

Desautels Capital Management

Boingo Pitch

TMT

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October-21-18



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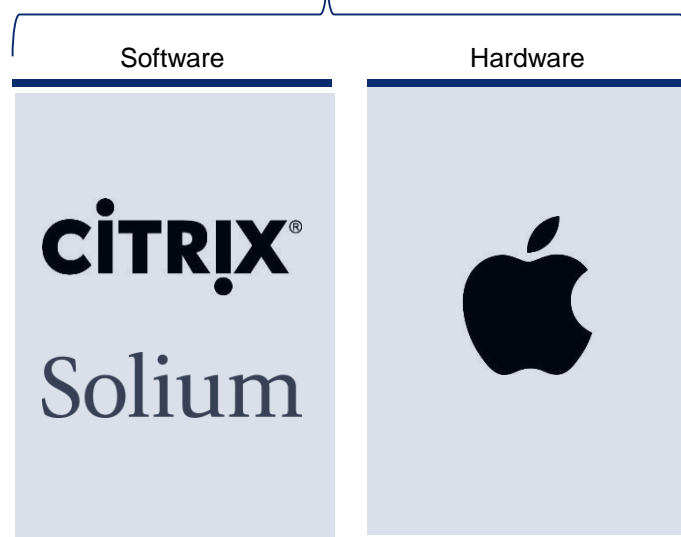
TMT Portfolio Update



SECTION I



TMT at a Glance

DCM Portfolio



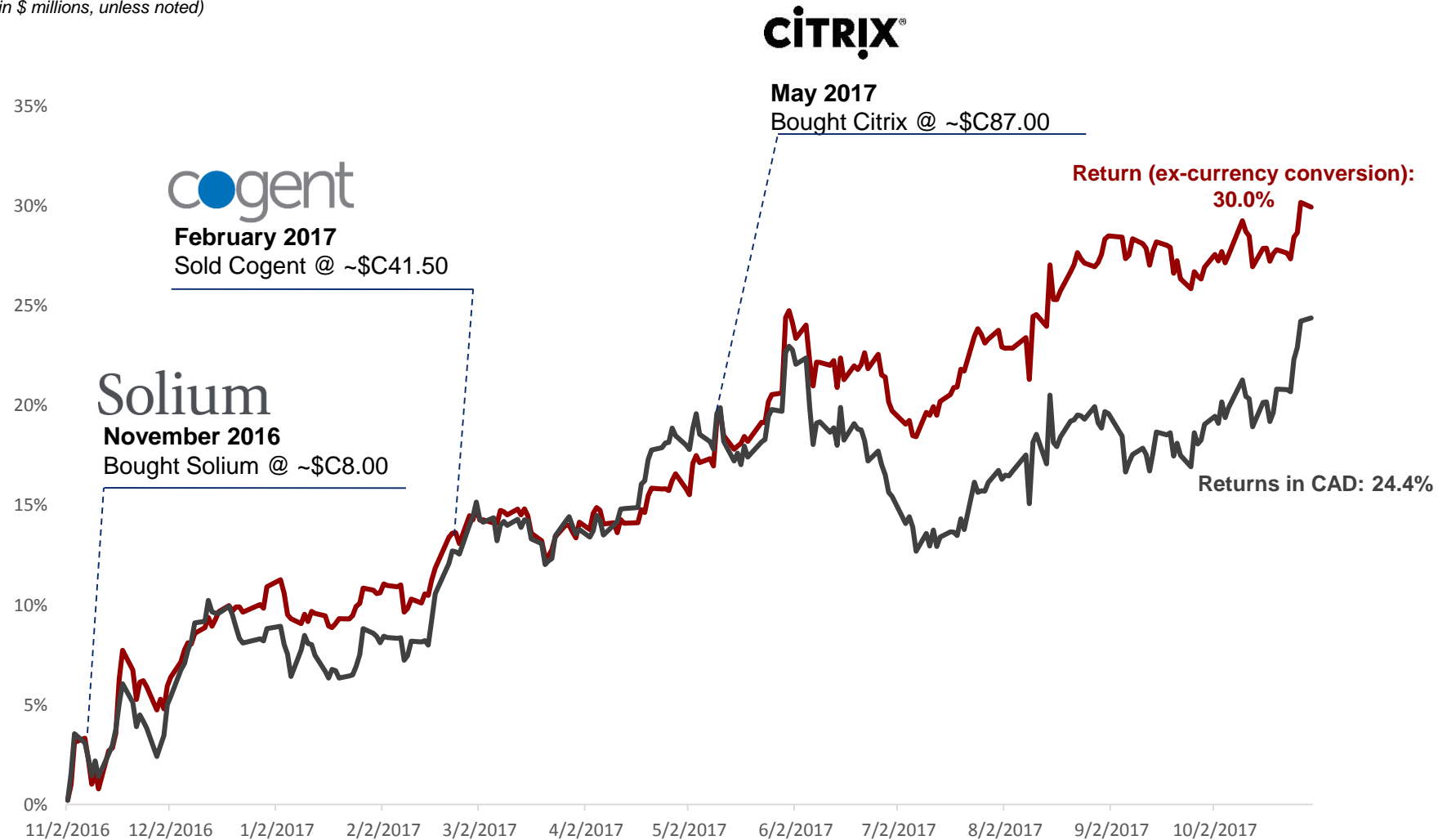
	1 yr Beta	Current Value (Local Price)	Current Value (CAD)
CITRIX®	1.25	\$57,693	\$74,171
Solium	1.04	\$122,094	\$122,094
	0.73	\$91,449	\$117,566
TimeWarner	0.27	\$133,097	\$171,109
 THE MADISON SQUARE GARDEN COMPANY	0.86	\$77,350	\$99,441
TMT	0.75	\$481,682	\$584,381

Source: DCM

TMT at a Glance

LTM Returns

(in \$ millions, unless noted)



Source: Bloomberg

TMT LTM Returns

Match Group Portfolio Profile

(in \$ millions, unless noted)

TMT Alpha

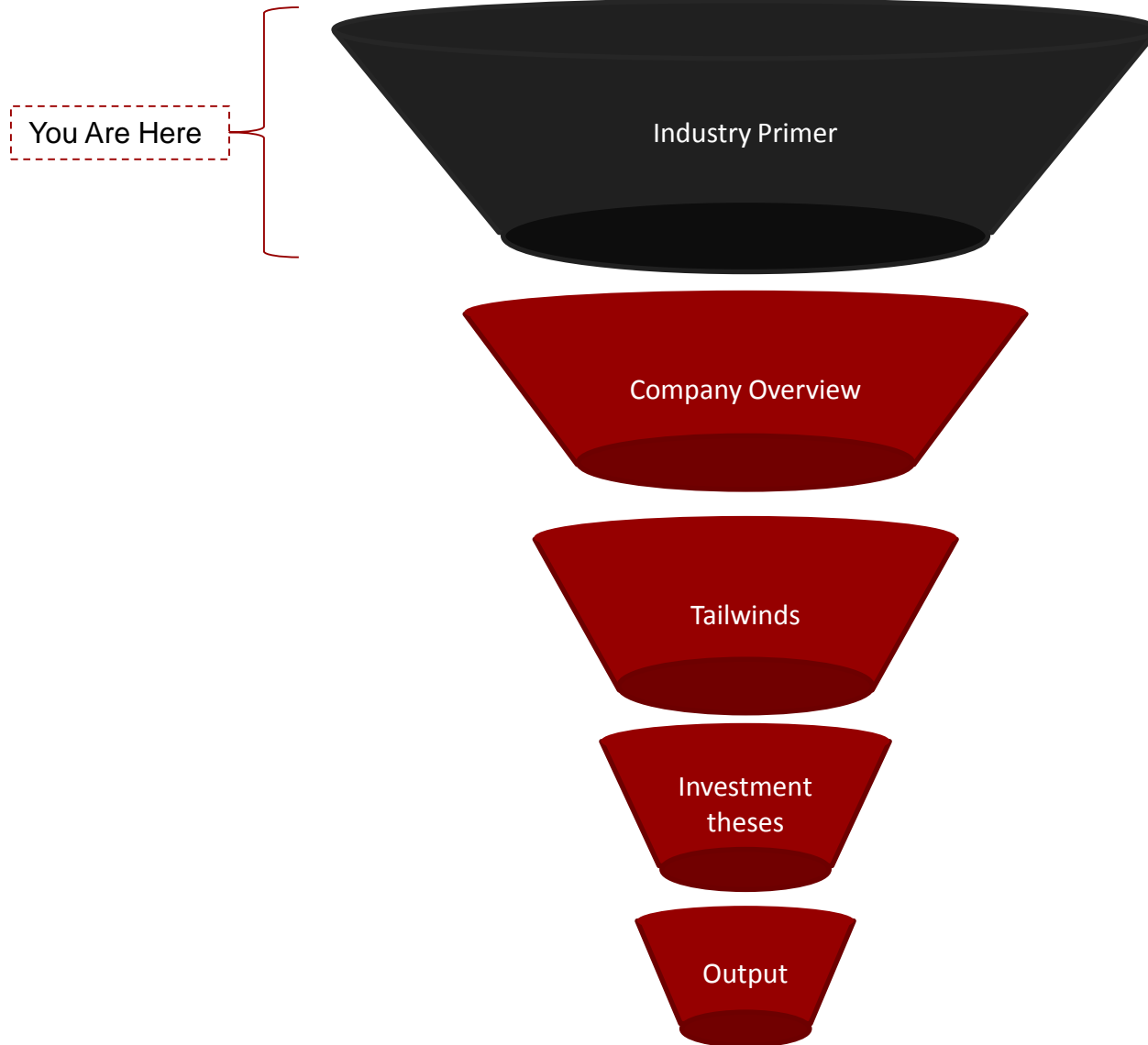
	Local Price Return	CAD Return
US 10-year (1yr VWAP)	2.3%	2.3%
Equity Risk Premium	5.6%	5.6%
TMT Beta	0.75	0.75
Expected Return	6.5%	6.5%
Actual Return	30.0%	24.4%
Alpha	23.5%	17.9%

Treynor Ratio

	Local Price Return	CAD Return	S&P 500
US 10-year (1yr VWAP)	2.3%	2.3%	2.3%
Actual 1 Year Return	30.0%	24.4%	21.0%
TMT Beta	0.75	0.75	1.00
Treynor Ratio	37.08	29.63	18.72

Source: Bloomberg

TMT Funnel



Industry Primer

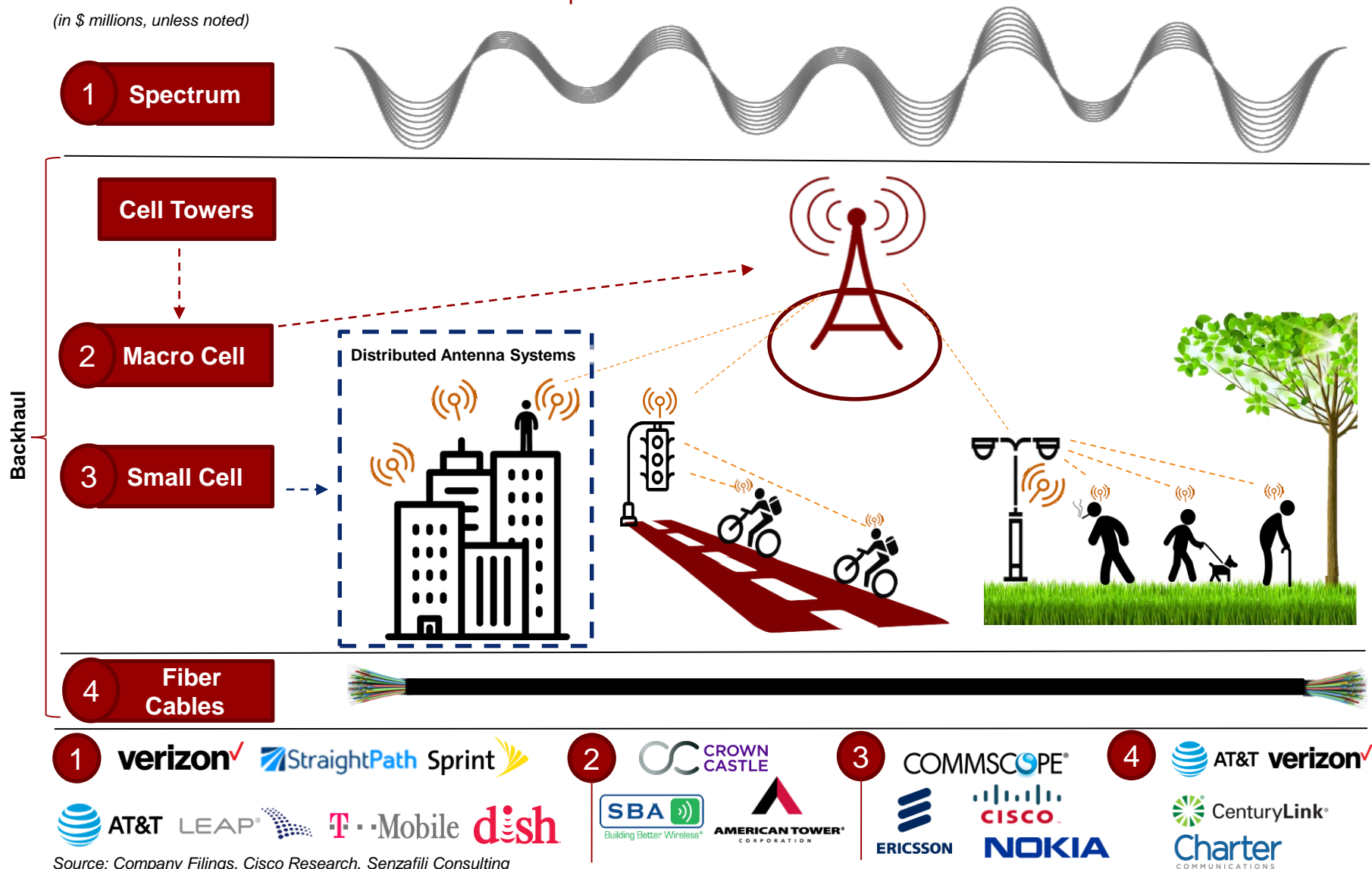
SECTION II



Mobile Network Architecture

“Mobile network architecture is a broad and complex area

(in \$ millions, unless noted)



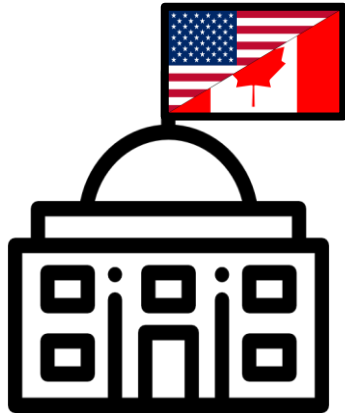
Source: Company Filings, Cisco Research, Senzafili Consulting

Spectrum

Government's Most Valuable Resource?

