Welcome

Long Island Wireless Forum

Presented by

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NEW YORK STATE WIRELESS ASSOCIATION

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Long Island Wireless Forum

Introduction

Kevin Law

President & Chief Executive Officer

Long Island Association

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Moderator

Christopher Fisher

Partner, Cuddy & Feder LLP

President, New York State Wireless Association

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Panelists

Thomas Bianculli
Vice President, Enterprise Technology Office (ETO)
Zebra Technologies Corp.

Jake Rasweiler
Chief Executive Officer
Sublime Wireless, Inc

David Chauvin
Vice President
Zimmerman/Edelson

Neil Macdonald
AIA LEED AP Partner
William F. Collins Architects

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Wireless Nearly Door-to-Door

Nearly 90% of U.S. households use wireless service. Thirty nine per cent of them are wireless-only, and almost 16% are 'wireless mostly'.

Source: Stephen J. Blumberg and Julian V. Luke, Wireless Substitution: Early Release of Estimates from the Health Interview Survey, January-June 2013, (Dec. 20, 2013) at http://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless201312.pdf.

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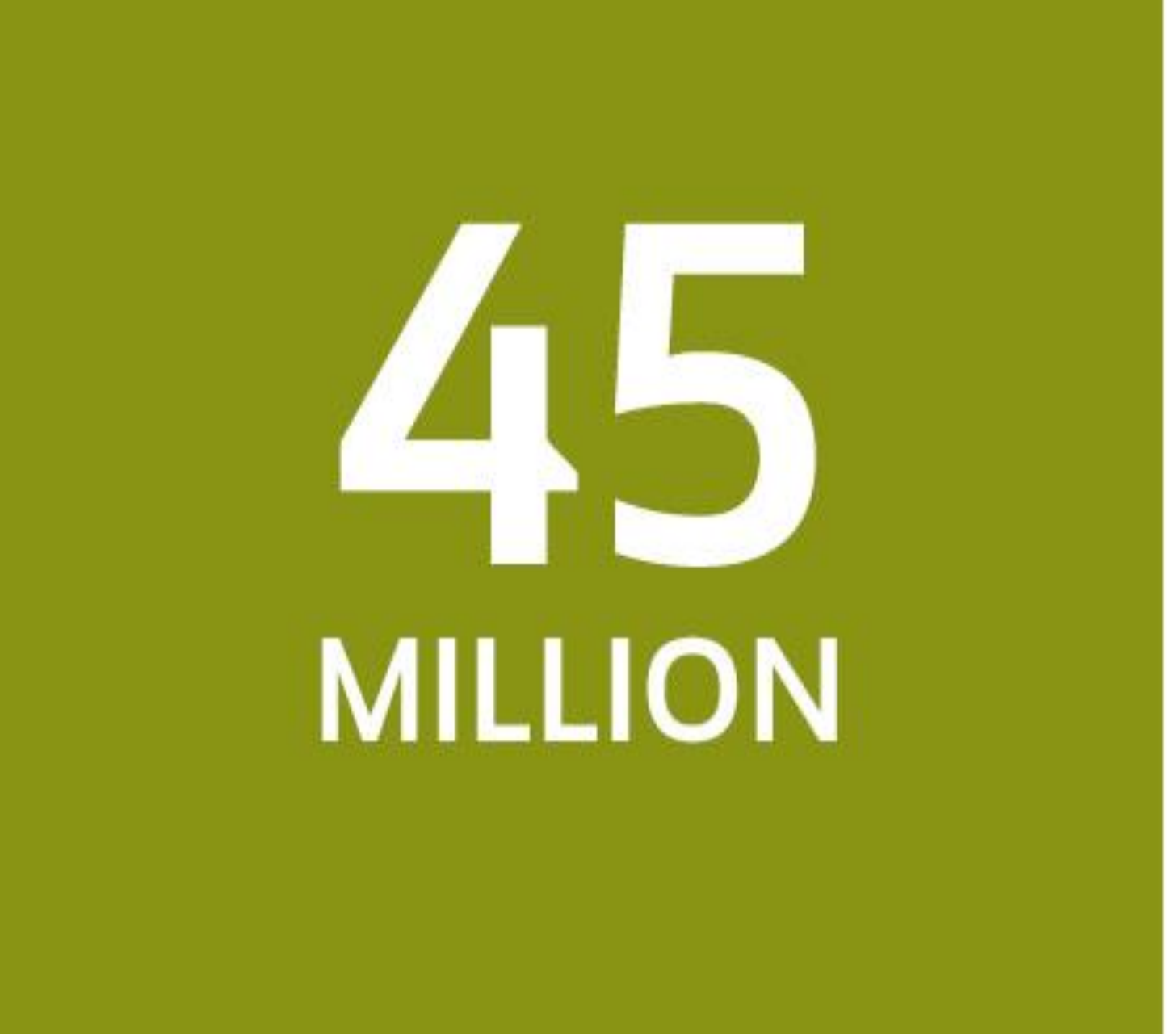

