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August 17, 2015

Ex Parte

Marlene H. Dortch
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: <u>Reexamination of Roaming Obligations of Commercial Mobile Radio Service Providers and other Providers of Mobile Data Services, WT Docket No. 05-265</u>

Dear Ms. Dortch:

In a recent filing in this docket, Sprint repeats decade-old arguments about Verizon's wireless network build-out in rural areas. These tired arguments are part of its campaign for artificially low roaming rates so it can avoid building out its own network as Verizon has. The Commission should reject Sprint's self-serving proposals and maintain its long-standing roaming policies that appropriately encourage carriers to expand and improve their wireless networks.

Sprint's filing makes its motives crystal clear: Sprint wants to rely on roaming instead of deploying its considerable spectrum assets and extending its network into more rural, less populated areas. Sprint's parent, SoftBank, built a highly profitable mobile business by concentrating its network deployment in major population centers, and it is reportedly directing a similar strategy for Sprint here in the United States.[1] Market analysts report that Sprint's CEO has described a two-track strategy for improving profitability: (1) building out a "superior network" that commands "premium" pricing for retail wireless service in the most densely populated urban markets, and (2) offering "lowest cost service," presumably with far less infrastructure investment, in "the rest of the country."[2] As it concentrates its investment in the richest markets, it is no surprise that Sprint wants the lowest conceivable roaming rates to help maximize its profits from this strategy. But Sprint's business interests are separate from (and in fact in opposition to) the Commission's public policy objectives. Those objectives have and should remain focused on the need to preserve investment incentives and encourage facilities-based competition in both urban and rural markets. That is what is best for consumers.

Given these motives, it is equally clear why Sprint sprinkles its filing with tirades against the alleged "head-start advantages" that Verizon has supposedly enjoyed over the years—allegedly giving Verizon a leg up in terms of investing in its network. Sprint is trying to shift the focus from the consequences of its business strategy by raising tangential issues. The Commission should reject these claims out of hand.

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[1] *See* "A Tale of Two Sprints: Analyzing Sprint's New Network Strategy," New Street (Oct. 18, 2014), attached.

[2] *Id*.

First, Sprint claims that Verizon avoided investing in rural areas by purchasing Alltel. This is just wrong: Verizon paid $28 billion for Alltel and its network assets—a very substantial commitment to rural America and to a robust, nationwide footprint. Second, Alltel's participation in the Commission's old high-cost universal service programs did not give Verizon a unique head start on network build-out. Verizon agreed to give up Alltel's legacy USF support as a condition of transaction approval, yet continued to invest in the network facilities acquired from Alltel by upgrading them to LTE. Sprint also was free to, and in fact did, participate in the same USF programs. And the Commission's new mobility fund USF programs are open and available to Sprint.

Sprint's complaint that Verizon collected "implicit subsidies granted through inflated access charges" that paid for build-out of its wireless network also rings hollow. If Sprint is suggesting that the Verizon ILECs' access charge revenues are subsidizing the Verizon Wireless business, that is just not true, and Sprint offers nothing to support such an allegation. The Communications Act and the Commission's orders prohibit this. *See, e.g.*, 47 U.S.C. § 254(k). And, like Verizon today, in the past Sprint also had its own ILEC affiliates.

Similarly, Sprint's argument about the supposed advantages of low-band spectrum is a red herring. Sprint relies on roaming not because it lacks spectrum or the ability to acquire more of it, but because it has made a deliberate business decision not to build out its network. Sprint has by far the largest spectrum holdings of any carrier in the country—on average 197 MHz nationwide—and more than four times more spectrum per customer than Verizon.[3] Sprint chose not to buy low-band spectrum in either the 700 MHz auction or on the secondary market (including cellular spectrum that Verizon divested after buying Alltel) so its complaints now that it suffers a competitive disadvantage fall flat. Sprint lobbied for and won a right to bid on up to 30 MHz of low-band spectrum in next year's broadcast incentive auction free of bidding competition from Verizon and AT&T.[4] And it is backed by a wealthy corporate parent, Softbank, with a market capitalization of close $75 billion. The obvious solution for Sprint is to deploy its vast spectrum holdings or to buy the low-band spectrum it claims it needs, as its competitors have done, rather than free-ride on other carriers' network investments.

This letter is being filed pursuant to Section 1.1206 of the Commission's rules. Should you have any questions, please do not hesitate to contact me.

Sincerely,

Attachment

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[3] *See* Letter from Kathleen Grillo, Verizon, to Chairman Tom Wheeler, FCC, GN Docket No. 12-268, WT Docket No. 12-269 (filed June 17, 2015), at 3.

[4] *Policies Regarding Mobile Spectrum Holdings*, WT Docket No. 12-269, Report and Order, 29 FCC Rcd 6133 (2014).

18 October 2014
Americas/United States
Equity Research
Telecommunications Services

new|street RESEARCH

Company Note

Sprint (Neutral; TP: $3.50; -42%)

A Tale Of Two Sprints: Analyzing Sprint's New Network Strategy

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- **What's new:** We gained some insight into Sprint's new strategic direction, following our recent meeting with the new CEO. It seems he intends to create two Sprints: a superior network experience, priced at a premium, in a handful of dense markets, and; the lowest cost offering, we assume priced at a discount, in the rest of the country. In this report, we lay out a framework for valuing Sprint under this new approach. Our preliminary conclusion: this is probably the right strategy; however, it likely won't generate enough value to make Sprint's stock compelling.
- **The two-state solution:** In this first cut of the analysis, we assumed: 1) Sprint invests in a "Tokyo-like" network in 5 markets covering 50MM POPs, which they price at a premium, with ARPU of $70; 2) Sprint halts investment and aggressively cuts costs in the rest of the country, pricing at a discount, with ARPU of $45. We built a simple cost model for each "state" with costs driven by the cell-site density that we believe Sprint will target. We then looked at margins for each "state" at various penetration levels. This is a preliminary, high level view. Claure's strategy is likely still evolving, and some elements of the approach may change.
- **Thesis impact:** At first blush this appears to be the right strategy, and Claure appears to be the right person to execute it (he is compelling in person). We believe Sprint needs to generate EBITDA of at least $10.9BN by 2020 to justify the current stock price. Our preliminary analysis suggests that the company would have to increase retail penetration from 16% to 20% while simultaneously increasing margins from 24% to 33% to generate EBITDA of this magnitude. While theoretically possible, we estimate that this would take 5 years of flawless execution with little competitive response. Given the time required and the execution risk in an increasingly competitive US wireless market, we are inclined to stay on the sidelines for now.

The New Strategy: Superior + Premium; Low Cost + Value

Based on Claure's comments and our discussions with the company, we believe Sprint will offer a different network experience in different markets:

1) **Premium Markets:** Sprint will initially target 3-5 large, dense markets with what Claure has dubbed a "Tokyo-like experience". We assume this means they will deploy a much denser cell site grid, augmented with small cells, similar to what Softbank has done in Tokyo. Sprint will leverage their tremendous 2.5GHz spectrum portfolio to best effect in these markets. The company will likely focus the bulk of their capex on these markets going forward. Finally, we believe Sprint will likely expand the Tokyo-like experience to more markets over time.

2) **Value Markets:** We believe Sprint will strive to be the low cost provider in the remainder of the country. These are markets where they can't economically deliver a superior network experience because they don't have enough low and mid-band spectrum and it may be too expensive to cover the market effectively with 2.5GHz. In these markets, Sprint will have to compete on price. This will require aggressive cost cutting so that Sprint has a cost advantage over peers.

Source: Company data, New Street Research estimates

Merits Of The New Strategy

If deployed effectively, this would give Sprint a basis for taking share in each region.

- **Leveraging spectrum advantage:** Sprint will have a structural competitive advantage in Tokyo-like markets based on more capacity at the outset and faster speeds combined with more capacity over time.

- **Leveraging cost advantage:** Sprint is anything but the cost leader today; however, Claure believes he will be able to cut costs in the value markets. If he can cut costs to below peers, Sprint can sustainably price at a discount to take share.

- **Capital efficient:** By focusing incremental capex on just a handful of dense markets, we estimate that Sprint will be able to maintain capex at around $6BN annually. We assume it takes 1-2 years to complete the Tokyo-like network. Thereafter, we assume they maintain capex in the $5-6BN range as they edge out to additional markets.

Source: Company data, New Street Research estimates

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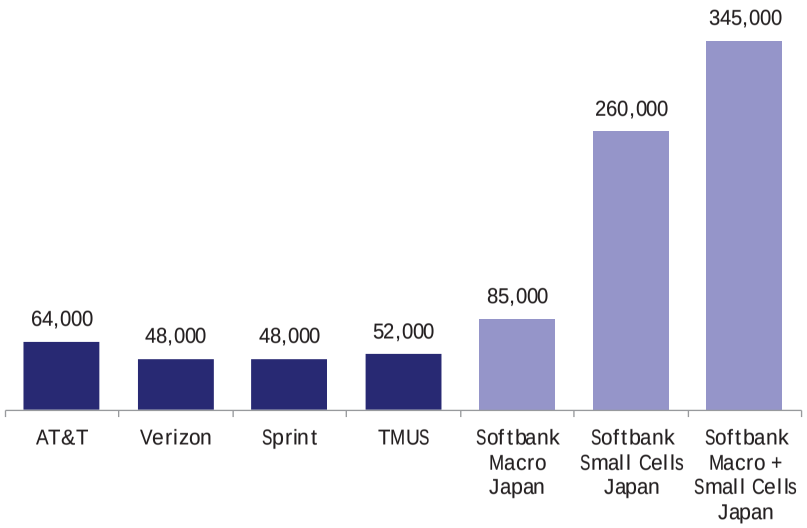
The Tokyo-like Experience

Sprint has not defined the Tokyo-like experience, yet. We assume it means three things: 1) better coverage; 2) faster speeds, and; 3) more capacity. Softbank has achieved this in Tokyo in large part by deploying a very dense network, with almost double the macro cell sites of Sprint to cover a population that is less than half of what Sprint covers (Sprint has almost 4x the POPs per macro site of Softbank). Softbank's density advantage is even more stark when you factor in their 260,000 small cells.

