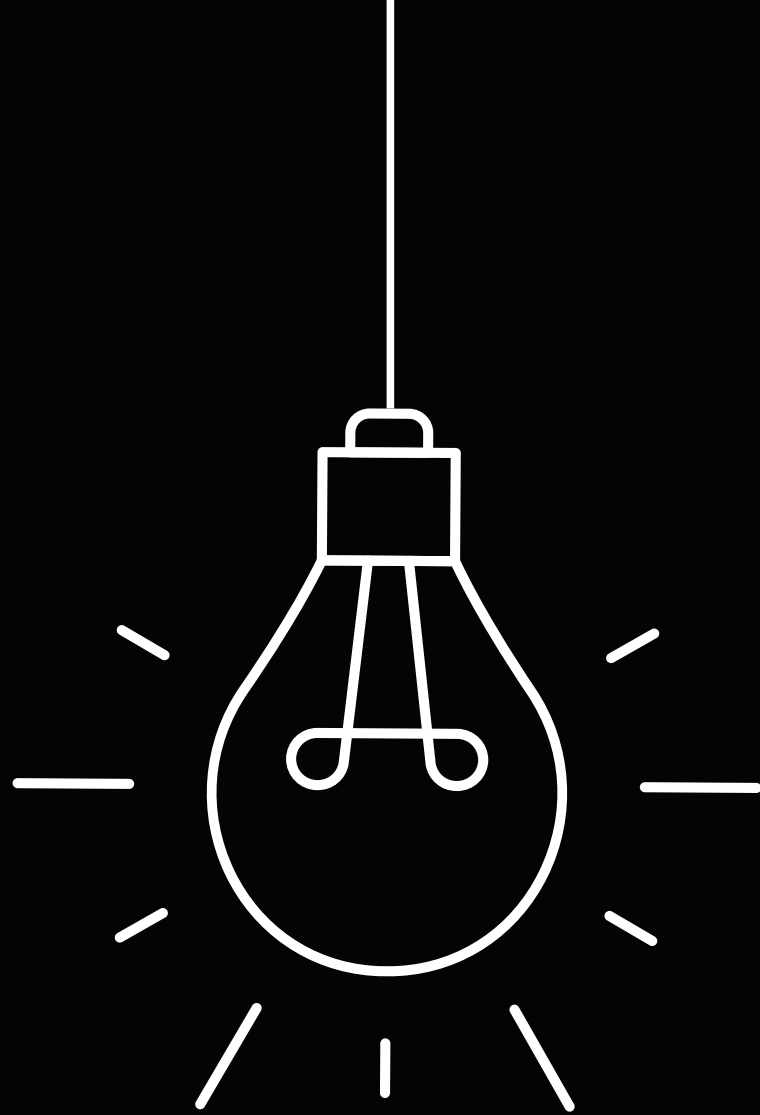


# COVVEN

# 15

**THEMES**  
TO FOCUS ON **2020**

A HANDBOOK FOR **PORTFOLIO MANAGERS**



OUR **AHEAD OF THE CURVE®** SERIES is the hallmark of Cowen's research effort. Each of our analysts is required to produce an Ahead of the Curve® report twice a year that focuses on a non-consensus idea, an investment controversy, or a topic we believe investors need to focus on in more depth.



Visit [www.cowen.com/themes2020](http://www.cowen.com/themes2020) to hear more from Cowen analysts on key investment themes and controversies.

Thematic research is arguably more important going into 2020 than it has been at any other time in the history of active US and global investment portfolio management.

Disruptive business models, trends and technologies are now touching virtually every industry, presenting opportunities and risks that are still in the early stages of their evolution. Moreover, these paradigm-changing developments are inextricably connected to the profound geopolitical rifts and shifts that tend to dominate headlines.

Teamwork and collaboration across analysts is the hallmark of Cowen Research. We work hard to keep sharp focus on our Ahead Of The Curve® mission of Outperformance, looking through a wide lens to develop a comprehensive, cross-sector view of the key themes we expect to drive investment gains and losses in 2020 and beyond.

In this Handbook, we once again highlight the Cowen analysts with domain expertise and company coverage most levered to our focus themes, along with selections of representative research and events.

We hope this work is helpful to you in the year ahead.