Millions Use Mobile for Internet Access

Forty five million Americans use mobile phones as their primary Internet access device.

Source: Maeve Duggan and Aaron Smith, Cell Internet Use, 2013, Pew Research Internet Project, Sept. 16, 2013, at p.7 ("among cell owners"). http://www.pewinternet.org/2013/09/16/cell-internet-use-2013/ and U.S. Census, Annual Estimates of the Resident Population by Single Year of Age and Sex for the United States: April 1, 2010 to July 1, 2013, 2013 Population Estimates, at http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk.

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Wireless Data Sustained Growth Spurt

Wireless data growth is projected to increase nearly 400 times from 2008 to 2018.

Source: Cisco, VNI Mobile Forecast Highlights, 2013-2018, at "United States – Year in Review and Device Growth Profiles – Smartphones."

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Applications economy huge job creator

U.S. applications-related jobs have gone from virtually none in 2007 to nearly three-quarters of a million by 2013.

Source: Michael Mandel, 750,000 App Economy jobs on the 5th anniversary of the App Store, Progressive Policy Institute Blog, July 8, 2013, at http://www.progressivepolicy.org/2013/07/752000-app-economy-jobs-on-the-5th-anniversary-of-the-app-store/.

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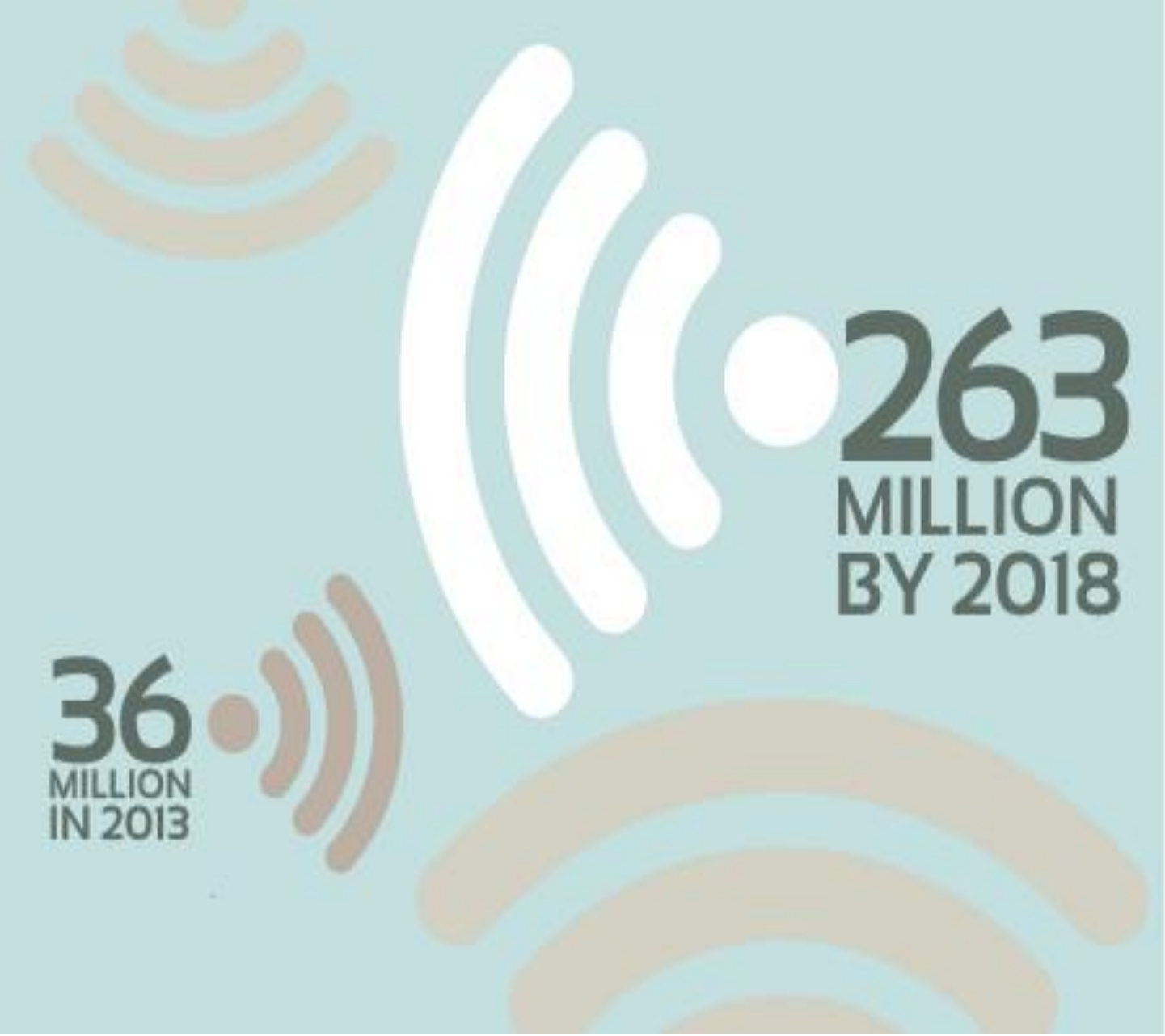

M2M On the Rise

