide liaison to BDAC for technical support
  - Provide list of any identified federal, state or local laws, regulations or policies that are inhibiting broadband investment
  - Analyze the purpose of each identified law, regulation or policy and propose alternative approaches, if possible, that will satisfy the intent without causing the same harm to broadband deployment

Thank you!

Technological Advisory Council

Implications of Next Generation TV Broadcasting Technology

Working Group

June 8, 2017

Implications of Next Generation TV Broadcasting Technology Working Group

- **Co-Chairs:**
  - Lynn Claudy, NAB
  - Mark Hess, Comcast
- **FCC Liaisons:**
  - Martin Doczkat
  - Jonathan Levy
  - Jeffrey Neumann
  - Matthew Pearl
- **Participants / Contributors:**
  - Adam Drobot, Open TechWorks
  - Charlie Zhang, Samsung
  - Brian Markwalter, CTA
  - Dick Green, Liberty Global
  - Kevin Leddy, Charter
  - Lisa Hobbs, Ericsson
  - Mark Bayliss, Visual Link
  - Mark Richer, ATSC
  - Marvin Sirbu, Carnegie Mellon U
  - Maureen O'Connell, Charter
  - Tom McGarry, Neustar

Working Group Charter (1)

- "TV broadcasting is poised to introduce its next generation standard ATSC 3.0. The new standard differs from the traditional TV broadcasting standard in several important ways. It has the capacity to carry not only what can be characterized as traditional content (in a high definition format), but also provides substantial additional capacity to offer new services. The task of the work group is to consider how the new standard might fit into the overall communications landscape of the future."

Working Group Charter (2)

- "For example, to what extent will this new service compete or integrate with services that are offered by commercial wireless services?
- To what extent might the implementation of ATSC 3.0 raise issues such as expanded deployment of distributed transmission systems that could face issues such as tower siting?
- What are the ways that ATSC 3.0 is likely to be deployed that could intersect with other communications facilities and devices such as the use of gateways that could rely on Wi-Fi to distribute multiple video signals throughout a dwelling?
- If a gateway and Wi-Fi were used, how would they interplay with wireless routers used for other services in the same dwelling?
- What other synergies or interfaces might exist between broadcast data services and commercial wireless services?"

Working Group Charter (3)

- “The intention is specifically not to address the topics raised in the Commission’s planned rulemaking to facilitate ATSC 3.0 but rather to look ahead to how implementation may impact the future of communications generally.”

Meetings

- Working Groups announced by FCC on March 10
- Chairs and participants announced by FCC on March 31
- 1st meeting April 13: Organizational
- 2nd meeting May 4: Review of Charter
- 3rd meeting May 11: ATSC 3.0 tutorial
- 4th meeting May 25: 5G tutorial
- 5th meeting June 1: slide review for June 8 TAC meeting
- Meeting cycle: every other Thursday at 4:00 pm

ATSC 3.0 Update

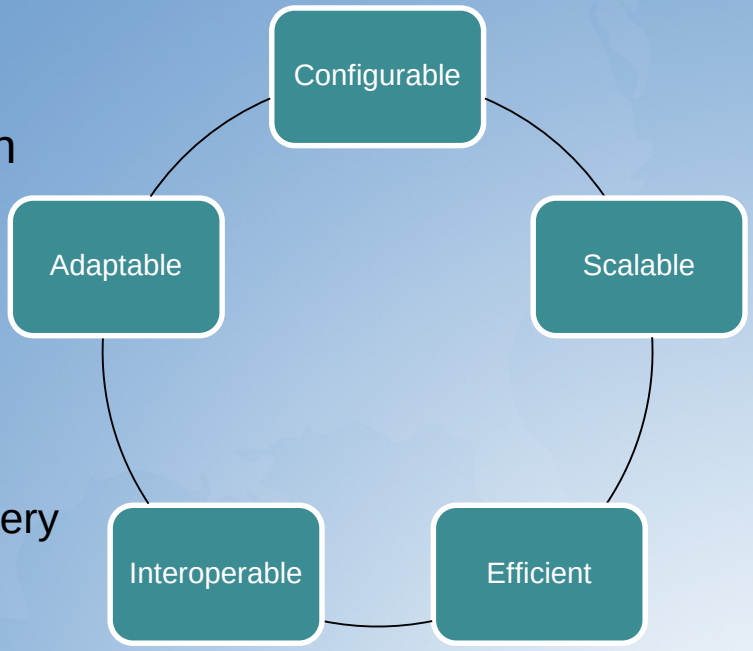
FOR TAC WG ON IMPLICATIONS OF NEXT GEN BROADCASTING TECHNOLOGY

11 MAY 2017

Rich Chernock, Triveni Digital

The Elevator Pitch

- Next generation broadcast television
  - Significantly higher data capacity
  - Flexible spectrum use
  - Higher physical layer robustness
  - Future extensibility
  - Mobile / handheld support
  - Hybrid broadcast + broadband delivery
  - Advanced A / V compression
  - Immersive audio, UHD video
  - Interactivity and personalization
  - Potential for new business models
  - Provide a path to the future of broadcasting

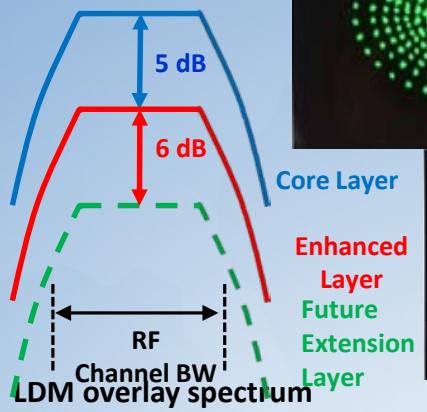


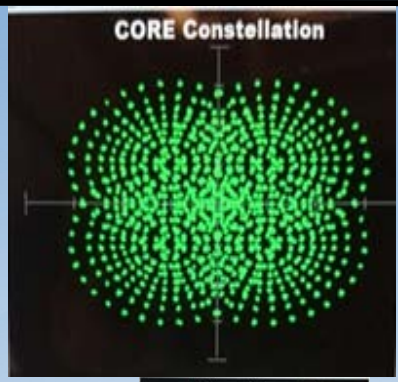
Physical Layer Pipes

- PLPs carry data in various configurations
  - Robustness vs. data capacity tradeoffs
    - Based on selections of modulation and coding
    - Based on selections among interleaving choices
- PLPs can be arranged in patterns of frequency and time resources
  - Patterns can vary between sub-frames
- Up to 64 active PLPs “simultaneously” on a single RF channel
- Up to 4 PLPs in a single service – limited by receiver resources

Layered Division Multiplexing (LDM)

- LDM is a transmission scheme that uses **spectrum overlay technology** to super-impose multiple physical layer data streams with different power levels, error correction codes and modulations for different services and reception environments;
- For each LDM layer, **100% of the channel bandwidth and 100% of the time** are used to transmit the multi-layered signals for spectrum efficiency and flexible spectrum use;
- The high power **Core Layer (CL)** signal is retrieved first, **Signal cancellation** can be used to cancel it from the received signal, and then start the decoding of **Enhanced Layer (EL)** signal;

