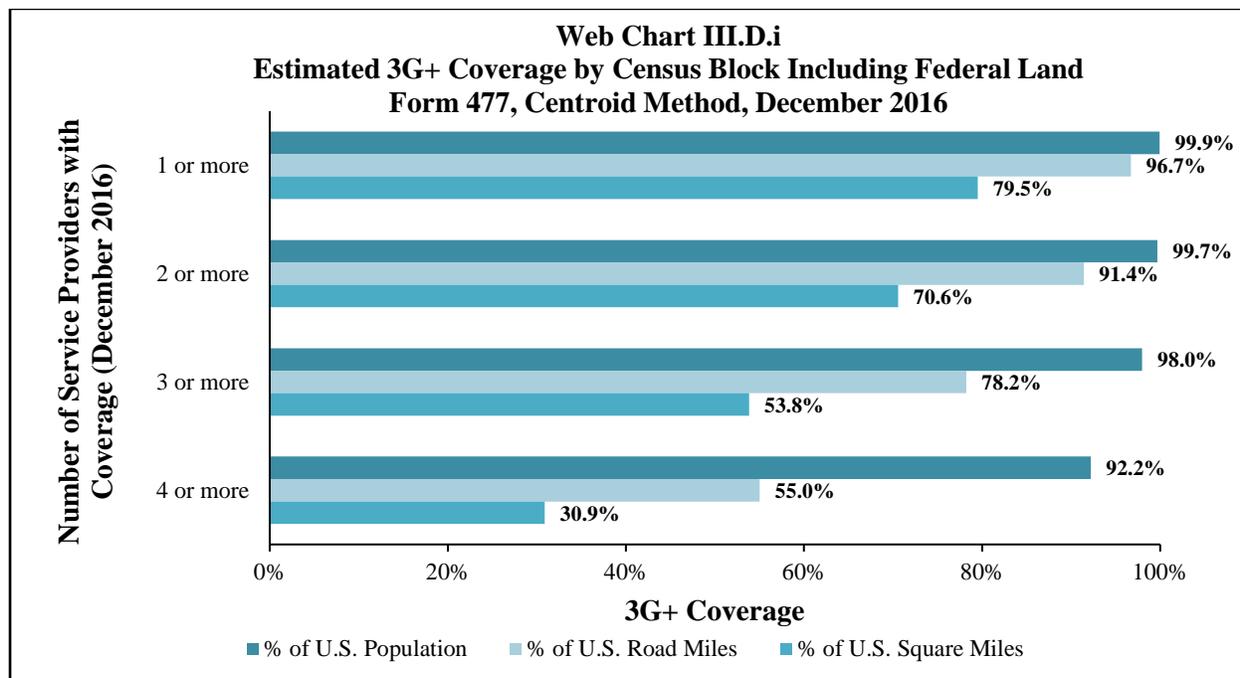


WEB APPENDIX III
SECTION III: ELEMENTS OF INTER-FIRM RIVALRY

3G+ COVERAGE BASED ON FORM 477
BY A CERTAIN NUMBER OF SERVICE PROVIDERS



Source: Based on centroid analysis of December 2016 Form 477 and 2010 Census data. Note that the number of service providers in a census block represents network coverage only. Network coverage does not necessarily reflect the number of service providers that actively offer service to individuals located in a given area. The 3G/4G technologies included are the following: EV-DO, EV-DO Rev A, WCDMA/HSPA, HSPA+, LTE, and mobile WiMAX.