Wireless machine-to-machine (M2M) connections in the U.S. are expected to increase from 36 million in 2013 to 263 million in 2018.

Source: Cisco, VNI Mobile Forecast Highlights, 2013-2018, at "United States – M2M Connections."

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The Internet of Things (IoT)

https://youtu.be/07MZVjjuLKw

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History of Commercial Network Infrastructure

1885 – American Telephone and Telegraph begins building wireline network from NY outward

1892 – NY to Chicago telephone service established

1915 – Vacuum tube amplifier enables transcontinental telephone service

1927 – Radio telephony enables trans-oceanic telephone service

1950 – Microwave radio relay and coaxial cable forms backbone of long distance service

1980 – Fiber-optic cable begins replacing microwave/coax system for high capacity backhaul

1982 – First-generation (1G) cellular network begins wide scale deployment of analog wireless telephony (voice)

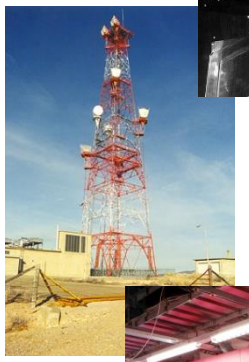
1991 – Second-generation (2G) wireless telephony digital network deployment (voice, text, limited data)

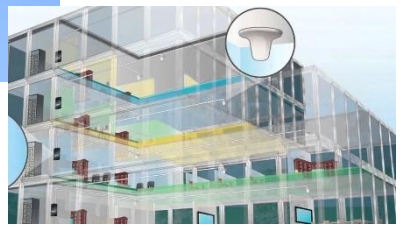
2000 – Third-generation (3G) mobile telecommunications networks (voice, text, data, internet, video calling)

2004 – Voice over Internet Protocol (VoIP) consumer offerings begin migration from copper wire telephone

2011 – Forth-generation (4G) mobile broadband networks (voice, text, data, broadband internet, video, HDTV)