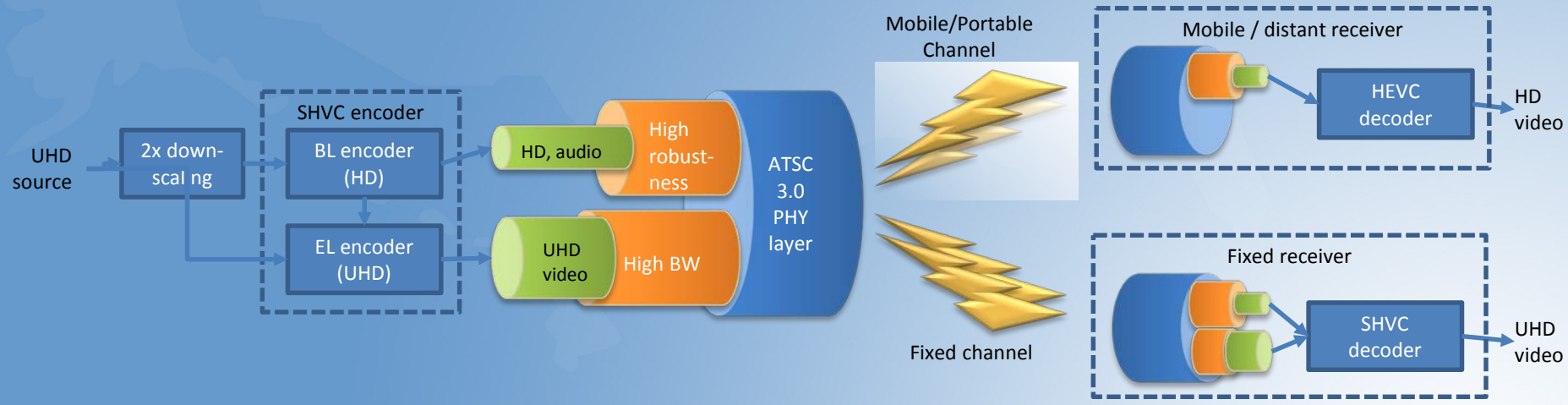




- The **Core Layer** is ultra-robust and well suited for HD portable, mobile, indoor reception. The high data rate **Enhanced Layer** transmission system is well suited for 4k-UHD and multiple-HD high data rate fixed reception;
- **Future Extension Layer (FEL)** can be added later with full backward compatibility;
- LDM is called Multiple User Superposition Transmission (MUST) that is under investigation in 3GPP for application in 5G.

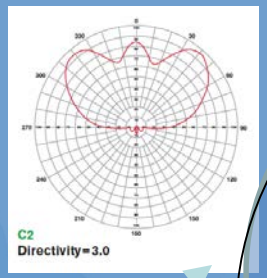
Example use of PLPs or LDM

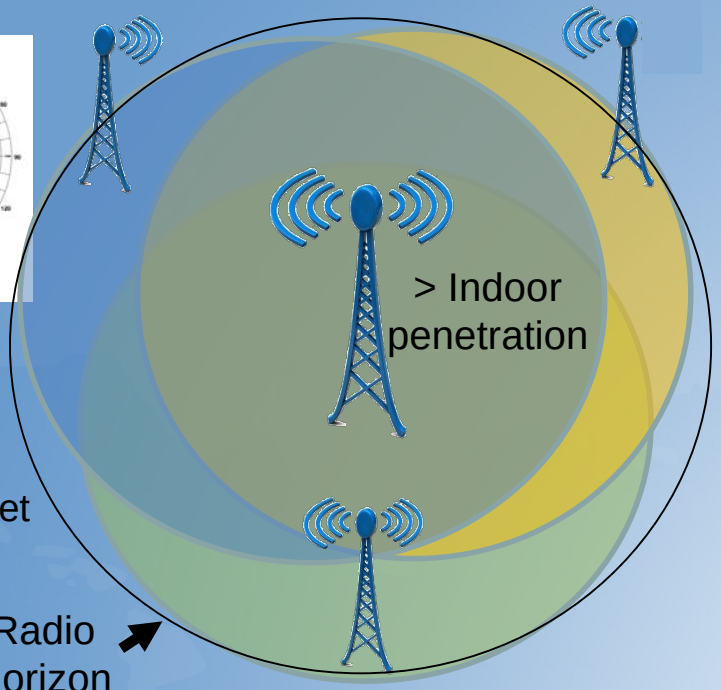
- SHVC (Video Spatial Scalability)
  - Base layer optimized for mobile reception
  - Enhancement layer optimized for UHD resolution
- Possibly considerable “advantage” vs simulcast



SFN

TU Series - Deltawing Panel Broadband Transmission





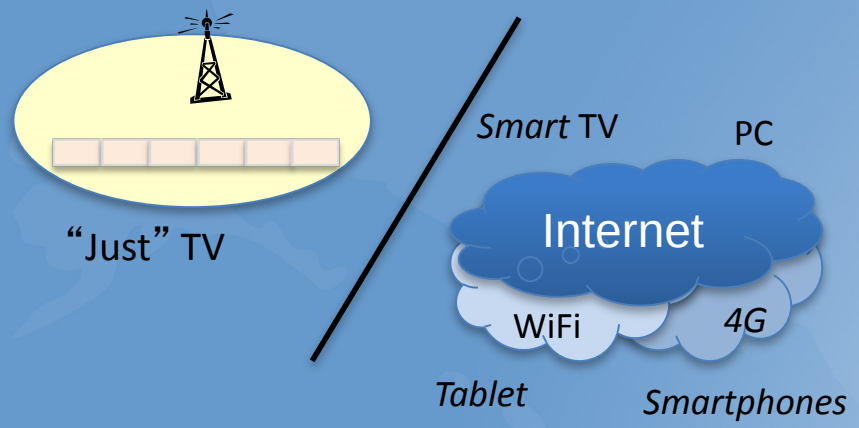
No spill-over into adjacent market

- Multiple transmitters in an SFN can be used to extend coverage and add capacity by raising SNR
- OFDM guard interval alleviates potential inter-symbol interference arising from multiple transmitters
- MISO can be used to artificially decorrelate signals from multiple transmitters to avoid destructive interference

Protocols

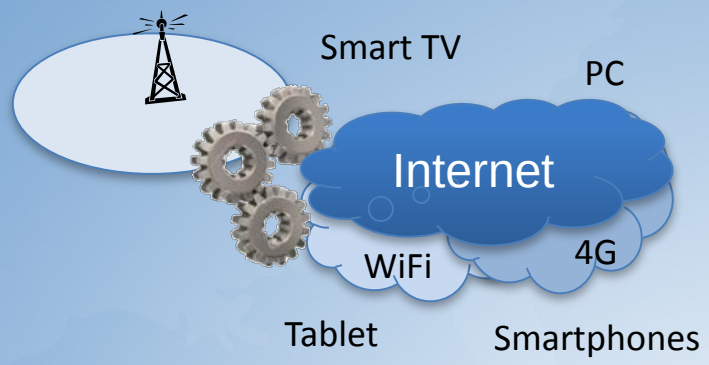
Broadcasting Becomes Part of the Internet

ATSC 1.0



- MPEG-2 Transport Stream provides service flexibility for multicasting
- But Broadcasting isn't part of the internet … and its massive global investment

ATSC 3.0



- Internet Protocol based - enable broadcasting to become PART OF the wireless internet
- Encryption, Conditional Access / DRM enables monetization
- File delivery enables VOD and Dynamic Ad Insertion

Hybrid Example - Sports: Replay key moments

USE CASE

Replay highlights of a game.

