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INSTITUTO FEDERAL DE TELECOMUNICACIONES

"Año del Centenario de la Promulgación de la Constitución Política de los Estados Unidos Mexicanos"

OFICINA DEL COMISIONADO MARIO GERMÁN FROMOW RANGEL
IFT/100/Pleno/OC-MGFR/024/2017

Ciudad de México a 27 de octubre de 2017

PLENO DEL INSTITUTO FEDERAL DE TELECOMUNICACIONES
P R E S E N T E

Me permito presentar el informe de mi participación en representación del Instituto y en calidad de conferencista en "The 5th Annual Internet of Things Global Summit" y en "The 6th Annual Americas Spectrum Management Conference" organizados por Forum Global, que se llevaron a cabo del 10 al 13 de octubre de 2017, en Washington D.C., Estados Unidos de América.

The 5th Annual Internet of Things Global Summit

La 5ª Cumbre Global Anual de Internet de las Cosas se enfoçó en el análisis y la discusión de aspectos relevantes del continuo desarrollo del ecosistema de IoT y las mejores prácticas para aprovechar su potencial. En las sesiones de esta cumbre se abordaron temas relacionados con:

- Desarrollo de estrategias nacionales y globales
- Infraestructura crítica
- Cibercriminalidad, seguridad y riesgos
- Consideraciones de política pública para la construcción de los autos del futuro
- Desarrollo de ciudades inteligentes y beneficios para los ciudadanos
- Inteligencia artificial y realidad aumentada
- Diseño de modelos de negocios
- Requerimientos de conectividad (enfoques y tecnologías)
- Propiedad de datos y licenciamiento

Insurgentes sur 1143,
Col. Nochebueno, C.P. 03720
Delegación Benito Juárez,
Ciudad de México.
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En este evento participé con la ponencia denominada "Case Study: Developing Spectrum Strategy for Iot in Mexico", en la cual destaqué los avances y la visión del IFT en materia de administración del espectro radioeléctrico tendiente a fomentar un desarrollo eficiente del ecosistema de IoT en México.

The 6th Annual Americas Spectrum Management Conference

La 6ª Conferencia Anual sobre Administración del Espectro de las Américas es una plataforma que sirve de punto de encuentro de alto nivel para intercambiar y debatir experiencias relacionadas con la administración del espectro radioeléctrico en la región Américas. La conferencia abordó temas relativos a:

- Política pública de espectro radioeléctrico en los EUA
- Opciones y oportunidades para la liberación de espectro radioeléctrico para uso federal en los EUA.
- Experiencias de la licitación por incentivos de la banda de 600 MHz en EUA
- Licitaciones para bandas de espectro radioeléctrico de uso compartido
- Espectro radioeléctrico para servicios inalámbricos de próxima generación, incluido 5G
- Futuro de las bandas de frecuencias de 3.7 a 4.2 GHz
- Futuro del espectro radioeléctrico de uso libre para servicios móviles de próxima generación
- Espectro radioeléctrico milimétrico para 5G
- Aspectos relevantes de la preparación para la Conferencia Mundial de Radiocomunicaciones 2019 (CMR-19) de la Unión Internacional de Telecomunicaciones (UIT)
- Requerimientos de espectro radioeléctrico para servicios de protección civil y mitigación de desastres, satelitales y de radiodifusión
- El papel de los satélites en tecnologías inalámbricas de próxima generación

En esta conferencia participé con la ponencia "The 600 MHz Band Across the Americas – is it time to explore moving forward with a consolidated approach", en la cual resalté el liderazgo del IFT en los trabajos preparatorios para la CMR-19 de la UIT, la propuesta conjunta de México y Nueva Zelanda al Grupo de Trabajo 5D de la UIT-R para el plan de banda de 600 MHz, los avances en licitaciones de diversas bandas de frecuencias de espectro radioeléctrico en México e identificación de bandas de espectro radioeléctrico arriba de 24 GHz para servicios IMT. Se anexa la presentación que contiene la

mencionada propuesta conjunta México y Nueva Zelanda para el plan de banda de 600 MHz.

Finalmente, con la participación en estos eventos se cumplió con el propósito de generar vías de cooperación o áreas de influencia conjunta con autoridades de organismos reguladores y entidades de gobierno encargados de la política pública de otros países sobre temas en el ámbito de competencia del Instituto.

Se anexan los programas de los eventos en cuestión.

ATENTAMENTE

M. en C. MARIO GERMÁN FROMOW RANGEL
COMISIONADO

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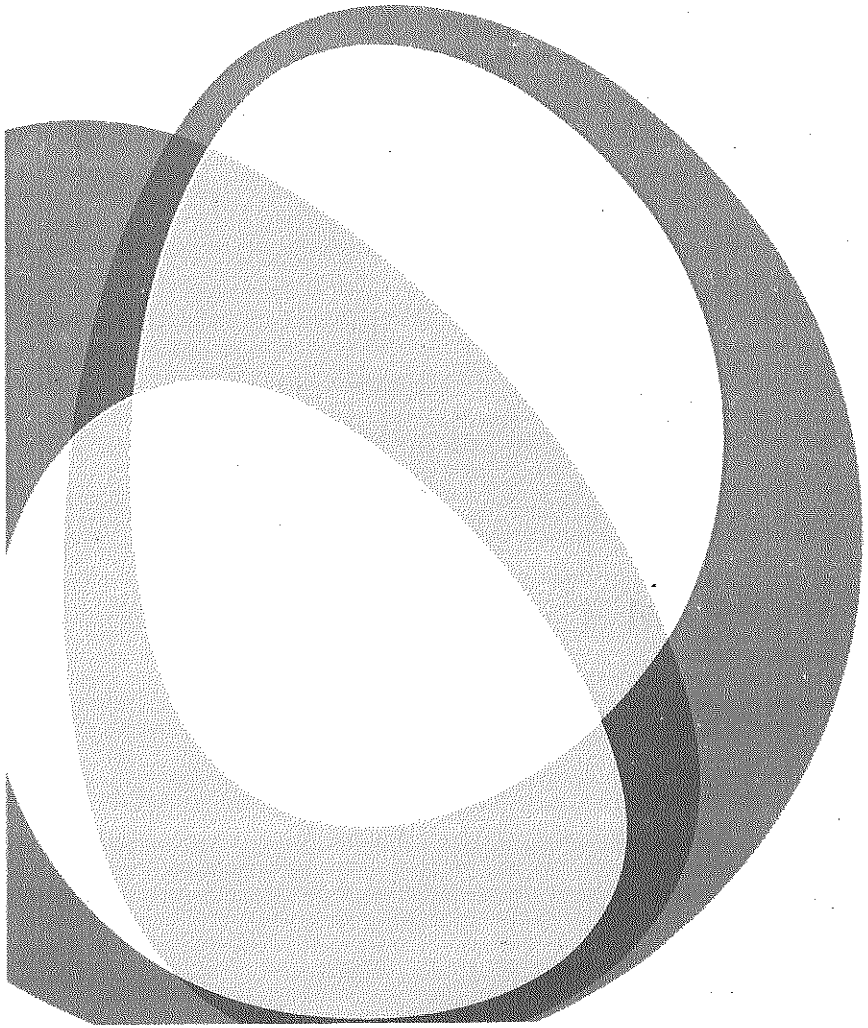