2020 – Fifth-generation (5G) heterogeneous networks (seamless communications, broadcast services, IoT)





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A brief History of Wireless

Technology	1G	2G/2.5G	3G	4G	5G
Deployment (R&D/Commercial)	1970/1984	1980/1999	1990/2002	2000/2010	2015/2020
Bandwidth	2kbps	14-64kbps	2Mbps	200Mbps	>1Gbps
Technology	Analog Cellular	Digital Cellular	Broadband IP Technology	Unified IP across LAN/WAN/WLAN/PAN	4G + WWWW
Service	Mobile Voice Telephony	Digital Voice + Short Messaging	Voice, Message & Data Service	Dynamic information access across devices & services	Dynamic information and experience across devices & services
Handoff	Horizontal	Horizontal	Horizontal	Horizontal/Vertical	Horizontal/Vertical

Voice
Messaging
Data
Entertainment

10101010101
01010111101
10001100

Regional Network
Local Network
Enterprise Network
Personal Network

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Smartphone Usage in Retail

64%

GENERATION Y USE THEIR MOBILE DEVICE TO SHOP

54%

LIKELY TO ACCESS GUEST WI-FI

95%

Handsets shipping that are Wi-Fi enabled

25%

Big Box and anchor tenant retailers offering free in-store Wi-Fi to shoppers

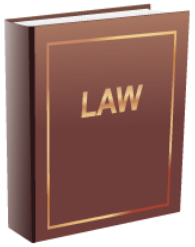
6%

AND RISING

Increased likelihood that a shopper using a mobile device in-store will make an in-store purchase


LinkNYC

FirstNet®



LAW

On 2.22.12 FirstNet becomes law
PL 112-96

FUNDING

$7B authorized to build the FirstNet network.
Funded by spectrum auctions through 2022

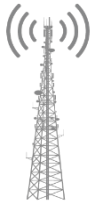
GOVERNANCE

The FirstNet Board has **15** members, including those with telecommunications and public safety backgrounds

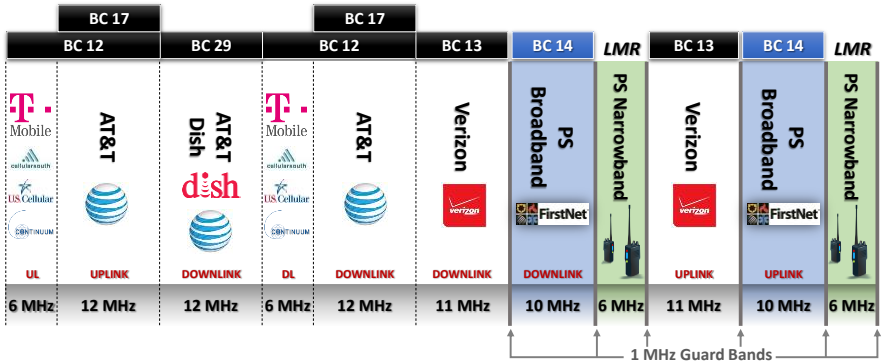
Each Governor appoints **1** Single Point of Contact (SPOC) and governing body to represent the state's interests to FirstNet

40 member Public Safety Advisory Committee (PSAC) advises FirstNet on public safety intergovernmental matters

BAND CLASS (BC) 14



20MHz of bandwidth has been dedicated to public safety in the prime upper **700MHz** frequency range