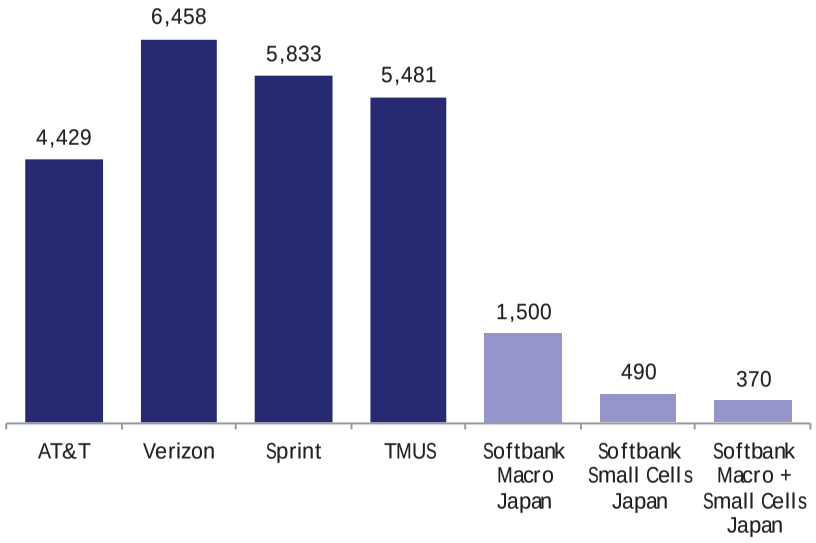
Cell Sites Across Major Carriers In The US & Japan

Units



Cell Site Density Across Major Carriers In The US & Japan

POPs / Cell site



Source: Company data, New Street Research estimates

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Identifying Tokyo-like Markets

Sprint has said that they will target 3-5 markets at the outset. We assume the company will select markets based on size and density. There may be other factors that Sprint weighs, such as the presence of an MPLS node and easy access to fiber for backhaul; however, we have ignored these for now. The top 5 markets, based on POP-weighted density, cover ~50MM POPs (16% of the US population). If the model works, we would expect Sprint to expand to additional markets over time. The Top 10 markets cover 73MM POPs, while the top 20 cover 110MM.

Top US Markets Ranked By Population Density [1]

Name	Population (MSA, 2010)	Percent of US POPs	Land Area (sq. mile)	POP density	POP weighted density	Sprint MPLS Node?
New York, NY	18,897,109	6%	6,687	2,826	31,251	√
San Francisco, CA	4,335,391	1%	2,471	1,755	12,145	
Los Angeles, CA	12,828,837	4%	4,848	2,646	12,114	√
Chicago, IL	9,461,105	3%	7,197	1,315	8,613	√
Boston, MA	4,552,402	1%	3,487	1,305	7,980	
Top 5 Markets	**50,074,844**	**16%**	**24,690**	**2,028**	**15,696**	
Philadelphia, PA	5,965,343	2%	4,602	1,296	7,773	√
Miami, FL	5,564,635	2%	5,077	1,096	7,395	√
San Diego, CA	3,095,313	1%	4,207	736	6,921	
Washington, DC	5,582,170	2%	5,598	997	6,388	√
Baltimore, MD	2,710,489	1%	2,601	1,042	5,436	
Top 10 markets	**72,992,794**	24%	**46,776**	**1,560**	**11,542**	
memo: Top 20 markets	*110,526,290*	36%	*143,557*	*770*	*6,636*	
memo: Total USA	*308,745,538*	100%	*3,531,905*	*87*	*5,369*	

[1] For complete list of top 25 markets, see Slide 18.

Source: Company data, 2010 Census data, New Street Research estimates

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Dividing The Realm: Comparing Markets

For the purposes of this preliminary analysis, we assume Sprint targets 50MM POPs with the Tokyo-like experience. We assume that they price at a premium to peers, with ARPU of $70 (20% above postpaid average). We assume they target macro cell site density of 1,800 POPs / site (see Slide 22 for more detail on density estimate). This would require Sprint to add 22,000 macro sites and 100,000 small cells in these markets. Finally, for the non-Tokyo-like markets, we assume no further expansion from 280MM covered POPs, no increase in cell sites, and pricing that equates to an ARPU of $45 (20% below postpaid average).

Comparison of Premium & Value Markets

USD in millions, subscribers in thousands

	Premium Markets	Value Markets	Total Markets
POPs covered (MM)	50	230	280
Land area (sq. mi.)	4,848	3,185,260	3,190,108
Population density	15,696	64	87
Postpaid ARPU	$70	$45	$50
Postpaid churn	1.3%	2.1%	1.9%
Current macro sites	5,989	42,011	48,000
New macro sites	22,320	0	22,320
Pro-forma Macro sites	28,309	42,011	70,320
Pro-forma Small cells	101,961	0	101,961
POPs / macro sites	1,766	5,475	3,982
POPs / small cells	490	0	2,746
POPs / total sites	384	5,475	1,625

Source: Company data, 2010 Census data, New Street Research estimates

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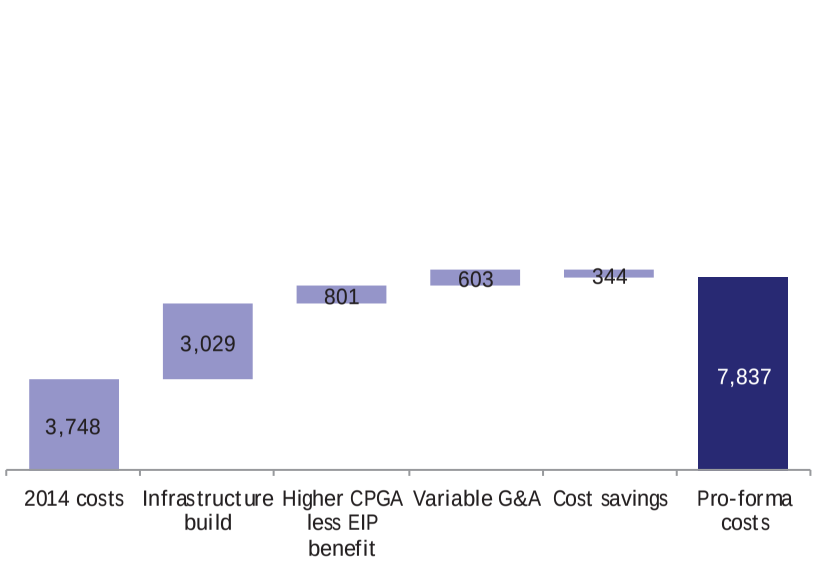
Opex Will Increase Substantially In Premium Markets

Creating a Tokyo-like experience covering 50MM POPs would increase network opex in just those markets by $3BN. We assume this is partly offset by an incremental $0.3BN in cost savings in premium markets and $3.0BN in cost savings in value markets. We assume Sprint migrates to 100% unsubsidized plans, so subsidies falls sharply; however, other components of CPGA rise as gross adds rise (mostly marketing & commissions). Finally, some of the structural G&A savings that we expect Claure to seek out will be partly offset by higher variable G&A as subs grow (mostly billing and customer care).