INSTITUTO FEDERAL DE
TELECOMUNICACIONES

MARIO FROMOW RANGEL
Commissioner

October 2017

México-New Zealand 600 MHz Band Plan Proposal

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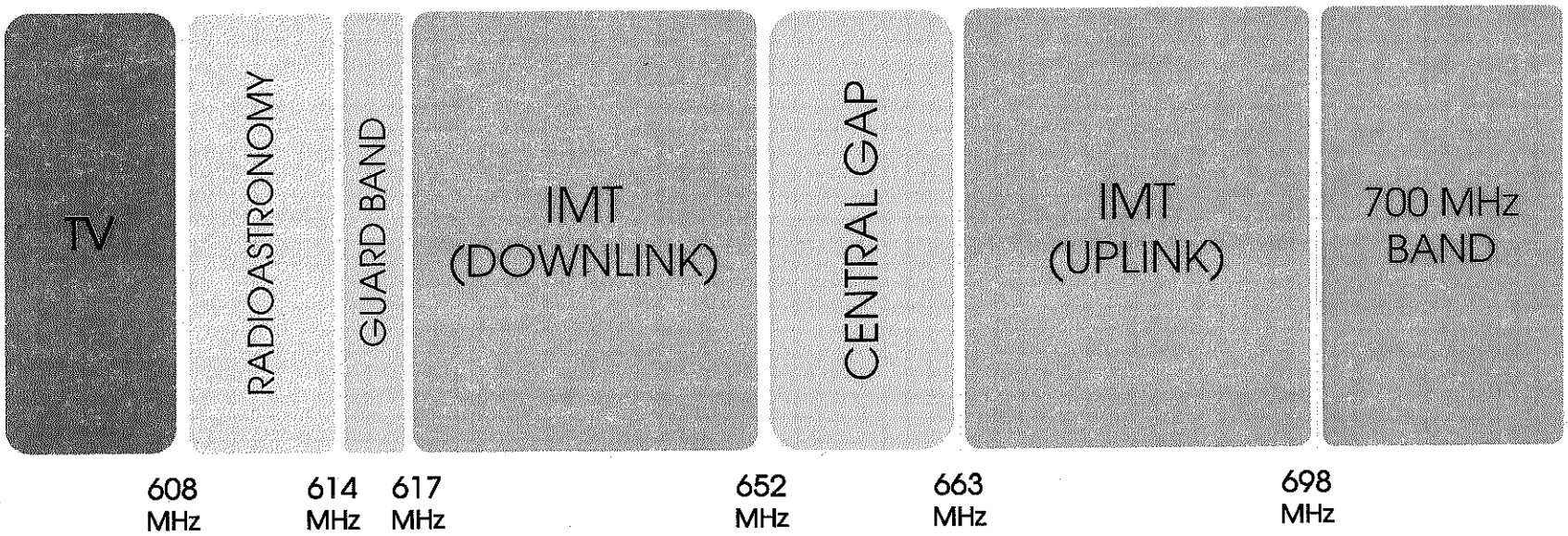
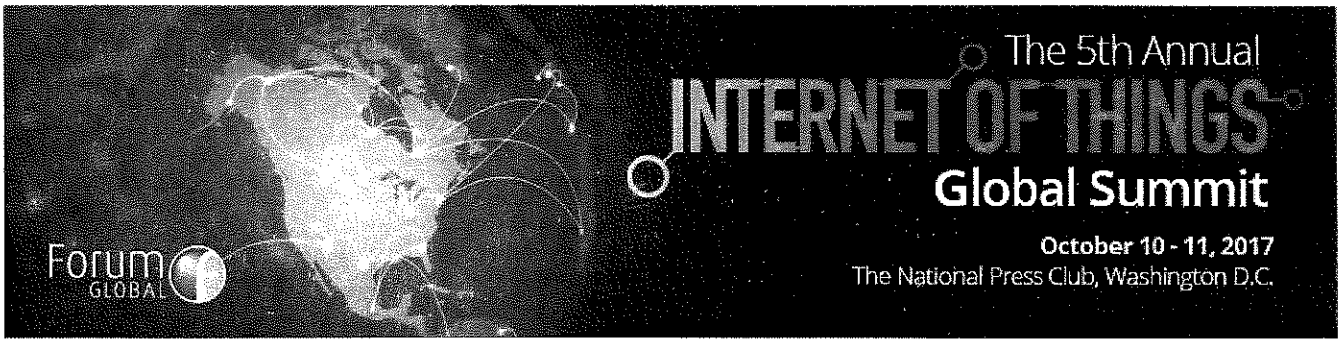
INSTITUTO FEDERAL DE TELECOMUNICACIONES