Especially relevant when joining late or missing key moments (and associated linear replay)

Hybrid Example - Companion Screen

USE CASE

Audio description or alternative commentary streamed to an app on the phone and listen on headphones.
(Avoid annoying everyone else in the room)

Application

ATSC 1.0

- Pictures, Graphics and Sound are “burned in”
- Same experience for entire audience

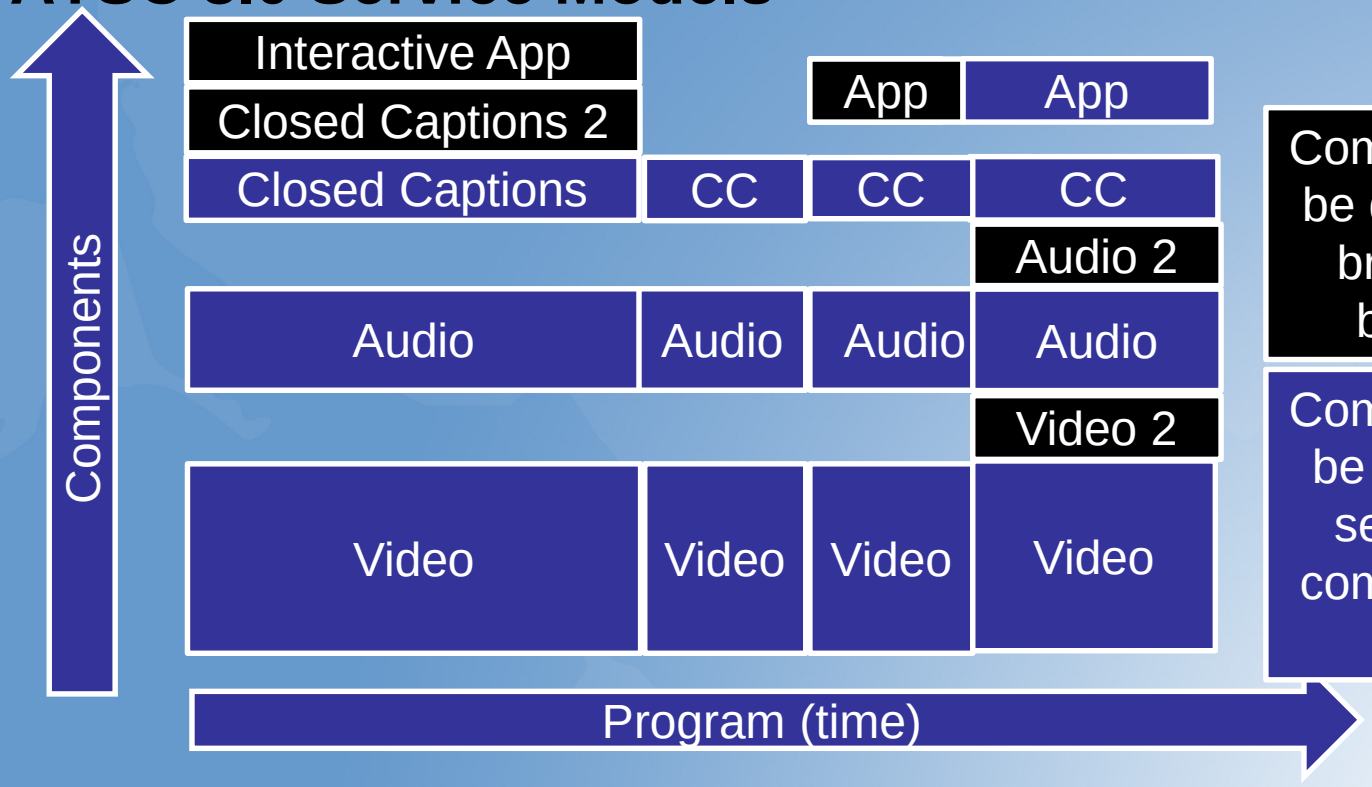
ATSC 3.0

- HTML5/Internet overlay graphics
- Hybrid delivery - merge broadcast & internet
- Dynamic Ad Insertion
- Personalized Graphics
- Interactivity
- Synchronized second-screen applications
- Immersive Audio - user control of tracks and mix
- Audience Measurement capabilities

Advanced Emergency Alerting

- Next step in robust delivery of emergency information to the public
  - Provide a more robust and reliable public warning and safety information communications system
    - Independent of cellular network congestion
  - Leverage broadcaster's major role as a public information provider with disaster-resistant facilities
  - Offload data and video traffic during times of emergency to preserve LTE for what it does best – point-to-point voice communications
- Opportunity for broadcasters
  - Enhance the station's brand for weather, essential information, and public service in times of emergency
  - Provide a pipeline for extensive information beyond simple text, for disaster preparation and recovery, in addition to acute warnings

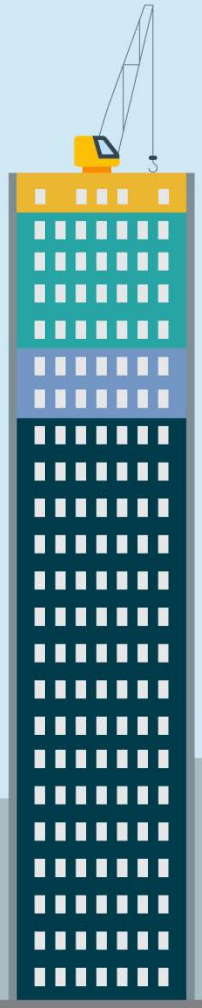
ATSC 3.0 Service Models



Components can be delivered via broadcast or broadband

Components can be dynamically selected and combined at the receiver.

ATSC 3.0 Standards Update
May 2017



DRAFT STANDARDS

A/323 Physical Layer Uplink

CANDIDATE STANDARDS

A/300 ATSC 3.0 System
A/324 Scheduler/Studio to Transmitter Link
A/337 Application Signaling
A/344 Interactive Content

PROPOSED STANDARDS

A/331 Signaling, Delivery, Sync, Error Protection
A/360 Security and Service Protection

FINALIZED STANDARDS

A/321 System Discovery and Signaling
A/322 Physical Layer Protocol
A/325 Lab Performance Test Plan (RP)*
A/326 Field Test Plan (RP)*
A/330 Link Layer Protocol
A/332 Service Announcement
A/333 Service Usage Reporting
A/334 Audio Watermark Emission
A/335 Video Watermark Emission
A/336 Content Recovery in Redistribution Scenarios
A/338 Companion Device
A/341 Video – HEVC
A/342 Part 1 Audio Common Elements
A/342 Part 2 Audio: AC-4 System
A/342 Part 3 Audio: MPEG-H System
A/343 Captions and Subtitles