(in \$ millions, unless noted)

1 Spectrum

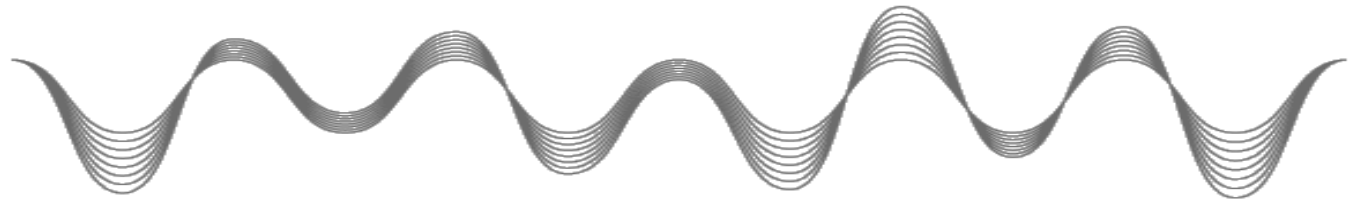


Auction

- International Telecommunication Union (ITU) recognizes “the sovereign right of each State to regulate its telecommunication”
- Auction Process:
 - Reduce congestion
 - Control traffic



Source: Rcrwireless



Spectrum: Spectrum relates to the radio frequencies allocated to the mobile industry and other sectors for communication over the airwaves

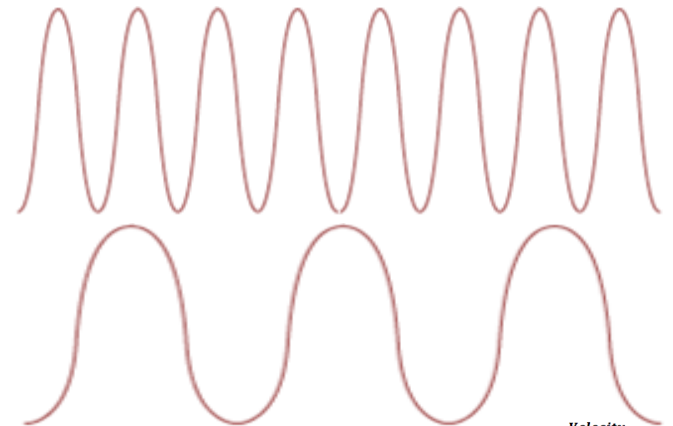
Electromagnetic Spectrum

3 kHz

300 GHz

Higher Frequency,
Shorter Wavelength

Lower Frequency,
Longer Wavelength



$$\text{Frequency} = \frac{\text{Velocity}}{\text{Wavelength}}$$
$$f = \frac{v}{\lambda}$$

Unit of Frequency: Hz

Macro Cells

High-Cost, High-Range, Low-Quality

(in \$ millions, unless noted)

2 Macro Cell



\$279,412

Cost of building a
macro cell phone
tower

215, 000

Total number of
cell phone towers
in the US

183.6

Number of cell
tower worker
deaths per
100,000 workers

Macro Cell Overview

21.7 Miles

Maximum range
of a macro tower

5-8 ms

One-way latency
standards

1 ms

Latency combined
with small cell

Latency: an expression of how much time it takes for a packet of data to get from one designated point to another. Ideally, latency is as close to zero as possible

Rank	Company	No. of Towers Owned in U.S.
1	Crown Castle Int'l Corp.	39,739
2	American Tower Corp.	28,463
3	SBA Communications Corp.	8,588
4	United Cellular Co	4,802
5	Verizon Wireless	1,400
6	T-Mobile Towers	1,003
7	Time Warner	950
8	Mediacom Communications	750
9	Charter Communications	650
10	Diamond Communications	637

Source: Rcrwireless, Company Filings

Small Cells and Fiber Cables

"An integral part of a greater system of infrastructure"

(in \$ millions, unless noted)

3 Small Cell



- Like towers, a small cell requires both an antenna and equipment
- Unlike towers though, the wireless industry likes to place the transmission equipment on the utility or other support structures

Small Cell Overview

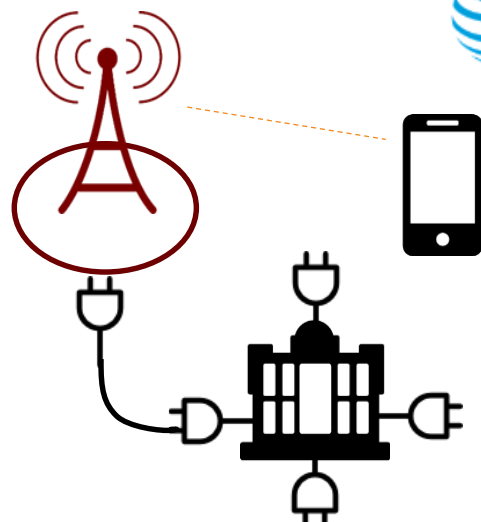
Coverage

32 Feet → 3,280 Feet

Growth

2013 → CAGR 22.22% → 2018

4 Fiber Cables



Rank	Company	Fiber Route Miles (in 000's)
1	AT&T	1,100
2	Verizon	520
3	CenturyLink	250
4	Charter	233
5	Level 3	200
6	Windstream	147
7	Comcast	145
8	Frontier	140
9	Zayo	113
10	Cogent	57

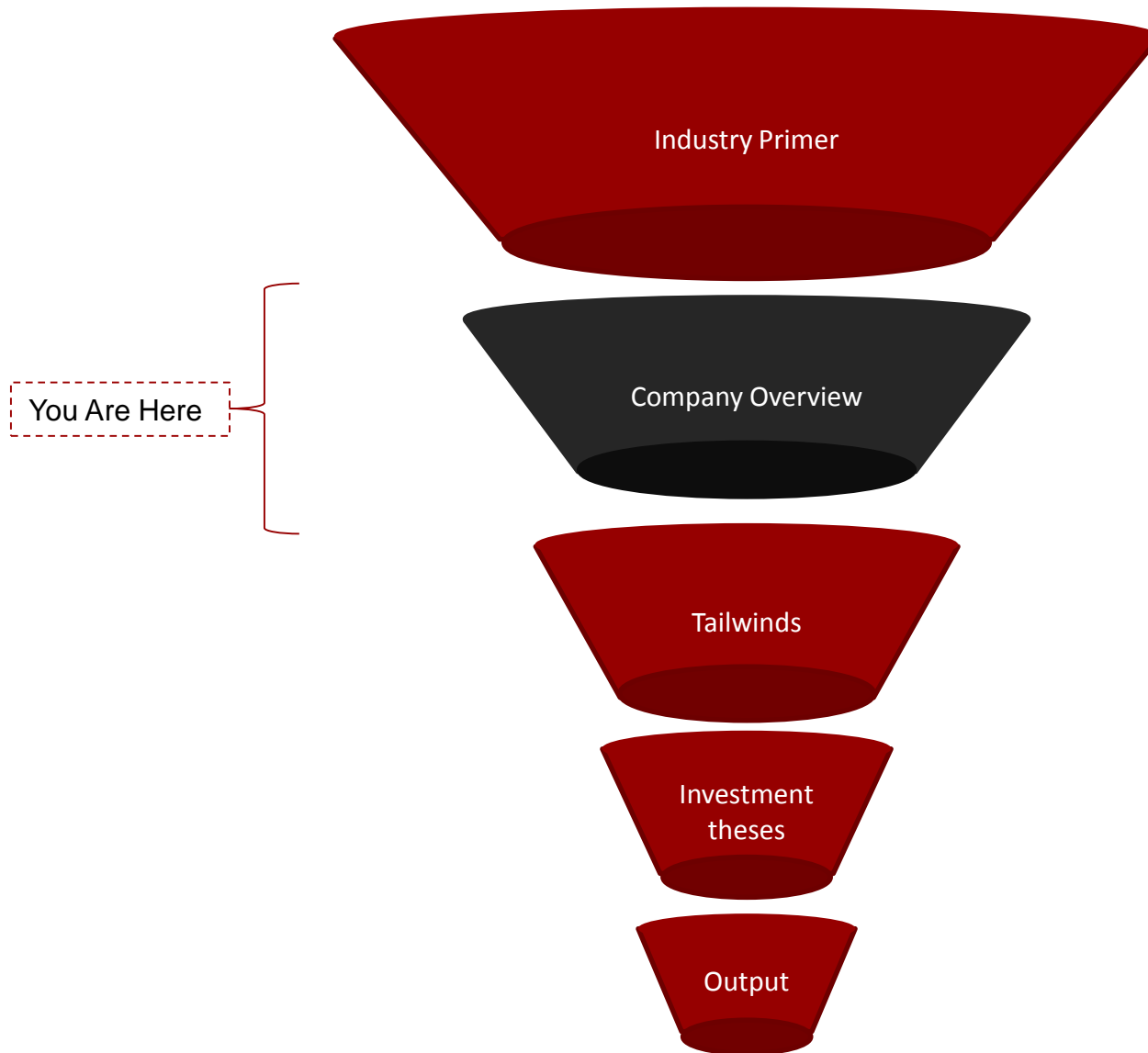
5G Tailwind

\$144.2B Fiber infrastructure spend by 2019

1000x Increase in bandwidth

100x More connected devices

Source: Fiercewireless, Pnwswire, Company Filings



Boingo Wireless

SECTION III



Boingo

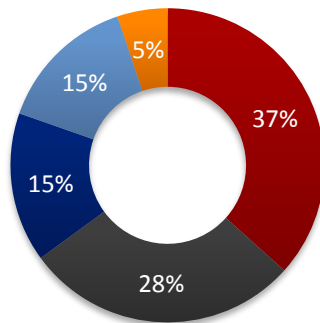
Leading wireless data player

(in \$ millions, unless noted)

Overview

- Boingo Wireless, Inc. is a leading global provider of wireless connectivity solutions for smartphones, tablets, laptops, wearable's and other wireless-enabled consumer devices
- Boingo has solutions for a variety of different consumers including; military, corporations, consumers, and advertisers
- Boingo generates revenue in 4 ways
 - Subscription basis network access
 - Long term contracts for access to DAS networks
 - Display advertisements on sign in pages
 - Arrangements with wholesale wi-fi providers

Revenue Breakdown



■ DAS ■ Military ■ Wholesale ■ Retail ■ Advertising

Global leader in wireless connectivity, which generates revenue through five main verticals; DAS, Military, Wholesale, Retail, and Advertising

Source: Bloomberg, Company 10-K

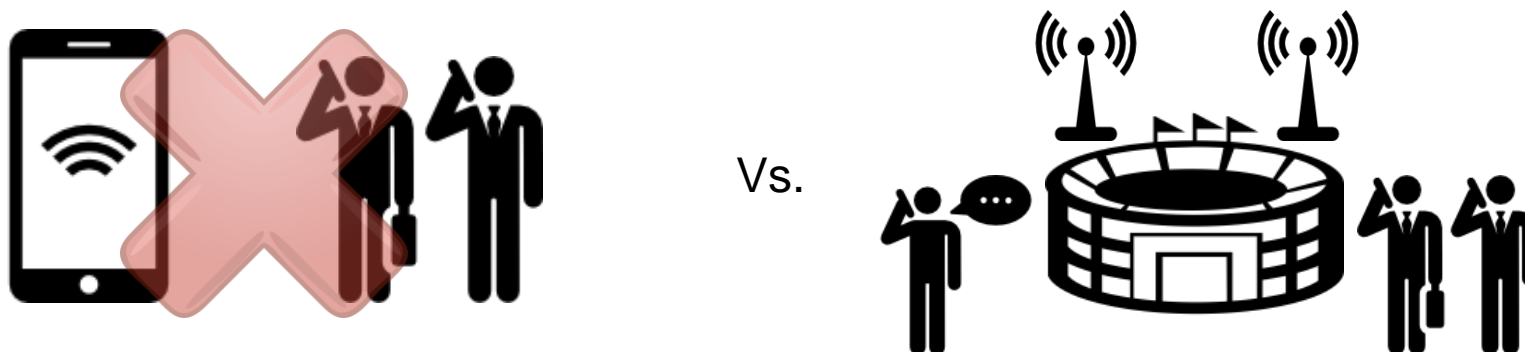
Financial Performance

Share Price	\$23.49
<i>FDSO</i>	45
Equity Value	1057.05
(-) Debt	14
(-) Preferred	0
(-) Minority Interest	0
(+) Cash	22
Enterprise Value	1065.05
52 Week High	\$25.10
52 Week Low	\$10.95
52 Week Trading Range	\$14.15
Levered Beta	0.77
WACC	10.38%
Revenue Growth YoY	14.17%
EBITDA Margin	25.30%

Revenue Segment – DAS (Distributed Antenna System)

Improves cellular coverage inside high traffic areas such as; airports, arenas, campuses, and convention centers

Why DAS?



What Boingo Offers

- ✓ In-House network design, while building and operating these DAS networks in high traffic areas
- ✓ Offers a neutral network host approach so that all guests will enjoy the same improved cellular service
- ✓ Continuously investing in R&D to improve their product offerings and to meet all data demands of the future (5G etc.)
- ✓ Also offers Small Cell, a inexpensive way to fill coverage gaps in buildings, an area of recent growth with venues
- ✓ 66%/33% revenue split between build up and subscription fees – majority of revenues are deferred due to contract nature



Source: Bloomberg, Company 10-K

Servicing military bases worldwide providing world class network connectivity

- ✓ Has a total of 107,000 military subscribers, which has grown significantly over the past few years with an ARPU ~\$35/month
- ✓ Partnered with Military bases worldwide to provide high speed internet and broadband services for troops looking to Skype with family, play video games, stream movies, or any other internet needs
- ✓ Easy to sign up once the base agrees to participate in the program – offers 24 hours service
- ✓ Recently, Boingo has also realized growth in both Small Cell networks and cellular offloading in military bases around the world to free bandwidth of major carriers

16

Revenue Segment – Wholesale Wi-Fi

1)



2)



How Boingo Generates Revenue

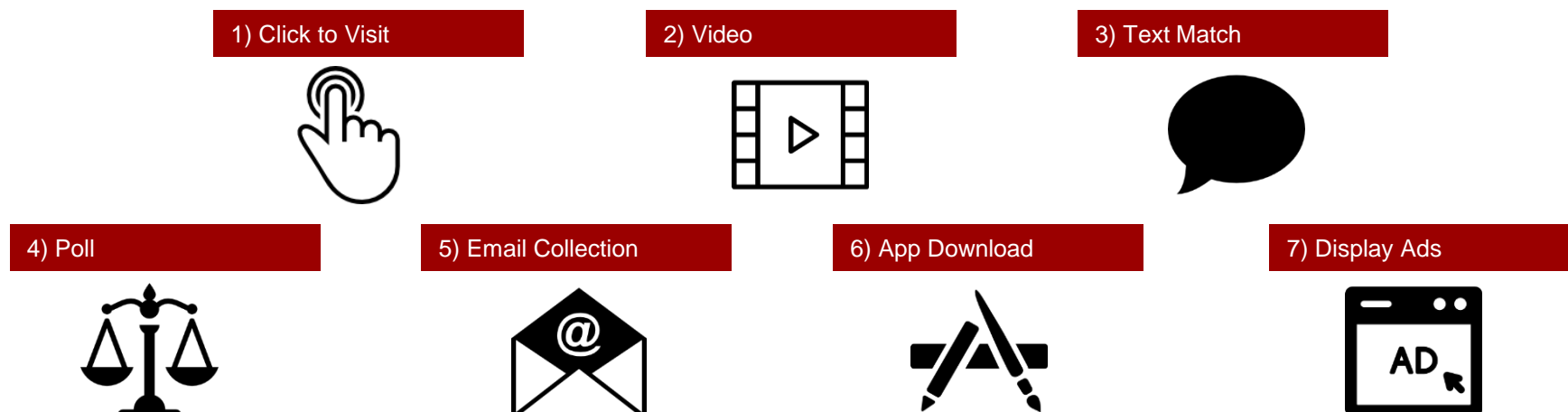
- ✓ Boingo has over a million Wi-Fi hotspots around the world including airports, venues, convention centers and more
- ✓ Enterprise customers such as telecom operators, cable companies, technology companies, and enterprise software/services companies, pay a usage-based Wi-Fi network access and software licensing fees to allow their customers' access to Boingo's footprint worldwide
- ✓ Other customers pay a monthly fee for Boingo to install, manage, and operate a wi-fi network at their venue under a service provider arrangement
- ✓ Companies use Boingo as a value-add for their customer's as they can access quality wi-fi throughout the world at Boingo's millions of hotspots
- ✓ Boingo has partners in all areas of the world including; the Americas, Asia, Europe, Africa, and Asia Pacific

Boingo has grown it's wi-fi hotspot network in order to offer a premium service to enterprises

Source: Bloomberg, Company 10-K

Revenue Segment - Advertising

Boingo offers a variety of different advertising options and uses analytics to track success of advertisement



How Boingo Generates Revenue

- ✓ Boingo plays an interactive role with companies to design, implement, and track advertisements to maximize satisfaction for customers
 - 1. Click-to Visit: Directs consumers to a specific website, login etc. in exchange for limited time free wi-fi
 - 2. Video: Engages audience with 15-30 seconds video prior to internet access, followed by a click-to visit option
 - 3. Text Match: Similar to a “CAPCHA” human verification type-in, Boingo uses this but with the company slogan
 - 4. Poll: Like the “click-visit” option, a full page advertisement is shown prompting users to answer a question before connecting to internet
 - 5. Email Collection: Prompts Boingo users for their email to sign up more newsletter, benefits etc. (There is a no button)
 - 6. App Download: Exchanges free Wi-Fi for users downloading the companies app
 - 7. Display Ads: Quick ad featured before users get web access
- ✓ Boingo uses data analytics to track impressions and clicks. They even can display the data across various segments to track specific campaigns