Agenda

Tuesday 10 October, 2017

Morning

08:15 – 08:55	**Networking Breakfast**
08:55 – 10:20	**Session 1i: Keynote and Introductory Presentations**
08:55 – 09:05	**Introduction and Welcome Remarks** Nigel Cameron , President and CEO, Center for Policy on Emerging Technologies
09:05 – 09:30	Keynote Presentation Neil Chilson , Acting Chief Technologist, FTC
09:30 – 09:55	Keynote Presentation Evelyn Remaley , Deputy Associate Administrator, Office of Policy Analysis and Development, NTIA
09:55 – 10:20	Keynote Presentation Steve Zipperstein , Chief Legal Council, Blackberry
10:20 – 10:40	**Networking Break**
10:40 – 11:20	**Session 1ii: Developing a Cohesive National IoT Strategy - A Global Perspective**
10:40 – 11:00	Case Study: Developing Spectrum Strategy for IoT in Mexico Mario Fromow , Commissioner, IFT Mexico
11:00 – 11:20	Case Study: Developing an IoT Strategy in India Anil Kaushal , Member, TRAI India
11:20 – 12:05	**Session 2: Thinking Point: Critical Infrastructure and IoT** As critical infrastructure and legacy systems begin to reach the end of their life cycle, the need to renew and extend these systems is essential in order to maintain a competitive advantage for the United States government. Funding such implementations can be extensive and this is where IoT technologies can play a pivotal role and improve efficiencies. This session will address the R&D projects and current investments that are already underway that are aligning IoT technology with the nations critical infrastructure, and the benefits it will have long term. • What current projects are being undertaken by the government in regards to maintaining critical infrastructure with the use of IoT? What benefits can IoT bring to these projects and how can this be maximised? • How can IoT be used to help future-proof critical infrastructure across all areas and ensure that the systems being put in place meet the needs of societies throughout the duration of their life-span? • What strategies are available for infrastructure owners to respond to nation state threats to IoT-enabled critical

infrastructure?
• How can federal agencies responsible for critical infrastructure sectors assist both to enable the IoT and to secure it?
• What additional challenges will also come with the use of IoT and how can these be addressed?

Moderator: Sokwoo Rhee , Associate Director of Cyber-Physical Systems Program, National Institute of Standards and Technology (NIST)

Robert Metzger , Shareholder, Rogers Joseph O'Donnell
Gary Butler , CEO, Camgian

Afternoon

12:05 – 13:15 **Networking Lunch**

13:15 – 14:30 **Session 3: Cyber-Criminality, Security and Risk in an IoT World**

By 2020, there will be an estimated 20 - 50 billion connected IoT devices online, and the potential benefits of this to citizens around the world is of course well documented. There is also however another side, and for law enforcement agencies and cybercrime bodies, this means a significantly increased attack surface and 50 billion additional potential problems. This session will discuss the way law enforcement agencies, governments and industry are addressing the vulnerabilities associated with the Internet of Things, and the different challenges that IoT creates when compared to other areas of cyber-criminality. It will look at the current framework that is in place to combat these threats both nationally and across international borders, and at how the security of connected devices around the world can be ensured.

• How is IoT changing the future of cyber-criminality and how it is being tackled?
• Are the national and international laws and treaties that are currently in place sufficient to efficiently support law enforcement and fight cyber crime across borders in the connected world of today and tomorrow?
• To what extent are these laws and treaties being modified to deal with IoT and is this sufficient to deal with the specific challenges that IoT provides?
• What role does education need to play in the solution, and how can it be ensured that both individuals and businesses are aware of the risks that they face and the measures they need to take to protect themselves? What work is being done in this area?
• What lessons can security practitioners learn from the vulnerabilities that emerged (and have been exploited by cyber criminals around the world) when data was digitally connected; and how can these be avoided with the Internet of Things now that it is actual devices that are being connected?
• How can it be ensured that security awareness is keeping up with the pace of innovation when it comes to IoT, and what success stories are being seen from law enforcement agencies and the private sector around the world?

Moderator: Jonathan Litchman , Co-Founder and CEO, The Providence Group

John Carlin , Chair, Cybersecurity & Technology Program, Aspen Institute
Stephen Pattison , VP Public Affairs, ARM
Samia Melhem , Global Lead, Digital Development, World Bank
Belisario Contreras , Cyber Security Program Manager, Organization of American States
Jeff Voas , Computer Scientist, Secure Systems and Application Group, National Institute of Standards and Technology

14:30 – 15:45 **Session 4: Key Policy Considerations for Building the Cars of Tomorrow - What do Industry Stakeholders Want from Policymakers?**

Communication and connected technologies are revolutionizing and transforming the auto industry, and new business models and commercial opportunities are emerging for stakeholders everywhere. For the potential of this key sector to continue to be realised, policymakers need to maintain their goal of working with industry to achieve their public goals, while also ensuring that innovation is able to flourish. This session will bring together a range of stakeholders from different policy and industry environments for a meaningful discussion around these important issues. Looking at emerging new business models and trends, speakers will provide their thoughts on the impact of current legislation and the work that different federal agencies are doing to deliver an ecosystem that balances safety and innovation. The focus will be on collaboration and the responsibility of stakeholders everywhere to work together in order to maximise the potential of this exciting opportunity.

• What opportunities are created by car connectivity and what impact is this having on the automotive industry??
• What new business models and trends are emerging as a direct result of this innovation?
• How are policymakers helping to create an environment where innovation is able to flourish, whilst also remembering their responsibility to protect consumers and their fundamental rights??

• How best can policymakers maintain the right incentives for global business models and all players of the value chain?
• Is there a need for more collaboration between policymakers and industry, and if so, during what stages and in what areas? How can policymakers help businesses achieve their goals?

Moderator: J. Armand Musey , Valuation and Financial Analysis Expert , Summit Ridge Group, LLC

Ken DiPrima , AVP New Product Development, IoT Solutions, AT&T
Rob Yates , Co-President, Lemay Yates Associates
Steven Bayless , Regulatory Affairs & Public Policy, Intelligent Transportation Society of America
Paul Scullion , Senior Manager, Vehicle Safety and Connected Automation, Global Automakers
Michelle Avary , Executive Board, FASTR, VP Automotive, Aeris

15:45 - 16:00 **Networking Break**

16:00 - 17:30 **Session 5: How Are Smart Cities Being Developed and Leveraged for the Citizen?**
As urbanization and population growth in cities continues to rise, the citizen is increasingly been placed at the centre of smart city initiatives all over the world. As technology advances to support straining public services and infrastructure, governments need to ensure these new technology implementations feel inclusive rather than imposed. Unless proper processes and standards are put in place, the speed and complexity of technological change and advances can make it hard for cities to understand the impact on citizens and their relationship with the city. This session will explore what smart city projects are taking place, and what governments are doing to ensure trust and adoption of IoT technologies, and the creation of smart citizens.