*Recommended Practice

In Summary…

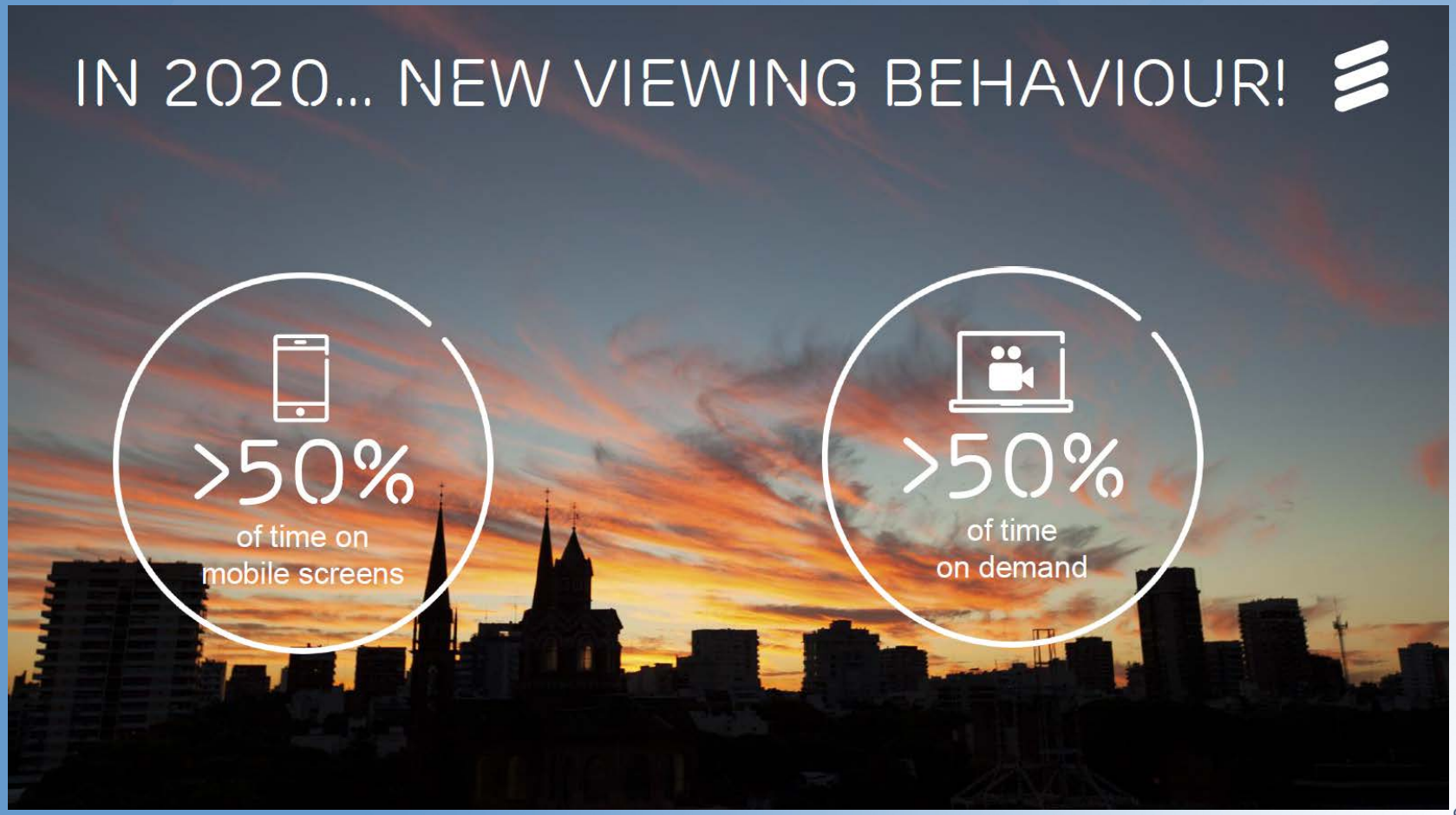
ATSC 3.0

- Will not be backward compatible to the legacy system
- Acknowledges changes of user environments and needs
- Understands broadcast spectrum regulation issues
- Supports viability and new business models of broadcasters
- Flexible to accommodate future improvements and developments

MEDIA EVERYWHERE
5G OVERVIEW

Hossam H'mimy, PhD
Principal solutions consultant, 5G and strategic networks , Ericsson

FCC TAC
May 25, 2017


IN 2020... NEW VIEWING BEHAVIOUR!
>50%
of time on
mobile screens
>50%
of time
on demand

5G MOMENTUM

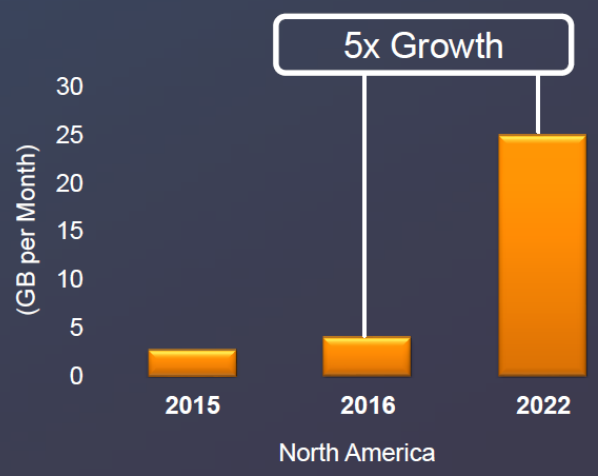
IN 2022

29 BILLION

GLOBAL CONNECTED DEVICES

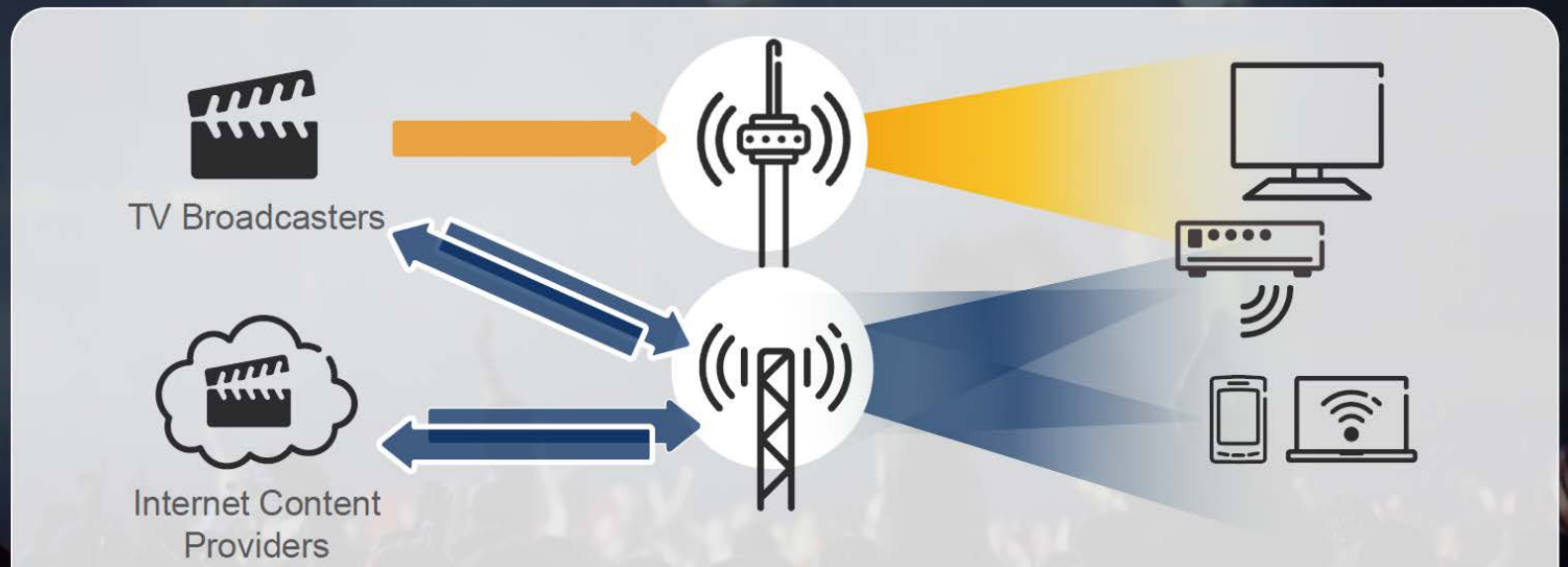
100 MILLION+

NA 5G SUBSCRIPTIONS



Ericsson Mobility Report, Nov 2016

THE MBB HYBRID OPPORTUNITY



- Broadens the Hybrid TV market beyond fixed BB
- Improves TV Broadcaster reach to Smartphones
- Optimizes the spectrum utilization

5G
MEDIA IN 5G
5G DRIVES MEDIA AND MEDIA DRIVES 5G
Broadband and Media Everywhere!

