



5G Business Case 2020

Abstract: This report explores the fixed-mobile convergence and competition trend in the U.S. telecommunications market in the context of 5G technology transition. The report explores mobile's fixed entry using 5G millimeter wave and a cable's wireless entry using MVNO to see how their cost-per-GB unit economics compare. The report examines potential financial outcomes of both cable and mobile operators to see how might they compete as each side explores an entry into the other's core markets.

Kyung Mun

January 2020



TABLE OF CONTENTS

1	FIXED AND MOBILE TELECOM LANDSCAPE IN THE U.S.....	5
2	MOBILE BROADBAND EVOLUTION WITH 5G.....	7
	MOBILE BROADBAND UNIT ECONOMICS.....	7
	MOBILE BROADBAND NETWORK CAPACITY VS. DEMAND	8
	FINANCIAL VIEW OF THE MOBILE NETWORK INVESTMENT	9
3	CABLE BROADBAND EVOLUTION WITH DOCSIS 3.1.....	11
	CABLE PLANT OVERVIEW.....	11
	CABLE NETWORK CAPACITY EXPANSION OPTIONS	12
	CABLE BROADBAND NETWORK ECONOMICS	13
	CABLE FIXED BROADBAND UNIT COST.....	15
	CABLE BROADBAND NETWORK CAPACITY VS. DEMAND.....	16
	FINANCIAL VIEW OF THE CABLE NETWORK INVESTMENT	18
4	MOBILE FIXED BROADBAND ENTRY WITH 5G MILLIMETER-WAVE	19
	5G MILLIMETER WAVE FIXED WIRELESS (TODAY).....	19
	5G MILLIMETER WAVE FIXED WIRELESS (FUTURE).....	22
	5G MILLIMETER WAVE FIXED WIRELESS UNIT COST	24
5	CABLE WIRELESS ENTRY WITH MVNO	26
6	COMPARATIVE FIXED AND MOBILE UNIT COSTS.....	30
7	CONCLUSIONS	32

FIGURES

Figure 1. U.S. Fixed and Mobile Broadband Connections Share (as of 3Q 2019).....	5
Figure 2. Mobile Broadband Cost-per-GB Estimates (per Cell Site)	8
Figure 3. Mobile Broadband Demand vs. Capacity of a Major MNO in the U.S.....	9
Figure 4. Mobile Broadband Operating Cash Flow	10
Figure 5. Cable Broadband Network – Hybrid Fiber Coaxial (HFC) Plant	11
Figure 6. DOCSIS Downstream and Upstream Channels.....	12
Figure 7. Cable Broadband Network Costs per Subscriber.....	14
Figure 8. Cable Fixed Broadband Breakeven Analyses.....	15
Figure 9. Cable Fixed Broadband Unit Costs (per Node).....	16
Figure 10. Cable Fixed Broadband Demand vs. Capacity	17
Figure 11. Cable Fixed Broadband Operating Cash Flow	18
Figure 12. 5G Millimeter Wave Fixed Wireless Cost Estimate (Today)	21
Figure 13. 5G Millimeter Wave Fixed Wireless (Today) Breakeven Analysis	22
Figure 14. 5G Millimeter Wave Fixed Wireless Cost Estimate (Future)	23
Figure 15. 5G Millimeter Wave Fixed Wireless (Future) Breakeven Analysis	24
Figure 16. 5G Millimeter Wave Fixed Wireless Unit Costs (per Cell Site)	25
Figure 17. Comcast Wireless Revenue and Operating Expense.....	27
Figure 18. Charter Wireless Revenue and Operating Expense	28
Figure 19. Cable Wireless MVNO Unit Cost Estimate (as of 3Q 2019)	29
Figure 20. Fixed Broadband Cost per GB for Mobile vs. Cable Operator.....	30
Figure 21. Mobile Broadband Cost per GB for Mobile vs. Cable Operator.....	31