• What Smart city projects are being implemented that will improve every day life for the citizen?
• How do we replicate Smart City projects/solutions from one city to another and what are some of the challenges that need to be overcome?
• How are Smart city projects addressing issues of security and privacy?
• How are citizens' awareness of the potential advantages and benefits of smart city projects being managed in order to increase citizen engagement.
• What methods are being used to engage and empower population groups difficult to reach such as people experiencing poverty and/or social exclusion, younger and older people, migrants, people with disabilities in order to encourage participation and engagement?
• How is the promotion of open data and/or an appropriate access to data by citizens, developers, start-ups being aligned with the evaluation of urban policies by government practices? How are governments promoting open innovation and open science to foster smart citizens?
• How are procurement and assessment procedures being improved to include citizens' involvement both at the specification and implementation level?

Moderator: Sokwoo Rhee , Associate Director of Cyber-Physical Systems Program, National Institute of Standards and Technology (NIST)

16:00 - 16:05 Introductory Presentation
Sokwoo Rhee , Associate Director of Cyber-Physical Systems Program, National Institute of Standards and Technology (NIST)

16:05 - 16:20 Presentation: Case Study
Bob Bennett , Chief Innovation Officer, City of Kansas, MO

16:20 - 16:35 Presentation: Case Study
Anil Sharma , Chief Network Officer, Office of the Chief Technology Officer, District of Columbia

16:35 - 17:30 Interactive Panel Discussion
Bob Bennett , Chief Innovation Officer, City of Kansas, MO
Anil Sharma , Chief Network Officer, Office of the Chief Technology Officer, District of Columbia
Mike Zeto , AVP General Manager, IoT Solutions, AT&T
Greg Toth , Founder, Internet of Things DC

17:30 - 19:00 The IoT Hub - Networking Reception and IoT Showcase
Presented by Forum Global, IoT DC and The LoRa Alliance

Wednesday 11 October, 2017

Morning

08:30 – 09:00 **Networking Breakfast**

09:00 – 09:20 **Keynote Presentation**
Suzan DelBene , Congresswoman, U.S. House of Representatives

09:20 – 10:35 **Session 6: IoT TECH TALKS**
Moderator: Herman Schepers , Founder and Director, Policy Impact Partners

09:20 – 09:45 Tech Talk: What Blockchain Means for You, and for the Internet of Things
Dominik Schiener , Co-Founder , IOTA

09:45 – 10:10 Tech Talk: IoT, AI and Augmented Reality
DJ Saul , CMO & Managing Director, iStrategyLabs

10:10 – 10:35 Tech Talk
Jocelyn Boudreau , CEO, Hortau

10:35 – 10:50 **Networking Break**

10:50 – 12:05 **Session 7: Designing Future-Proof Business Models for the Evolving IoT Ecosystem**
IoT is already starting to impact the way in which companies in the US and globally operate and do business, and going forward, this impact is only going to increase. This 'IoT disruption' that are witnessing means that in order to generate value and remain competitive, companies are moving away from traditional business models and towards more creative and innovative ways of working. However, as the IoT ecosystem evolves over time, it is argued that companies and organisations will have to once again rethink the way they do business in order to stay ahead of the curve. This session will examine how the 'early winners' in IoT achieved success and the business models that they have used, and look at how sustainable these may be going forward. It will look at what companies need to be doing in order to perThe session will also analyse the steps companies will need to take now in order to prepare for further disruption, and discuss whether there could be a new set of 'winners'. Crucially, the session will explore the importance of cross-cutting business models, and the role of policymakers in contributing to a friendly environment where these can flourish.

• What new business models are emerging in the IoT sector, and how do these differ from traditional telecom services?
• Who have been the 'early winners' in IoT and how sustainable are the business models that have been seen so far?
• How important are the formation of strategic partnerships when developing IoT business models, and which stakeholder groups are best placed to work together in this way?
• How best can companies prepare for further IoT disruption and ensure a future-proof business model? What challenges and opportunities are likely to emerge in future years
• How important are cross-cutting business models in ensuring the successful and sustainable growth of IoT technologies?
• What role can policymakers play in delivering an environment for IoT business models to thrive, and how can IoT help businesses develop in line with the new administrations focus on increased competitiveness and productivity?

Moderator: David Stephenson , Principal, Stephenson Strategies

Julie Kearney , Vice President Regulatory Affairs, Consumer Technology Association
Mark Crawford , Secretary to IIC Steering Committee, Industrial Internet Consortium;, SAP SE
Andrea Glorioso , Counsellor, Digital Economy / Cyber, Delegation of the European Union to the USA
Paul Martino , Vice President, Senior Policy Council , National Retail Federation
Geoff Mulligan , Chairman, LoRa Alliance; Former Presidential Innovation Fellow, The White House

Afternoon

12:05 – 13:10 **Session 8: Raising the bar for federal IoT Security – 'The Internet of Things Cybersecurity Improvement Act'**
The Internet of Things Cybersecurity Improvement Act was introduced by a bipartisan group of Senators in August 2017 in response to several attacks spread via networks of infected IoT devices over the past year. The bill, which has been widely welcomed by stakeholders on all sides, is an attempt by legislators to establish minimum security requirements for federal procurements of connected devices, and work towards addressing the significant security challenges posed by the release and spread of insecure internet-connected devices. This session will explore the bill's requirements and aims, and debate whether it goes far enough. It will look at areas in which

possible clarifications may be needed; and examine challenges and opportunities that it may create for stakeholders on both federal agencies procuring goods and services; and the companies providing them. Ultimately, it will look at the extent to which it is likely to meet its objective of helping to create a more secure digital environment.

• What impact is the bill likely to have in helping to address security challenges posed by IoT and does the bill go far enough to ensure Internet of things devices used by federal agencies consistently meet enhanced security standards?
• What does the bill consider as the definition of 'Connected devices' and the scope of research exemption, and is there any clarification needed here? Does the legislation need to look further into mandating user behavior?
• What technical and competitive opportunities would this bill, if enacted, concretely represent to manufacturers of connected devices? What challenges may they face and how could these be overcome?
• How can it be ensured that the bill doesn't hinder innovation in the IoT space? Should a country of origin-based limitation on purchase and storage be considered?
• What support may vendors need to make the required investments to further secure their IoT offerings?
• To what extent will the challenges related to the practical enforcement of this legislation be addressed?
• Although the proposed bill only applies to technology firms and contractors selling products to federal agencies, to what extent can it be expected to extend into private sector guidelines moving forward?
• What opportunities does the bill represent for cyber researchers and white-hat hackers, and to what extent will further cooperation between researchers and vendors be encouraged?