Web Table III.D.i
Estimated 3G+ Coverage by Census Block Including Federal Land
Form 477, Centroid Method, December 2016

# of Providers in a Block	Number of Blocks	POPs in those Blocks	% Total US POPs	Square Miles in those Blocks	% Total US Square Miles	Road Miles in those Blocks	% Total US Road Miles
<i>US Total</i>	10,609,302	312,471,320	100.0%	3,550,852	100.0%	6,817,734	100.0%
1 or more	10,482,136	312,280,436	99.9%	2,823,417	79.5%	6,593,394	96.7%
2 or more	10,254,553	311,453,160	99.7%	2,506,243	70.6%	6,232,458	91.4%
3 or more	9,528,926	306,135,944	98.0%	1,911,252	53.8%	5,333,945	78.2%
4 or more	7,861,961	288,072,444	92.2%	1,096,850	30.9%	3,751,828	55.0%

Source: Based on centroid analysis of December 2016 Form 477 and 2010 Census data. Note that the number of service providers in a census block represents network coverage only. Network coverage does not necessarily reflect the number of service providers that actively offer service to individuals located in a given area. The 3G/4G technologies included are the following: EV-DO, EV-DO Rev A, WCDMA/HSPA, HSPA+, LTE, and mobile WiMAX.

Web Table III.D.ii
Estimated 3G+ Coverage by Census Block Excluding Federal Land
Form 477, Centroid Method, December 2016

# of Providers in a Block	Number of Blocks	POPs in those Blocks	% Total US POPs	Square Miles in those Blocks	% Total US Square Miles	Road Miles in those Blocks	% Total US Road Miles
<i>US Total</i>	9,969,315	307,208,956	100.0%	2,441,456	100.0%	5,890,295	100.0%
1 or more	9,910,154	307,089,592	100.0%	2,227,029	91.2%	5,805,497	98.6%
2 or more	9,758,604	306,419,560	99.7%	2,076,541	85.1%	5,608,065	95.2%
3 or more	9,141,350	301,484,832	98.1%	1,663,641	68.1%	4,923,170	83.6%
4 or more	7,612,987	284,169,704	92.5%	1,002,351	41.1%	3,551,182	60.3%

Source: Based on centroid analysis of December 2016 Form 477 and 2010 Census data. Note that the number of service providers in a census block represents network coverage only. Network coverage does not necessarily reflect the number of service providers that actively offer service to individuals located in a given area. The 3G/4G technologies included are the following: EV-DO, EV-DO Rev A, WCDMA/HSPA, HSPA+, LTE, and mobile WiMAX.

Web Table III.D.iii
Estimated 3G+ Coverage in Rural Areas by Census Block Including Federal Land
Form 477, Centroid Method, December 2016