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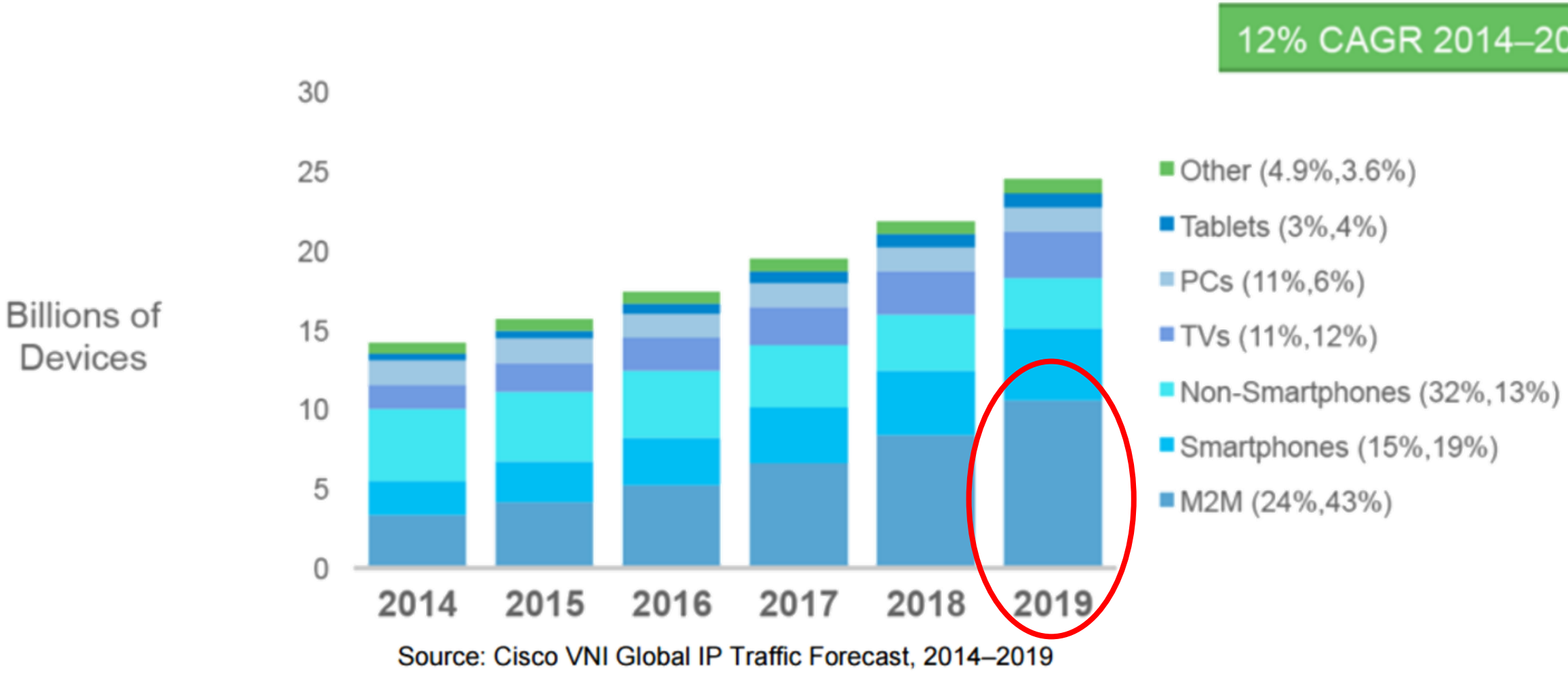
The Rise of Connected Machines