Moderator: Dan Caprio , Co-founder and Executive Chairman, The Providence Group

12:05 – 12:30 Keynote Presentation
Jim Langevin , Congressman, US House of Representatives

12:30 – 13:10 Panel Discussion
Beau Woods , Deputy Director, Cyber Statecraft Initiative, Atlantic Council
John Marinho , Vice President Cybersecurity and Technology, CTIA

13:10 – 14:10 Networking Lunch

14:10 – 15:25 Session 9: Meeting the Short and Long-Term Connectivity Requirements of IoT - Approaches and Technologies

There are many IoT connectivity solutions to help power and connect the billions of connected devices that make up the IoT. Each one is unique and has advantages, and for the connectivity requirements of the hyper-connected IoT world to be fully met, a mix of different solutions and technology will be required. 5G is set to be right at the centre of this mix, and this session will look at what needs to be done to make its potential to help fuel the hyper-connected IoT world a reality, and at what makes 5G technologies so attractive to IoT developers and stakeholders. And with wide-scale 5G roll-out still some time away, it will also look at solutions that are being put forward in the meantime to meet today's immediate demand for low-power, wide-area IoT. It will examine the growing debate between stakeholders regarding the role of proprietary Low Power Wide Area Network (LPWAN) technologies operating in the unlicensed spectrum bands, such as LoRa and Sigfox; and how these fit with those technologies and standards operating in licensed spectrum bands, such as NB-IoT and LTE-M. Finally, participants are encouraged to consider the growing demand for other connectivity solutions, for example WiFi and satellite services, and the role these will play in building the future IoT.

• What makes 5G particularly appealing for IoT and how can IoT stakeholders prepare for the 5G world? To what extent will 5G meet the promise that many are suggesting of being the true 'enabling technology' for IoT?
• What options are available to meet today's immediate demand for low-power, wide-area IoT connectivity?
• What role can Low Power Wide Area Networks play?
• What are the respective advantages and disadvantages of proprietary network technologies operating in unlicensed spectrum bands (such as LoRa and Sigfox); and those technologies and standards operating in licensed bands, such as NB-IoT and LTE-M?
• What role with other technologies such as WiFi and satellite play and what will be the right technology mix to deliver the required quality of service and connectivity for IoT?

Moderator: Johanne Lemay , Co-President, Lemay Yates Associates

Andreas Geiss , Head of Unit 'Spectrum Policy', DG CONNECT, European Commission
Geoff Mulligan , Chairman, LoRa Alliance; Former Presidential Innovation Fellow, The White House
Jeffrey Yan , Director, Technology Policy, Microsoft
Julius Knapp , Chief, Office of Engineering & Technology, Federal Communications Commission
Charity Weeden , Senior Director of Policy, SIA
Andrew Hudson , Head of Technology Policy, GSMA

15:25 – 15:45 Networking Break

15:45 – 17:00

Session 10: IoT Data-Ownership and Licencing - Who Owns the Data?
The issue of data ownership and licensing is moving to the forefront of the IoT agenda, and it is not always obvious who actually owns the 'machine-generated data' produced by connected devices. With multiple entities often involved in initiatives such as smart cities, connected vehicles and elsewhere, a defined title of ownership is not clear, and this is an issue that potentially will restrict the benefits of analyzing that data being fully realized. This session will discuss the challenges around defining ownership, and will look at the different approaches being taken within different industries and companies to regulate the transfer of data control and title. Looking forward, it will also look at how the issue lies within wider policy framework for data protection and privacy. With the General Data Protection Regulation (GDPR) now going through the implementation stage in Europe (and due to be completed by May 2018), it will look at the impact that this may have on data ownership globally, and more generally at the best way forward in ensuring an environment that both protects consumer interests and feeds a growing data ecosystem.

• How are data rights when it comes to ownership and licensing being currently handled by different companies and different sectors?
• To what extent should policymakers be looking to intervene and set a framework for how ownership over IoT data is assigned and how it is licensed?
• How does current thinking with regards to data ownership fit with current data protection and privacy regulation, especially when it considering the sharing of IoT data with third parties?
• What impact will the European GDPR have on data ownership in the US and globally, and how will the environment change post-GDMR implementation?
• How is the issue of liability dealt with when there is a data-breach, and how does this fit in with data ownership?
• How can it be ensured that an environment is delivered that allows the benefits of data analytics to be fully realized by all involved, whilst also ensuring the protection of consumer interests?

Moderator: Robert Holleyman , President and CEO, C&M International

Patrick Parodi , Founder, The Wireless Registry
Stacey Gray , Policy Lead IoT, Future Privacy Forum
Susan Allen , Attorney-Advisor, Office of Policy and International Affairs, United States Patent & Trademark Office
Mark Eichorn , Assistant Director, Division of Privacy and Identity Protection, Federal Trade Commission
Vince Jesaitis , Director, US Public Affairs, ARM

17:00 – 17:05

Summary and Conclusions
Nigel Cameron , President and CEO, Center for Policy on Emerging Technologies