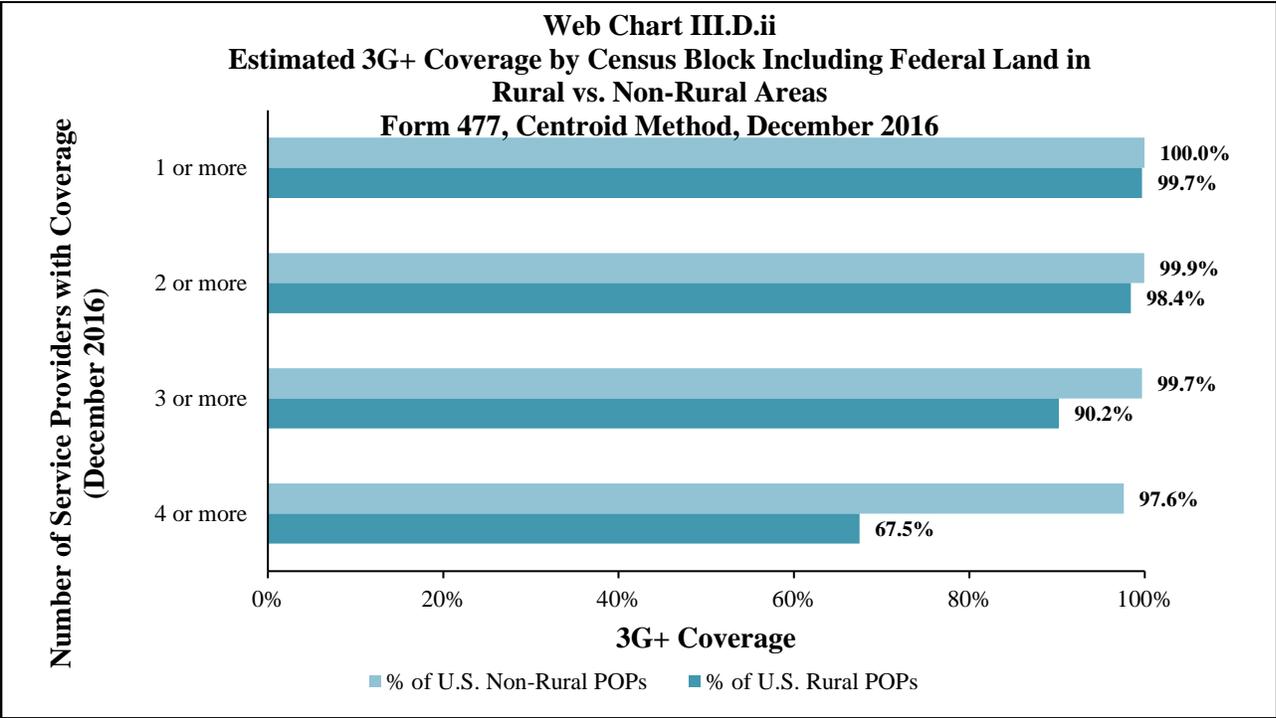
# of Providers in a Block	Number of Blocks	POPs in those Blocks	% Total Rural US POPs	Square Miles in those Blocks	% Total Rural US Square Miles	Road Miles in those Blocks	% Total Rural US Road Miles
<i>US Total</i>	4,937,330	56,094,552	100.0%	2,987,281	100.0%	4,518,876	100.0%
1 or more	4,817,473	55,924,404	99.7%	2,272,865	97.7%	4,305,901	95.3%
2 or more	4,606,676	55,209,544	98.4%	1,971,153	94.9%	3,963,700	87.7%
3 or more	3,944,949	50,605,880	90.2%	1,414,231	88.2%	3,127,642	69.2%
4 or more	2,546,505	37,853,244	67.5%	687,189	72.7%	1,747,214	38.7%

Source: Based on centroid analysis of December 2016 Form 477 and 2010 Census data. Note that the number of service providers in a census block represents network coverage only. Network coverage does not necessarily reflect the number of service providers that actively offer service to individuals located in a given area. The 3G/4G technologies included are the following: EV-DO, EV-DO Rev A, WCDMA/HSPA, HSPA+, LTE, and mobile WiMAX.

Web Table III.D.iv
Estimated 3G+ Coverage in Non-Rural Areas by Census Block Including Federal Land
Form 477, Centroid Method, December 2016

# of Providers in a Block	Number of Blocks	POPs in those Blocks	% Total Non-Rural US POPs	Square Miles in those Blocks	% Total Non-Rural US Square Miles	Road Miles in those Blocks	% Total Non-Rural US Road Miles
<i>US Total</i>	5,671,972	256,376,768	100.0%	563,570	100.0%	2,298,858	100.0%
1 or more	5,664,663	256,356,032	100.0%	550,552	97.7%	2,287,494	99.5%
2 or more	5,647,877	256,243,616	99.9%	535,090	94.9%	2,268,758	98.7%
3 or more	5,583,977	255,530,064	99.7%	497,020	88.2%	2,206,303	96.0%
4 or more	5,315,456	250,219,200	97.6%	409,661	72.7%	2,004,614	87.2%

Source: Based on centroid analysis of December 2016 Form 477 and 2010 Census data. Note that the number of service providers in a census block represents network coverage only. Network coverage does not necessarily reflect the number of service providers that actively offer service to individuals located in a given area. The 3G/4G technologies included are the following: EV-DO, EV-DO Rev A, WCDMA/HSPA, HSPA+, LTE, and mobile WiMAX.