80% value is B2B Services



Source: Cisco VNI Global IP Traffic Forecast, 2014–2019

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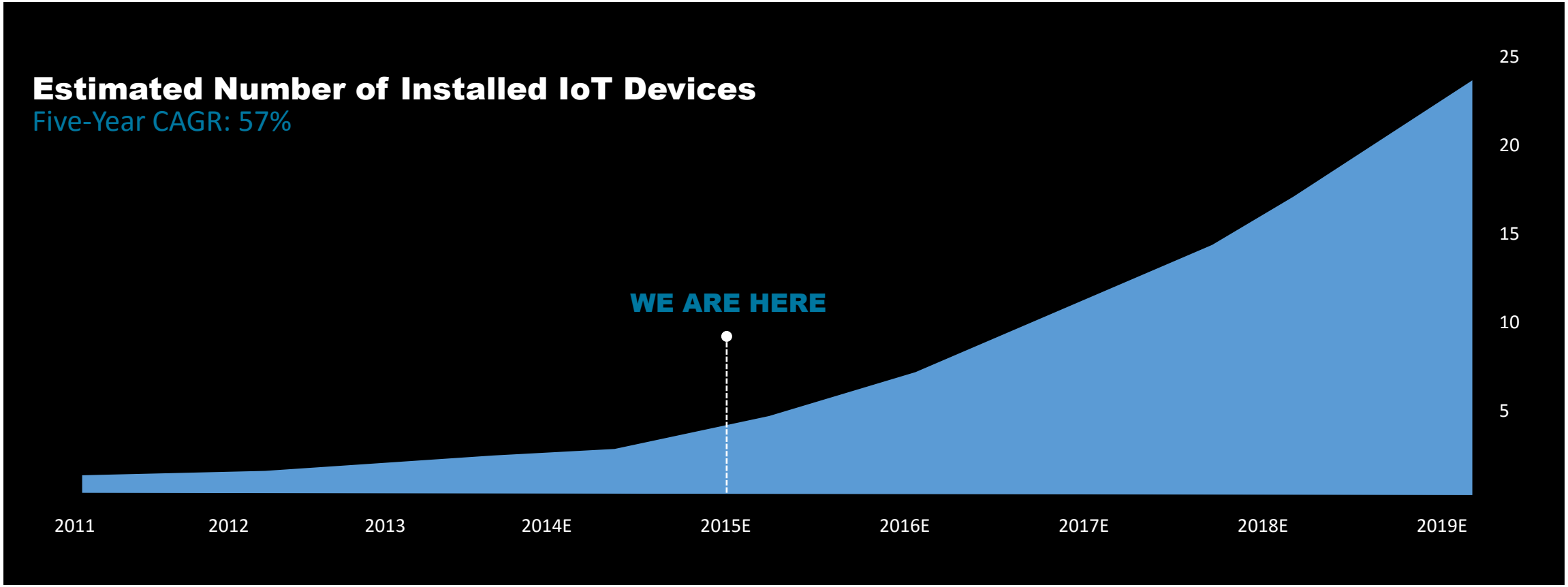

There will be 6 billion mobile phones but 30 billion connected smart devices taking 42% of the mobile bandwidth.

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M2M/IoT: A Series of Verticals

- Environmental sensors
- Water, power leak detection
- Pollution, weather monitoring

Smart Planet
Green Environmental

- Lighting, water management
- Monitoring & security
- Traffic Control

Smart Cities
Connected Communities

- Voltage and power sensors
- Meters and breakers
- Fault detection

Smart Energy
Electric Grid

- Thermostats, HVAC, lighting
- Presence sensors, lockers, actuators
- Meters, smart-plugs, HEC

Smart Buildings
Buildings, Smart Homes

- Electric Mobility, EV's and HEVs
- High Speed Trains
- Infrastructure, V2I, V2V, V2I+1

Smart Transport
HEVs, EVs

- Lighting, security, actuators
- Production control
- Robotics

Smart Industry
Industrial Environments

- People monitoring
- Bio sensors, probes
- Remote health

Smart Health
Healthcare System

- Independence through technology
- Information when you need it
- Connected when you need it