Source: Bloomberg, Company 10-K

Revenue Segment - Retail



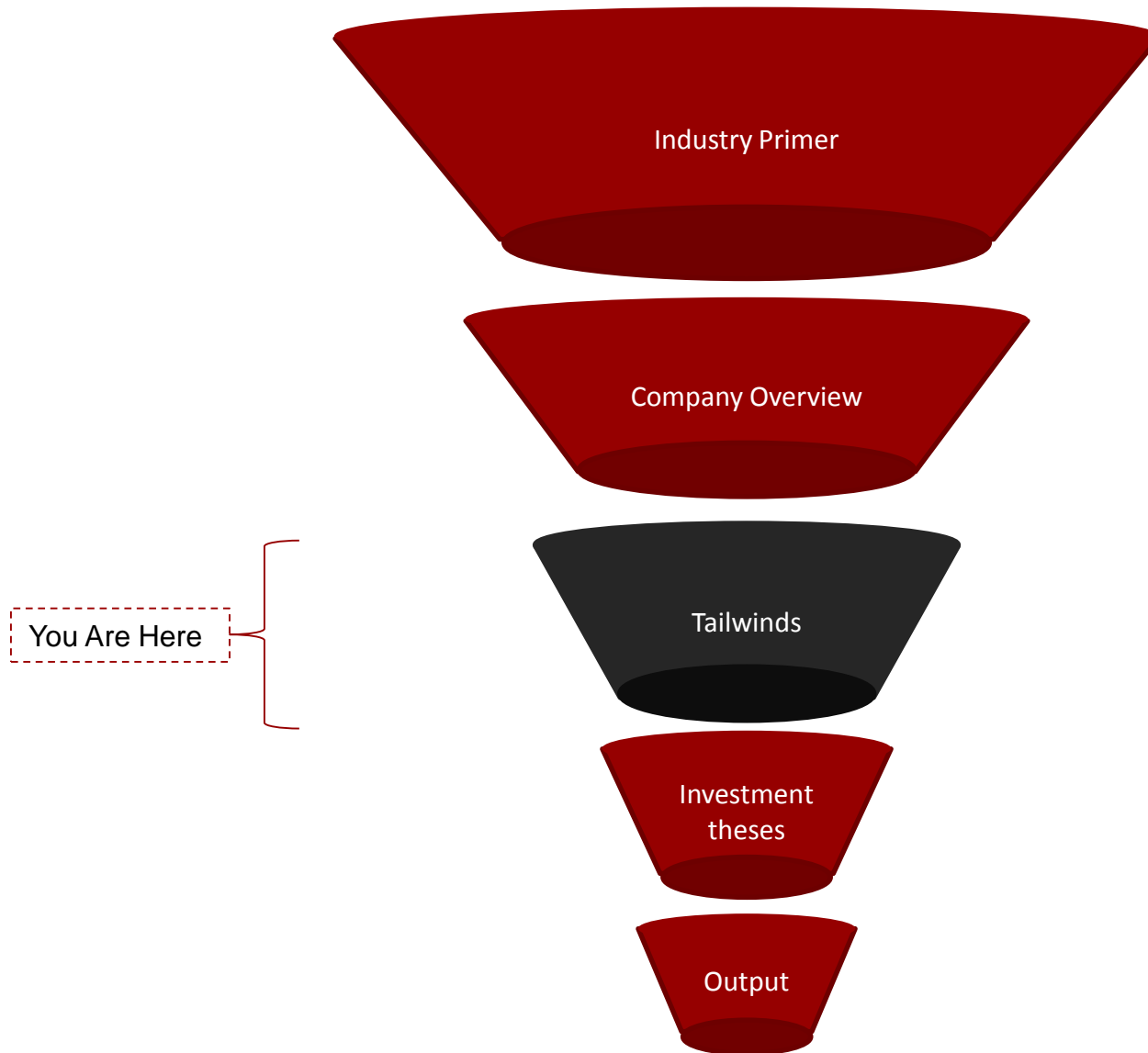
How Boingo Generates Revenue

- ✓ Offers different plans for consumers in order to access unlimited Wi-Fi at any Boingo hotspots throughout the world
- ✓ Boingo has different plans depending on the geographic region that consumers are trying to access: Americas, Asia, Europe, Asia Pacific, UK, or full global coverage

Plans:

1. Global: Access to internet through any Wi-Fi hotspot in the world for up to 4 devices - \$39/month
 2. Americas or Asia Pacific: \$9.95 unlimited access through any hotspot in your specific region
 3. Europe: \$19.95 for unlimited access to any European hotspot of Wi-Fi
- ✓ Boingo also offers “one-time” plans for short term web access at any of their hotspots throughout the world

Source: Bloomberg, Company 10-K



Key Industry Tailwinds

BOINGO well positioned to take advantage of key growth drivers in the industry

(in \$ millions, unless noted)

5G Rollout

A



Unlimited Data

B

verizon✓

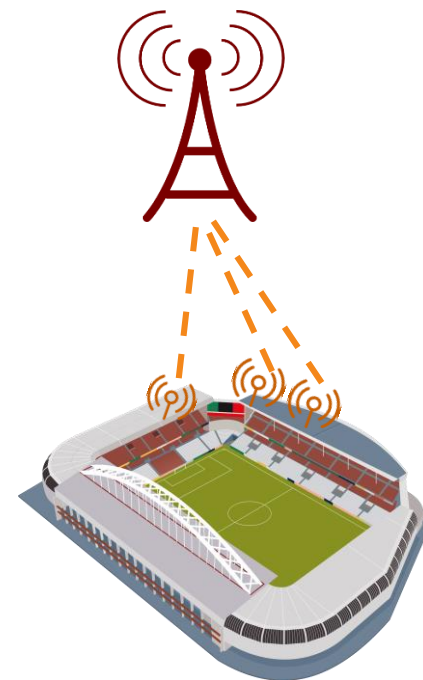
T-Mobile



Sprint

DAS Densification

C



A 5G Rollout

The 5G Rollout is set to be the next big driver in Telecom
(in \$ millions, unless noted)

What is 5G?

The aim of 5G is to create a more 'hyper connected' society by:

1

Enhanced mobile broadband: applications like virtual reality and the ability to support extensive data traffic growth

2

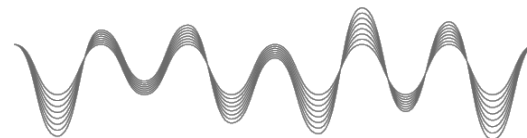
Ultra-reliable communications: Including very low latency (sub-1ms) to support services such as autonomous vehicles and mobile healthcare

3

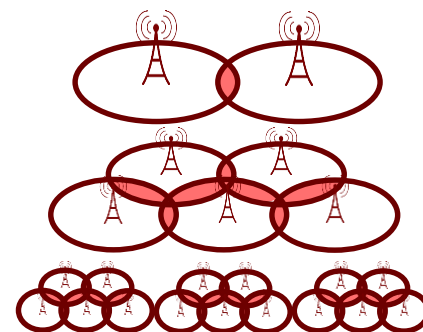
Massive machine-type communications: the ability to support low cost IoT and coverage inside buildings

What Does This Mean?

New
Spectrum
Bands



Shift to Small
Cell
Densification

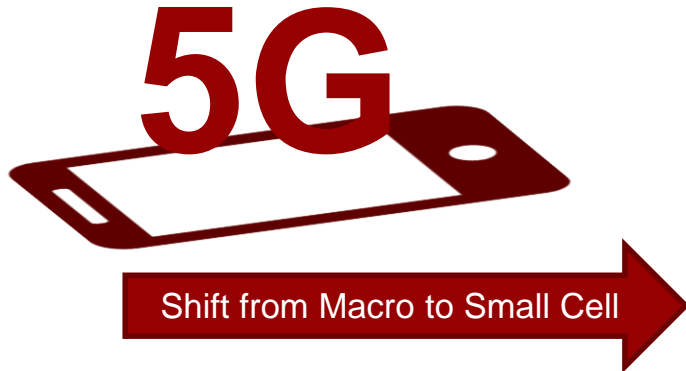


The shift to small cell densification will be a significant tailwind for small cell and DAS companies in the 5G rollout

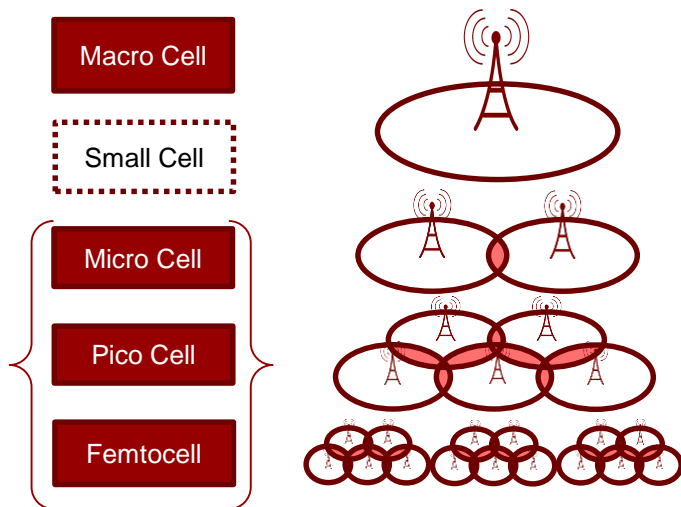
5G Rollout Shift from Macro to Small Cell

Small Cell will allow greater capacity for data

(in \$ millions, unless noted)



Macro to Small Cell Infrastructure



Highway Traffic Analogy

Macro Cell: One Lane

Small Cell: Opens a Lane



Congestion

Speed



Congestion

Speed

The 5G rollout is expected to be commercially implemented by 2020, over the next 3 years we will see a shift to a small cell architecture to improve user experience

Key Industry Tailwinds

BOINGO well positioned to take advantage of key growth drivers in the industry

(in \$ millions, unless noted)

5G Rollout

A



Unlimited Data

B



DAS densification

C



B Shift to Unlimited Data Plans

A new value proposition for Telecom consumers



Q1 2017- Announces Unlimited Data Plan



Q1 2017- Announces Unlimited Data Plan

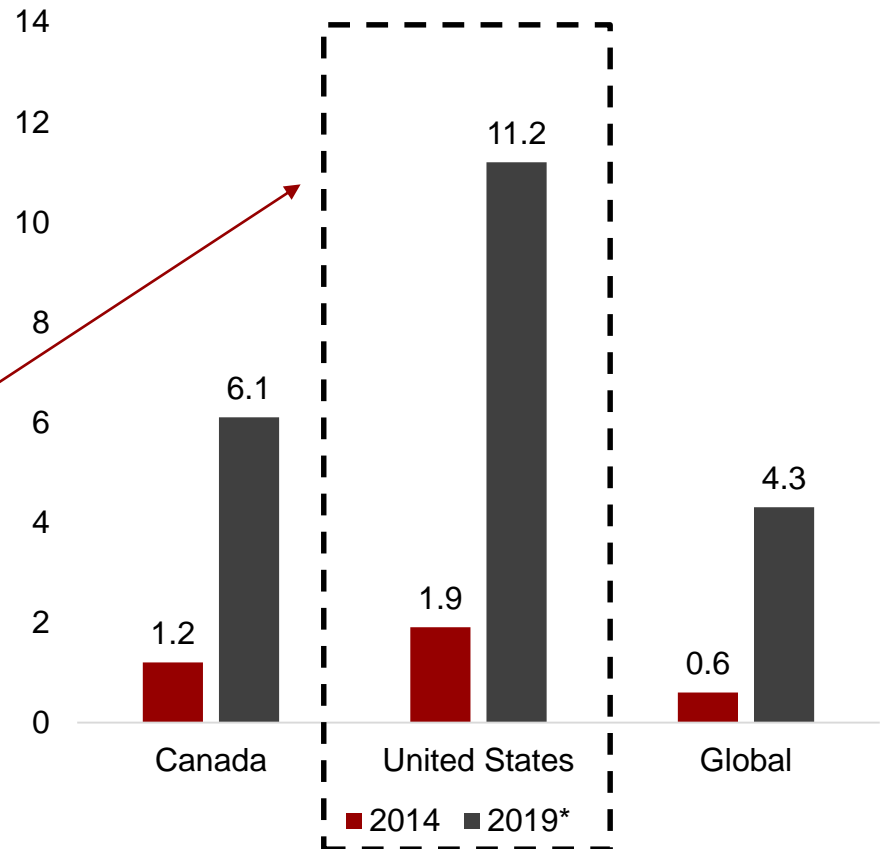


Q1 2017- Announces Unlimited Data Plan



Q1 2017- Announces Unlimited Data Plan

Average Mobile Wireless Data Usage (in gigabytes per month)



Intense competition among the largest carriers has spurred the emergence of “unlimited data plans”. Increased consumer data usage causes congestion in cellular networks, leading the large carriers to search for ways to offload this congestion.

Source: Company Filings, Statista

Small Cell Architecture: A Necessity to Support Increased Data Usage

Small cell architecture takes pressure off of macro cells

(in \$ millions, unless noted)

Shifting Tides

- Small cells and Wi-Fi are crucial to providing the increase in capacity density that operators need and subscribers expect, especially in large urban areas
- Operators need both small cells and Wi-Fi to cost-effectively meet their capacity requirements

Data Offload: one of the implementations of using small cell technologies to provide data services to cellular users in a more efficient and economically viable manner, freeing up **bandwidth**.

Bandwidth: amount of data that can be transmitted in a fixed amount of time

Just Look at the Numbers

86%

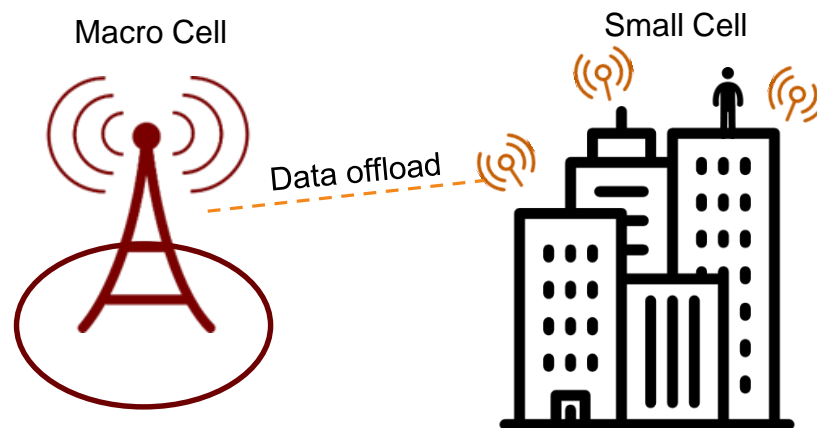
Of total mobile
traffic from
Smartphones by
2021

7.2- 49

Exabytes of
data per
month from
2016-2021

78%

of the world's
mobile data
traffic will be
video by 2021



With massive data growth and the shift to more data offload, Boingo will be able to capitalize on these tailwinds as a DAS vendor

Key Industry Tailwinds

BOINGO well positioned to take advantage of key growth drivers in the industry

(in \$ millions, unless noted)

5G Rollout

A



Unlimited Data

B

verizon✓

T-Mobile

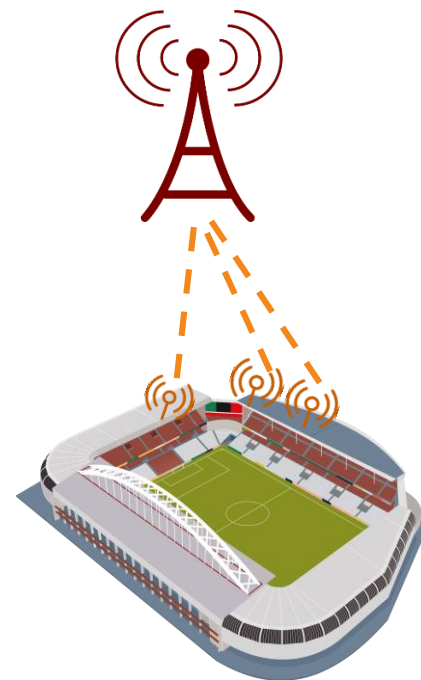


AT&T

Sprint

DAS densification

C



Distributed Antenna System (DAS)

DAS Bolsters Cellular Coverage and Capacity

(in \$ millions, unless noted)

DAS: A distributed antenna system is a way to bolster cellular coverage and capacity by installing managed hubs and multiband antennas precisely where demand is greatest.

Propagation: the reflection, refraction, absorption of radio waves



Distributed Antenna Systems



Signals can become blocked because of line-of-sight **propagation** barriers (i.e: walls), these DAS systems are needed to increase wavelength, signal strength and penetrate walls.