RE-DEFINING THE MEDIA LANDSCAPE

5G

1000X
Mobile Data Volumes

5X
Lower Latency

10-100X
Connected Devices

10-100X
End-user Data Rates

>10yr
Battery Life

Broadband and Media Everywhere!

All media use cases

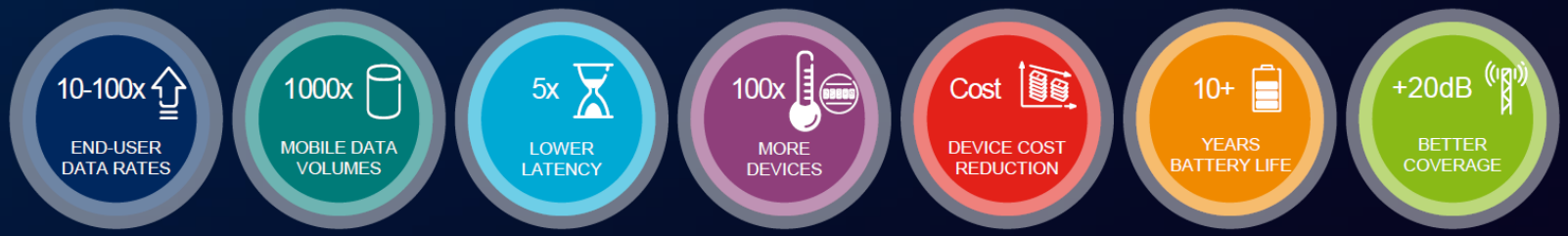
In all user settings

In all parts of the world

ESTIMATED PERFORMANCE

WHAT 5G WILL ENABLE

5G NETWORK SUPPORTS GROWTH



One network supporting multiple use cases & multiple industries

ENABLING THE FUTURE OF TV

ERICSSON

Trends	• Continued high growth of on-demand and mobile viewing • Increasing focus and acceptance in personalization
5G	• Huge jump in speed, latency, and control • Media will drive 5G and 5G will enable media experiences
Hybrid	• The best of Terrestrial/Satellite and Broadband • 4G/5G technology evolution enable MBB to be cost competitive

FEDERAL COMMUNICATIONS COMMISSION FCC USA

What's next?

- Guest experts to present broadcasters' view of integration of next generation TV broadcasting with elements of 5G wireless broadband
- Guest experts to present wireless broadband industry's view of integration of 5G with elements of next generation TV broadcasting
- Discussion and tentative answers to questions posed in working group charter for September 24 TAC meeting
- Summarize work in a report to TAC at December 6 TAC meeting

Discussion of Working Group Charter's Questions

- "For example, to what extent will this new service compete or integrate with services that are offered by commercial wireless services?
- To what extent might the implementation of ATSC 3.0 raise issues such as expanded deployment of distributed transmission systems that could face issues such as tower siting?
- What are the ways that ATSC 3.0 is likely to be deployed that could intersect with other communications facilities and devices such as the use of gateways that could rely on Wi-Fi to distribute multiple video signals throughout a dwelling?
- If a gateway and Wi-Fi were used, how would they interplay with wireless routers used for other services in the same dwelling?
- What other synergies or interfaces might exist between broadcast data services and commercial wireless services?"

THANK YOU

FCC Technological Advisory Council Working Group:

Satellite Communication Plan

June 8, 2017

Satellite Communication Plan Working Group

Working Group

- Jack Nasielski (Qualcomm)
- Karri Kuoppamaki (T-Mobile)
- Michael Tseytlin (Facebook)
- Dave Tennenhouse (Vmware)
- Dale Hatfield (CU - Boulder)
- Mark Bayliss (Visualink)
- Adam Drobot (OpenTechWorks)
- John Chapin (IEEE)

FCC Liaisons

- Mathew Pearl (FCC - Wireless)
- Antonio Sweet (FCC - OSP)
- Robert Pavlak (FCC - OET)
- Padma Krishnaswamy (FCC)
- Jose Albuquerque (FCC - International)

Chairs

- Steve Lanning (ViaSat)
- Pierre de Vries (CU - Boulder) – subgroup Chair

Satellite Communication Plan Working Group Contributors

- Mike Lindsey (OneWeb)
- Zachary Rosenbaum (O3b/SES)
- Patricia Cooper (SpaceX)
- Joe Cramer (Boeing)
- Ahmad Armand (T-Mobile)
- Ralph Ewig (Audacy Corporation)
- Paul Konopka (ViaSat, Inc.)
- Jennifer Manner (Hughes/EchoStar)
- Fernando Carrillo (Hughes/EchoStar)
- Mariah Shuman (OneWeb)
- Jonathan Sheffield (Facebook)
- Alex Epshteyn (Boeing)

Satellite Communication Plan Charter

- This work group will look at recommendations for processes and communication solutions to support both startup venture satellite operations as well as massively scaled satellite operations.
- The work group will assess the challenges faced by these new satellite ventures in the context of current and planned communication/telemetry solutions.
- The work group will focus on streamlining the regulatory process, the impact on current satellite operations from expected scaling of operations in both frequency and number, the effect of possible interference from satellites operation in MEO and LEO orbits, and proposals that would allow for higher spectral efficiency and lower costs for satellite communication needs.

3D Wireless Management

- Geostationary
- Non Geostationary
  - Highly Elliptical Orbits
  - Medium (altitude) Earth Orbits
  - Low (altitude) Earth Orbits
- High Altitude Platforms (HAPS)
- Aeronautical
  - Manned
  - Unmanned Aerial Vehicle (UAV)
- Associated Ground Terminals
- Terrestrial Services

Work Plan And Products

- Use cases including
  - satellite as primary platform for access,
  - IoT and new requirements,
  - vehicle to space vehicle communication as part of a network in the sky as generalization from bent pipe operations
  - identification of sensible spectrum as input to provide prioritization of decisions and identification of where advocates are coming from
  - White Paper
- Risk Informed Interference Assessment (Pierre to give details)
  - White Paper
- Presentations by leaders in Geostationary Satellites, LEO and MEO as well as those working in research field. Expectation is that presentations will inform and enrich the deliberations and work product of the group

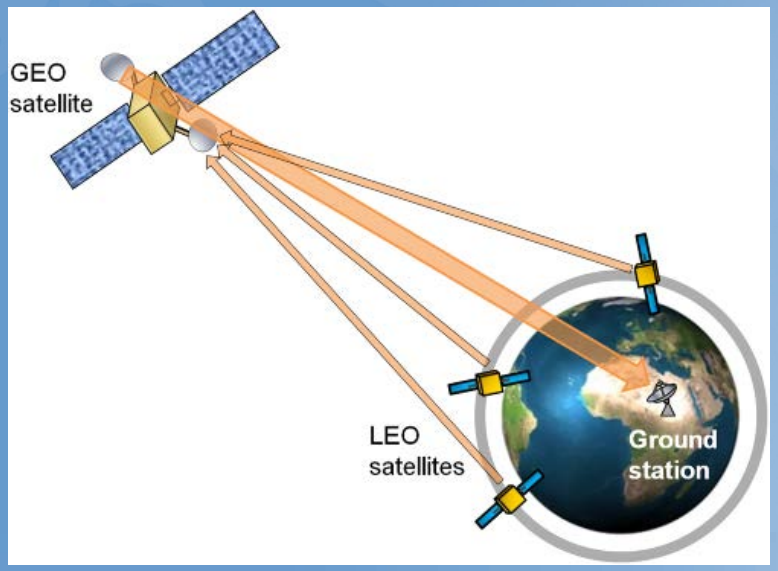
Risk assessment framework for GSO/NGSO coexistence