Smart Living
Entertaining, Leisure

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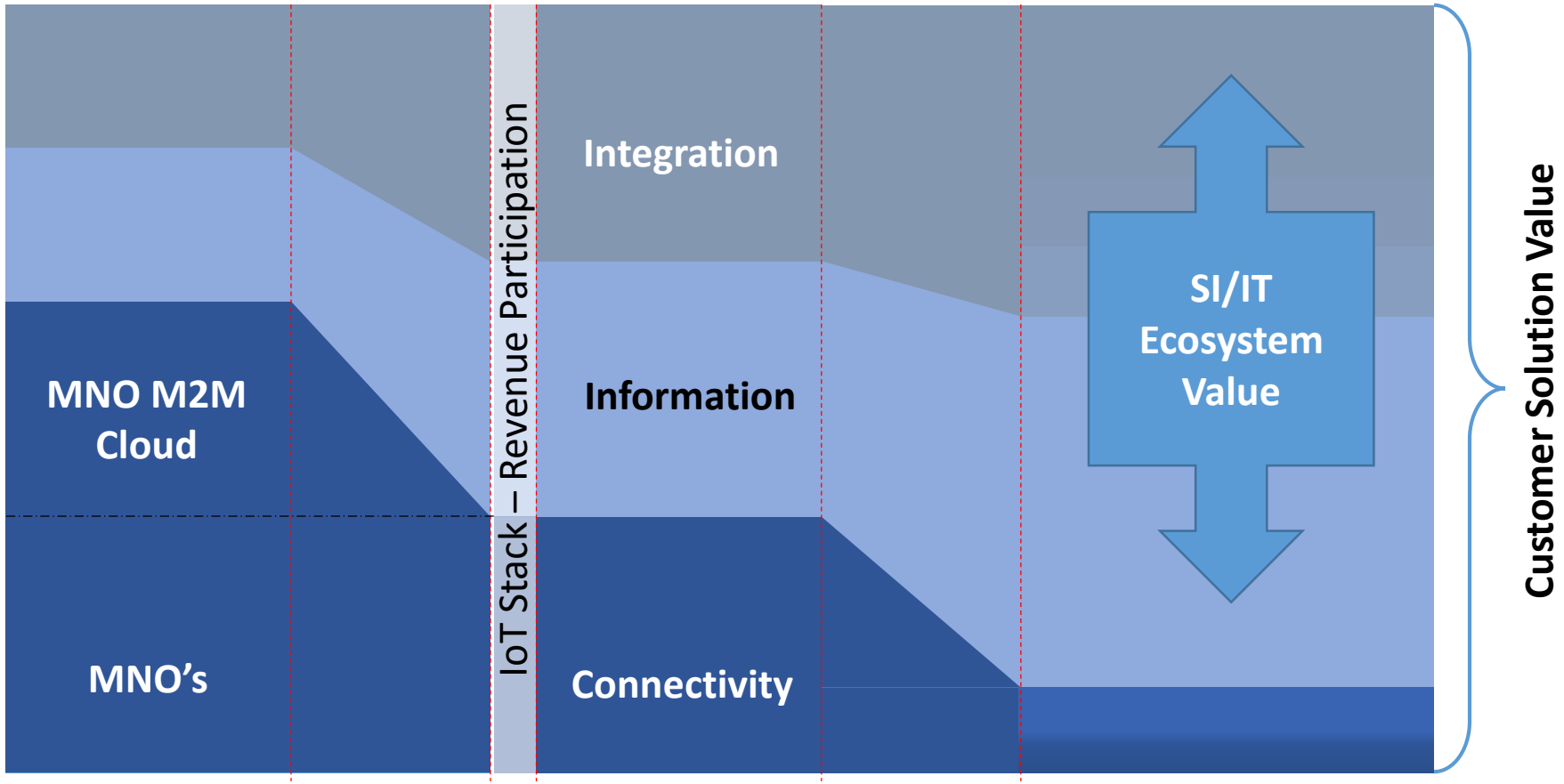
Three Pillars of M2M/IoT Value

Conceptual Representation of Building Ecosystem Revenue enabled by Wireless



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EMPOWERED & UNDERSTOOD

Where located…
What is of interest…
How to best engage…

GREETED & ENABLED

On-boarded to the store as a platform

ENGAGED & INFORMED

Customer profiling delivers personalized offers & communications

CONNECTED & AWARE

Informed staff anticipates & quickly responds to customers' needs

GREETED AND ENABLED

Convergence of networks and technologies

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IoT: Automation of Clinician Workflow to Enable Better Quality of Care

Current State

New mandates are requiring increased patient documentation. Nurses now spend more than half their time on activities other than patient care. Manual collection of data and collaboration results in errors.

Future State

Solution	Mobile workflow software and collaboration tools, smart location aware infrastructure and mobile devices enable the accurate and timely capture of data automatically
New use-cases	"Demonstrating meaningful use of accountable care" is an emerging requirement for healthcare facilities. Through the automation of workflow based data collection and collaboration we have the opportunity to transform the way information is collected, shared and mobilized.