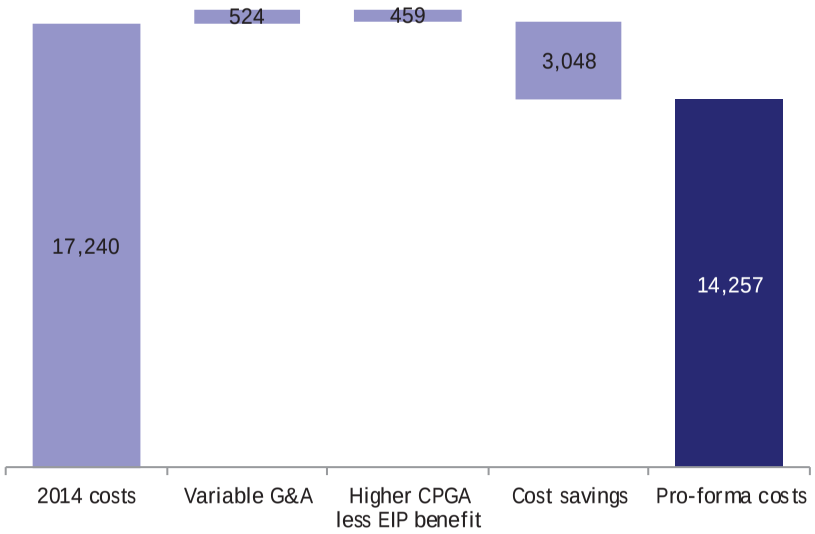
Premium Market Opex

USD per month, 2020E



Value Market Opex

USD per month, 2020E



Source: Company data, 2010 Census data, New Street Research estimates

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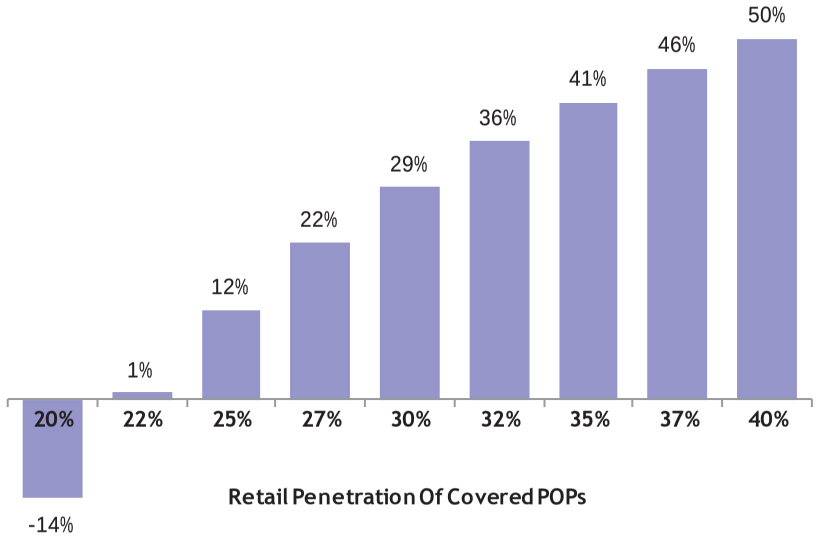
Margins Will Depend On Penetration

Based on our simple model, margins are largely a function of price and penetration in each market. We assume an ARPU of $70 in Premium markets and $45 in Value markets (see Slide 15 for pricing comparison versus the industry). We then compare margins at different penetration levels in the different markets (see Slide 16 for industry EBITDA margins at different penetration levels). EBITDA margins are more sensitive to penetration in the premium markets due to higher fixed costs from the Tokyo-like network build and higher ARPU from each incremental subscriber.

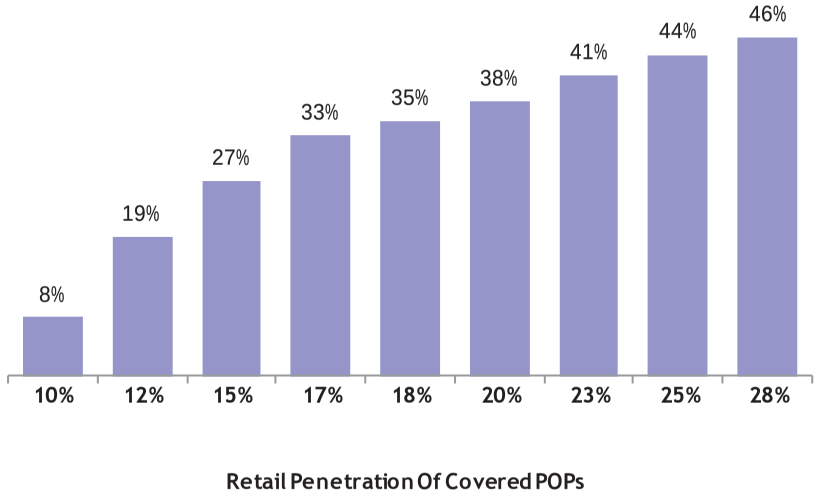
Premium Market EBITDA Margins Sensitized To Penetration Of Covered POPs

%



Value Market EBITDA Margins Sensitized To Penetration Of Covered POPs

%



Source: Company data, Senza Fili, New Street Research estimates

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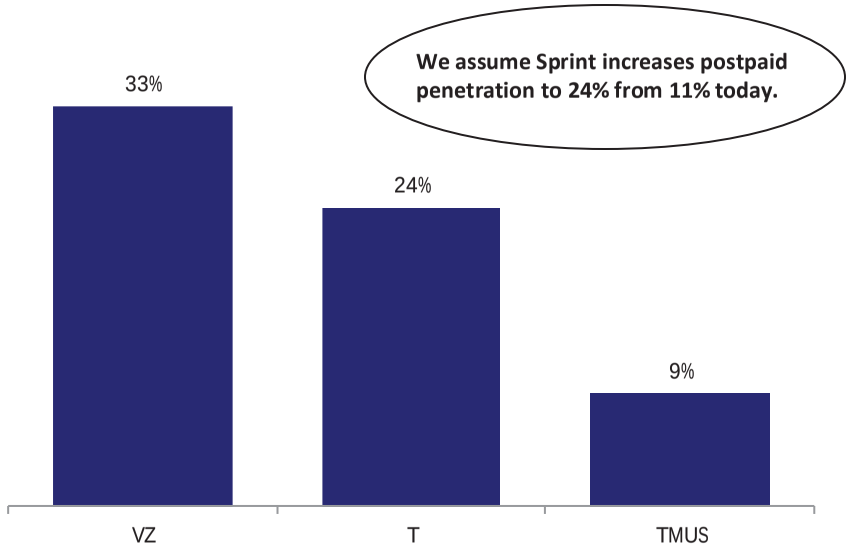
Where Can Penetration Go

If successful, retail penetration could reach 30% in premium markets and 20% in value markets. This would imply an increase in overall retail penetration from 17% to 22%. Our long-term premium market penetration assumption is based on Verizon's current postpaid penetration (they have gained this by having the best network, which is what Sprint hopes to create). Our long-term value market penetration assumption is based on TMUS' retail SOGA of 20% (TMUS is a value carrier and their penetration should match SOGA over time) – by 2020, we estimate retail penetration will only reach 18%. We would note that both of these are best-case scenarios that would require flawless execution and complacent competitors.

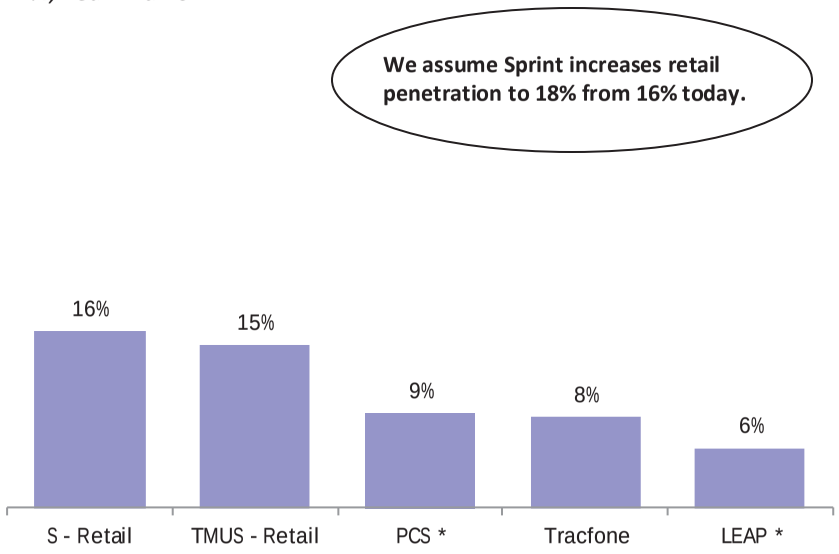
Premium Markets: Postpaid Penetration Of Covered POPs

%, Year End 2014E



Value Markets: Retail Penetration Of Covered POPs

%, Year End 2014E



* Subscriber data as of year end 2012

Source: Company data, Senza Fili, New Street Research estimates

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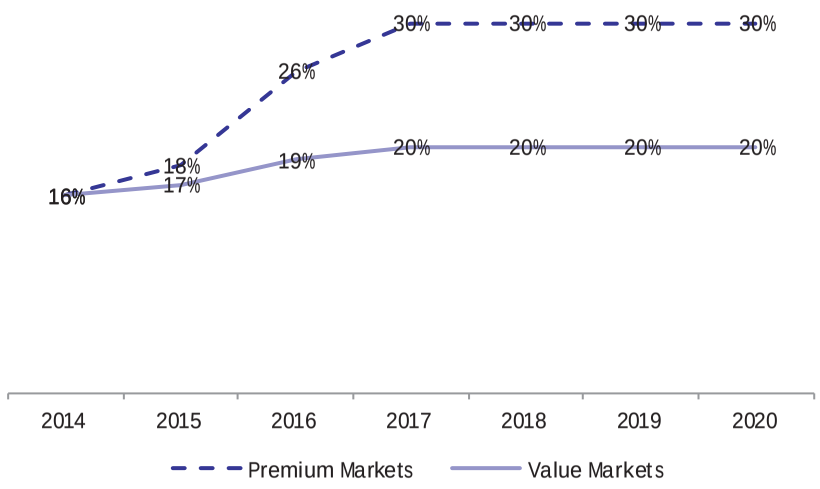
Time To Get There

We assume Sprint can deploy the Tokyo-like network in premium markets over 18 months, based on the expectation that they can deploy sites at a rate of 5k per quarter, with a 6-month delay on average for zoning and permitting (this would be an aggressive pace). We assume share of gross adds (SOGA) rises to our penetration targets over this time frame. Based on these assumptions, it would take Sprint until around 2020 to achieve our penetration targets. We assume churn of 1.25% for premium markets (in-line with industry postpaid average) and 2.1% for value markets (in-line with industry retail average).