- Goal ("What"): Frame a Risk-informed Interference Assessment (RIA) of GSO/NGSO coexistence
- Purpose ("Why"): Outline a risk assessment framework that can help frame the coexistence debate
- Non-goals
  - A complete risk assessment (we will only provide framework, not calculations)
  - Policy recommendations (we will not take a position on merits of active proceedings)
- Deliverable: White Paper for December TAC meeting

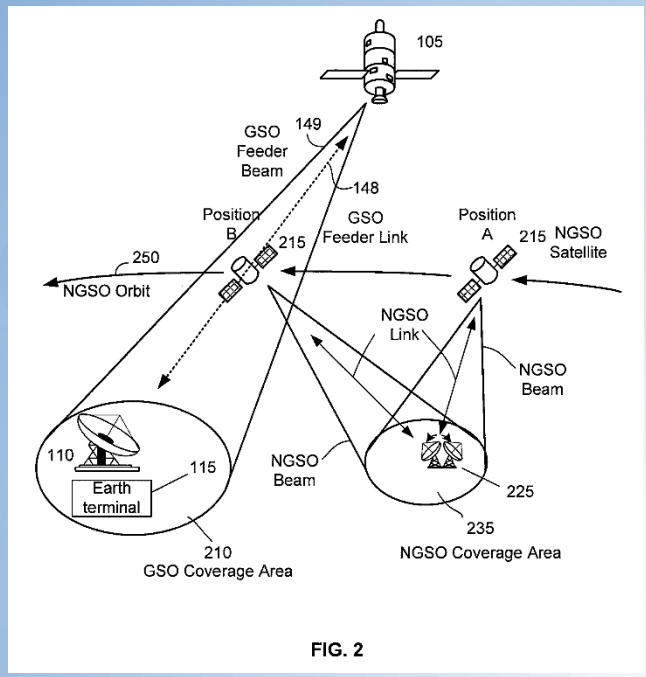
GSO/NGSO coexistence

Consider thousands of LEOs as well as some MEOs with services including aerial mobility

Co-existence becomes an increasingly difficult technical feat



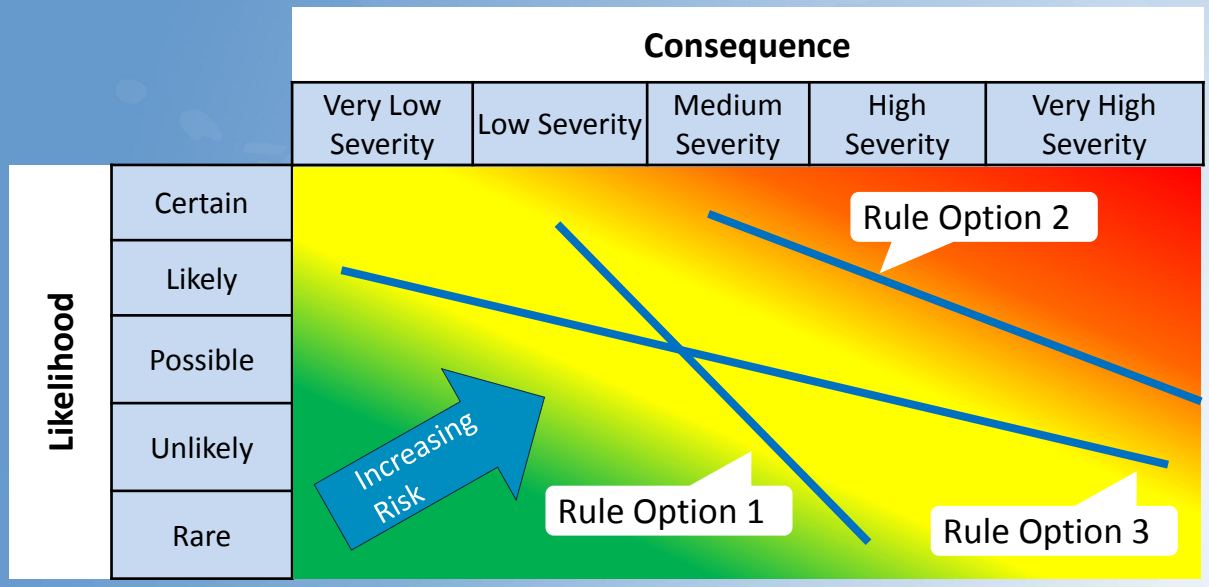
http://onlinelibrary.wiley.com/doi/10.1002/sat.1213/full



https://www.google.com/patents/US8068827

Risk-informed Interference Assessment (RIA)

- Follows 2015 TAC Recommendation
- Key concepts
  - Risk triplet: What can go wrong? How likely is it? What are the consequences?
  - Risk-informed interference assessment: Quantitative analysis of the likelihood & consequence of interference hazards to inform regulatory trade-offs



Elements of a Risk-informed Interference Assessment

- This project will focus on the first two of the four elements
  1. Make an inventory of hazards
     - Baseline hazards: degradation of desired signal; non-interference faults and failures
     - Coexistence hazards: intentional, spurious, unintentional and incidental interference
  2. Define a consequence metric to quantify impact of hazards
     - Quant measure of harm caused by any/all hazards
     - Select few from many candidates, e.g. RF metrics and service KPIs
  3. Calculate likelihood-consequence values for each hazard
  4. Aggregate the results to inform decisions about coexistence rules
- If time allows, we will examine
  - Mitigation options, with approximate costs
  - Pro forma calculations to illustrate implied trade-offs, e.g. order-of-magnitude probability/severity regions where services are degraded at different levels

Satellite Communication Plan Working Group Presentations

Done

- Jennifer Manner and Brennan Price (Hughes/EchoStar on evolution of GEO technology
- Professor Albin Gasiewski (University of Colorado) research perspective on Remote Sensing.

Planned

- Jennifer Manner: update on ITU
- Patricia Cooper SpaceX
- Daryl Hunter and Fernando Carrillo Protection Criteria for FSS Interference Above 30 GHz
- Alex Epshteyn: Boeing's NGSO plans and Boeing studies of sharing between GSO and NGSO
- White paper review on Risk Informed Interference Assessment
- White paper review on Use Cases

More Representation From Start-ups Needed

- Invitations have been extended and there has been light attendance
- Seems start-ups are very stretched and time to participate is limited
- Will continue to reach out as charter requires consideration of their needs

Mobile Device Theft Prevention WG
Report to the FCC TAC

June 8, 2017

2017 MDTP WG

- The MDTP Work Group has focused on analyzing the theft of mobile devices in the United States; working with industry and law enforcement to increase the security of mobile devices, facilitate coordination of theft related data between industry, law enforcement and the consumer, and track trends in the theft of mobile devices.
- Prior work has led to alignment of theft prevention features among smartphone manufacturers and initial development of an industry information portal to coordinate theft data among stakeholders.
- The work group is tasked in 2017 to build on this early work. It will focus on:
  - Working with law enforcement in assessing the benefits of the information portal to relevant stakeholders
  - Make recommendations for the continuing involvement of law enforcement in industry theft prevention efforts, and analyzing the ongoing effectiveness of past efforts in combatting device theft.
- Study future mobile device threats in an evolving ecosystem and make further recommendations on actions to combat theft.
- Develop baseline statistics on device theft based on data from directed consumer surveys and law enforcement data to help track long term progress and identify theft scenarios.