Program

Thursday October 12, 2017

Morning

08:45 – 10:20	**Session 1: Spectrum Policy in the US – Where are we currently, and what lies ahead?** Moderator: Ruth Milkman , Partnerr, Quadra Partners, LLC
08:45 – 09:00	Opening Presentation Rachael Bender , Wireless and International Advisor to Chairman Pai, FCC
09:00 – 10:20	**Session 1: High Level Policy Roundtable** With the new administration coming into power this year, the major project of the incentive auction now completed and the launch of 5G on the horizon, now seems a good time to take stock of where we are in the US with regards to current thinking relating to spectrum policy and allocation. This session will offer an opportunity do exactly that. It will look at the current spectrum policy framework in the US, and at the extent to which they is likely to meet the FCC and Government's aims of encouraging innovation and investment; and to deliver the connectivity requirements both now and in the future. - To what extent does the current spectrum policy framework in the US meet with the needs of stakeholders and citizens everywhere? - Is the right balance being hit between the need for regulation and the need to encourage flexibility, competition, innovation and investment? - One of the aims of the FCC's National Broadband Plan, was to deliver reforms that "...reflect expectations of how the wireless world will look 10 years from now." How will the wireless world look in 10 years, and how can it be ensured that a spectrum strategy is put in place now to match its requirements? - What approaches are being seen to close the digital divide, and to deliver the infrastructure and spectrum to connect rural areas? - What should be the priorities for the new administration in order to ensure that the power and promise of spectrum is maximized for citizens everywhere?
09:00 – 10:20	Policy Roundtable Thomas Hazlett , H.H. Macaulay Endowed Professor of Economics, Clemson University, and author, The Political Spectrum: The Tumultuous Liberation of Wireless Technology, from Herbert Hoover to the Smartphone (Yale, 2017), Clemson University Rick Kaplan , General Counsel and Executive Vice President, Legal and Regulatory Affairs, National Association of Broadcasters Charla Rath , Vice President, Wireless Policy Development, Verizon Gerry Oberst , Senior Vice President, Global Regulatory and Governmental Strategy, SES Jeffrey Yan , Director Technology Policy, Microsoft Donald Stockdale , Chief, Wireless Telecommunications Bureau, FCC
10:20 – 10:40	**Morning Coffee**

10:35 – 12:10	**Session 2: Freeing up federal spectrum - exploring the options and opportunities** Stakeholders and regulators around the world are continually facing up to the challenge of finding ways to increase the efficiency of spectrum, and this includes that used by federal as well as private users. In the US, the Spectrum Pipeline Act of 2015 set out plans to reallocate at least 30MHz of federal spectrum for non-federal use or shared federal/ non-federal use by 2024. Two years on, this session will bring together representatives from some of the key Government agencies responsible for federal spectrum use, and look at the progress that is being made in this area. It will look at the new technologies and policy tools that are being used in this area, and examine the situations in which the respective approaches of reallocation or sharing are most appropriate. Moderator: Brent Skorup , Research Fellow, Mercatus Center, George Mason University
10:35 – 10:50	Presentation: The view from the NTIA Paige Atkins , Associate Administrator, NTIA
10:50 – 11:05	Presentation Ron Repasi , Deputy Chief, Office of Engineering and Technology, FCC
11:05 – 11:20	Presentation – Balancing critical defense requirements with the need to increase available spectrum for commercial users Gregory Wagner , Chief, Strategic Planning Division, DISA Defense Spectrum Organization
11:20 – 11:35	Presentation Dave Wright , Secretary of the CBRS Alliance, Director of Regulatory Affairs & Network Standards at Ruckus
11:35 – 11:50	Presentation Tom Power , Senior Vice President & General Counsel, CTIA
11:50 – 12:10	Panel Discussion
Afternoon	
12:00 – 13:10	**Lunch**
13:10 – 15:20	**Session 3: After the Incentive Auction - lessons learnt and what's next**
13:10 – 13:30	The view from the FCC – the Incentive Auction and what comes next Jean Kiddoo , Chair, Incentive Auction Task Force, FCC
13:30 – 14:40	**Session 3.i: The legacy of the incentive auction - What next for spectrum auctions?** The Incentive Auction is the biggest and boldest spectrum auction ever implemented. It delivered on core goals such as clearing a beautiful band plan for mobile and efficiently repacking broadcasters in the remaining UHF spectrum ... but it also took a staggeringly long time - 4 years to design and 12 months of bidding, with 39 months of repacking to come – and featured a degree of complexity rarely seen before. It was designed to address a bespoke problem and we may never see anything quite like it again. Nevertheless, future awards may draw on many of its innovative features, such as the use of optimization techniques and "clock round" bidding. With the auction now concluded and the dust beginning to settle, this session will explore the legacy of the Incentive Auction for future spectrum awards. - Was the format of the incentive auction too complex or can it be said to have worked well? - Are there any lessons that can be taken or any aspects that could have been done differently? - How successful was the auction overall, and to what extent has it met the objectives set out by the FCC? - Is the model something that it is likely to see repeated in the future, either partially or fully? - If so then in which bands is it most likely? - What other innovations in auction design are likely to be seen in the future, and how may the process of license award change and develop over coming years? Moderator: Richard Marsden , Senior Vice President, NERA Economic Consulting
13:30 – 13:45	The Incentive Auction - lessons for the next generation of spectrum auctions Lawrence M Ausubel , Chairman, Power Auctions, and Professor of Economics, University of Maryland
13:45 – 14:00	The role of set-asides, spectrum reserves and spectrum caps in the incentive auction – successes and failures David Salant , Founder, Auction Technologies