“They [big 4] are losing tenants and losing clients by not having good coverage.” – Bobby McClunk, CEO of AWS Communications

Only 10-15% of the world's commercial buildings have adequate cellular coverage; DAS systems will improve this problem

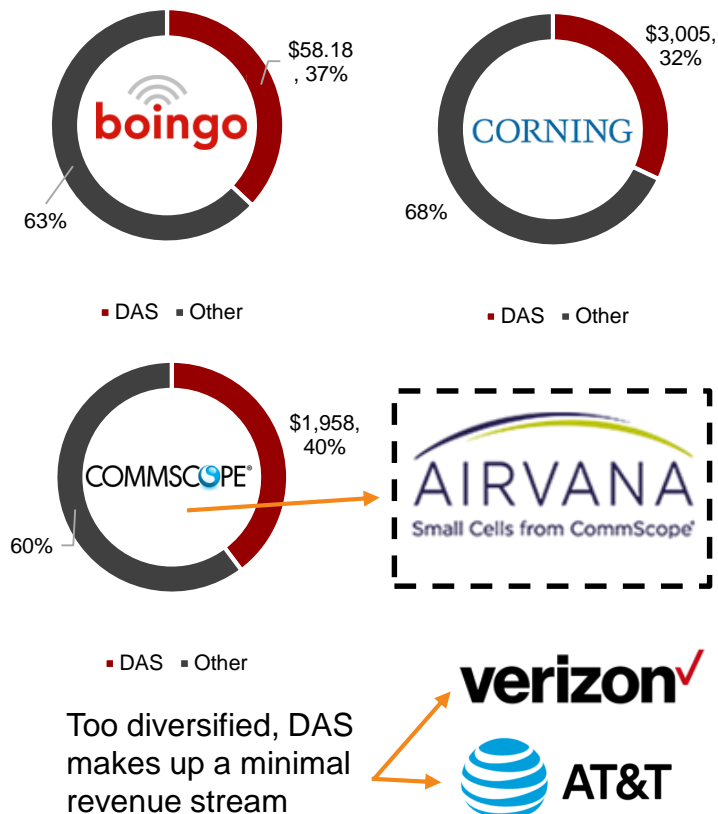
Source: Rcrwireless, UPenn Academic Paper

C DAS Market

DAS Implementation to Keep Major Telcos Competitive

(in \$ millions, unless noted)

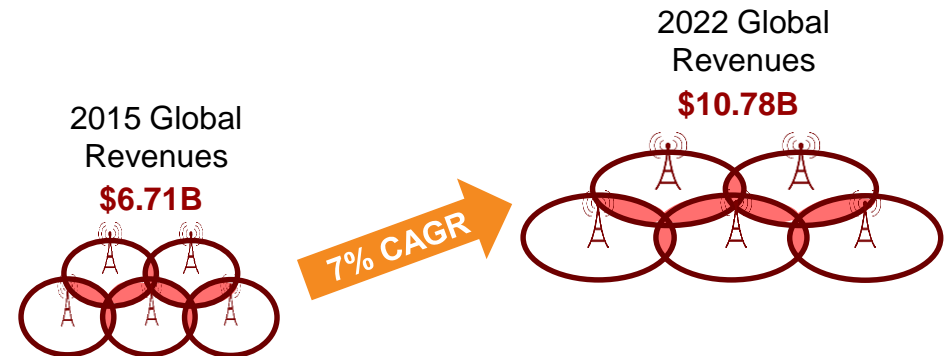
Key Players



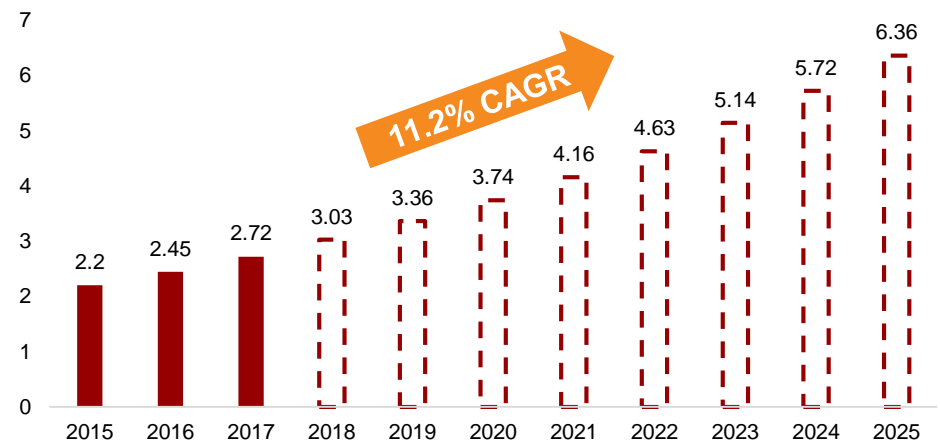
2 themes in Telco space: copycat and acquisition

Boingo is an indoor DAS and wifi-offloading pure-play company, CommScope and Corning offer both outdoor and indoor DAS, and Verizon and AT&T are massive Telco companies that have a diversified stream of revenues

Global DAS Market Revenue

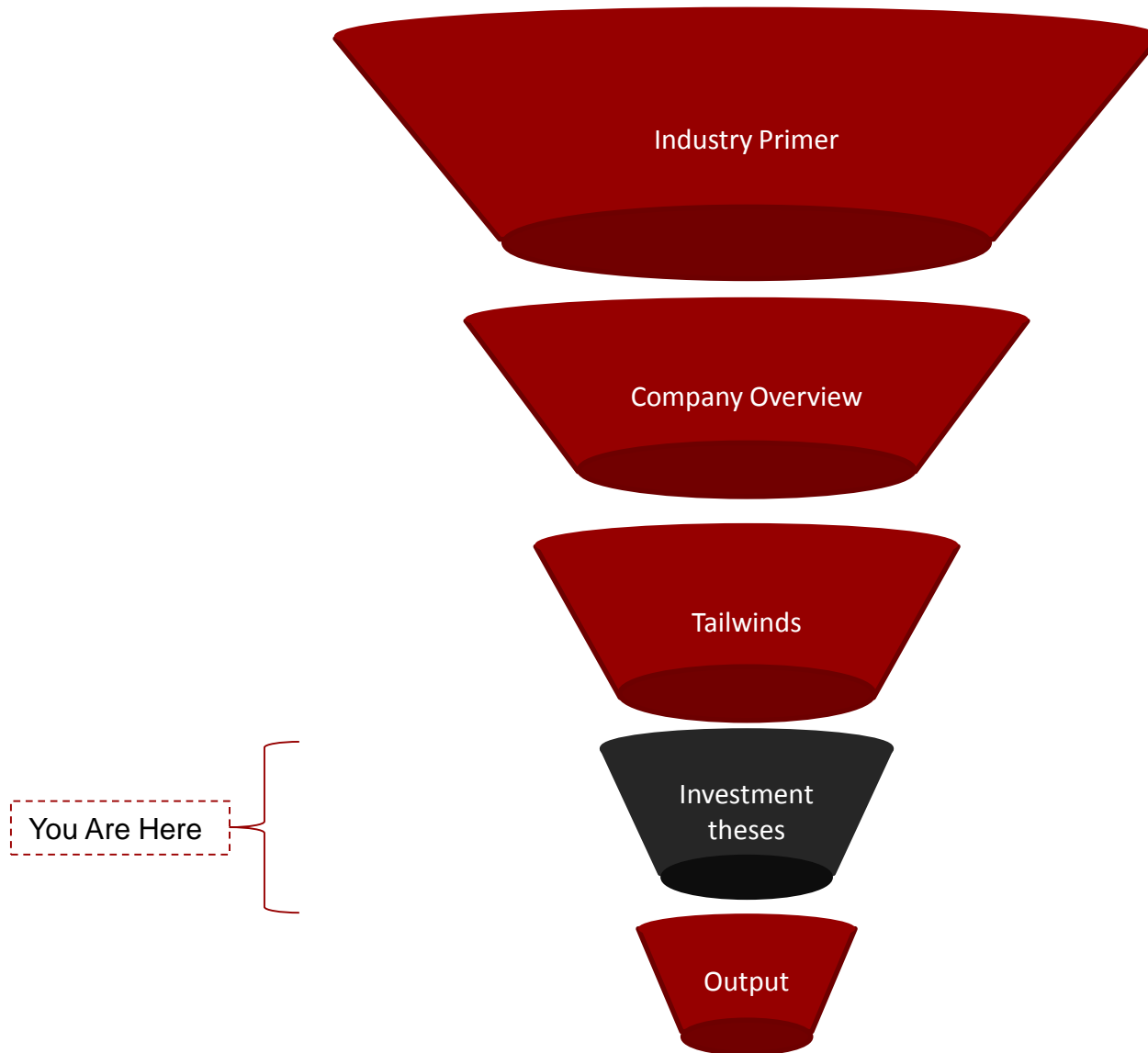


US DAS Market Revenue (in Bil USD)



Source: Rcrwireless, Company filings

TMT Funnel



No Risk No Reward

(in \$ millions, unless noted)



Strong Long-Term Contracts

- BOINGO has contracts in place with 2 of the big 4 Telcos and several airports and venues across the US



Regulatory Approval

- The process to build out DAS networks take 18-24 months, the lion share of the project comes from regulatory approval and negotiation; Boingo is well placed to expedite these regulatory approvals



Infrastructure in Place

- Building off the regulatory approval theme, Boingo already has 37 DAS networks in place with 81 projects in the pipeline allowing for a swift ability to expand their networks

Boingo's Strong Long-Term Contracts

Early-Mover Advantage

(in \$ millions, unless noted)

Contracts to Service Army, Air Force and Marine Corps
both Domestically and Abroad until 2024



U.S. Marine Corps



U.S. Army



U.S. Air Force

Multi-year contracts with AT&T and Sprint



AT&T

Sprint

T-Mobile

verizon

Airport and Other Venue Contracts



Honolulu Int'l Airport 2017



LAX International 2015



TDECU Stadium (U of Houston) 2015

"Stadiums are the toughest venues to do... nothing is as high density as a stadium. They have up to 100,000 people in them sitting hip-to-hip—that is the ultimate in density. And literally everyone in that environment is trying to do something on their phone." – David Hagan, Boingo CEO

Boingo's first-mover advantage places them well as an incumbent in the shift to small cell from the 5G rollout

Source: Bloomberg, Company filings.

Regulatory Approval

Boingo's Approval Allows for Expansion

(in \$ millions, unless noted)

Section 6409(a) Middle Class Tax Relief and Job Creation Act:

A State or local government may not deny, and shall approve, any eligible facilities request for a modification of an existing wireless tower or base station that does not substantially change the physical dimensions of such tower or base station.

This Includes:

- i Collocation of new transmission equipment
- ii Removal of transmission equipment
- iii Replacement of transmission equipment.

Boingo will not have to apply for government approval for new wireless facility deployment

Source: US Congress

Boingo's Infrastructure in Place

CAPEX Intensity of the Business Presents a Barrier-to-Entry

(in \$ millions, unless noted)



**~300mm invested in
CAPEX over the past 3
years**

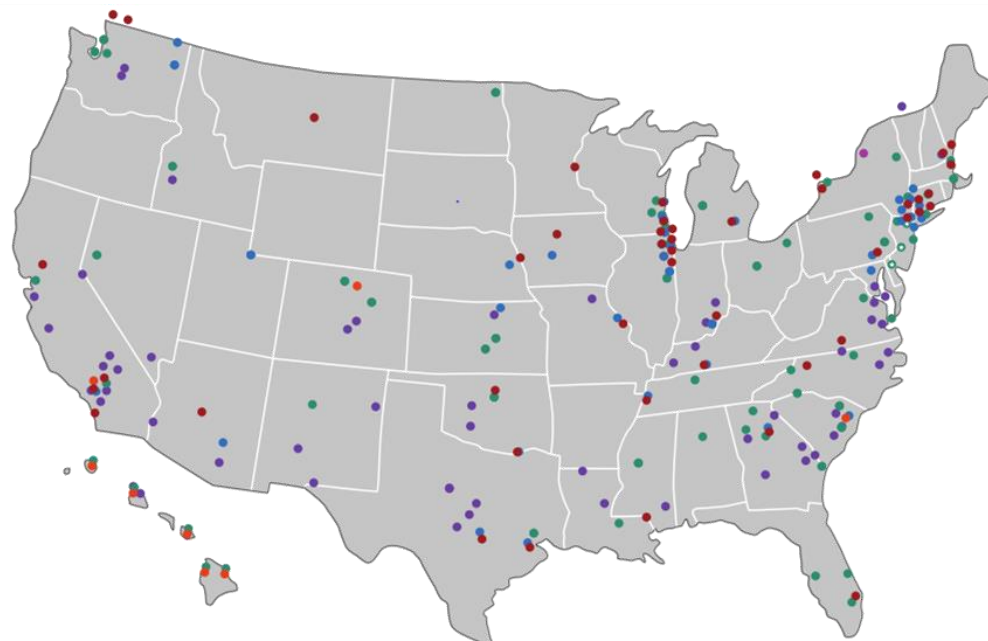


**“It takes two years from
start to finish to deploy a
small cell network.”
Verizon CFO Fran
Shammo**



**Regulatory approval takes
time and money**

20,300 Total Nodes over 37 DAS Networks



Wi-Fi ● Live (45) ● Pending (8)
DAS ● Live (37*) ● Pending (81)
Military ● Live (60*) ● Pending (2*)

Boingo already has 37 DAS networks in place, along with 20,300 nodes; furthermore, they have 81 pending DAS networks coming online

Source: Rcrwireless, Company filings.

Boingo's relationship with the military will allow it to benefit from increased capacity and base penetration rates



New Legislation

- National Defense Authorization Act that was recently passed will increase troop count
- Boingo stands to benefit from this given the excess capacity within existing domestic military bases



Upcoming Partnerships

- Boingo has begun implementing cellular offloading and/or small cell systems within domestic military bases
- With majority of military bases being in rural areas, coupled with the increasing head count within each base, telco companies want to find better ways to service these patriots

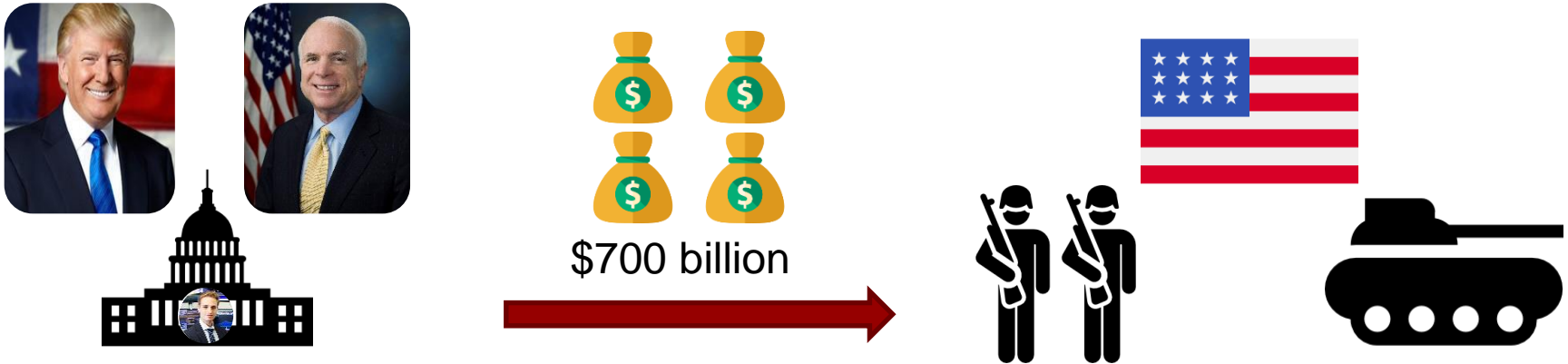


Increasing Penetration

- Boingo has been increasing their penetration rate within bases, with the growing trend of connectivity and demand for quality internet/TV, we expect penetration rate within bases to increase

Investment Thesis – Military Segment Poised to Take Advantage of Industry Tailwinds

“To help alleviate the stress on the force, the NDAA authorizes increases the size of Army, Navy, Air Force, Army Guard and Reserve, Naval and Air Reserve, and Air Guard commensurate with the threats we face” –US House Committee on Armed Services



Effect Of This Bill

Key Highlights

- \$700 billion defense spending was passed by the senate 89-8, this was an increase over Trump's initial request for \$630 billion
- Authorized increased troop count
- Pay for troops will increase by 2.1%
- \$60 billion allocated for Overseas contingency operations war funding – money for wars in Iraq, Afghanistan, Syria and other locations

Effect on Boingo

- More troops means that Boingos' TAM will increase, further more crowded bases will increase the need for small cell systems in order to improve connectivity within bases
- Increased spending on military bonuses could be a catalyst for the government to build neutral host DAS networks within bases

Senate passes \$700 billion National Defense Authorization Act – this is expected to increase the number of US military reserves

Source: New York Times, Reuters, CNBC, NDAA 2018 (armedservices.house.gov)

Bonus: Boingo Military Presence in Japan

“We are going to be increasing our budget by many billions of dollars because of North Korea.....” – Donald Trump, POTUS



How Boingo Can Benefit

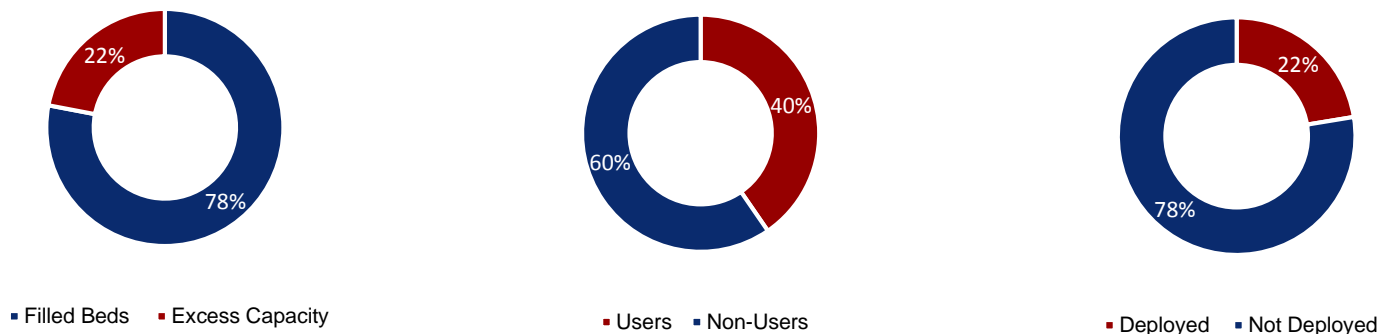
- ✓ Bases positioned in Japan and South Korea are in the closest proximity to North Korea, which has been a potential threat to the U.S safety
- ✓ Boingo currently operates Wi-Fi/IPTV for 9 bases within Japan and South Korea, the fill rate at these bases will benefit from both North Korea threat and increased troop counts
- ✓ We believe that if the North Korea threat increases these bases will see larger growth than the US bases

Source: Department of Defense Infrastructure Capacity Report, Twitter, militarybases.com

Military Tailwinds Benefitting Wholesale Segment

Boingo has deployed carrier offloading at 13 of their 58 domestic military bases

Current Standing For Boingo in Domestic US Military Bases



Boingo has room to benefit from new industry trends

Offloading

- Carriers increasing their cellular offloading amount within Military bases, benefitting the troops by providing better service than previously, as many of these bases are located in rural locations. With the telecommunications industry being a “copy-cat” industry, we expect deployment to begin at majority of bases
- Carriers can leverage Boingo’s existing infrastructure – saving significant capex for large telco companies that do not need to install infrastructure in these low density geographies