WG Participants

- Co-Chairs:
  - Brian Daly, AT&T
  - Rob Kubik, Samsung
- FCC Liaisons:
  - Walter Johnston
  - Charles Mathias
  - Elizabeth Mumaw
  - Theo Marcus
  - Michele Wu-Bailey
- Dennis Roberson, FCC TAC Chair
- Document Editor: DeWayne Sennett, AT&T

- Jason Novak, Apple
- Timothy Powderly, Apple
- Ogechi Anyatonwu, Asurion
- Jay Barbour, Blackberry
- Brad Blanken, CCA
- John Marinho, CTIA
- Jamie Hastings, CTIA
- Mike Carson, ebay
- Mike Rou, eBay
- David Mersten, ecoATM
- Max Santiago, ecoATM
- Christian Schorle, FBI
- James Moran, GSMA
- Craig Boswell, Hobi
- Chris Drake, iconectiv
- Chip Stevens, iconectiv
- Sang Kim, LG

- Gunnar Halley, Microsoft
- Joseph Hansen, Motorola
- Joe Heaps, National Institute of Justice
- Thomas Fitzgerald, New York City Police Department
- Jack Mcartney, Recipero
- Les Gray, Recipero
- David Dillard, Recipero
- Mark Harman, Recipero
- Maxwell Szabo, City and County of San Francisco
- Gary Jones, T-Mobile
- Samir Vaidya, Verizon Wireless
- Samuel Messinger, U.S. Secret Service

Thank You!

Review of MDTP WG 2016 Priorities

- Set up the common framework for collection of centralized data post July 2015 (e.g., through CTIA with input from OS providers, mobile operators, and law enforcement agencies) and framework for analysis of the data
  - (CTIA) Nielsen survey of consumers is in the field on the effectiveness of the theft prevention
  - (CTIA) Operator survey is currently underway to aggregate information

- Continued studies to determine whether implementations post July 2015 have the desired effect on mobile device theft
  - Need to have data from CTIA and LEA from the above item before analysis can be performed.

- Using the mechanisms being developed in ATIS and GSMA on enabling a mechanism for IMEI to be retrieved on disabled devices and educational outreach to law enforcement on using the mechanism
  - ATIS and GSMA best practices are in place.
  - Education outreach should be delayed until devices are available aligning with best practices.

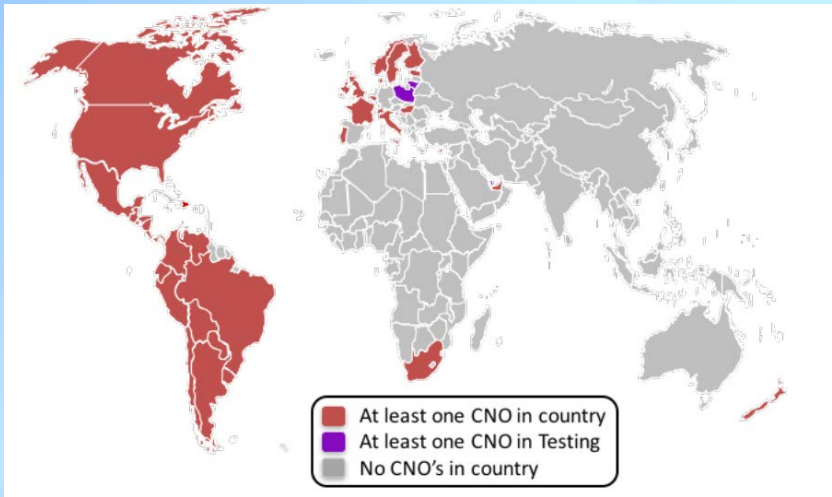
- Consider a study on how to expand blacklisting to all US carriers, working with the GSM Association/GSMA North American Regional Interest Group and CTIA
  - GSMA/GSMA-NA are attempting to work with carriers in the region to encourage them to use the IMEI database.
  - CTIA joint meeting with GSMA discussed development of a plan to outreach to these other US carriers.

Focus Areas for 2017

- Develop additional actionable recommendations for:
  - Law enforcement statistics refresh
    - Select sample list of cities to refresh stolen phone statistics obtained in 2014 to see trends post implementation of on-device mobile theft solutions
    - Develop procedure to obtain regular updates of the data
  - Getting more operators engaged both domestically and internationally
  - Analysis of 5G and what 5G may offer in terms of additional solutions
  - Enhancements to the Stolen Phone Checker
- IMEI Security
  - Reliability and issues of compromising the IMEI
  - Where is the industry on this?
- Where are stolen devices ending up?

GSMA Stolen Device Data Sharing Reports

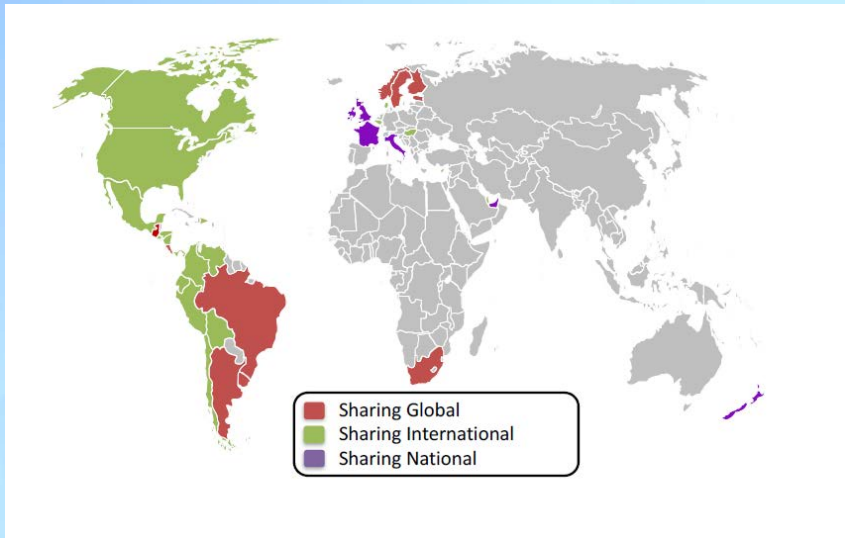
- Describes the network operators participating in the exchange of IMEI data concerning devices reported lost or stolen
- Data is taken from the GSMA IMEI database and relates to operators with active live or test user accounts
- GSMA provides the blacklist information on a 24/7 basis to the operators that have established connections to the IMEI Database for them to download and use within their own networks for device blocking purposes