14:00 – 14:10	Complexity in spectrum auctions: how much is too much? Richard Marsden , Senior Vice President, NERA Economic Consulting
14:10 – 14:40	Panel Session: Have spectrum auctions become too complex and does it matter? Richard Marsden , Senior Vice President, NERA Economic Consulting Lawrence M Ausubel , Chairman, Power Auctions, and Professor of Economics, University of Maryland David Salant , Founder, Auction Technologies Evan Kwerel , Senior Economic Advisor, FCC Geoff Catliff , Director, Spectrum Policy & Acquisition, TELUS
14:40 – 15:20	**Session 3.ii: The repack process** The post-incentive auction 39-month repack process is now well underway. Prior to the auction, there was significant dispute between representatives of the mobile and broadcast industry over whether the timeline was realistic, and the extent of challenges ahead. And this disagreement has continued since the auction has finished - T-Mobile have set ambitious targets of launching commercial networks using spectrum won in the auction before the end of the year, whilst many in the broadcasting sector (and LPTV companies in particular) have claimed this is far too early and does not give them enough time to find new channels. This session will look at the various timelines being set and at how realistic they are, explore options that are available to protect LPTV stations and other broadcasters affected by the incentive auction, and address the obstacles ahead.
14:40 – 15:20	Panel Discussion Chris Wieczorek , Director, Spectrum Policy, T-Mobile Patrick Mcfadden , Associate General Counsel, NAB Mike Gravino , Director, LPTV Spectrum Rights Coalition
15:20 – 15:40	**Afternoon Coffee**
15:40 – 17:15	**Session 3.iii: The UHF and beyond - future shape of the mobile spectrum landscape** Unlike the FCC's "ugly" 700 MHz plan, the simple 2x35 MHz plan at 600 MHz could provide a "beautiful" template for the band throughout the Americas. However, demand from US operators for 600 MHz was less than many expected, with two of the four major operators sitting out the auction – as fact that has raised questions about demand for 600 MHz in other countries as well. This session will examine whether this this slightly surprising lack of interest in the spectrum indicates a trend towards reduced demand more generally in UHF spectrum, or whether there are other factors based on the existing spectrum portfolio of the major players and how this influenced their future needs. With operators everywhere needing to have the right mix of spectrum across low, mid and high frequency ranges, speakers will then look more generally at the current situation of major players, the factors that operators consider when building a spectrum portfolio, and how this is likely to affect both demand and value of spectrum in different bands. - What do the results of the incentive auction mean for the future of mobile in the UHF band both in the US and elsewhere? - What factors do mobile operators need to take into account when building a spectrum portfolio, and how can this affect both the demand and value of spectrum in different bands? - How important is harmonization and co-ordination in order to develop a coherent spectrum eco-system, and what work is being done to achieve this? - What role can mergers, acquisitions and secondary trading play in acquiring a spectrum portfolio as an alternative to purchasing licenses in auctions, and what challenges does this pose for regulators and others? - What implications is 5G already having on the decisions that operators take when building their spectrum portfolio, and how is likely to continue once networks start to become rolled-out? - What will be the key bands for mobile going forward in both the US and elsewhere? Johanne Lemay , Co-President, LYA
15:40 – 15:50	Introductory Presentation from Moderator Moderator: Johanne Lemay , Co-President, LYA
15:50 – 16:05	The 600MHz Band Across the Americas – is it time to explore moving forward with a consolidated approach? Mario Fromow , Commissioner , IFT Mexico
16:05 – 16:20	Building a spectrum portfolio – considerations, options and factors to consider Philip Junker , Executive Director of Strategic Alliances, Verizon

16:20 – 17:15 Panel Session: The future shape of the mobile landscape across the Americas
Mario Fromow , Commissioner , IFT Mexico
Philip Junker , Executive Director of Strategic Alliances, Verizon
Veena Rawat , Senior Spectrum Advisor, GSMA
Jeffrey Blum , Senior Vice President and Deputy General Counsel, DISH

17:15 – 19:00 Cocktail reception

Friday October 13, 2017

Morning

08:45 – 09:05 **Session 4: Spectrum for Next Generation Wireless Services including 5G**

08:45 – 09:05 Keynote Presentation
Michael O'Rielly , Commissioner , FCC

09:05 – 10:05 **Session 4i. What future for the 3.7GHz – 4.2GHz band?**
The 3.4GHz – 4.2GHz C-Band has been identified globally as the next frontier for mobile spectrum – 4G networks are already being rolled out, and it is also one of the key bands identified for 5G. In the US, a specific focus is on the 3.7GHz – 4.2GHz band – a frequency range in which satellite users currently hold the spectrum under a 'full-band, full-arc' licensing practice. There have been a number of petitions filed to the FCC arguing that this is a highly inefficient use of the band and asking for it to be eliminated, but the satellite industry counter that this would cause them and the customers that they serve substantial harm. This session will hear from key players in the discussion and look at the best way forward to balance the need to maximize the efficiency of this highly sought-after spectrum with the need to protect the rights of incumbent users.

- What proposals have been put forward to increase sharing or to reallocate spectrum in the 3.7GHz – 4.2GHz band, and what would these mean for the satellite industry and current incumbent users?
- When considered alongside the 3.5Ghz band, what potential does the spectrum in the 3.7Ghz – 4.2Ghz band offer to different potential users and technologies?
- Could the 3.55-4.2 GHz range offer potential for to become a globally harmonized range for 5G?
- What property rights exist for incumbent users in the band, and how can it be ensured that these are honored and protected?

Moderator: Carolyn Brandon , Senior Industry and Innovation Fellow, Georgetown Center for Business and Public Policy, Georgetown University; & Founder, Whitworth Analytics LLC , Whitworth Analytics LLC

09:05 – 10:05 Panel Discussion
Rob Yates , Co-President, LYA
John Hunter , Director of Spectrum Policy, T-Mobile
Hazem Moakkit , Vice President, Corporate & Spectrum Strategy, Intelsat
Andrew Clegg , Spectrum Engineering Lead, Google

10:05 – 11:05 **Session 4ii: What is the future of unlicensed spectrum in a world of next generation wireless services?**
The FCC have set aside a large amount of spectrum to be allocated both on a licensed and unlicensed basis to support the deployment of the next generational evolution of wireless technology, including 5G. This session will focus specifically on the unlicensed side of things, and explore the shape of the unlicensed landscape moving forward, and the role that it will play in the development and rollout of next generation services, including 5G.

- What role will unlicensed spectrum play in developing next generation services, including 5G?
- How much spectrum and in which bands should be made available on an unlicensed basis?
- What is the future of technologies operating in unlicensed spectrum such as LTE-U / LAA, and how can it be ensured that they co-exist peacefully with WiFi?
- What will the unlicensed spectrum landscape look like ten years from now?
- How important will unlicensed technologies such as WiFi be in offloading traffic from mobile networks going forward?

Moderator: Scott Wallsten , President and Senior Fellow, Technology Policy Institute

10:05 – 11:05 Panel Discussion
Edgar Figueroa , President & CEO , Wi-Fi Alliance
Brett Kilbourne , General Counsel & VP of Policy, Utilities Telecom Council

Jeffrey Yan , Director Technology Policy, Microsoft
Dileep Srihari , Director, Legislative & Government Affairs, TIA

11:05 – 11:20 **Morning Coffee**

11:20 – 12:30 **Session 4iii: Millimeter spectrum for 5G – the battle of the bands?**
Millimeter bands are set to be a key enabler for 5G, and are one of the areas in which a great amount of work is going on around the world. And one of the most contentious discussions is around the 26GHz and 28GHz bands – the US (along with other countries including Japan and Korea) are continuing with trials and plans to roll out 5G in the 28GHz band; whilst Europe and others remain in line with the decision taken at WRC-15 to focus on the 26GHz band. This session will look at the situation within these two bands and other bands under consideration for 5G (including the 39GHz band), and at the suitability of the various options in the millimeter band that are being considered. Focusing on the current situation in the US, the Americas and Globally, it will look at the next steps and ensuring the best path forward.