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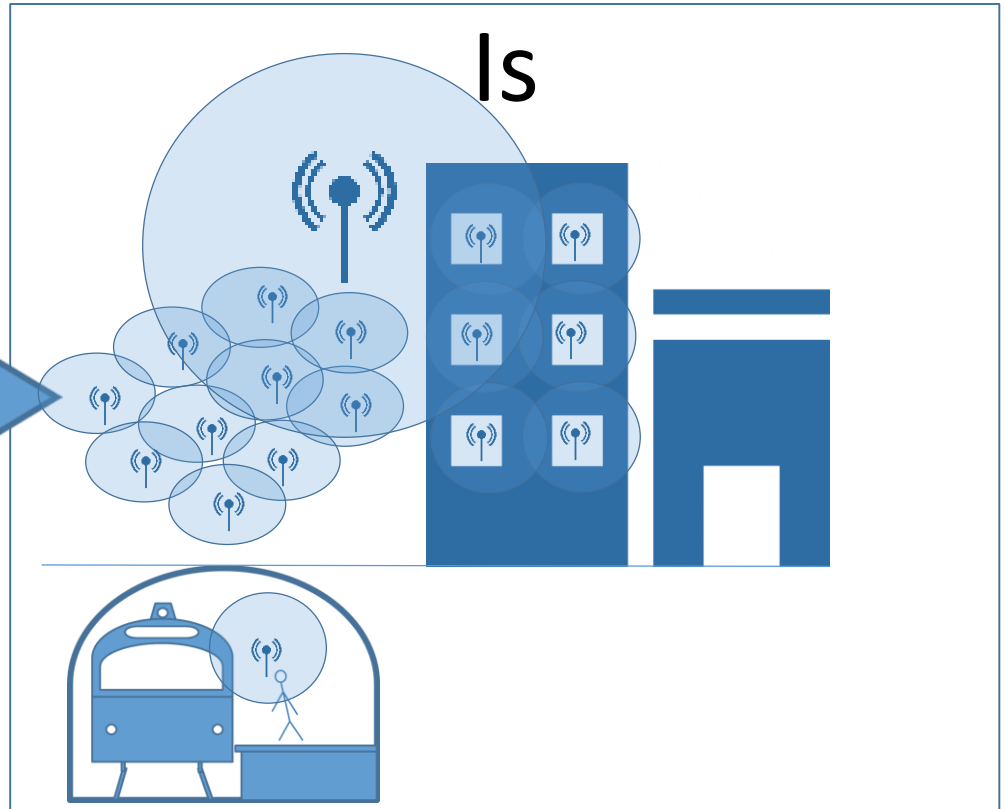
Network Densification

Ubiquitous Need for Connectivity

Was

Wireless Site

Is



DAS - Small Cells - C/RAN - WiFi

SWI SUBLIME WIRELESS INC.

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Regulatory Hurdles: Local Headwinds

Long Island has a challenging regulatory environment:

- Over 100 separate and distinct cities, towns and villages
- Each municipality has its own regulatory process
- Many have adopted their own Wireless Ordinances
- No widely adopted model code or regulatory standard
- Long history of successful opposition to proposed development

On a national and global level, many governments have successfully embraced wireless access:

- UK's "Universal Service Obligation" all homes and businesses receive access to 10 Mbs Broadband by 2020.
- US "Broadband Conduit Deployment Act of 2015" – Fiber conduits in all federally funded highways
- FCC recently awarded $9B to Commercial Service Providers (CSP) for rural broadband deployment
- In Colorado residents in 46 municipalities recently voted to fund public broadband networks

What can informed business leaders and local governments do?

- Adopt universal regulatory standards based on best practices
- Provide expedited review times, administrative approval processes
- Encourage public-private partnerships for enhanced wireless

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Closing Remarks

Jane Builder

T-Mobile U.S. Northeast Senior Manager for Development—Engineering Division

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