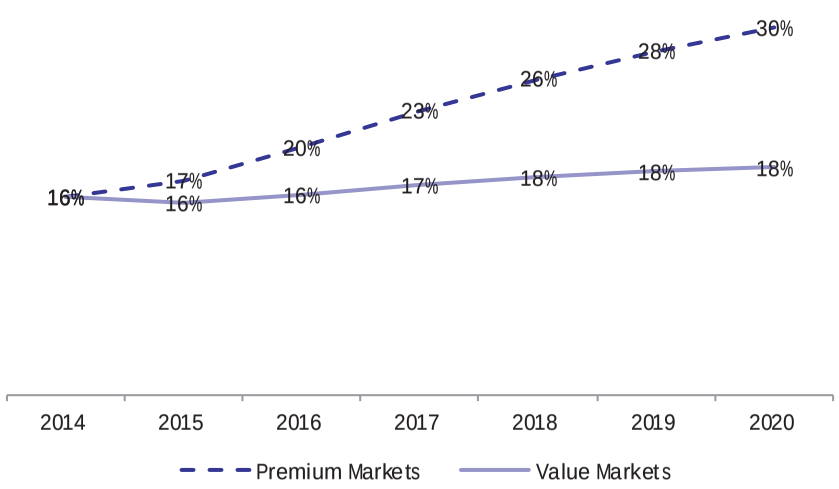
Postpaid SOGA In Premium & Value Markets

USD, millions



Retail Penetration In Premium & Value Markets

USD, millions



Source: Company data, New Street Research estimates

Adding It Up: Sensitivity Of EBITDA To Price & Penetration

Based on our best-case penetration, ARPU and cost assumptions laid out on the preceding slides, we believe Sprint could generate $11BN in EBITDA once they achieve these penetration levels. This would be comprised of $3.3BN (30%) from the premium markets and $7.7BN (70%) from the value markets. For every 5% change in penetration, EBITDA would change by $2.1BN in premium markets and $4BN in value markets. Similarly, for every $5 change in ARPU, EBITDA would change by $0.7BN in premium markets and $1.7BN in value markets. We assume wireline EBITDA of zero for the purposes of this analysis.

Premium Market EBITDA Sensitized To Retail Penetration & ARPU

USD, millions, 2017 EBITDA

Premium Market ARPU	Premium Market Penetration 20%	25%	30%	35%	40%
$60	(1,812)	40	1,891	3,741	5,589
$65	(1,398)	591	2,578	4,564	6,547
$70	(983)	1,142	3,266	5,387	7,506
$75	(569)	1,693	3,953	6,210	8,464
$80	(155)	2,244	4,640	7,033	9,423

Value Market EBITDA Sensitized To Retail Penetration & ARPU

USD, millions, 2017 EBITDA

Value Market ARPU	Value Market Penetration 10%	15%	18%	20%	25%
$35	(319)	2,283	4,325	5,203	8,137
$40	337	3,519	6,010	7,079	10,651
$45	993	4,755	7,694	8,955	13,165
$50	1,649	5,991	9,378	10,831	15,679
$55	2,305	7,226	11,062	12,707	18,193

Total EBITDA Sensitized To Retail Penetration & ARPU

USD, millions, 2017 EBITDA

Total ARPU	Total Penetration 12%	17%	20%	23%	28%
$42	(2,131)	2,323	6,217	8,944	13,725
$47	(1,061)	4,110	8,588	11,643	17,198
$52	10	5,897	10,959	14,342	20,671
$57	1,080	7,684	13,331	17,041	24,143
$62	2,150	9,471	15,702	19,740	27,616

Source: Company data, New Street Research estimates

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Valuation: Sensitivity Of Equity Value To Price & Penetration

We apply a multiple of 5.5x to Sprint's target EBITDA, which is the multiple that the other three carriers trade at in 2020 (when Sprint could conceivably reach our target penetration estimate). On this basis, Sprint's equity would be worth $6 / share today. We would note that this preliminary, high-level cut of the analysis assumes static operating losses of $7.1BN, spectrum purchases of $4.2BN and capex of $6BN per year. We will refine the model in subsequent iterations. Even with a strong turn-around in sub trends, and aggressive cost cuts, we can barely justify Sprint's current share price. The balance sheet is the problem.

Total EV Sensitized To Retail Penetration Of Premium & Value Markets

USD per share

Value Market Penetration \ Premium Market Penetration	20%	25%	30%	35%	40%
10%	52	11,646	23,234	34,819	46,402
15%	20,887	32,472	44,054	55,635	67,214
18%	37,118	48,698	60,276	71,853	83,429
20%	44,078	55,656	67,232	78,808	90,383
25%	67,285	78,858	90,430	102,002	113,574

Equity Value Sensitized To Retail Penetration Of Premium & Value Markets

USD per share

Value Market Penetration \ Premium Market Penetration	20%	25%	30%	35%	40%
10%	(36,436)	(24,842)	(13,253)	(1,668)	9,914
15%	(15,601)	(4,016)	7,567	19,147	30,727
18%	631	12,210	23,789	35,366	46,942
20%	7,591	19,168	30,745	42,321	53,896
25%	30,798	42,370	53,943	65,515	77,086

Value / Share Sensitized To Retail Penetration Of Premium & Value Markets

USD per share

Value Market Penetration \ Premium Market Penetration	20%	25%	30%	35%	40%
10%	($9.24)	($6.30)	($3.36)	($0.42)	$2.51
15%	($3.95)	($1.02)	$1.92	$4.85	$7.79
18%	$0.16	$3.10	$6.03	$8.96	$11.90
20%	$1.92	$4.86	$7.79	$10.73	$13.66
25%	$7.81	$10.74	$13.67	$16.61	$19.54

Source: Company data, New Street Research estimates

Where Could We Be Wrong?

This is a preliminary analysis of Sprint's new, and still evolving strategy. We have more work to do in a number of areas, and we will publish on this in future iterations of the analysis. Areas that require further analysis include:

1) **Premium POPs:** We have assumed that Sprint launches a Tokyo-like network in 5 markets covering 50MM POPs at the outset. We think it is likely that they will expand the superior network to additional markets over time and, if they capture the same penetration levels as we have assumed in the first five markets, this would increase the value of the business. We are doing further analysis to see which markets could support a Tokyo-like cost structure at our target penetration levels.

2) **Pricing:** We have assumed unsubsidized unlimited pricing of $90 in premium markets, resulting in an ARPU for these markets of $70 (ARPU lowered by family plans and corporate discounts). Similarly, we have assumed pricing of $70 and ARPU of $45 in value markets. A $5 change in ARPU up or down is worth about 25% to EBITDA and 50% to the equity. We have more work to do around what pricing would be required to reach our target penetration assumptions.

3) **Cost cuts:** We have assumed Sprint cuts $3.3BN in costs, largely in the value markets. Our cost cutting estimates are based on a high-level analysis of the relationship between margins and penetration for the industry historically. We have more bottom-up analysis to do on what cost savings could be. Every $500MM change in our cost cutting assumption would impact equity value by about 10%.

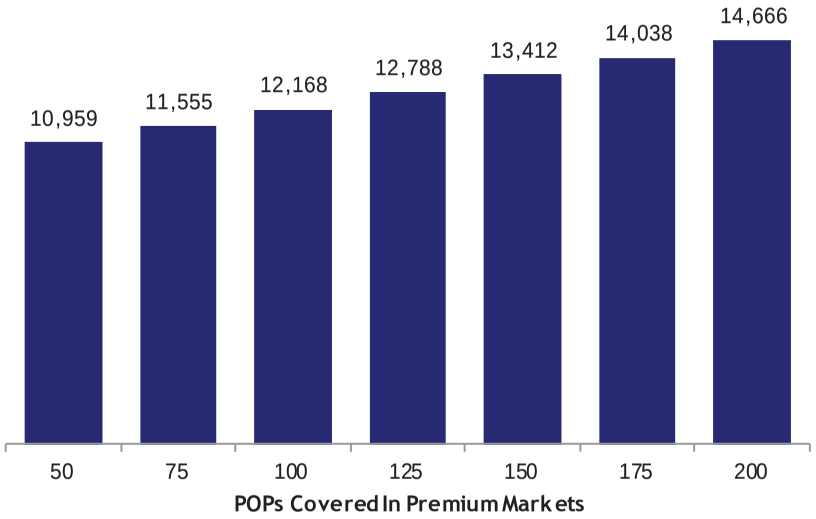
Source: Company data, New Street Research estimates

Where Could We Be Wrong: POP Coverage

We believe Sprint will start with the Tokyo-like network experience in 5 big markets; however, they will likely expand to additional markets over time. This could obviously have a big impact on the value of the business. If premium markets cover 100MM POPs with our penetration assumptions, we would value Sprint at ~$7.75 / share (+29%) and at 150MM POPs we would value the equity at ~$9.50 (+58%). Of course it would take longer to get there and we may be underestimating the costs required to deploy the Tokyo-like experience in less dense markets (we will focus on this in our next report).

