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# The Future of Connectivity: Where Is Broadband Investment Headed?

Technology Policy Institute

January 23, 2018

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MICHELLE CONNOLLY, PH.D.

DUKE UNIVERSITY



# Increasing Competition Across Platforms to Provide General Connectivity

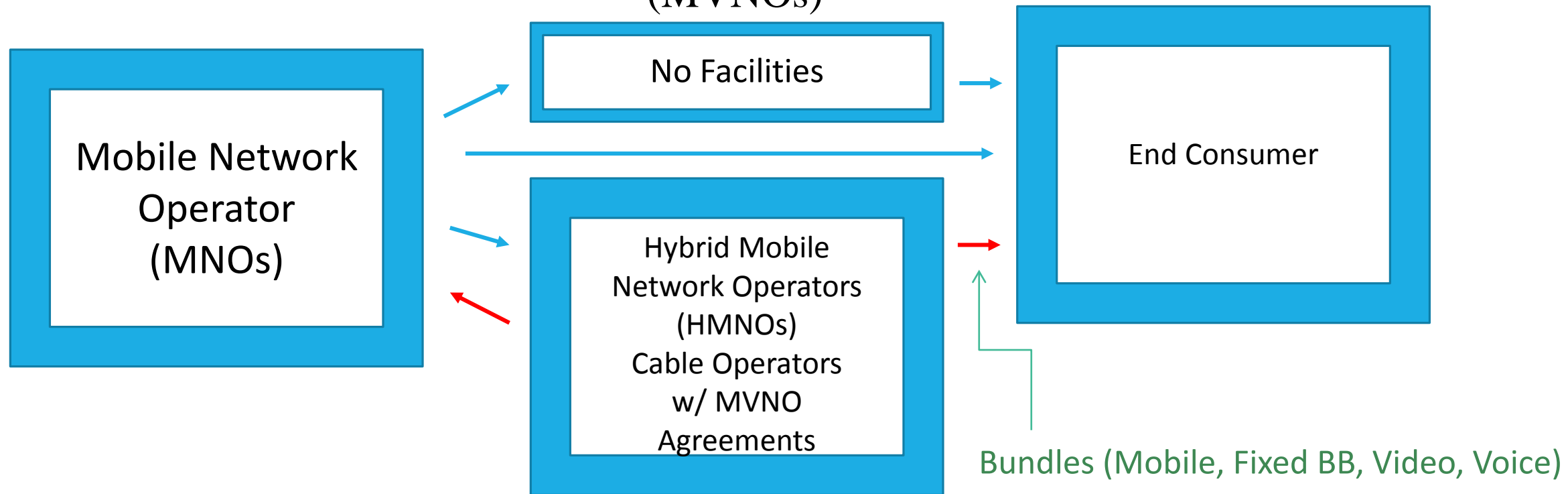
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## Increasing substitutability between fixed and wireless networks

- 20% of pop. connecting to internet only via mobile devices
- 5G networks - speeds and latency that would enable wireless to compete with fixed networks in buildings
- Cable upgrading to DOCSIS 3.1 - terms like “10G”
- Cable emerging as mobile providers relying on both MVNO agreements and own facilities (fiber & coax, Wi-Fi hotspots, spectrum (Comcast), etc.) => Hybrid Mobile Network Operators

# Changing role of MVNOs

## Mobile Virtual Network Operators (MVNOs)



# Cable's Entry into Wireless

	Launch Date	Postpaid Mobile Subs Q3 2018	Total Customers (% with bundles) Q2 2018	Households Passed 2017 (million)
Comcast	April 2017	> 1 million	29.80 (69%)	57.2
Charter	June 30, 2018	21K	27.62 (59%)	50.1
Altice	exp. Q2 2019	-	4.9	8.6
Cox	?	-	Approx. 6	10.8
Combined				<b>127</b> (116 w/o Cox)

# Cable's Entry into Wireless

Increasing churn in Q3 2018 at AT&T and Verizon

Comcast purchase of \$1.7 billion – 600 MHz licenses

**Bring your phone.  
Switch your carrier.  
Save hundreds a year.**



T-MOBILE BAD. SPECTRUM MOBILE GOOD.