Small Cell

- Boingo is in talks with a “handful” of carriers to and/or implement a small cell system at domestic bases
- A carrier puts traffic on the network and Boingo collects revenue on a per-megabyte basis. Separately, with its service provider business, Boingo runs the network on behalf of a carrier, and that typically involves a monthly fee to Boingo

Boingo has already incurred capex to setup necessary infrastructure which they can leverage with carriers for cellular offloading

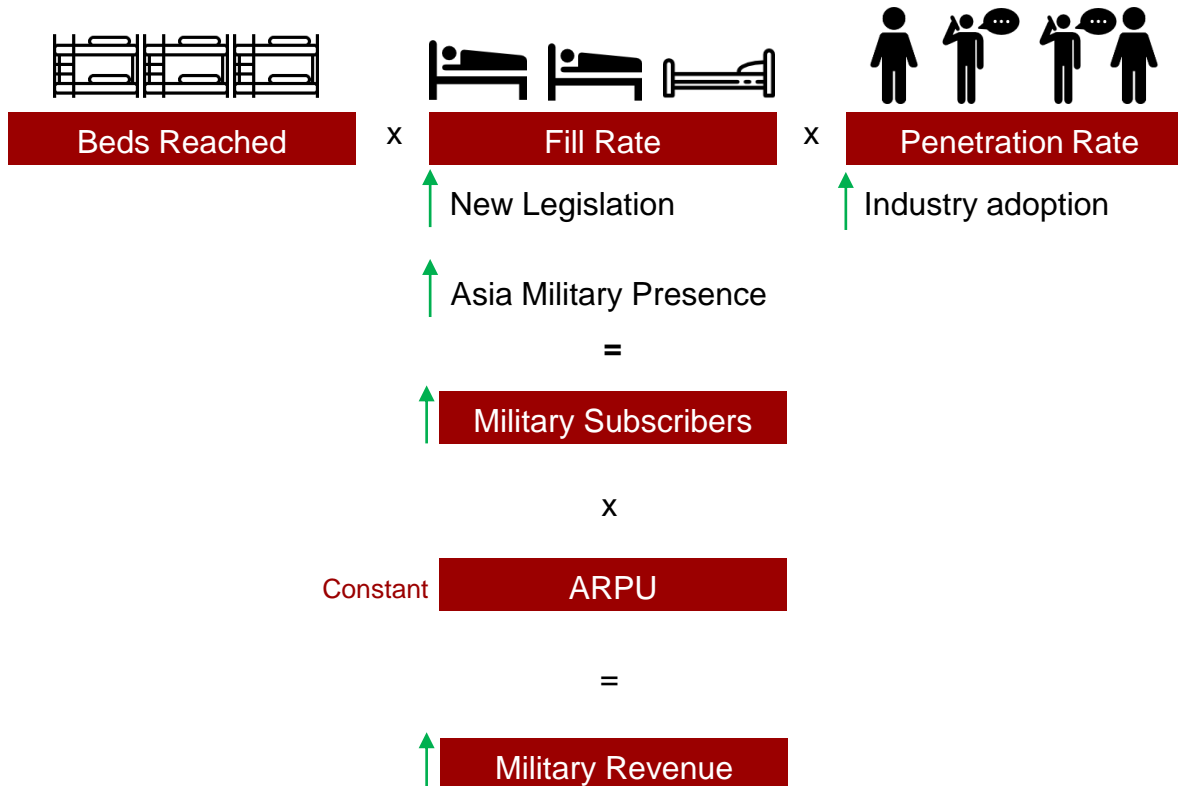
Source: Department of Defense Infrastructure Capacity Report, militarybases.com,

How To Quantify All Of This?

Military thesis revenue build up and outputs

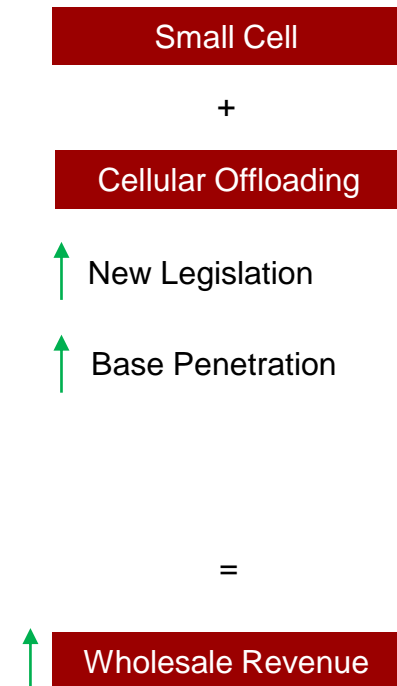
1

Military Segment



2

Wholesale



Increasing Troop Count And Improving Penetration Will Drive Military Revenues While Also Benefitting Wholesale Revenues Through Carrier Offloading

Source: Department of Defense Infrastructure Report

DCM View On Military Tailwinds

$$\text{Profit} = \text{Revenue} - \text{Expenses}$$



With approval of new defense bill the number of US troops will increase, which boosts revenue per base (per bed revenue model)



Boingo has already established the infrastructure at each military base and thus increasing users marginally increases expenses due to the high operating leverage of the company's operations



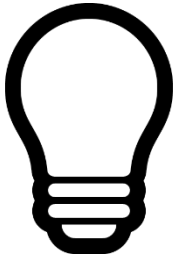
Significant Growth in Operating Income

Bottom Line: Recent legislation increasing expenditure on US military coupled with industry trends of cellular offloading, and DAS systems creates large opportunity for network players. With Boingo's existing infrastructure, stronghold on domestic bases, excess base capacity of 22% and proven track record they are best placed to capture this market opportunity

3 Ideal Acquisition Target for Multiple Subverticals

"Boingo is attractive as a potential acquisition target on multiple fronts

(in \$ millions, unless noted)



Strategic

- BOINGO has already established long term contracts with key customers and in key markets
- Installing new infrastructure is very costly and timely, especially in such a competitive industry



Operational

- Illustrative cost analysis suggests significant synergies between small cells and wifi
- Company size may provides ease of integration



Financial

- Precedents suggest potential attractive valuation
- Hidden NOLs and underleverage could provide opportunity for acquirer to extract value currently not forecasted by the market

Wireless Carriers



Towers



Wireline Carriers



"Wireless has been super competitive over the last year... These guys are doing everything they can to get subscribers on board." - IDC analyst Brian Haven

Boingo's Strong Long-Term Contracts + Established infrastructure

Contracts + Infrastructure = High growth potential

(in \$ millions, unless noted)

Contracts to Service Army, Air Force and Marine Corps both Domestically and Abroad until 2024



U.S. Marine Corps



U.S. Army

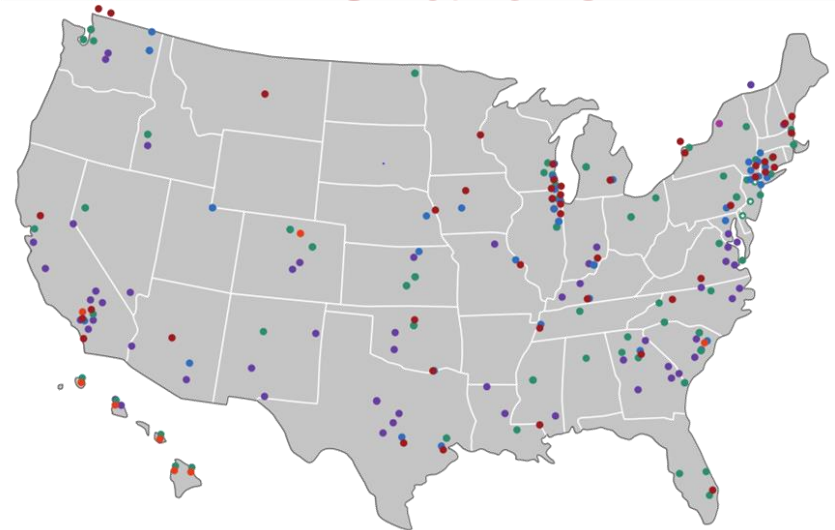


U.S. Air Force

Multi-year contracts with AT&T and Sprint



20,300 Total Nodes over 37 DAS Networks



Wi-Fi ● Live (45) ● Pending (8)

DAS ● Live (37*) ● Pending (81)

Military ● Live (60*) ● Pending (2*)

Boingo's first-mover advantage places them well as an incumbent in the shift to small cell from the 5G rollout

Source: DCM analyst knowledge

TMT M&A Open-Faced Sandwich - Operational

Significant Expense Synergies with Wifi companies

Illustrative Integration Cost Synergies

	<u>Small Cell</u>	<u>Wifi</u>	<u>Sum</u>	<u>Integrated</u>	<u>Pro-Forma Synergies</u>
Base station	\$4,463	\$1,488	\$5,951	5058	\$893
Backhaul equipment investment	\$2,730	\$2,400	\$5,130	3205	\$1,925
Planning, installation, commissioning	\$5,438	\$3,093	\$8,531	5523	\$3,008
Total Initial Investment	\$12,631	\$6,981	\$19,612	\$13,786	\$5,826
Leasing Costs	\$792	\$1,488	\$2,280	864	\$1,416
Backhaul Maintenance	\$5,390	\$4,900	\$10,290	7080	\$3,210
Energy	\$979	\$596	\$1,575	998	\$577
Total Annual Expense	\$7,161	\$6,984	\$14,145	\$8,942	\$5,203
MBPS	67.5	48	115.5	115.5	n.a.
Capex/MBPS	\$187.13	\$145.44	\$169.80	\$119.36	\$50.44
Annual maintenance expense/MBPS	\$106.09	\$145.50	\$122.47	\$77.42	\$45.05

Where do these synergies come from?

- ✓ Although not incorporated into this analysis, another cost synergies results from the fact that less small cell towers need to deployed given the increased capacity of each integrated small cell and wifi.
- ✓ Cost and timing of finding a lease, installing the equipment are all significantly reduced
- ✓ A limitation to this analysis is that certain geographies may not necessarily require densification and thus would render the integration irrelevant. Since BOINGO has a significant number of urban contracts, we believe there is value to many acquirers

Integrated wireless carriers, wireline companies or companies with much spectrum would be potential acquirers

Source: Senzafile Consulting

Financial View

Net operating losses and low leverage are financial positives for Boingo as an acquisition target

Significantly under-levered relative to peers

Company	D/E
Airline Connectivity Peers (50%)	
ViaSat	46%
Gogo Inc	132%
DAS Vendors (25%)	
Corning	27%
Commscope	293%
Tower Cos (25%)	
American Tower Corp	233%
Crown Castle Corp	120%
SBA Communications	48%
Industry Average	118.0%
Boingo Wireless	14.5%

- Since BOINGO is significantly under-levered compared to peers, value can be created through implementing higher leverage
- In addition, there are less debt retirement and transaction costs associated with the transaction

Acquirer could utilize NOLs at faster rate

NOLs			
	<u>Currency</u>	<u>FY2017E</u>	<u>FY2018E</u>
Federal NOLs	\$USMM	\$164	\$164
State NOLs	\$USMM	\$165	\$165
Foreign NOLs	\$USMM	\$28	\$28
Beginning NOL Balance	\$USMM	\$357	\$357
Tax savings	\$USMM		\$357
Ending NOL Balance	\$USMM	\$357	\$0
Discount Rate	%	10%	10%
Discount Factor		1	0.91
Present Value of NOLs to acquirer	\$USMM	\$0	\$325

Section 382:

An acquirer may utilize a target's NOLs if those NOLs are applied to a similarly operating business

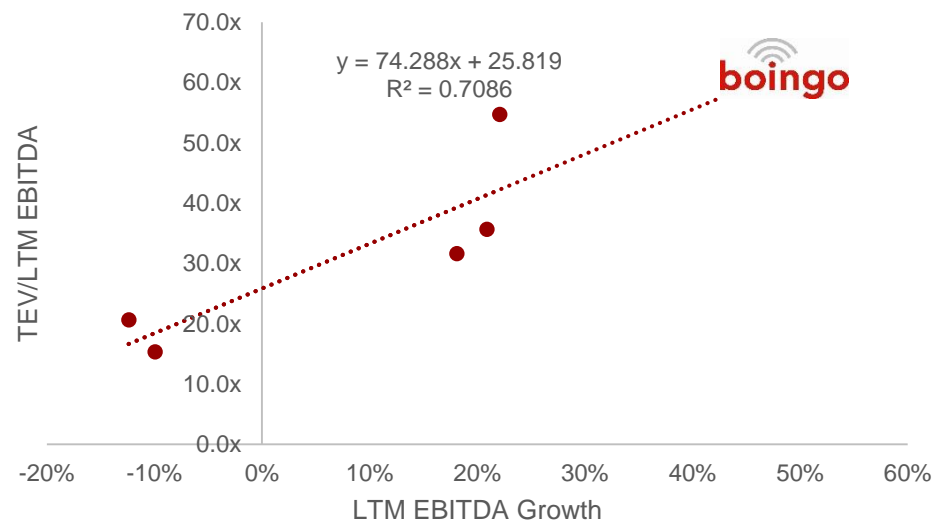
- We assume that the acquirer has enough EBIT to utilize the NOLs upon closing of the acquisition (assumed to be end of FY2018)
- Assumed similar WACC
- As shown on the next slide, an acquirer can create value by recognizing the NOLs

Precedent Transaction Valuation

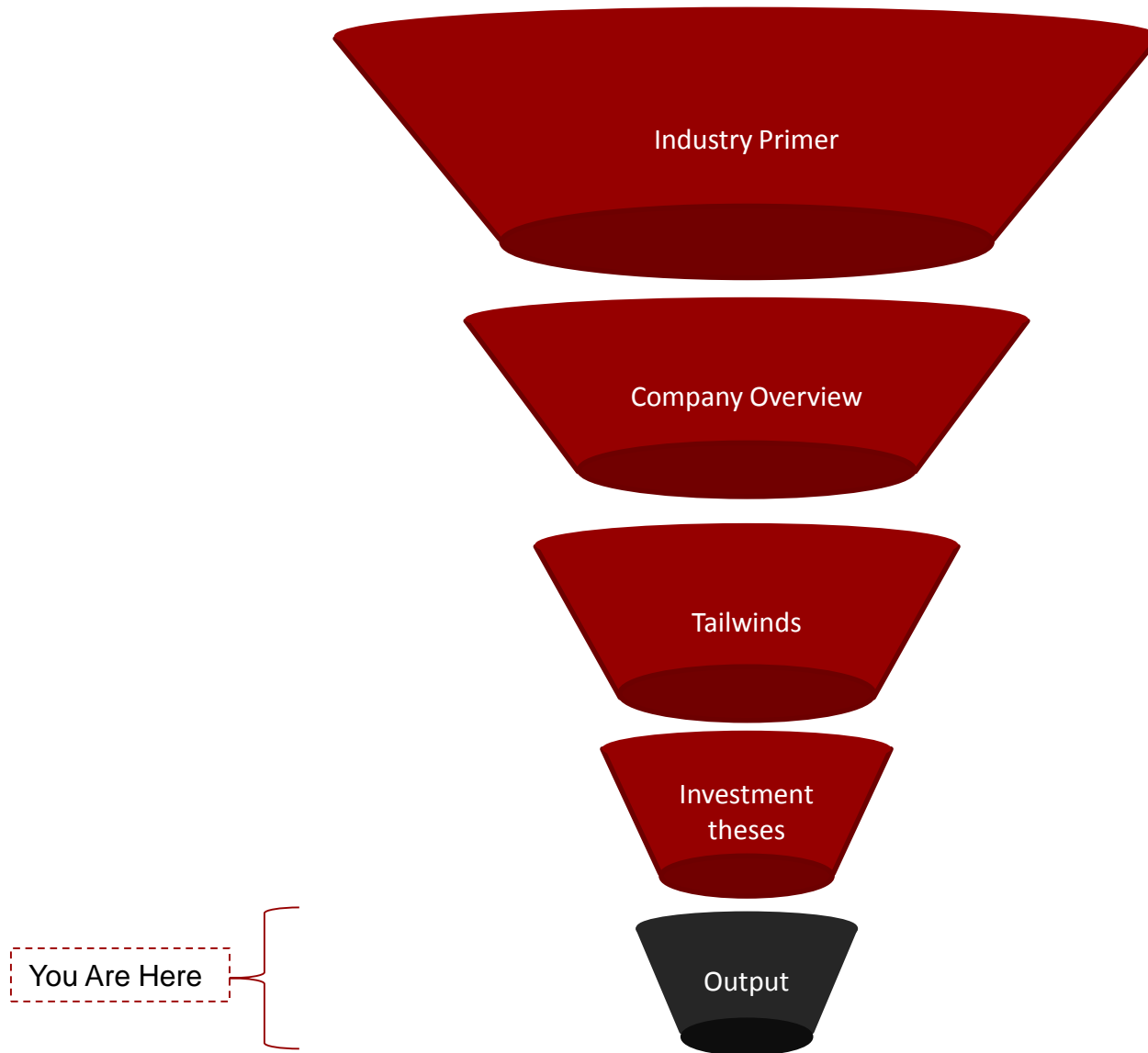
Significant Upside

Date	Target	Acquirer	Country	Value (\$M)	TEV/ LTM Revenue	TEV/ LTM EBITDA	LTM EBITDA Growth
May 2017	Drillisch AG	United Internet AG	Germany	\$12,055	5.1x	31.6x	18%
January 2017	Ixia	Keysight Technologies	USA	\$1,559	3.2x	20.6x	-12%
April 2016	Ruckus wireless	Brocade Communications	USA	\$1,044	2.7x	54.7x	22%
April 2015	Alcatel-Lucent	Nokia	France	\$10,600	0.8x	15.3x	-10%
March 2015	Aruba Networks	Hewlett-Packard	USA	\$2,518	3.1x	35.7x	21%
Mean				\$5,555	3.0x	31.6x	8%
Median				\$2,518	3.1x	31.6x	18%

