

**U.S. 5G Revenues,
2021 - 2026: *The
need for new
revenue sources***

Market Study
Third Quarter, 2016





U.S. 5G Revenues, 2021 - 2026: *The need for new revenue sources*

A Market Study

Published Third Quarter, 2016

Version 1.0

Report Number: 3Q2016-04

iGR

12400 W. Hwy 71

Suite 350 PMB 341

Austin TX 78738

Table of Contents

Abstract	1
Executive Summary	3
Defining 5G.....	3
5G Revenue Sources	4
Mobile Broadband.....	5
Fixed wireless broadband.....	5
Advertising	6
Entertainment	6
IoT.....	7
Network slicing.....	7
U.S. 5G Revenue Model	7
Figure A: Total Annual 5G Revenue (\$M) by Service, 2021-2026.....	9
Figure B: Total Annual 5G Revenue (\$M), 2021-2026	9
Figure C: Total Annual 5G Revenue by Service (Percent), 2021-2026.....	10
Figure D: Revenue from Non-Mobile Services (Percent), 2021-2026	11
Methodology.....	12
Terminology	12
Connections and Subscribers	13
Requirements of 5G	14
Latency	14
Figure 1: Average Wired Broadband Latency, Reported by FCC in 2014	15
Fixed Wireless Broadband	15
5G Network Requirements	16
Operational Requirements	18
5G Timeline	19
Figure 2: Timeline for IMT-2020 (5G)	19
5G Services and Use Cases.....	21
5G Revenue Sources	23
Mobile Broadband.....	23
Fixed wireless broadband	24
Advertising	27
The Lessons of Facebook and YouTube.....	28
Figure 3: Facebook Advertising Revenue (\$M).....	28
Figure 4: Google Advertising Revenue (\$M).....	30
Figure 5: Verizon go90.....	31
Entertainment	32
IoT	32
Network slicing.....	33

Quoting information from an iGillottResearch publication: external — any iGillottResearch information that is to be used in press releases, sales presentations, marketing materials, advertising, or promotional materials requires prior written approval from iGillottResearch. iGillottResearch reserves the right to deny approval of external usage for any reason. Internal-quoting individual sentences and paragraphs for use in your company's internal communications activities does not require permission from iGillottResearch. The use of large portions or the reproduction of any iGillottResearch document in its entirety does require prior written approval and may have some financial implications.

Copyright © 2016 iGillottResearch, Inc. Reproduction is forbidden unless authorized.

FOR INFORMATION PLEASE CONTACT IAIN GILLOTT (512) 263-5682.

5G Revenue Model Assumptions	34
Overall assumptions	34
Mobile service revenue assumptions	35
Fixed wireless revenue assumptions	35
Advertising revenue assumptions	36
Entertainment revenue assumptions	36
U.S. 5G Revenue Model	38
Connections and Subscribers	38
Table 1: U.S. IMT-2020 Connections and Subscribers, 2021-2026	38
Figure 6: U.S. IMT-2020 Connections and Subscribers, 2021-2026	38
Revenue from Mobile Services	39
Table 2: ARPU and Revenue(\$M) from 5G Mobile Services, 2021-2026	39
Figure 7: Revenue (\$M) from 5G Mobile Services, 2021-2026	40
Revenue from Advertising	40
Table 3: Monthly Unique Visitor Amount and Annual Revenue (\$M) from 5G Web Advertising, 2021-2026	40
Figure 8: Annual Revenue (\$M) from 5G Web Advertising, 2021-2026	41
Table 4: CPM Amount and Annual Revenue from 5G Video Advertising, 2021-2026	41
Figure 9: Annual Revenue (\$M) from 5G Video Advertising, 2021-2026	42
Table 5: Total Annual Revenue from 5G Advertising, 2021-2026	42
Figure 10: Total Annual Revenue from 5G Advertising, 2021-2026	43
Revenue from Fixed Wireless Broadband	43
Table 6: ARPU, Penetration and Annual Revenue from 5G Fixed Wireless Broadband Services, 2021-2026	43
Figure 11: Annual Revenue from 5G Fixed Wireless Broadband Services, 2021-2026	44
Revenue from Entertainment Packages	44
Table 7: ARPU, Penetration and Annual Revenue from 5G Entertainment Services, 2021-2026	45
Figure 12: Annual Revenue from 5G Entertainment Services, 2021-2026	45
Total 5G Revenue	45
Table 8: Total Annual 5G Revenue (\$M) by Service, 2021-2026	45
Figure 13: Total Annual 5G Revenue (\$M) by Service, 2021-2026	46
Figure 14: Total Annual 5G Revenue (\$M), 2021-2026	47
Table 9: Blended ARPU for all 5G Services, 2021-2026	47
Figure 15: Blended ARPU for all 5G Services, 2021-2026	48
Table 10: Total Annual 5G Revenue by Service (Percent), 2021-2026	48
Figure 16: Total Annual 5G Revenue by Service (Percent), 2021-2026	49
Table 11: Revenue from Non-Mobile Services (Percent), 2021-2026	49
Figure 17: Revenue from Non-Mobile Services (Percent), 2021-2026	50
Definitions	51
General	51
Device Types	51
Services	52
Network Technology	53

Quoting information from an iGillottResearch publication: external — any iGillottResearch information that is to be used in press releases, sales presentations, marketing materials, advertising, or promotional materials requires prior written approval from iGillottResearch. iGillottResearch reserves the right to deny approval of external usage for any reason. Internal-quoting individual sentences and paragraphs for use in your company's internal communications activities does not require permission from iGillottResearch. The use of large portions or the reproduction of any iGillottResearch document in its entirety does require prior written approval and may have some financial implications.

Copyright © 2016 iGillottResearch, Inc. Reproduction is forbidden unless authorized.