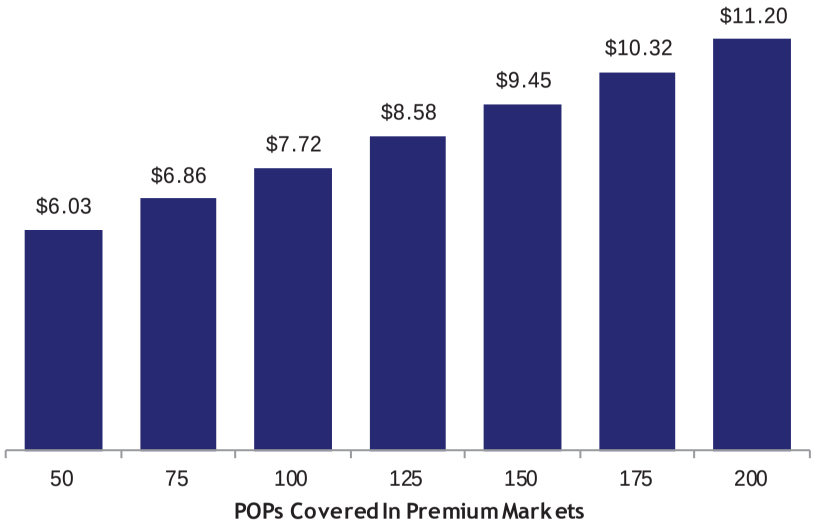
EBITDA Sensitized To POPs Covered In Premium Markets

USD, millions



Value Per Share Sensitized To POPs Covered In Premium Markets

USD, millions, assumes 5.5x EV/EBITDA multiple



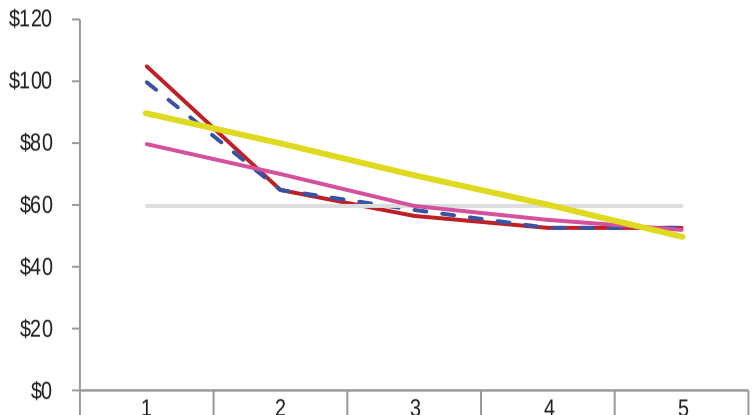
Source: Company data, New Street Research estimates

Where Could We Be Wrong: Pricing

In Premium markets, we assume that Sprint can price $10 above TMUS for superior quality service. In Value markets, we assume Sprint prices in-line with what LEAP and PCS used to charge for plans with 1 to 2 subscribers but cheaper on plans with more than 2 subscribers. If Sprint's strategy works and competitors respond, these ARPU assumptions may not be sustainable. Every $5 change to ARPU in Premium markets would change valuation by ~$0.95 (16%) and every $5 change to ARPU in Value markets would change valuation by $2.35 (40%).

Price Comparison In Premium Markets

USD per month

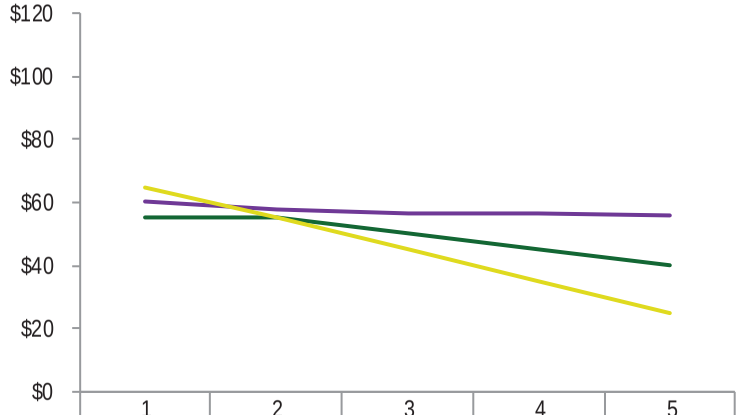


	1	2	3	4	5
VZ (5GB / line)	$105	$65	$57	$53	$53
T (5GB / line)	$100	$65	$58	$53	$53
S - Current UL	$60	$60	$60	$60	$60
TMUS UL	$80	$70	$60	$55	$52
S - Prem. Mkt.	$90	$80	$70	$60	$50

VZ (5GB / line) — T (5GB / line) — S - Current UL — TMUS UL — S - Prem. Mkt.

Price Comparison In Value Markets

USD per month



	1	2	3	4	5
Cricket (10GB)	$55	$55	$50	$45	$40
MetroPCS (UL)	$60	$58	$57	$56	$56
S - Rural Mkt.	$65	$55	$45	$35	$25

Cricket (10GB) — MetroPCS (UL) — S - Rural Mkt.

Source: Company data, New Street Research estimates

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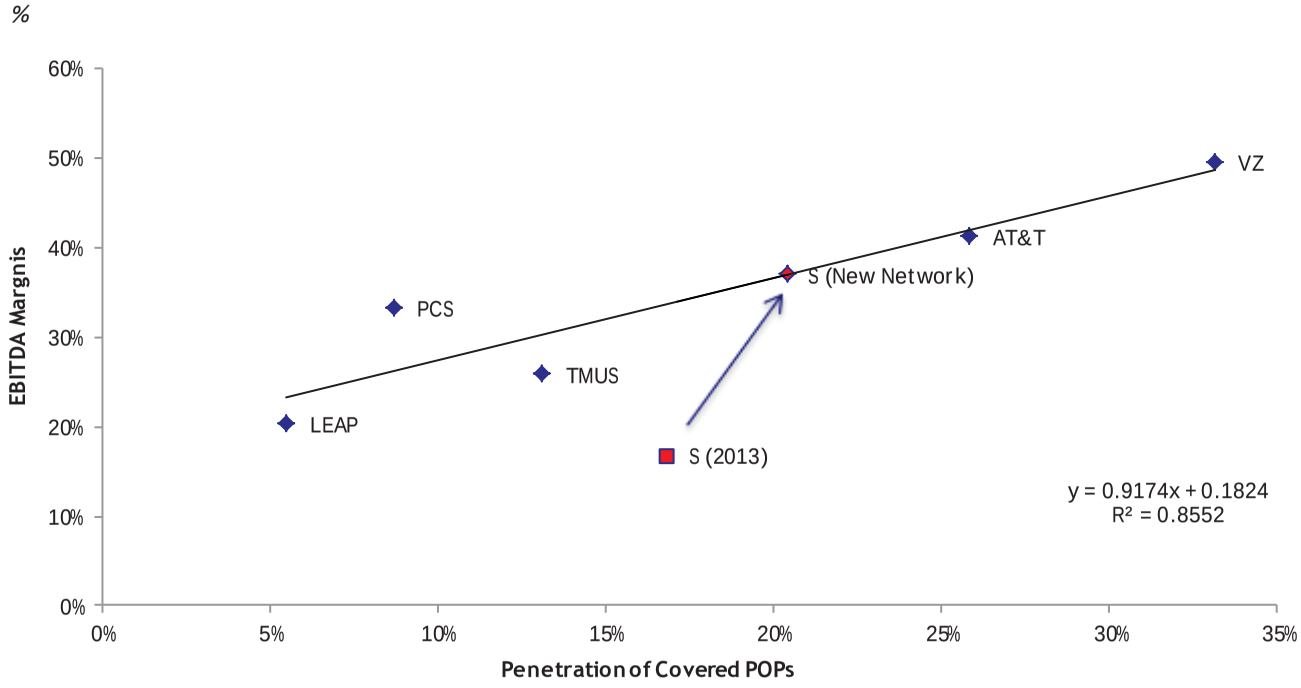
Where Could We Be Wrong: Cost Cutting

We have assumed that Sprint can increase margins across both segments from 24% today to 33% based on an historical regression of EBITDA margins to penetration of covered POPs. This amounts to cost cutting of $3.3BN, $3.0BN of which comes from value markets. Of course, based on this methodology any change to penetration assumptions will have a corresponding change to the margins Sprint can generate. Every $500MM change to our cost cutting assumption would change equity value by about 10%.