Sincerely,

Robert Fagin  
Director of Research  
Cowen

## COWEN RESEARCH LANDSCAPE



## COWEN THEMES

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# CANNABIS

We expect the cannabis industry to generate \$85B in US sales in 2030. However, the nascent legal cannabis industry faces challenges as it evolves into the mainstream, despite encouraging consumer and political trends. Increased demand has been balanced by supply shortages and slow retail rollout in Canada. Growing adoption of THC and CBD products in the US, along with political advances toward legalization, have been offset by concerns around vaping-related illnesses and a persistent illicit market. Incidence trends lead us to believe these headwinds will become positive catalysts as this global sector evolves from infancy. However, investors should expect volatility matching the disruptive size and potential of the cannabis industry in 2020 and beyond.



## WHAT WE'RE WATCHING

- Profitability
- Canadian Cannabis 2.0
- Retail rollout
- Illicit market
- Vaping issues





# THE POLITICS OF CANNABIS HAVE CHANGED MORE QUICKLY THAN ALMOST ANY OTHER ISSUE IN WASHINGTON

**JARET SEIBERG**  
CANNABIS POLICY: UPDATING THE LEGISLATIVE LANDSCAPE AS CONGRESS RETURNS

# WELL-RATIONALIZED SCALE, PROFITABLE OPERATIONS AND OPTIONALITY THROUGH M&A ARE KEY VALUE DRIVERS FOR MEANINGFUL UPSIDE

**VIVIEN AZER**  
THE GREEN RUSH NEEDS TO MAKE GOOD ON ITS PROMISE

## REPRESENTATIVE RESEARCH

**AHEAD OF THE CURVE®** SERIES  
**COWEN'S COLLECTIVE VIEW OF CBD**  
February 25, 2019  
Cowen Analysts: Vivien Azer, John Blackledge, Andrew Charles, Oliver Chen, John Kernan, CFA, Phil Nadeau, Ph.D., Charles Neivert, Jeffrey Osborne, Charles Rhyee, Doug Schenkel, Eric Assaraf

**AHEAD OF THE CURVE®** SERIES  
**THE MEDICAL CANNABIS AND CANNABINOID LANDSCAPE**  
March 8, 2019  
Cowen Analyst: Phil Nadeau, Ph.D.

**AHEAD OF THE CURVE®** SERIES  
**UNCOVERING THE COVERT CANNABIS CONSUMER**  
May 20, 2019  
Cowen Analyst: Vivien Azer

**CANNABIS POLICY: UPDATING THE LEGISLATIVE LANDSCAPE AS CONGRESS RETURNS**  
September 4, 2019  
Cowen Analyst: Jaret Seiberg

**AHEAD OF THE CURVE®** SERIES  
**THE GREEN RUSH NEEDS TO MAKE GOOD ON ITS PROMISE**  
September 13, 2019  
Cowen Analyst: Vivien Azer

**AHEAD OF THE CURVE®** SERIES  
**DISRUPTION JUNCTION, THE CANNABIS GROWTH FUNCTION**  
November 11, 2019  
Cowen Analyst: Vivien Azer

## COWEN COMPANY COVERAGE

ACREAGE HOLDINGS **ACRG/U**  
AURORA CANNABIS **ACB**  
CANOPY GROWTH CORPORATION **WEED**  
CRESCO LABS **CRLBF**  
CURALEAF HOLDINGS **CURLF**  
GREEN THUMB INDUSTRIES **GTBIF**  
GREENLANE HOLDINGS **GNLN**  
GW PHARMACEUTICALS **GWPH**  
KUSHCO HOLDINGS **KSHB**  
MEDMEN ENTERPRISES **MMNFF**  
PERKIN ELMER **PKI**  
SUNDIAL GROWERS **SNDL**  
THE CRONOS GROUP **CRON.CN**  
TILRAY **TLRY**