Bridge to Equity	
LTM EBITDA	\$62
Implied Multiple	31.6x
Implied enterprise value	1,966
Less: Debt	\$14
Add: Cash & Investments	\$22
Implied equity value	\$1,974
Basic shares outstanding	40
Fully diluted shares outstanding	45
Implied share price	\$43.56
Current share price	\$25.10
Implied upside / (downside)	73.5%



Source: US Congress



Valuation Implications

Thesis 1: Boingo Best-Positioned to Capitalize on Network Densification

(in \$ millions, unless noted)

Revenue : Boingo's superior positioning will allow it to **fully capture passive industry growth** in the US DAS market while **building market share**

Street Consensus: 2.9% Market Share FY 17E – 5.8% Market Share FY27

DCM: 2.9% Market Share FY 17E - 7.9% Market Share FY27

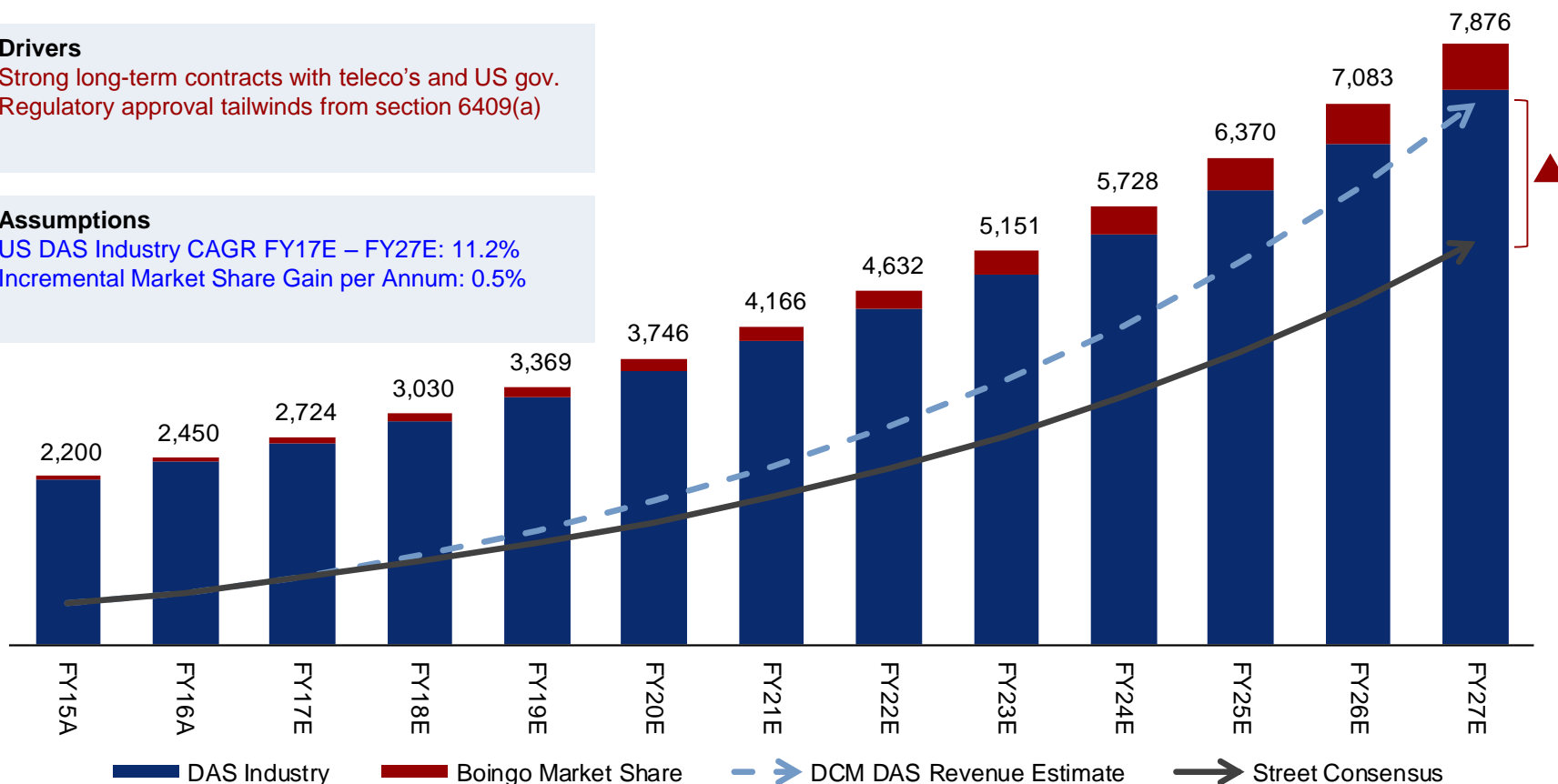
FY27E Delta: \$159.5MM

Drivers

Strong long-term contracts with teleco's and US gov.
Regulatory approval tailwinds from section 6409(a)

Assumptions

US DAS Industry CAGR FY17E – FY27E: 11.2%
Incremental Market Share Gain per Annum: 0.5%



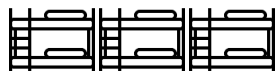
Source: DCM Model

Valuation Implications

Thesis 2: Boingo to Benefit From Military Spending Tailwinds (National Defense Authorization Act)

1

Military Segment



Beds Reached

Source: Company

x ↑



Fill Rate

Source: Industry Report

x ↑



Penetration Rate

Backed Out

=



Military Subscribers

Historical: Given
Forecast: Backed Out

x

ARPU

Constant

=



Military Revenue

Output

Enough Data To Precisely Incorporate Into Valuation

2

Wholesale

Small Cell

+

Cellular Offloading

=



Wholesale Revenue

Not Incorporated Into Upside

Valuation Implications

Thesis 2: Boingo to Benefit From Military Spending Tailwinds (National Defense Authorization Act)

(in \$ millions, unless noted)

Revenue : The market is not fully appreciating the potential growth in **military subscribers** due to **government spending tailwinds**

Street Consensus: 78% Fill Rate FY 17E – 83% Fill Rate FY27

DCM: 78% Fill Rate FY 17E – 90% Fill Rate FY27

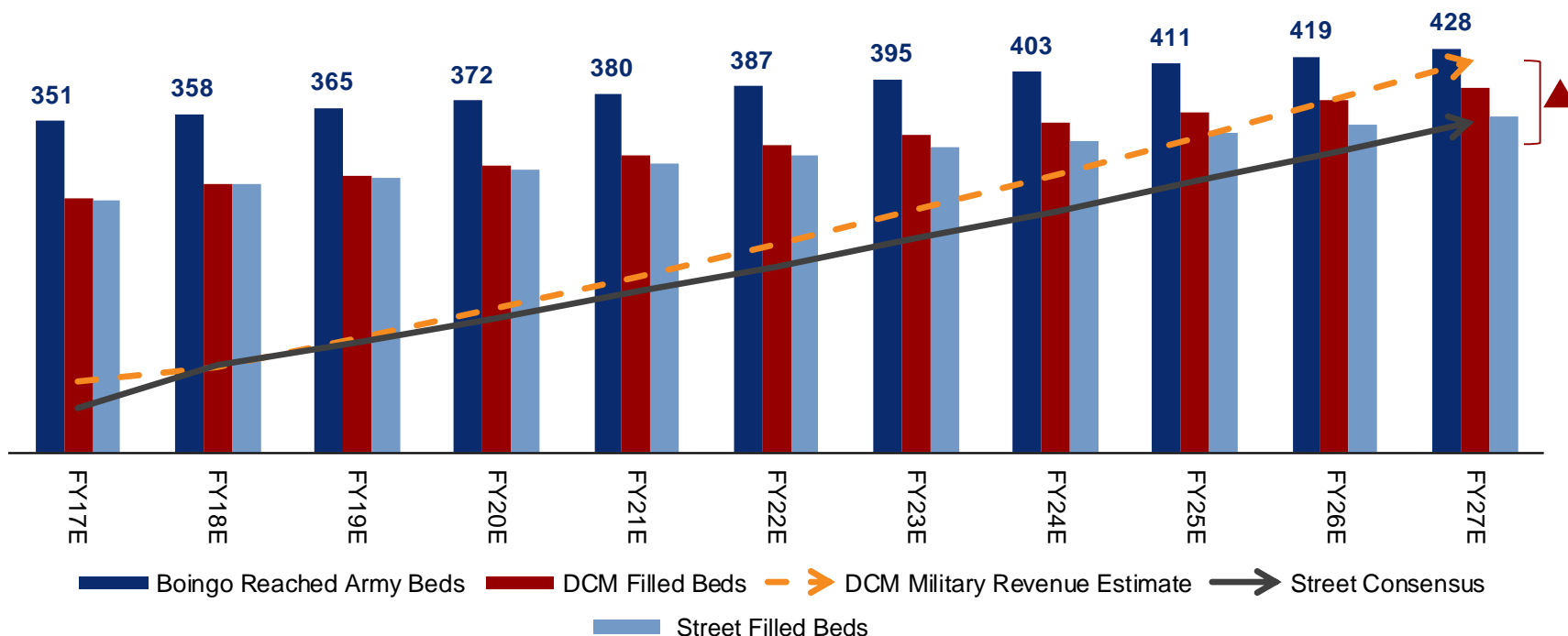
FY27E Delta: \$7.2MM

Drivers

Continued Military DAS buildout by Boingo
Significant bed capacity exists in US military bases
Military spending bill to boost bed fill rate in bases
As well as average pay per soldier (discretionary income)
DCM bullish on overall US military activity & political climate

Assumptions

Reached Army Beds: 2% CAGR
US Army Bed Fill Rate: 78% FY16A – 83% FY27E
Military Subscriber Penetration: 49.6% FY16A – 59.6% FY27E
Military Subscriber ARPU: Constant FY16A – FY27E



Source: DCM Model

Valuation Implications

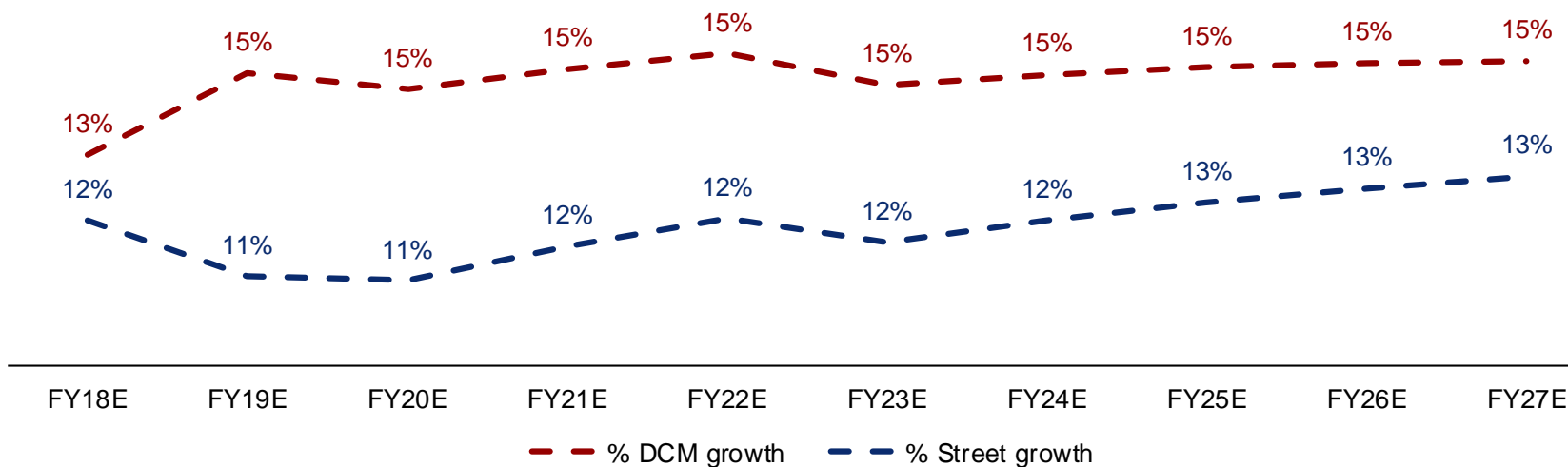
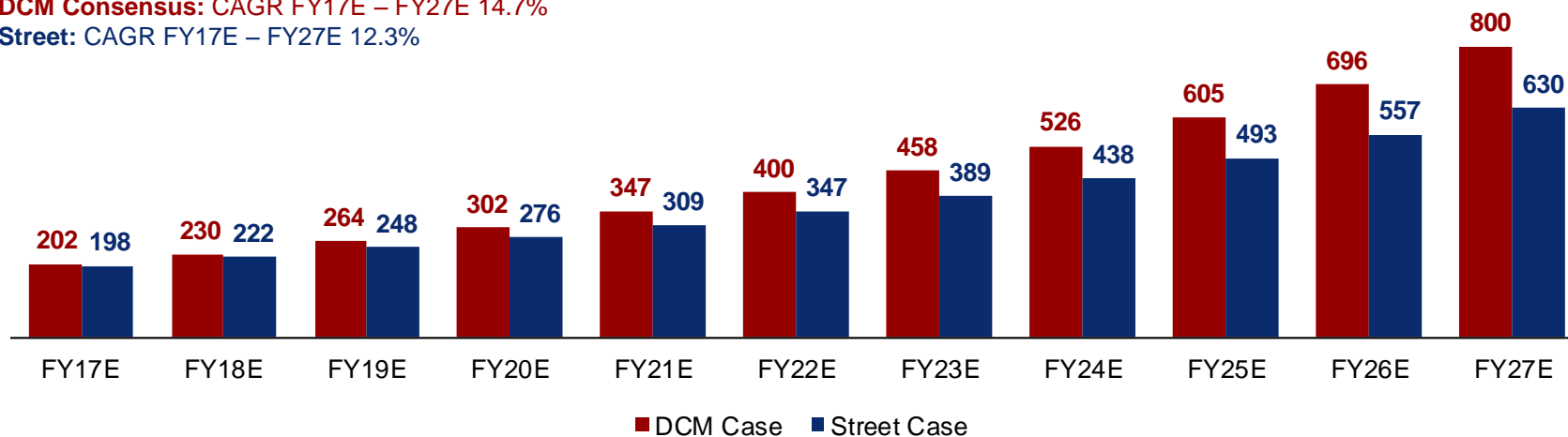
Revenue Summary

(in \$ millions, unless noted)

Implication: DCM is slightly more bullish than the street on topline growth, esp. in the short term

DCM Consensus: CAGR FY17E – FY27E 14.7%

Street: CAGR FY17E – FY27E 12.3%



Source: DCM Model

WACC Analysis

Peer Unlevered Betas Table

(in \$ millions, unless noted)

Beta Analysis					WACC Calculation	
Company	2YR L. Beta	Unlv. Beta	Tax Rate	D/E		
Airline Connectivity Peers (50%)					Levered beta	0.85
ViaSat	1.41	1.08	35.0%	46%	D/EV	13%
Gogo Inc	1.57	0.85	35.0%	132%	D/E	14.5%
DAS Vendors (25%)					R(f)	2.20%
Corning	1.11	0.95	35.0%	27%	MRP	4.50%
CommScope	1.13	0.39	35.0%	293%		
Tower Cos (25%)					Tax rate	34.00%
American Tower Corp	0.90	0.36	35.0%	233%	Cost of debt	3.8%
Crown Castle Corp	0.71	0.40	35.0%	120%	Cost of equity	8.4%
SBA Communications	0.92	0.70	35.0%	48%	Base WACC	7.66%
Industry Average	1.24	0.77	35.0%	118.0%	Small Cap Premium	4.00%
Boingo Wireless	0.93	0.77	34.0%	14.5%	Implied WACC	11.66%

Source: DCM Model

DCF Summary

Valuation Output: DCM Case

(in \$ millions, unless noted)