EBITDA Margins Vs. Penetration Of Covered POPs



Source: Company data, New Street Research estimates

Appendix

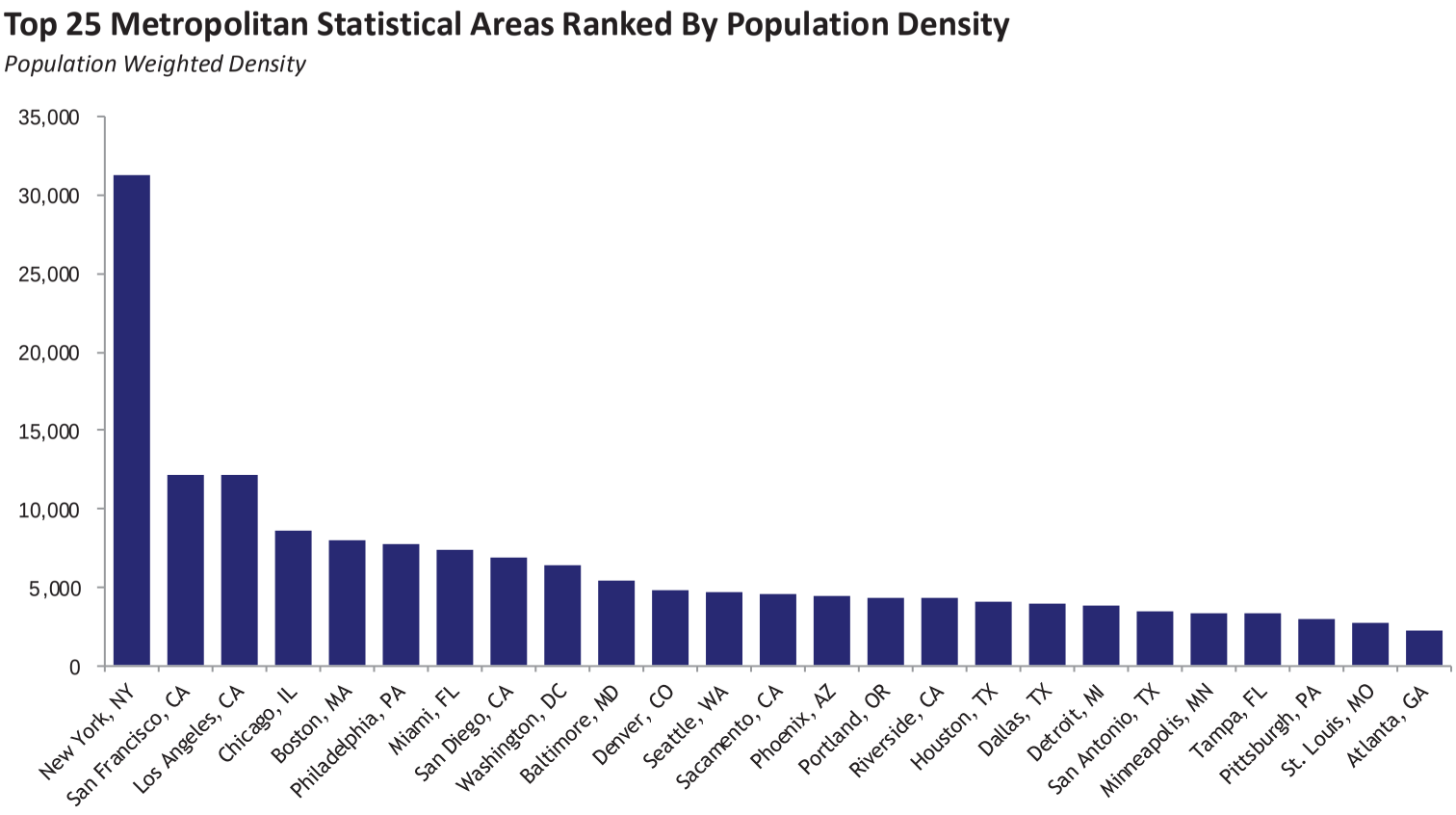
Source: Company data, New Street Research estimates

Top 25 Metropolitan Statistical Areas Ranked By Population Density

Name	Population (MSA, 2010)	Land Area (sq. mile)	POP density	POP weighted density	Sprint MPLS Node?
New York-Northern New Jersey-Long Island, NY-NJ-PA	18,897,109	6,687	2,826	31,251	√
San Francisco-Oakland-Fremont, CA	4,335,391	2,471	1,755	12,145	
Los Angeles-Long Beach-Santa Ana, CA	12,828,837	4,848	2,646	12,114	√
Chicago-Joliet-Naperville, IL-IN-WI	9,461,105	7,197	1,315	8,613	√
Boston-Cambridge-Quincy, MA-NH	4,552,402	3,487	1,305	7,980	
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	5,965,343	4,602	1,296	7,773	√
Miami-Fort Lauderdale-Pompano Beach, FL	5,564,635	5,077	1,096	7,395	√
San Diego-Carlsbad-San Marcos, CA	3,095,313	4,207	736	6,921	
Washington-Arlington-Alexandria, DC-VA-MD-WV	5,582,170	5,598	997	6,388	√
Baltimore-Towson, MD	2,710,489	2,601	1,042	5,436	
Denver-Aurora-Broomfield, CO	2,543,482	8,346	305	4,804	
Seattle-Tacoma-Bellevue, WA	3,439,809	5,872	586	4,722	√
Sacramento--Arden-Arcade--Roseville, CA	2,149,127	5,094	422	4,538	
Phoenix-Mesa-Glendale, AZ	4,192,887	14,566	288	4,395	
Portland-Vancouver-Hillsboro, OR-WA	2,226,009	6,684	333	4,373	
Riverside-San Bernardino-Ontario, CA	4,224,851	27,263	155	4,300	
Houston-Sugar Land-Baytown, TX	5,946,800	8,827	674	4,110	√
Dallas-Fort Worth-Arlington, TX	6,371,773	8,928	714	3,909	√
Detroit-Warren-Livonia, MI	4,296,250	3,888	1,105	3,800	√
San Antonio-New Braunfels, TX	2,142,508	7,313	293	3,475	
Minneapolis-St. Paul-Bloomington, MN-WI	3,279,833	6,027	544	3,383	√
Tampa-St. Petersburg-Clearwater, FL	2,783,243	2,513	1,107	3,323	
Pittsburgh, PA	2,356,285	5,281	446	2,991	
St. Louis, MO-IL	2,812,896	8,623	326	2,742	
Atlanta-Sandy Springs-Marietta, GA	5,268,860	8,339	632	2,173	√
Total top 25 markets	**127,027,407**	**174,341**	**729**	**5,959**	
memo: Top 5 markets	*50,074,844*	*24,690*	*2,028*	*15,696*	
memo: Top 10 markets	*72,992,794*	*46,776*	*1,560*	*11,542*	
memo: Top 20 markets	*110,526,290*	*143,557*	*770*	*6,636*	
memo: Total USA	*308,745,538*	*3,531,905*	*87*	*5,369*	

Source: Company data, 2010 Census Data

Top 25 Metropolitan Statistical Areas Ranked By Population Density



Source: 2010 Census Data

Cell Site Density Supporting Data: Tower Density By BTA

Name	Population (BTA, 2010)	Land Area (sq. mile)	POP density	SBA Towers	AMT Towers *
New York, NY	20,264,298	9,877	2,052	216	2,109
Los Angeles, CA	17,895,552	44,398	403	855	2,077
Chicago, IL	9,461,105	7,290	1,298	249	1,657
San Francisco, CA	7,620,896	13,828	551	117	983
Dallas-Fort Worth, TX	6,826,845	19,011	359	205	1,341
Philadelphia, PA	6,488,754	5,529	1,174	186	1,065
Houston, TX	6,298,003	19,700	320	260	1,022
Washington, DC	5,543,091	6,118	906	133	737
Atlanta, GA	5,450,974	11,118	490	319	1,363
Detroit, MI	4,836,176	6,250	774	133	923
Boston, MA	4,552,402	3,681	1,237	120	646
Phoenix, AZ	4,420,079	40,369	109	122	561
Miami, FL	4,317,591	4,436	973	42	671
Seattle-Tacoma, WA	3,650,985	8,408	434	71	660
Minneapolis-St. Paul, MN	3,606,470	15,916	227	119	426
Denver, CO	3,128,555	47,556	66	76	450
San Diego, CA	3,095,313	4,264	726	69	479
St. Louis, MO	2,999,346	13,523	222	106	574
Cleveland-Akron, OH	2,937,326	3,918	750	66	537
Tampa-St. Petersberg, FL	2,909,554	5,131	567	116	439
Baltimore, MD	2,768,468	3,408	812	51	472
San Juan, PR	2,674,278	1,968	1,359	60	158
Portland, OR	2,420,282	31,865	76	72	274
Pittsburgh, PA	2,394,971	5,914	405	108	258
Cincinatti, OH	2,301,251	6,933	332	88	633
Total Top 25 BTAs	**138,862,565**	**340,409**	**408**	**3,959**	**20,515**
memo: Total USA	*308,745,538*	*3,531,905*	*87*	*15,425*	*52,730*
memo: Percent of total - top 5	*20%*	*3%*	*657*	*11%*	*15%*
memo: Percent of total - top 10	*41%*	*8%*	*435*	*23%*	*36%*
memo: Percent of total - top 25	*45%*	*10%*		*26%*	*39%*
** Includes managed rooftops*					

Source: Company data, 2010 Census Data

Cell Site Density Supporting Data: Site Density For US Carriers

Towers Located In Top BTAs

	AMT	CCI	SBAC	Total
Top 25	39%	39%	26%	37%
Top 50	35%	56%	19%	42%
Top 100	62%	71%	59%	66%
Total US sites	29,040	39,600	15,038	83,678

USA Population & Land Area Cell Site Density

	AT&T	Verizon	Sprint	TMUS
Cell sites	70,000	48,000	48,000	54,000
x Percent located in top 5 BTAs	15%	15%	15%	15%
= Cell sites in top 5 BTAs	**19,293**	**7,434**	**7,434**	**8,364**
memo: Average ex. Sprint	*11,697*			
Population of top 5 BTAs	62,068,696	62,068,696	62,068,696	62,068,696
/ Cell sites in top 5 BTAs	19,293	7,434	7,434	8,364
= POPs / cell site in top 5 BTAs	**3,217**	**8,349**	**8,349**	**7,421**
memo: Average ex. Sprint	*6,329*			
Total population covered	310,000,000	310,000,000	280,000,000	285,000,000
- Population of top 5 BTAs	62,068,696	62,068,696	62,068,696	62,068,696
= Population covered outside top 5 BTAs	247,931,304	247,931,304	217,931,304	222,931,304
/ Cell sites outside top 5 BTAs	50,707	40,566	40,566	45,636
= POPs / cell site outside top 5 BTAs	**4,889**	**6,112**	**5,372**	**4,885**
memo: Average ex. Sprint outside top 5 BTAs	*5,295*			
memo: POPs / cell site total USA	*4,429*	*6,458*	*5,833*	*5,278*
memo: Average ex. Sprint total USA	*5,388*			

Source: Company data, New Street Research estimates

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Sprint Cell Sites Based On Softbank Deployment In Japan