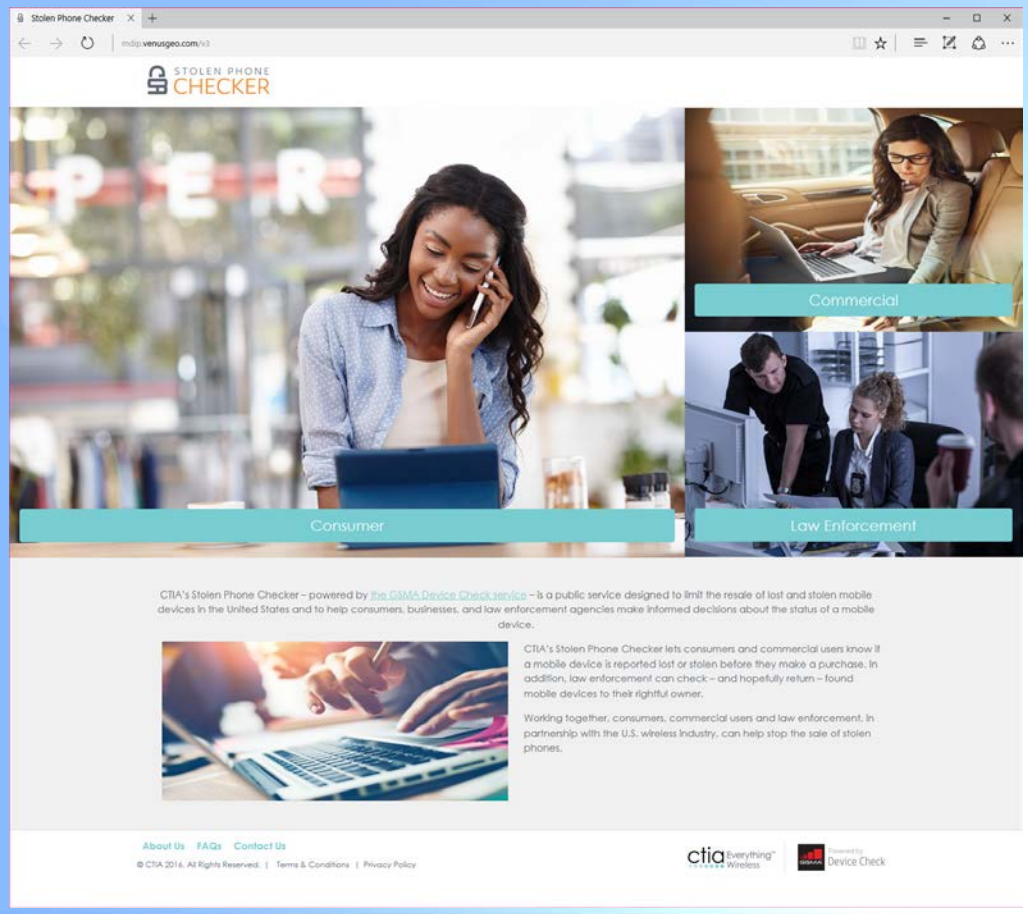
Key Take-away: There are many countries currently not participating in lost and stolen blacklisting and/or lost and stolen data sharing not taking place between operators, Especially Asia, Africa, Middle East

U.S. Operator Participation in GSMA IMEI Database

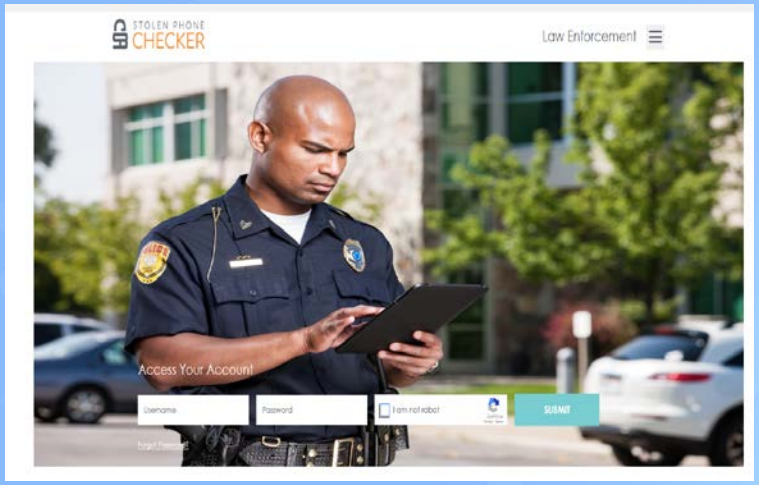
- Connected Network Operator & Data Sharing Coverage
  - Verizon Wireless: Global
  - T-Mobile USA, Inc: North America
  - Sprint: Canada, USA
  - AT&T Mobility: North America (Partial)
  - US Cellular: Global
  - NewCore Wireless LLC: USA



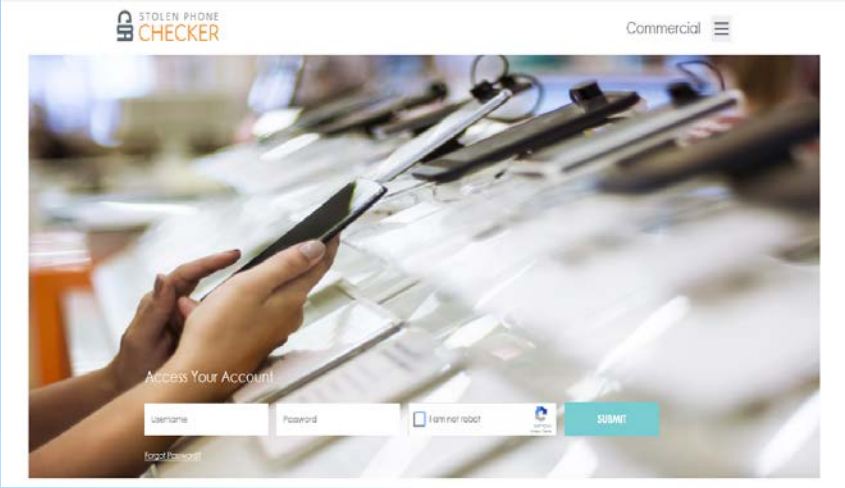
CTIA Stolen Phone Checker



Law Enforcement & Commercial



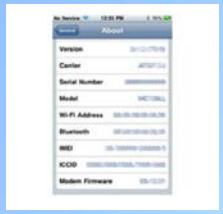
Stolenphonechecker.org



Stolen Phone Checker – How It Works

What is an IMEI/ESN? It is your device serial number. To find it…

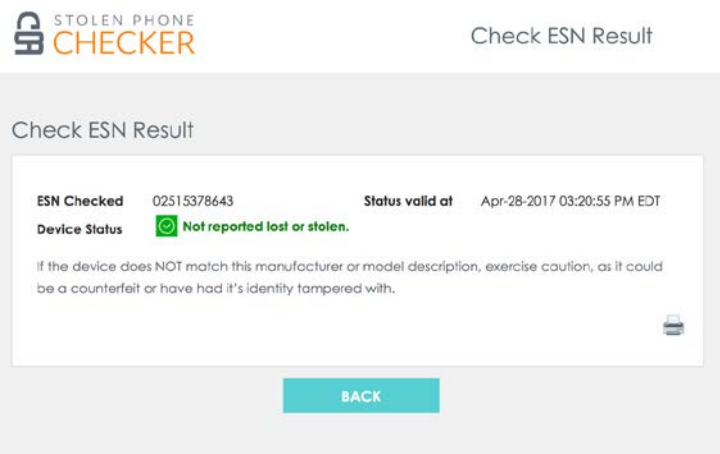
1. Dial *#06# on your mobile



2. Check device settings

3. Look behind the battery

4. Examine Device Packaging



Stolen Phone Checker – Successful Launch

"Empowering consumers to ensure their refurbished cell phones aren't stolen is a win-win. I applaud CTIA for its work on this issue and hope to do what we can at the FCC to raise awareness of this tool, which can provide peace of mind to consumers and decrease the incentive to steal mobile phones. This is another area where consumers, industry, and the FCC are all pulling in the same direction and getting results."

Chairman Ajit Pai
May 12, 2017

Next Steps

- Analyze future threats and consequences of mobile phone theft solutions
- Additional Studies Addressing Challenges of Tracking Where Stolen Devices Go
- Impact of Stolen Phone Checker launch
- Discussions with Federal/State/Local/Tribal Law Enforcement
  - Providing the Police Chiefs with a briefing on the Stolen Phone Checker
  - Soliciting feedback from the Police Chiefs on the Stolen Phone Checker
  - Request the Police Chiefs to advertise the Stolen Phone Checker with Enforcement colleagues.
  - Request updated smartphone theft statistics in order to evaluate the effectiveness of the theft prevention measures implemented to date.
- Review CTIA surveys & results