Income Statement	FY2014A	FY2015A	FY2016A	FY2017E	FY2018E	FY2019E	FY2020E	FY2021E	FY2022E	FY2023E	FY2024E	FY2025E	FY2026E	FY2027E	17E-27E CAGR
Net Sales	119	140	159	202	230	264	302	347	400	458	526	605	696	800	14.7%
% growth		17.0%	14.1%	27.0%	13.5%	14.8%	14.6%	14.9%	15.2%	14.7%	14.8%	14.9%	15.0%	15.0%	
Adjusted EBITDA	20	30	40	65	75	86	98	113	130	149	171	197	226	260	14.9%
% margin	17.0%	21.2%	25.3%	32.0%	32.5%	32.5%	32.5%	32.5%	32.5%	32.5%	32.5%	32.5%	32.5%	32.5%	
Adjusted EBIT	(11)	(12)	(12)	(2)	(1)	(0)	2	5	6	11	13	15	17	20	nm
% margin	-9.1%	-8.8%	-7.8%	-1.0%	-0.5%	0.0%	0.5%	1.5%	1.5%	2.5%	2.5%	2.5%	2.5%	2.5%	
Tax Expense	-	-	-	-	-	-	1	2	2	4	4	5	6	7	
% tax rate	34.0%	34.0%	34.0%	34.0%	34.0%	34.0%	34.0%	34.0%	34.0%	34.0%	34.0%	34.0%	34.0%	34.0%	
NOPAT				(2)	(1)	(0)	1	3	4	8	9	10	11	13	nm
(+) D&A				67	76	86	97	108	124	138	158	182	209	240	
(-) Capex				(126)	(142)	(167)	(183)	(205)	(222)	(232)	(266)	(306)	(352)	(405)	
(-) Changes in NWC				97	110	126	145	166	191	219	252	290	333	383	
Unlevered Free Cash Flow				36	42	45	59	72	97	133	152	175	201	231	20.6%
PV Unlevered Free Cash Flow				21	39	37	43	48	57	70	72	74	77	79	
Perpetuity Growth Method				Key Assumptions											
Terminal Value				2,444	Terminal Growth Rate										2.0%
PV of Terminal Value:				834	WACC										11.7%
Sum of PV of FCF				618	Tax Rate										34.0%
Implied enterprise value				1,452	FY27E US DAS Market Share										7.9%
Debt & debt equivalents				14	FY27E US Army Bed Fill Rate										90.0%
Cash and cash equivalents				22											
(-) Net debt				(8)											
(+) PV of NOL tax savings				8											
Implied equity value				1,468	Implied Share Price						Implied 2027E EV/EBITDA Multiple				
Basic shares outstanding				40											
Fully diluted shares outstanding				45											
Implied share price				\$32.39	WACC	Terminal Growth Rate				WACC	Terminal Growth Rate				
						\$32.39	1.50%	2.00%	2.50%		\$32.39	1.50%	2.00%	2.50%	
						12.38%	\$28.75	\$29.57	\$30.46		12.38%	9.2x	9.6x	10.1x	
						11.38%	\$32.53	\$33.60	\$34.80		11.38%	10.1x	10.7x	11.3x	
Current share price				\$25.10	WACC	10.38%	\$37.23	\$38.68	\$40.31	WACC	10.38%	11.3x	11.9x	12.7x	
Implied upside / (downside)				29.02%											

DCM Case With In-house View on Revenue Buildup Yields 29.02% Upside

Source: DCM Model

DCF Summary

Valuation Output: Street Case

(in \$ millions, unless noted)

Income Statement	FY2014A	FY2015A	FY2016A	FY2017E	FY2018E	FY2019E	FY2020E	FY2021E	FY2022E	FY2023E	FY2024E	FY2025E	FY2026E	FY2027E	17E-27E CAGR
Net Sales	119	140	159	198	222	248	276	309	347	389	438	493	557	630	12.3%
% growth		17.0%	14.1%	24.0%	12.4%	11.5%	11.4%	12.0%	12.4%	12.1%	12.4%	12.7%	12.9%	13.1%	
Adjusted EBITDA	20	30	40	63	72	80	90	100	113	127	142	160	181	205	12.5%
% margin	17.0%	21.2%	25.3%	32.0%	32.5%	32.5%	32.5%	32.5%	32.5%	32.5%	32.5%	32.5%	32.5%	32.5%	
Adjusted EBIT	(11)	(12)	(12)	(2)	(1)	(0)	1	5	5	10	11	12	14	16	nm
% margin	-9.1%	-8.8%	-7.8%	-1.0%	-0.5%	0.0%	0.5%	1.5%	1.5%	2.5%	2.5%	2.5%	2.5%	2.5%	
Tax Expense	-	-	-	-	-	-	0	2	2	3	4	4	5	5	
% tax rate	34.0%	34.0%	34.0%	34.0%	34.0%	34.0%	34.0%	34.0%	34.0%	34.0%	34.0%	34.0%	34.0%	34.0%	
NOPAT				(2)	(1)	(0)	1	3	3	6	7	8	9	10	nm
(+) D&A				65	73	80	88	96	108	117	131	148	167	189	
(-) Capex				(124)	(140)	(162)	(175)	(193)	(205)	(209)	(238)	(270)	(307)	(350)	
(-) Changes in NWC				95	106	118	132	148	166	186	209	236	267	302	
Unlevered Free Cash Flow				33	39	37	46	54	72	100	110	122	136	151	16.3%
PV Unlevered Free Cash Flow				18	35	31	34	36	43	53	52	52	52	52	
Perpetuity Growth Method				Key Assumptions											
Terminal Value				1,596	Terminal Growth Rate										2.0%
PV of Terminal Value:				545	WACC										11.7%
Sum of PV of FCF				458	Tax Rate										34.0%
Implied enterprise value				1,002	FY27E US DAS Market Share										5.8%
Debt & debt equivalents				14	FY27E US Army Bed Fill Rate										83.3%
Cash and cash equivalents				22											
(-) Net debt				(8)											
(+) PV of NOL tax savings				7											
Implied equity value				1,017	Implied Share Price					Implied 2027E EV/EBITDA Multiple					
Basic shares outstanding				40	Terminal Growth Rate					Terminal Growth Rate					
Fully diluted shares outstanding				45											
Implied share price				\$22.44	WACC	\$22.44	1.50%	2.00%	2.50%	WACC	\$REF1	1.50%	2.00%	2.50%	
						12.38%	\$20.04	\$20.57	\$21.16		12.38%	9.2x	9.6x	10.1x	
Current share price				\$25.10		11.38%	\$22.55	\$23.25	\$24.03		11.38%	10.1x	10.7x	11.3x	
Implied upside / (downside)				-10.59%		10.38%	\$25.66	\$26.60	\$27.67		10.38%	11.3x	11.9x	12.7x	

Conservative WACC yields downside with Street Operating Assumptions

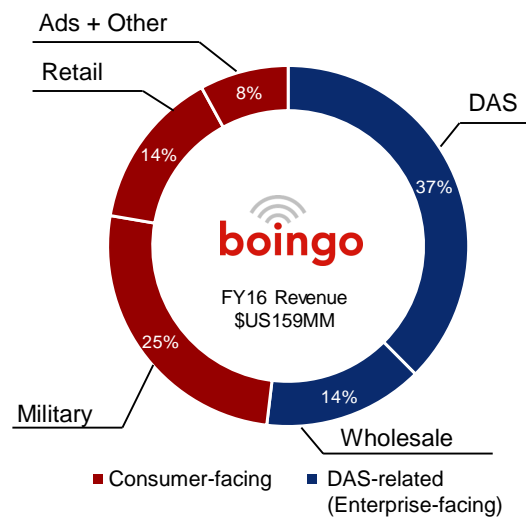
Source: DCM Model

Comparables Analysis

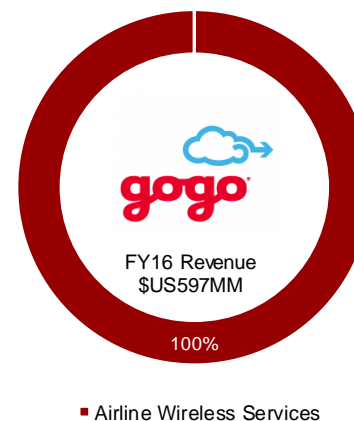
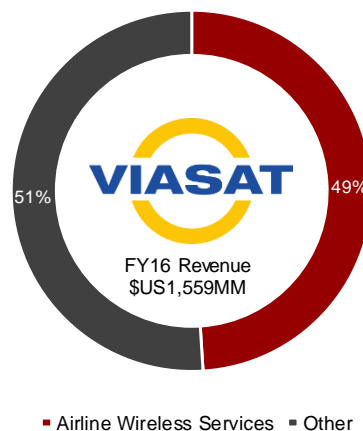
Peer Universe

(in \$ millions, unless noted)

Our Company



Airline Connectivity Peers



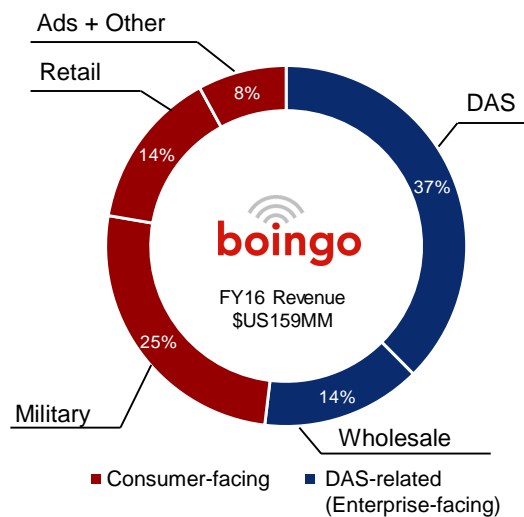
Source: Company Filings

Comparables Analysis

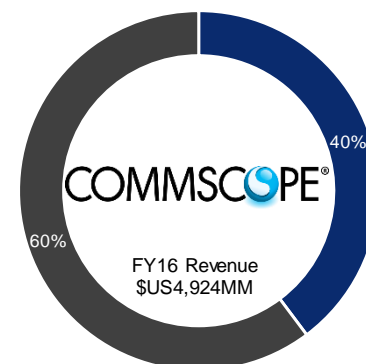
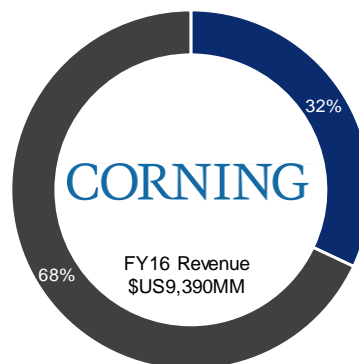
Peer Universe

(in \$ millions, unless noted)

Our Company



DAS Vendors



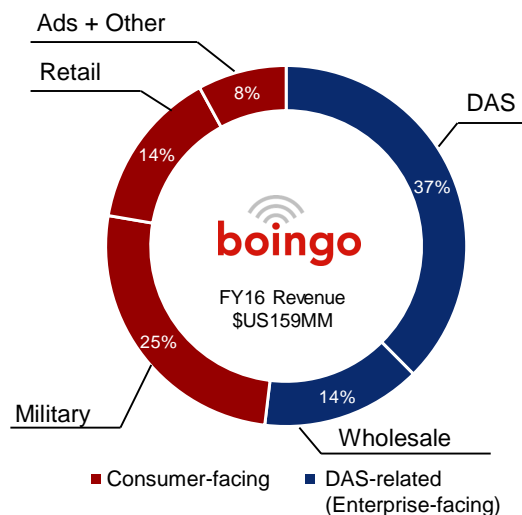
Source: Company Filings

Comparables Analysis

Peer Universe

(in \$ millions, unless noted)

Our Company

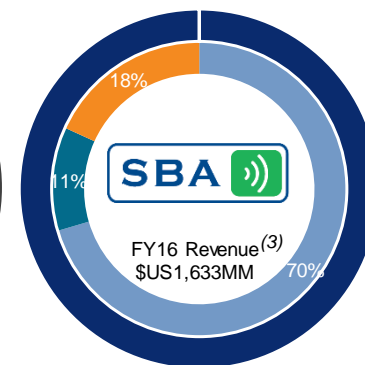
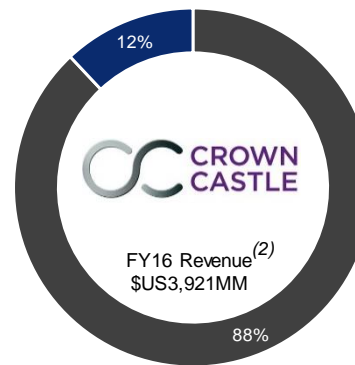
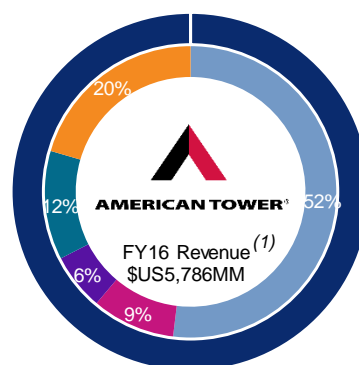


Tower Companies

(1) **US:** Verizon, AT&T, Sprint, T-Mobile; **Asia:** TATA, Idea Cellular, Vodafone, Airtel; **EMEA:** Airtel, MTN; **LatAm:** Telefónica, AT&T, Telecom Italia and Nextel

(2) **US:** 100%; **Customers:** Verizon, AT&T, Sprint, T-Mobile comprise ~90% of revenues

(3) **US:** AT&T: 26%; Sprint: 15%; T-Mobile: 15%; Verizon: 14%; **LatAm:** Oi S.A.: 7%; Telefonica: 4%



*"We own and operate **DAS networks** in the United States and certain international markets. We obtain rights from property owners to install and operate in-building DAS networks, and we grant rights to wireless service providers to attach their equipment to our installations. We also offer outdoor DAS networks as a complementary shared infrastructure solution for our tenants in the United States and in certain international markets" – AMT FY2016 10-K*

Comparables Analysis

Peer Universe

(in \$ millions, unless noted)

Overview		Operating Metrics				Valuation Metrics			
Company Name	EV	Levered Beta	Revenue Growth	Debt/Equity	EBITDA Margin	EV / Sales		EV / EBITDA	
		2Y	18E-19E	LTM	CY18E	CY18E	CY19E	CY18E	CY19E
Airline Connectivity Peers (25%)									
ViaSat	\$4,423	1.41	15.3%	46.4%	17.2%	2.7x	2.3x	15.6x	10.9x
Gogo Inc	\$1,348	1.57	10.5%	131.6%	13.0%	1.7x	1.6x	13.5x	8.7x
DAS Vendors (25%)									
Corning Incorporated	\$31,101	1.11	5.5%	26.6%	30.4%	2.9x	2.8x	9.5x	9.3x
CommScope	\$10,650	1.13	2.2%	293.3%	22.7%	2.2x	2.2x	9.8x	9.8x
Tower Cos (50%)									
American Tower Corp	\$27,525	0.90	6.6%	233.4%	62.0%	3.9x	3.6x	6.2x	5.8x
Crown Castle Corp	\$51,758	0.71	4.7%	120.0%	57.8%	9.9x	9.4x	17.1x	16.2x
SBA Communications	\$27,399	0.92	7.6%	48.2%	70.5%	14.9x	13.8x	21.1x	19.4x
Weighted Average		1.08	7.4%	129.2%	42.1%	6.0x	5.6x	13.5x	11.7x
25th Percentile		0.90	4.7%	46.4%	17.2%	2.2x	2.2x	9.5x	8.7x
75th Percentile		1.41	10.5%	233.4%	62.0%	9.9x	9.4x	17.1x	16.2x
Boingo Wireless	\$1,113	0.93	14.8%	14.5%	32.5%	4.8x	4.2x	14.9x	13.0x

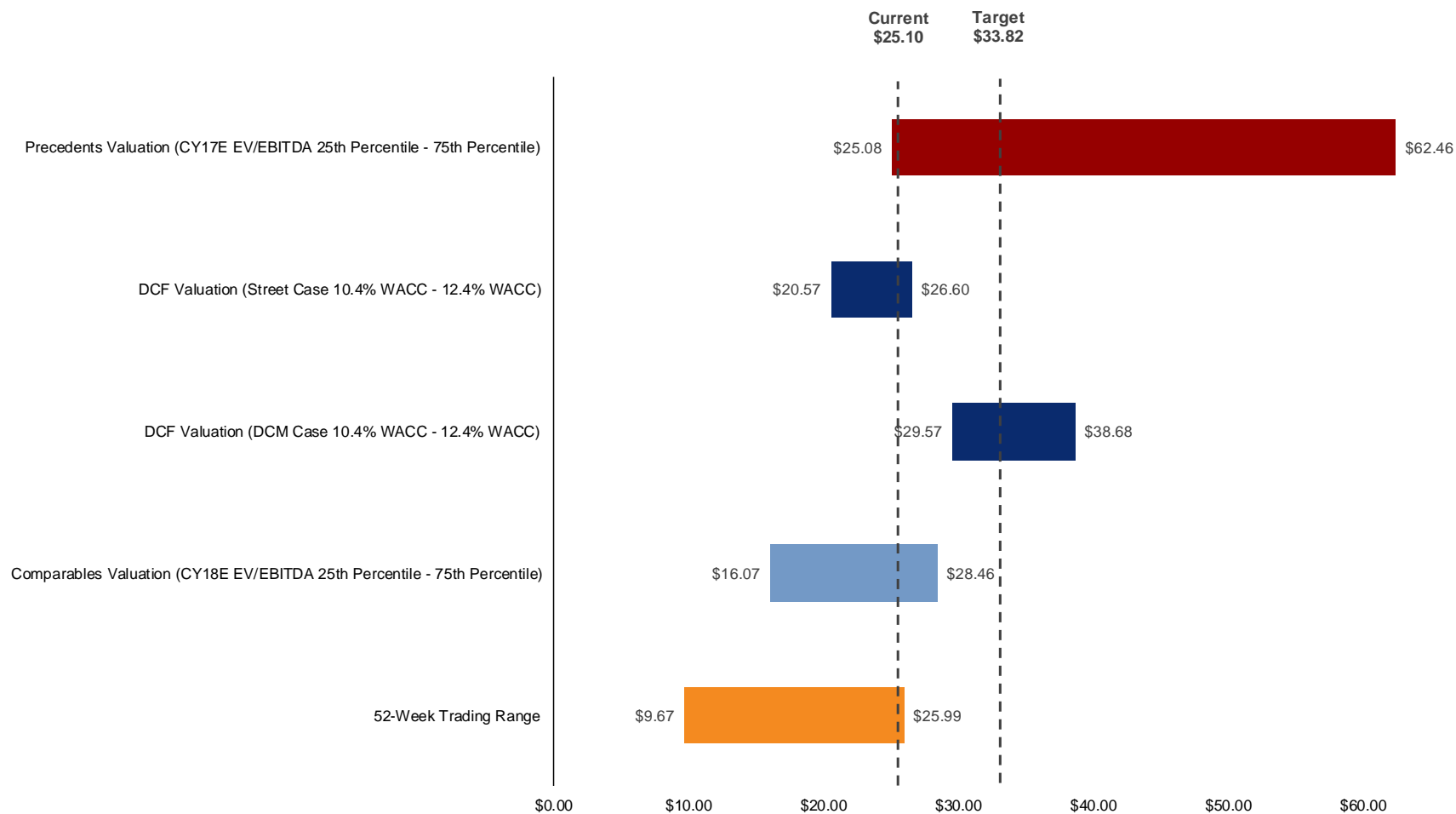
WIFI Trading At Slight Premium To Peers But Warranted By Significantly Higher Revenue Growth and Lower Beta