Source: Based on centroid analysis of December 2016 Form 477 and 2010 Census data. Note that the number of service providers in a census block represents network coverage only. Network coverage does not necessarily reflect the number of service providers that actively offer service to individuals located in a given area. The 3G/4G technologies included are the following: EV-DO, EV-DO Rev A, WCDMA/HSPA, HSPA+, LTE, and mobile WiMAX.

**OVERALL MOBILE WIRELESS COVERAGE
AND LTE COVERAGE, EXCLUDING FEDERAL LAND
BY A CERTAIN NUMBER OF SERVICE PROVIDERS**

Web Table III.D.v

***Estimated Overall Wireless Coverage by Census Block Excluding Federal Land
Form 477, Centroid Method, December 2016***

# of Providers in a Block	Number of Blocks	POPs in those Blocks	% Total US POPs	Square Miles in those Blocks	% Total US Square Miles	Road Miles in those Blocks	% Total US Road Miles
<i>US Total</i>	9,969,315	307,208,960	100.0%	2,441,456	100.0%	5,890,295	100.0%
1 or more	9,918,417	307,112,736	100.0%	2,240,344	91.8%	5,815,125	98.7%
2 or more	9,785,261	306,521,888	99.8%	2,101,322	86.1%	5,640,561	95.8%
3 or more	9,210,374	302,042,304	98.3%	1,708,732	70.0%	5,002,322	84.9%
4 or more	7,854,147	287,372,960	93.5%	1,103,549	45.2%	3,770,022	64.0%

Source: Based on centroid analysis of December 2016 Form 477 and 2010 Census data. Note that the number of service providers in a census block represents network coverage only. Network coverage does not necessarily reflect the number of service providers that actively offer service to individuals located in a given area.

Web Table III.D.vi

***Estimated LTE Coverage by Census Block Excluding Federal Land
Form 477, Centroid Method, December 2016***

# of Providers in a Block	Number of Blocks	POPs in those Blocks	% Total US POPs	Square Miles in those Blocks	% Total US Square Miles	Road Miles in those Blocks	% Total US Road Miles
<i>US Total</i>	9,969,315	307,208,960	100.0%	2,441,456	100.0%	5,890,295	100.0%
1 or more	9,801,009	306,620,960	99.8%	2,118,261	86.8%	5,662,623	96.1%
2 or more	9,470,385	304,651,008	99.2%	1,845,194	75.6%	5,251,392	89.2%
3 or more	8,683,611	297,622,336	96.9%	1,417,651	58.1%	4,458,256	75.7%
4 or more	6,883,404	273,397,024	89.0%	768,212	31.5%	2,986,921	50.7%

Source: Based on centroid analysis of December 2016 Form 477 and 2010 Census data. Note that the number of service providers in a census block represents network coverage only. Network coverage does not necessarily reflect the number of service providers that actively offer service to individuals located in a given area.

Web Table III.D.vii

***Estimated LTE Coverage by Census Block Excluding Federal Land
Form 477, Actual Area Coverage Method, December 2016***

# of Providers in a Block	Covered POPs	% Total US POPs	Covered Square Miles	% Total US Square Miles	Covered Road Miles	% Total US Road Miles
<i>US Total</i>	307,208,959	100.0%	2,441,456	100.0%	5,890,295	100.0%
1 or more	306,581,057	99.8%	2,110,005	86.4%	5,651,172	95.9%
2 or more	304,509,178	99.1%	1,833,874	75.1%	5,232,449	88.8%
3 or more	297,420,981	96.8%	1,409,956	57.8%	4,443,404	75.4%
4 or more	273,127,903	88.9%	764,404	31.3%	2,975,649	50.5%

Source: Based on actual area coverage analysis of December 2016 Form 477 and 2010 Census data. Unlike the centroid methodology where each block is either covered or not, the actual area coverage methodology acknowledges that many blocks are only partially covered. Because it is unclear which census blocks should be considered covered or not, we do not report the number of blocks covered in these results.