Population Density In Japan

Cell sites in units

	Macro sites	Small cells	Total
POPs in Japan (MM)	128	128	128
/ Square miles in Japan	152,411	152,411	152,411
= Population density in Japan	**837**	**837**	**837**
Softbank cell sites in Japan	85,000	260,000	345,000
/ Population density in Japan	837	837	837
= Softbank cell sites / population den	**101.6**	**310.8**	**412.4**
POPs in Japan (MM)	128	128	128
/ Softbank cell sites	85,000	260,000	345,000
= Softbank POPs / cell site in Japan	**1,500**	**490**	**370**
memo: Share of total sites	*25%*	*75%*	*100%*
Land area in Japan (square mile	152,411	152,411	152,411
/ Softbank cell sites	85,000	260,000	345,000
= Square miles / cell site in Japan	**1.8**	**0.6**	**0.4**

Macro Site & Small Cells Assumptions

Cell sites in units

	Premium Markets	Value Markets	Total
Sprint Current Macro Sites			
POPs covered (MM)	50	230	280
/ Sprint POPs / macro cell site	8,349	5,475	5,833
= Sprint current macro cell sites	**5,989**	**42,011**	**48,000**
Sprint Future Macro Sites			
POPs covered	50	230	280
/ POPs / macro cell site	1,762	5,475	3,978
= Sprint future macro cell sites	**28,378**	**42,011**	**70,389**
memo: Percent increase	*374%*	*0%*	*47%*
Sprint Small Cells Required In Future			
POPs covered (MMs)	50	230	280
/ POPs / small cell	490	0	2,746
= Sprint future small cells	**101,961**	**0**	**101,961**
Softbank POPs / macro cell	1,500		
x Urban / rural adjustment	1.2		
= Softbank POPs / urban macro cell	**1,762**		

Source: Company data, New Street Research estimates

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ARPU Distribution Across Premium & Value Markets

Premium Market ARPU Distribution

USD per month

	Tablet	Phone 1 Line	Phone 2 Lines	Phone 3 Lines	Phone 4 Lines	Phone 5 Lines	Total
Price per line	$25	$90	$80	$70	$60	$50	$70
% of postpaid base	10%	23%	23%	27%	9%	9%	100%
% of phone base		25%	25%	30%	10%	10%	
Avg lines/account	*2.65*						

	Tablet	Single	Family	Business	Total
Price per line	$25	$90	$72	$60	**$70**
% of base	10%	23%	53%	15%	**100%**

Value Market ARPU Distribution

USD per month

	Tablet	Phone 1 Line	Phone 2 Lines	Phone 3 Lines	Phone 4 Lines	Phone 5 Lines	Total
Price per line	$25	$65	$55	$45	$35	$25	$47
% of postpaid base	10%	23%	23%	27%	9%	9%	100%
% of phone base		25%	25%	30%	10%	10%	
Avg lines/account	*2.65*						

	Tablet	Single	Family	Business	Total
Price per line	$25	$65	$46	$38	**$47**
% of base	10%	23%	53%	15%	**100%**

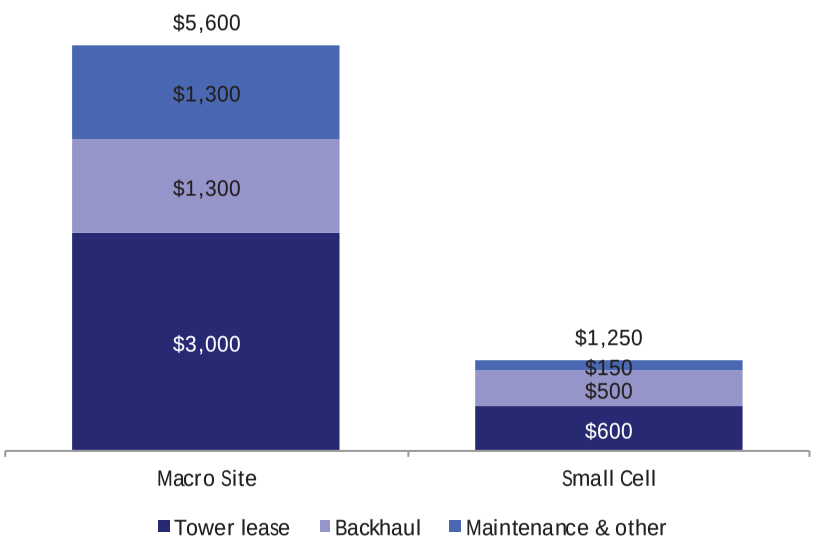
Source: Company data, New Street Research estimates

Comparing The Cost Profile Of The Two Markets

Based on our site density estimates and assuming monthly opex of $5,600 and $1,150 for macro sites and small cells, respectively, Sprint's Tokyo-like network could drive opex higher by $3BN per year. We think this will be partly offset by aggressive cost cutting in value markets. Sprint currently operates with costs excluding subsidies of $27 / sub / month, relative to the industry average at $22 and best-in-class Verizon at $20. Assuming that Claure can bring Sprint's costs in line with Verizon, we estimate that Sprint could save ~$3.3BN per year in opex across both markets.

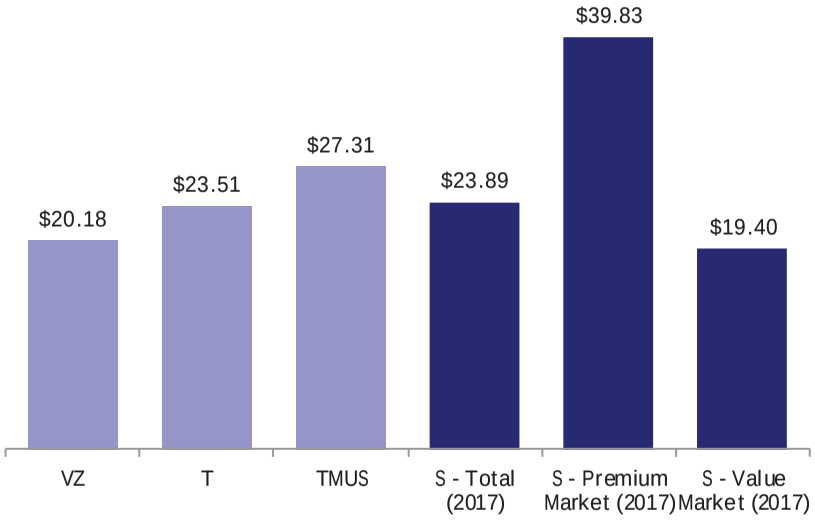
Opex Per Site Assumptions

USD per month



Costs Ex. Subsidies / Retail Subscriber

USD per month



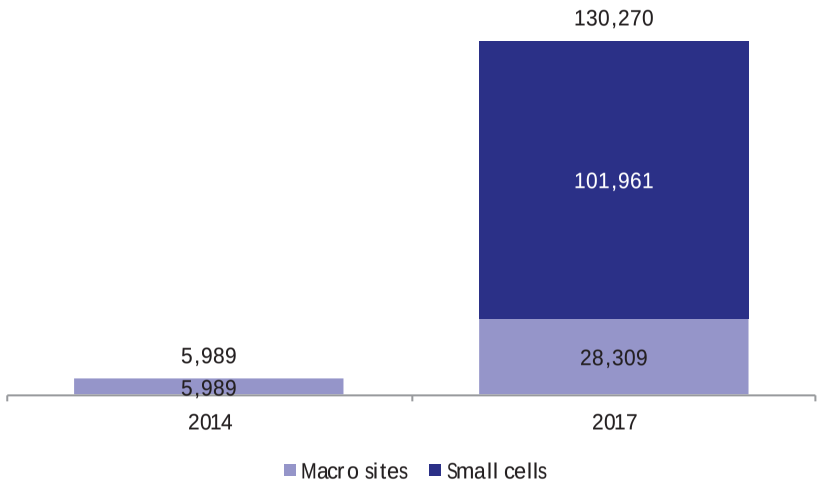
Source: Company data, 2010 Census data, New Street Research estimates

Opex With & Without Small Cells

We believe Sprint will deploy more macro and small cells in their Tokyo-like cities over time; however, they may focus their efforts on macro cells first and fill in additional capacity with small cells at later points in time. For this reason, we thought it would be instructive to show the opex impact of macro cells and small cells separately. Assuming Sprint adds 22k macro cells in their Premium Markets with opex of $5,600 per month, incremental macro site opex would amount to $1.5BN once fully deployed. Assuming Sprint adds 100,000 small cells with opex of $1,150 per month, incremental small cell opex would amount to another $1.5BN once fully deployed.