FOR INFORMATION PLEASE CONTACT IAIN GILLOTT (512) 263-5682.

About <i>iGR</i>.....	57
Disclaimer	57

Quoting information from an *iGillottResearch* publication: external — any *iGillottResearch* information that is to be used in press releases, sales presentations, marketing materials, advertising, or promotional materials requires prior written approval from *iGillottResearch*. *iGillottResearch* reserves the right to deny approval of external usage for any reason. Internal-quoting individual sentences and paragraphs for use in your company's internal communications activities does not require permission from *iGillottResearch*. The use of large portions or the reproduction of any *iGillottResearch* document in its entirety does require prior written approval and may have some financial implications.

Copyright © 2016 *iGillottResearch*, Inc. Reproduction is forbidden unless authorized.

FOR INFORMATION PLEASE CONTACT IAIN GILLOTT (512) 263-5682.

Abstract

In this market study, *iGR* presents a model for the potential 5G revenues in the U.S. from 2021 to 2026, including the potential of each major source of revenue.

For the purposes of this report, '5G' is defined as networks using IMT-2020. The first networks are not expected to be deployed before 2020, with the first commercial services launched in 2021. The model does include, however, the potential for fixed wireless broadband services to the home, such as those using the LMDS (Local Multipoint Distribution Service) bands.

The first 5G services are likely to include some or all of the following:

- High bandwidth services for mobile devices, including support for HD video.
- Support for fixed wireless video and Internet services, including HD video.
- Types of "evolved" IoT use cases that goes beyond today's examples of metering, connected cars and homes, and B2B applications that connect stoves and vending machines to their owners' back-end systems – and many other examples. Potential revenues from 5G IoT are not included in this model.
- Wide-support for advertising-driven business models to support new mobile business cases. Note that potential revenues from product placement (in operator-created content) and sponsored content are not included in this model.
- Support for network 'slicing' enabling mobile operators to provide private network services to third party organizations. This model does not include a revenue forecast for network slicing.

This report models four major sources of potential revenue for 5G for the mobile operators:

- Mobile data subscriptions based on the data used on each connection per month (the current business model for LTE networks)
- Advertising revenues for basic services and for video services
- Entertainment revenues from the mobile operators selling video, TV and other entertainment to consumers
- Fixed wireless broadband services to the home, in competition to cable, fiber-to-the-home, DSL and other wired broadband services.

Quoting information from an *iGillottResearch* publication: external — any *iGillottResearch* information that is to be used in press releases, sales presentations, marketing materials, advertising, or promotional materials requires prior written approval from *iGillottResearch*. *iGillottResearch* reserves the right to deny approval of external usage for any reason. Internal-quoting individual sentences and paragraphs for use in your company's internal communications activities does not require permission from *iGillottResearch*. The use of large portions or the reproduction of any *iGillottResearch* document in its entirety does require prior written approval and may have some financial implications.

Copyright © 2016 *iGillottResearch*, Inc. Reproduction is forbidden unless authorized.

FOR INFORMATION PLEASE CONTACT IAIN GILLOTT (512) 263-5682.

iGR did not model the potential revenues from IoT or network slicing. At this time, the revenue potential from 5G IoT is believed to be small, since most IoT connections will be carried by 3G, LTE and low power networks, including LTE-LP. While the concept of network slicing is understood, the business models have yet to be defined or the value proposition (i.e., how the service is likely to be priced) fully understood.

Key questions addressed in this market study include:

- What is 5G? How is it defined and/or viewed right now?
- What is in 5G? When will 5G happen?
- What is the anticipated timing of 5G services based on the IMT-2020 standard?
- What are the characteristics of the core 5G services?
- How many IMT-2020 5G connections can be expected in the U.S. from 2021 to 2026?
- What are potential sources of revenue for 5G networks?
- What will drive the 5G subscription service model?
- What will drive the 5G advertising revenue model?
- What are the drivers for 5G-based entertainment revenues?
- How do each source of revenues compare? Which is the most significant and why?
- What are the total revenues expected from 5G from 2021-2026?

Who should read this report?

- Mobile operators
- Mobile device OEMs
- Mobile service and application developers
- IoT vendors and solutions providers
- Infrastructure OEMs
- Small cell product and solution vendors
- Backhaul service providers and equipment OEMs
- Financial analysts and investors.

Quoting information from an *iGillottResearch* publication: external — any *iGillottResearch* information that is to be used in press releases, sales presentations, marketing materials, advertising, or promotional materials requires prior written approval from *iGillottResearch*. *iGillottResearch* reserves the right to deny approval of external usage for any reason. Internal-quoting individual sentences and paragraphs for use in your company's internal communications activities does not require permission from *iGillottResearch*. The use of large portions or the reproduction of any *iGillottResearch* document in its entirety does require prior written approval and may have some financial implications.

Copyright © 2016 *iGillottResearch*, Inc. Reproduction is forbidden unless authorized.

FOR INFORMATION PLEASE CONTACT IAIN GILLOTT (512) 263-5682.

Quoting information from an *iGillottResearch* publication: external — any *iGillottResearch* information that is to be used in press releases, sales presentations, marketing materials, advertising, or promotional materials requires prior written approval from *iGillottResearch*. *iGillottResearch* reserves the right to deny approval of external usage for any reason. Internal-quoting individual sentences and paragraphs for use in your company's internal communications activities does not require permission from *iGillottResearch*. The use of large portions or the reproduction of any *iGillottResearch* document in its entirety does require prior written approval and may have some financial implications.

Copyright © 2016 *iGillottResearch*, Inc. Reproduction is forbidden unless authorized.

FOR INFORMATION PLEASE CONTACT IAIN GILLOTT (512) 263-5682.