3G+ COVERAGE BASED ON FORM 477
BY INDIVIDUAL SERVICE PROVIDER

Web Table III.D.viii
Estimated 3G+ Coverage in the U.S. by Provider
Form 477, Centroid Method, December 2016

Provider	Number of Blocks	POPS in those Blocks	% Total US POPS	Square Miles in those Blocks	% Total US Square Miles	Road Miles in those Blocks	% Total US Road Miles
<i>US Total</i>	10,609,302	312,471,327	100.0%	3,550,852	100.0%	6,817,734	100.0%
AT&T	10,143,108	310,329,123	99.3%	2,526,778	71.2%	6,182,466	90.7%
Sprint	7,432,618	284,444,077	91.0%	884,995	24.9%	3,324,465	48.8%
T-Mobile	8,784,066	296,564,269	94.9%	1,657,954	46.7%	4,771,139	70.0%
Verizon Wireless	9,850,298	304,258,185	97.4%	2,363,775	66.6%	5,928,982	87.0%

Source: Based on centroid analysis of December 2016 F477 and 2010 Census data. That a particular service provider has indicated that it has network coverage in a particular census block does not necessarily mean that it offers service to residents in that census block. Also, the fact that a service provider reports coverage in a particular census block does not mean that it necessarily provides coverage everywhere in the census block. The 3G/4G technologies included are the following: EV-DO, EV-DO Rev A, WCDMA/HSPA, HSPA+, LTE, and mobile WiMAX.

Web Table III.D.ix
Estimated Rural 3G+ Coverage in the U.S. by Provider
Form 477, Centroid Method, December 2016

Provider	Number of Blocks	POPS in those Blocks	% Total Rural US POPS	Road Miles in those Blocks	% Total US Rural Road Miles
<i>US Total</i>	4,937,330	56,094,554	100.0%	4,518,876	100.0%
AT&T	4,495,209	54,151,235	96.5%	3,911,665	86.6%
Sprint	2,116,341	34,549,067	61.6%	1,329,407	29.4%
T-Mobile	3,320,474	44,054,412	78.5%	2,628,974	58.2%
Verizon Wireless	4,305,663	52,222,198	93.1%	3,705,864	82.0%

Source: Based on centroid analysis of December 2016 F477 and 2010 Census data. That a particular service provider has indicated that it has network coverage in a particular census block does not necessarily mean that it offers service to residents in that census block. Also, the fact that a service provider reports coverage in a particular census block does not mean that it necessarily provides coverage everywhere in the census block. The 3G/4G technologies included are the following: EV-DO, EV-DO Rev A, WCDMA/HSPA, HSPA+, LTE, and mobile WiMAX.

Web Table III.D.x
Estimated Non-Rural 3G+ Coverage in the U.S. by Provider
Form 477, Centroid Method, December 2016

Provider	Number of Blocks	POPS in those Blocks	% Total Non-Rural US POPS	Road Miles in those Blocks	% Total Non-Rural US Road Miles
<i>US Total</i>	5,671,972	256,376,773	100.0%	2,298,858	100.0%
AT&T	5,647,899	256,177,888	99.9%	2,270,801	98.8%
Sprint	5,316,277	249,895,010	97.5%	1,995,059	86.8%
T-Mobile	5,463,592	252,509,857	98.5%	2,142,166	93.2%
Verizon Wireless	5,544,635	252,035,987	98.3%	2,223,118	96.7%

Source: Based on centroid analysis of December 2016 F477 and 2010 Census data. That a particular service provider has indicated that it has network coverage in a particular census block does not necessarily mean that it offers service to residents in that census block. Also, the fact that a service provider reports coverage in a particular census block does not mean that it necessarily provides coverage everywhere in the census block. The 3G/4G technologies included are the following: EV-DO, EV-DO Rev A, WCDMA/HSPA, HSPA+, LTE, and mobile WiMAX.