Source: DCM Model

Football Field

Illustrative Range

(in \$ millions, unless noted)



Implied Upside of 29.02% Based on DCM Proprietary Model: Recommend BUY

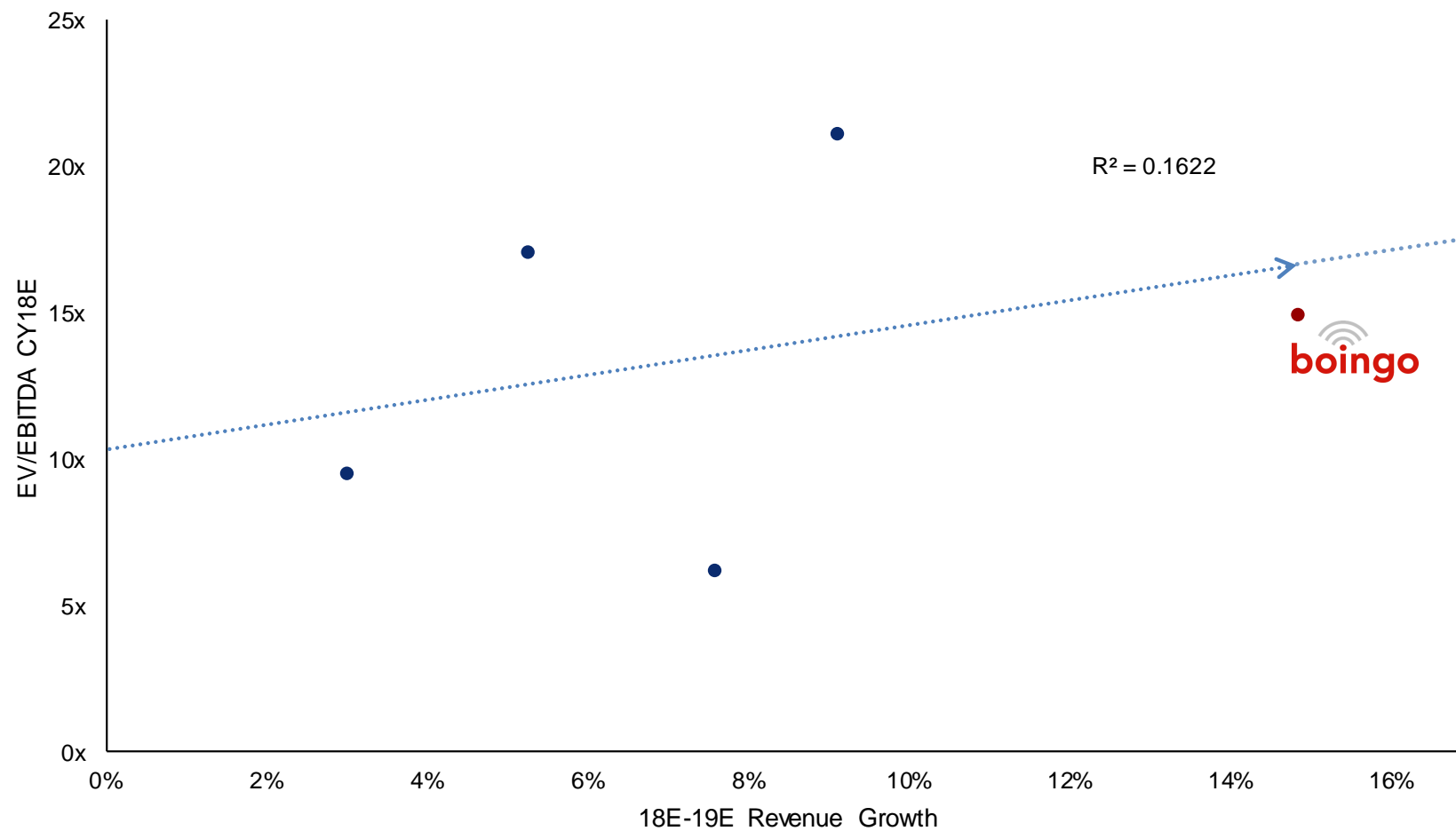
Source: DCM Model

Appendix

Multiples Regression

(in \$ millions, unless noted)

Multiple Regression Analysis



Source: DCM Model

Solium Sell Update

SECTION IV

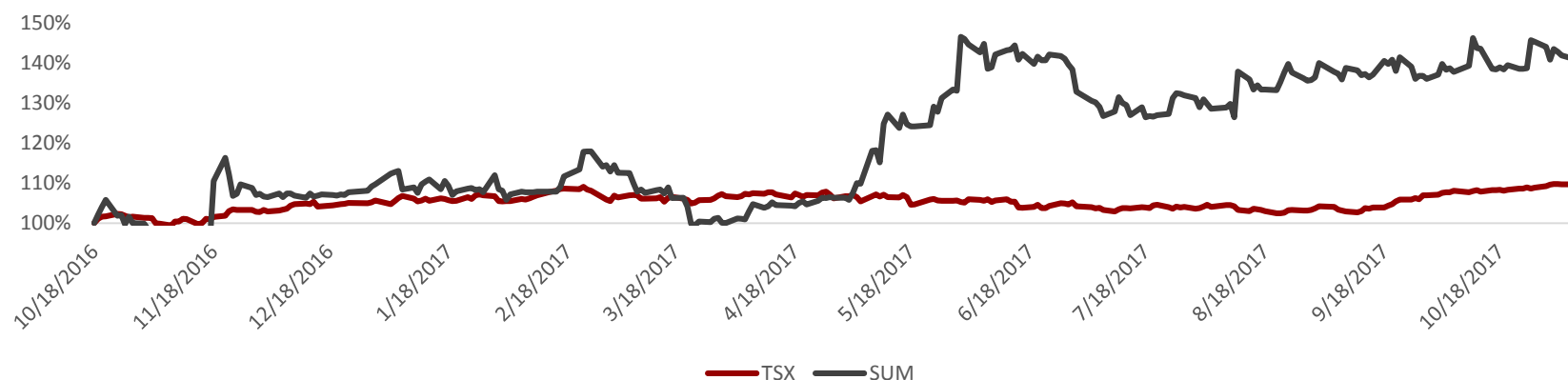


Solium Sell

DCM recognizes materialized investment theses for Solium

(in \$ millions, unless noted)

- ✓ **Thesis 1: International investments underappreciated**
 - International margins have increased at a faster rate than the market and DCM predicted
- ✓ **Thesis 2: Current margins depressed due to volatility in Canadian equity markets**
 - The TSX has returned 10% in the last year while Solium has returned 40%
 - At the time of pitch, the TSX was relatively depressed due to the fall in commodities
 - Canadian margins outperformed street forecasts over the holding period



- ✓ **Thesis 3: Proven track record of strategic bolt-on acquisitions likely to reoccur in the future**
 - Cash/Total assets has increased over the holding period while the company has pursued strategic M&A
 - One example includes Capshare (competitor) with over 10,000 subscribers
 - Although this thesis still has potential to materialize, we believe that the materialization of the first two theses and our valuation convince us of our sell rating

Source: Bloomberg

Solium Sell

Solium's model required several adjustments

(in \$ millions, unless noted)

Model Update

Last updated	11/7/2017	Tax rate	25%	PV of cash of flows	\$153,113	% Equity	100%
Case	base	Share price	\$10.95	PV of Terminal Value	\$220,770	%Debt	0%
Transaction Revenue	1	Upside	2%	Enterprise Value	\$373,882	risk free rate	2%
Terminal growth	2%			(+) Cash	\$85,600		
Output Price (USD)	\$8.75	USD/CAD	1.28	Market Value	\$459,482	Beta	0.8
Output Price (CAD)	\$11.20			share count	50711	MRP	6%
				options outstanding	2838.611	Small Cap Premium	3%
				weighted strike price (CAD)	\$4.58	Return of Equity	9.400%
				dilution from options	1353		
				RSU	430.226		
				fully diluted shares	52495	WACC	9.400%
				Price per share	\$8.75		

	Historical				Forecast											
Revenue by Segment	2013A	2014A	2015A	2016A	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E			
Canada	28289	32203	25145	27516	28341	29192	30067	30669	31282	31595	31911	32230	32552			
% growth		14%	-22%	9%	3%	3%	3%	2%	2%	1%	1%	1%	1%			
United States	35132	38253	35555	35939	40611	45891	51397	56537	61060	64113	66678	68011	69371			
% growth		9%	-7%	1%	13%	13%	12%	10%	8%	5%	4%	2%	2%			
International	4658	8690	11796	13764	17893	20577	23664	26030	28633	31496	34016	35717	36788			
% growth		87%	36%	17%	30%	15%	15%	10%	10%	10%	8%	5%	3%			
Total Revenue	\$68,079	\$79,146	\$72,496	\$77,219	\$86,846	\$95,659	\$105,129	\$113,236	\$120,975	\$127,205	\$132,605	\$135,958	\$138,712			
% growth		16%	-8%	7%	12%	10%	10%	8%	7%	5%	4%	3%	2%			
EBITDA by Segment																
Canada	9964	12457	7864	6641	9920	10217	10524	10734	10949	11058	11169	11281	11393			
% of revenue	35%	39%	31%	24%	35%	35%	35%	35%	35%	35%	35%	35%	35%			
United States	8158	10056	6355	6690	7310	9178	11307	13569	15265	19234	20003	23804	24280			
% of revenue	23%	26%	18%	19%	18%	20%	22%	24%	25%	30%	30%	35%	35%			
International	-661	-4085	-463	32	716	1029	1183	2603	4295	6299	8504	8929	9197			
% of revenue	-14%	-47%	-4%	0%	4%	5%	5%	10%	15%	20%	25%	25%	25%			
Total EBITDA	\$17,461	\$18,428	\$13,756	\$13,363	\$17,945	\$20,424	\$23,014	\$26,906	\$30,509	\$36,591	\$39,676	\$44,014	\$44,870			
% of revenue	26%	23%	19%	17%	21%	21%	22%	24%	25%	29%	30%	32%	32%			
Depreciation	-4837	-4470	-4532	-4827.25	-4342	-4783	-4205	-4529	-4839	-3816	-3978	-2719	-2774			
% of revenue	-7%	-6%	-6%	-6%	-5%	-5%	-4%	-4%	-4%	-3%	-3%	-2%	-2%			
Operating Income	\$12,624	\$13,958	\$9,224	\$8,536	\$13,603	\$15,641	\$18,809	\$22,377	\$25,670	\$32,775	\$35,698	\$41,295	\$42,096			

Summary

- Adjusted for higher than expected international margins
- Also adjusted for lower than expected performance for U.S. revenues
- Upwards revision on Canadian segment revenues
- Adjusted WACC for higher beta

Source: Bloomberg

Time Warner Merger Update

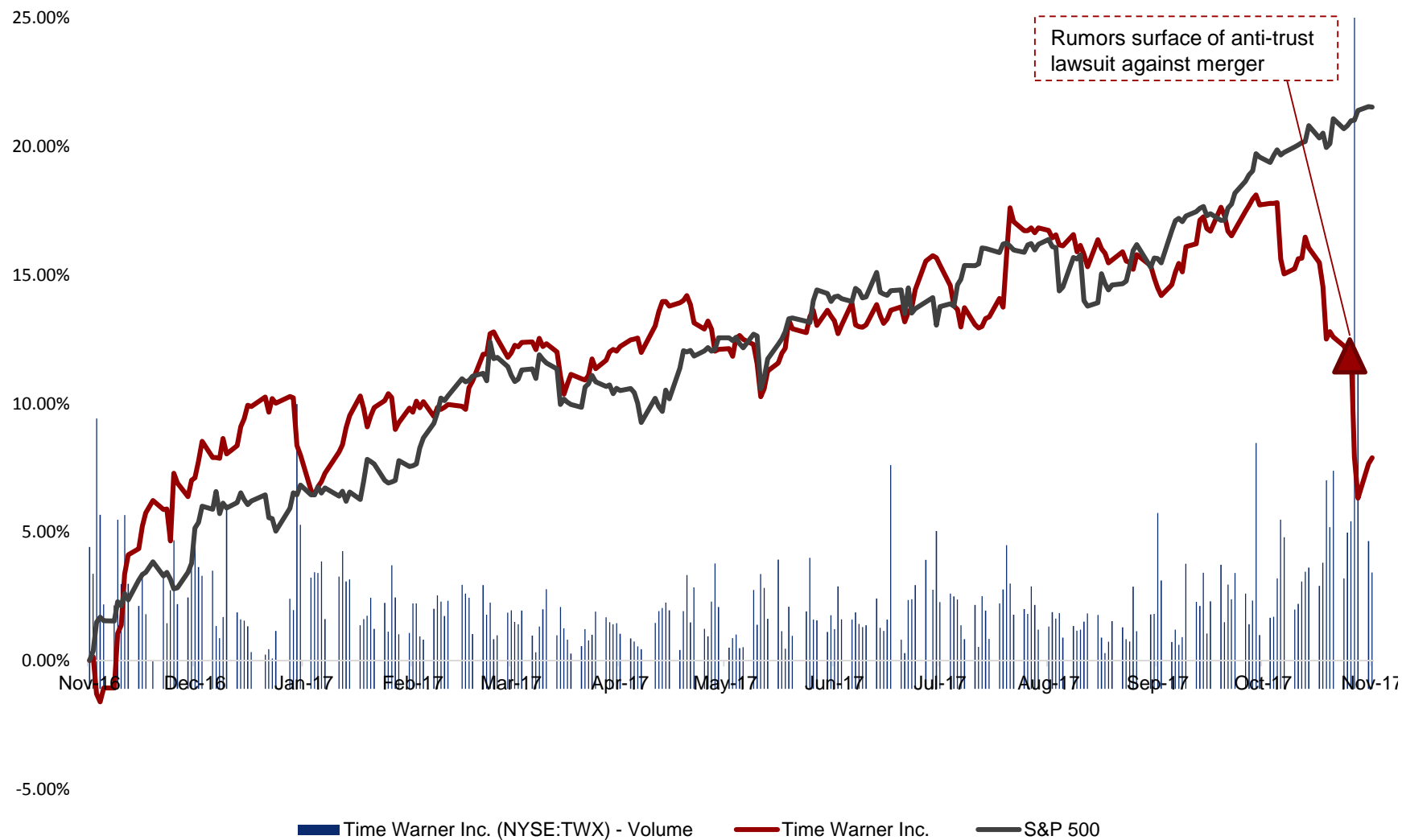
SECTION V



Time Warner Merger Update

Time Warner Chart Update

(in \$ millions, unless noted)



Source: Bloomberg

Time Warner Merger Update / Post Earnings

Quarterly Highlights

- On November 2, 2017 rumors about an anti-trust lawsuit surfaced that could potentially block the AT&T and Time Warner merger the stock dropped 6% following the announcement
- Justice Department's new antitrust chief takes a hands-on role in the review, according to people familiar with the matter
- Both companies had expected the deal to close by the end of fiscal 2017
- The Wall Street Journal said on Nov. 2 that the company and the Justice Department weren't close to an accord and that the department was preparing for litigation in case they don't reach a settlement

Earnings Highlights

\$USD millions except per share values		
Revenue		
Result		7595
EBITDA Margin		
Result		33.0%
EBITDA		
Result		2508
EPS (GAAP)		
Result		1.73

Key Points

- On October 22nd, AT&T announced a cash and share bid for Time Warner inc.
- The current market implied probability of the deal going through is 60%
- U.S. antitrust officials, who have blocked many tie-ups between direct competitors, rarely step in to stop vertical deals like this one
- Market overreacted to the news of potential litigation and unnecessarily sent the stock down (-6%)

We Cannot Make An Educated Decision On Time Warner As Limited News Has Been Published And We Believe The Market Overreacted To The News

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