- How does the thinking in other countries in the Americas fit with the approach for 5G in the US? To what extent is
there a possibility that the 28GHz band becomes harmonized across the region?
- To what extent can there be synergies between equipment operating in 28GHz band and that operating in 26GHz
and other millimeter bands?
- What effect is the progress that is being seen within the 28GHz band in the US and elsewhere likely to have on discussions at WRC-19?
- What other millimeter bands beyond the 26GHz and 28GHz bands are being considered for 5G, and which of these offer a most viable solution?
- What potential does the 39GHz band offer as an option for 5G, and how much bandwidth could be available here?
What obstacles would need to be overcome?
- What can be done to help ensure a more harmonized approach globally with these bands?
- How can policymakers and other stakeholders help to develop an environment that encourages long-term investments in 5G networks?

Moderator: Amit Nagpal , Partner, Aetha Consulting

11:20 – 12:30 Panel Discussion
Andreas Geiss , Head of Spectrum Policy Unit, European Commission
Carl Povelites , Assistant Vice President Public Policy, AT&T
Julius Knapp , Chief, Office of Engineering and Technology, FCC
Jennifer Manner , Global Spectrum Policy, ESOA

Afternoon

12:30 – 13:00 **Session 5: Looking forward to WRC-19 approaching the key issues and ensuring the interests of all stakeholders are protected**

12:30 – 12:45 Presentation - The view from CITEL
Carmelo Rivera , Chair for WRC-19 Preparation, CITEL

12:45 – 13:00 Presentation - The view from Europe
Alexander Kühn , Chair for WRC-19 Preparation, CEPT

13:00 – 13:50 **Lunch**

13:50 – 14:30 **Session 6: A focus on...the changing shape of broadcast, satellite and PPDR services and spectrum requirements**
The satellite, broadcast and PPDR communities have all seen a number of exciting developments over the past 12 months, which have the potential in each case to alter the shape of the sector and mold their future development. This session will take the opportunity to examine each of these sectors individually, discuss both the challenges and opportunities ahead; and focus on implications that these may have for their use of spectrum.

Moderator: J.Armand Musey , Valuation and Financial Analysis Expert , Summit Ridge Group, LLC

13:50 – 14:30 **Session 6.i: The role of satellite in next generation wireless technologies**

In order to fully meet the growing demands for wireless broadband, a mix of different technologies is going to be required. With satellite set to be a big part of this, the industry is making significant strides in increasing capacity and efficiency through the use of new technologies and standards such as High Throughput Satellite (HTS) and Non-Geosynchronous (NGSO) systems. Moving beyond the earlier session which focused specifically on the C-Band,
this session will look at the role more generally that satellite is set to play in delivering next generation services, and how satellite operators can work together with regulators and the mobile sector to ensure co-ordination and co-existence that ultimately will be for the benefit of both sectors.

- What role is satellite set to play in the delivery of next generation wireless technologies (including 5G), and what role will developments in technology such as HTS and NGSO play in this?
- What effect will the ongoing FCC 'Spectrum Frontiers' proceeding have on satellite usage above 24GHz, and how can the successful co-existence of mobile and satellite services be ensured?
- What are the responsibilities of both mobile and satellite in managing connectivity
and interference and ensuring active co-existence across all bands?

13:50 – 14:30 Panel Discussion
Representative , Mobile Industry
Tom Stroup , President, SIA
Jose Albuquerque , Chief, International Bureau Satellite Division, FCC

14:30 – 15:10 **Session 6.ii: Spectrum for PPDR – Approaches to delivering PPDR networks in the US and beyond**
In March this year, the contract to build, operate and maintain the United States' nationwide 'FirstNet' first responder network was awarded to AT&T. This session will look at the next steps now that the contract has been awarded and the challenges that still lie ahead. It will examine how the approach in the US compares to that in Canada and in Mexico and in other countries around the world, and ultimately it will look at what needs to be done going forward to ensure a highly robust, reliable and efficient public safety network.

- What are the next steps now that the contract for the FirstNet network has been awarded?
- What other approaches are being seen in countries around the world that are delivering a PPDR network, and how
do these compare to that in the US?
- What border issues need to be considered between the US and Mexico and the US and Canada respectively?

14:30 – 14:45 Presentation: FirstNet – update and next steps post-award stage
Jeff Bratcher , Chief Technology Officer, FirstNet

14:45 – 15:00 Presentation: Global approaches to delivering PPDR networks
Paul Steinberg , Chief Technology Officer , Motorola Solutions

15:00 – 15:10 Room-Wide Discussion

15:10 – 15:50 **Session 6.iii: The future of broadcast – opportunities, challenges and the path ahead**
The broadcast industry is evolving with companies facing up to a number of disruptive challenges, and looking to employ innovative solutions to overcome them. With the introduction of new standards such as ATSC 3.0 and also the possibility of moving services towards an IP-based infrastructure offering new opportunities and the potential of additional spectrum efficiency, this 'thinking point' will explore what this would mean for the future shape of the sector.

- What new opportunities do ATSC 3.0 and Next-Gen Broadcast Standards offer the industry in terms of increasing spectrum efficiency? How are broadcasters working together to maximize this?
- To what extent does the future of broadcast lie within an IP-based infrastructure?
- With new standards and approaches offering a potential spectrum surplus, how best could this additional capacity
be used and what new opportunities would this create for the broadcast sector?
- How would this feed into the future shape of the broadcast sector and could it make companies more able to compete in the wireless data transmission sector?
- What will the regulatory environment around this look like and should the obligations that they currently have extend to these other services?

15:10 – 15:50 Panel Discussion
Rebecca Hanson , Senior Vice President, Strategy and Policy , Sinclair Broadcast Group
Representative , Mobile Vendor
Mike Gravino , Director, LPTV Spectrum Rights Coalition
Mike Fratrik , SVP & Chief Economist, BIA/Kelsey