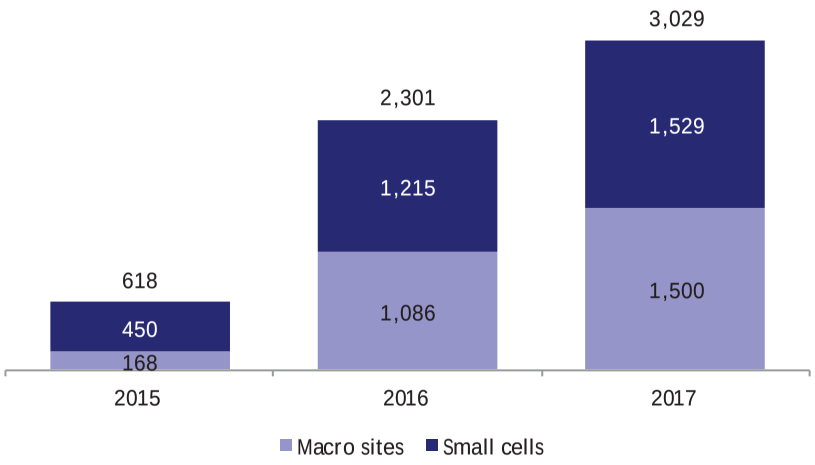
Cell Sites In Premium Markets

Units



Incremental Opex From Premium Market Build

USD, millions



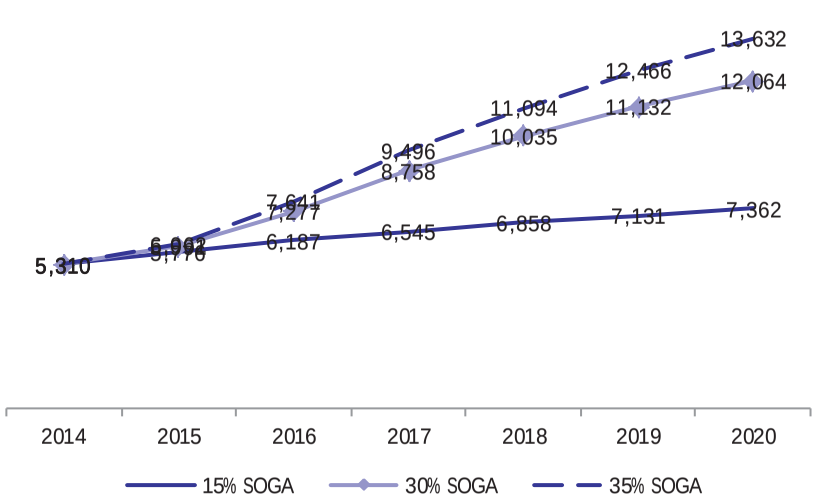
Source: Company data, 2010 Census data, New Street Research estimates

Premium Market Postpaid Subs & Revenue Sensitized To SOGA

Sprint currently has postpaid SOGA of 15%, sharply lower than that of Verizon and AT&T of 35% and 30%, respectively. To reach 30% retail penetration in Premium markets by 2020 and achieve an EBITDA that fairly values the equity today, one would have to assume that Sprint's SOGA jumps to 30% and churn simultaneously falls to 1.25%.

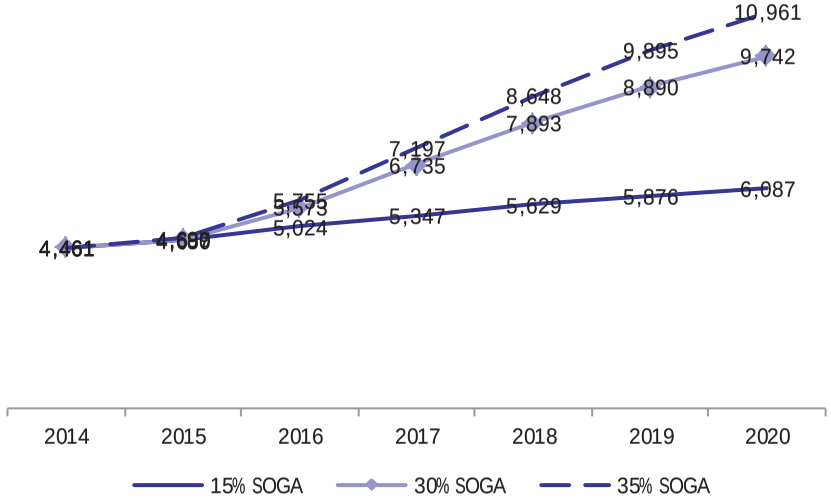
Premium Market Postpaid Subscribers Sensitized To Postpaid SOGA

Subscribers in thousands



Premium Market Revenue Sensitized To Postpaid SOGA

USD, millions



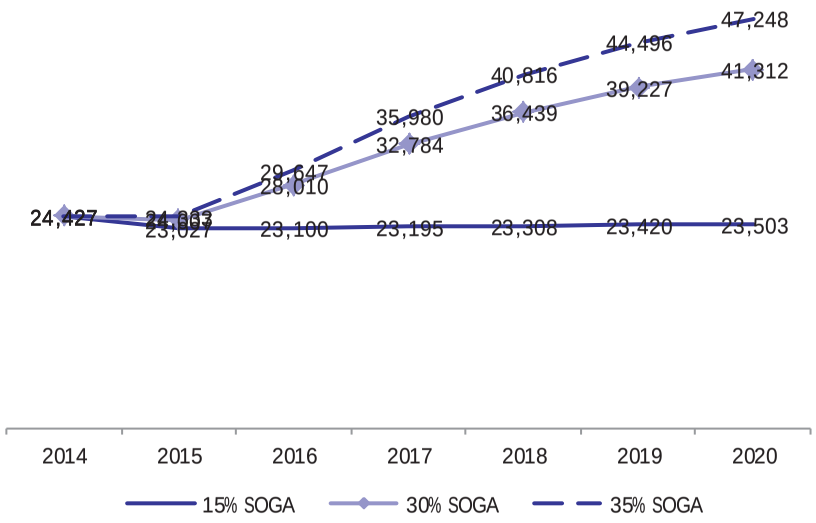
Source: Company data, 2010 Census Data

Value Market Postpaid Subs & Revenue Sensitized To SOGA

To reach 20% retail penetration in Value markets by 2020, one would have to assume SOGA of 20% and churn of 2.1%. Based on the higher churn we expect from offering a lower quality product, SOGA in Value markets would have to rise above 15% to see positive growth in subscribers and revenue.

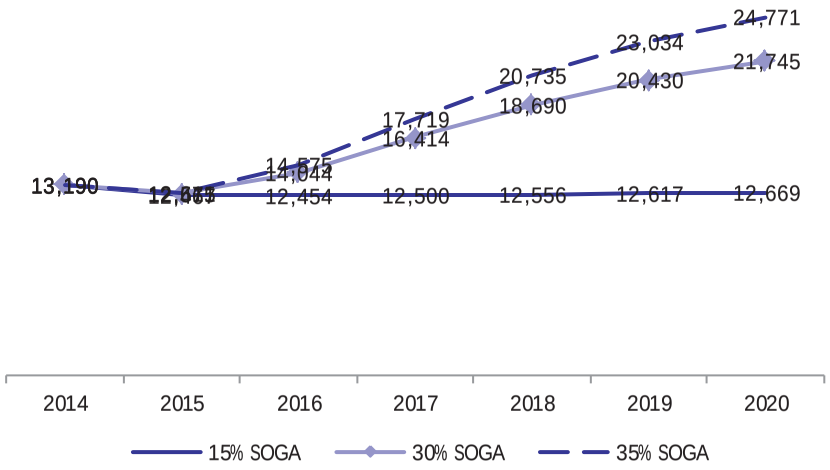
Premium Market Postpaid Subscribers Sensitized To Postpaid SOGA

Subscribers in thousands



Premium Market Revenue Sensitized To Postpaid SOGA

USD, millions



Source: Company data, 2010 Census Data

Sensitivity Of EBITDA To Price & Postpaid SOGA

Premium Market EBITDA Sensitized To Postpaid SOGA & ARPU

USD, millions, 2020 EBITDA

Premium Market ARPU	Premium Market Postpaid SOGA 15%	30%	35%
$60	1,880	2,048	2,104
$65	2,565	2,771	2,840
$70	3,249	3,494	3,576
$75	3,934	4,217	4,312
$80	4,619	4,940	5,048

Value Market EBITDA Sensitized To Postpaid SOGA & ARPU

USD, millions, 2020 EBITDA

Value Market ARPU	Value Market Postpaid SOGA 15%	30%	35%
$35	4,361	4,512	4,562
$40	6,040	6,273	6,350
$45	7,719	8,033	8,138
$50	9,397	9,794	9,927
$55	11,076	11,555	11,715

Total EBITDA Sensitized To Postpaid SOGA & ARPU

USD, millions, 2020 EBITDA

Total ARPU	Total Postpaid SOGA 15%	30%	35%
$41	6,241	6,560	6,666
$46	8,604	9,044	9,190
$51	10,968	11,528	11,714
$56	13,331	14,012	14,239
$61	15,694	16,496	16,763

Source: Company data, New Street Research estimates

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Sensitivity Of Value To Price & Postpaid SOGA

Premium Market Value Sensitized To Postpaid SOGA & ARPU

USD, millions, EV at 5.5x 2020 EBITDA

Premium Market ARPU	Premium Market Postpaid SOGA 15%	30%	35%
$60	10,340	11,265	11,573
$65	14,105	15,242	15,620
$70	17,871	19,219	19,668
$75	21,636	23,196	23,715
$80	25,402	27,172	27,763

Value Market Value Sensitized To Postpaid SOGA & ARPU

USD, millions, EV at 5.5x 2020 EBITDA

Value Market ARPU	Value Market Postpaid SOGA 15%	30%	35%
$35	23,986	24,815	25,091
$40	33,219	34,500	34,926
$45	42,452	44,184	44,762
$50	51,685	53,869	54,597
$55	60,917	63,553	64,432

Value Per Share Sensitized To Postpaid SOGA & ARPU

USD per share

Total ARPU	Total Postpaid SOGA 15%	30%	35%
$41	($0.55)	($0.10)	$0.04
$46	$2.75	$3.36	$3.56
$51	$6.04	$6.82	$7.08
$56	$9.34	$10.29	$10.60
$61	$12.63	$13.75	$14.12

Source: Company data, New Street Research estimates

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