## SELECTED EVENTS

**39<sup>TH</sup> ANNUAL HEALTH CARE CONFERENCE**  
March 11-13, 2019 | Boston, MA

**5<sup>TH</sup> ANNUAL FUTURE OF THE CONSUMER CONFERENCE**  
April 2, 2019 | New York, NY

**NEW YORK CBD BUS TOUR**  
April 3, 2019 | New York, NY

**TORONTO CANNABIS SUMMIT**  
May 22, 2019 | Toronto, ON

**DC DAY: CANNABIS**  
July 11, 2019 | Washington, DC

**2<sup>ND</sup> ANNUAL CANNABIS CONFERENCE**  
November 12-13 | Boston, MA

## COWEN ANALYSTS

**VIVIEN** AZER  
**JARET** SEIBERG  
**CHRIS** KRUEGER

**PHIL** NADEAU, PH.D.  
**JOHN** BLACKLEDGE  
**ANDREW** CHARLES, CFA

**OLIVER** CHEN, CFA  
**JOHN** KERNAN, CFA  
**JEFFREY** OSBORNE

**CHARLES** RHYEE  
**DOUG** SCHENKEL  
**CHARLES** NEIVERT

**ERIC** ASSARAF  
**GERALD** PASCARELLI, CFA  
**GEORGE** MIHALOS



# MILLENNIALS + GEN Z

Millennials and Gen Z will represent 70% of the global population by 2028, but will not command the lion's share of wealth until 2050 as part of a generational transfer, representing a paradox in the worlds of traditional retail, e-commerce, technology and beyond. Millennials and Gen Z are more responsive to differentiated physical experiences than prior generations, and yet are leading the revolution of online shopping. They are focused on value, while growing sneaker purchases into an alternative asset class. We expect to see increasing focus on this population in the years to come, culminating in a retail environment reflecting this generation's life-cycle, attitudes and consumption patterns.



## WHAT WE'RE WATCHING

- P2P transactions
- Ride-sharing growth
- Instagram brand influence
- Supply chain evolution



74M

ESTIMATED US MILLENNIAL  
POPULATION BY 2050

40%

SURVEYED INSTAGRAM  
USERS WHO HAVE  
PURCHASED A PRODUCT  
FROM A BRAND  
DISCOVERED ON  
THE PLATFORM

78%

MILLENNIALS SURVEYED  
WHO SAY THEY DO NOT  
WANT TO BUY THE BRANDS  
THEY GREW UP WITH

+633BPS

INCREASE IN 4-5 PAIR  
SNEAKER OWNERSHIP BY  
MILLENNIALS AND GEN Z  
WOMEN OVER THE LAST 5  
YEARS

## REPRESENTATIVE RESEARCH

### AHEAD OF THE CURVE® SERIES

#### GEN Z + MILLENNIALS REACH FOR SUSTAINABILITY, VALUE

October 4, 2019

Cowen Analysts: John Kernan, CFA, John Blackledge, Oliver Chen, CFA,  
George Mihalos

### AHEAD OF THE CURVE® SERIES

#### SNEAKERS AS AN ALTERNATIVE ASSET CLASS

April 15, 2019

Cowen Analysts: John Kernan, CFA, John Blackledge

### AHEAD OF THE CURVE® SERIES

#### DIGITAL DELIVERY: SURVEY SAYS INFLECTION UNDERWAY

January 11, 2019

Cowen Analysts: Andrew Charles, CFA, Thomas Champion

### AHEAD OF THE CURVE® SERIES

#### CONNECTIONS, CONTEXT & COMMUNITY DRIVE CUSTOMER LIFETIME VALUE

April 12, 2019

Cowen Analysts: Oliver Chen, CFA, John Kernan, CFA

### AHEAD OF THE CURVE® SERIES

#### RESTAURANTS SHOULD ROOT FOR PLANT-BASED PROTEINS

October 1, 2019

Cowen Analysts: Andrew Charles, CFA, Steve Scala, R.Ph., CFA, Charles Neivert

## COWEN ANALYSTS

JOHN KERNAN, CFA

JOHN BLACKLEDGE

OLIVER CHEN, CFA

GEORGE MIHALOS

STEVE SCALA, R.PH., CFA

CHARLES NEIVERT

ANDREW CHARLES, CFA

THOMAS CHAMPION

VIVIEN AZER

## COWEN COMPANY COVERAGE

ACREAGE HOLDINGS **ACRG/U**

ADIDAS AG **ADS.GR**

ALPHABET **GOOG**

AMAZON **AMZN**

APPLE **AAPL**

AURORA CANNABIS **ACB**

BURLINGTON STORES **BURL**

CANOPY GROWTH CORPORATION **WEED**

CRESCO LABS **CRLBF**

COSTCO WHOLESALE **COST**

CURALEAF HOLDINGS **CURLF**

E.L.F. BEAUTY **ELF**

FACEBOOK **FB**

FARFETCH LIMITED **FTCH**

GREENLANE HOLDINGS **GNLN**

GREEN THUMB INDUSTRIES **GTBIF**

GROCERY OUTLET **GO**

GRUBHUB **GRUB**

KOHL'S CORPORATION **KSS**

KUSHCO HOLDINGS **KSHB**

LULULEMON ATHLETICA **LULU**

LYFT **LYFT**

LVMH MOET HENNESSEY LOUIS

VUITTON SE **MC FP**

MACY'S **M**

MASTERCARD **MA**

MEDMEN ENTERPRISES **MMNFF**

NIKE **NKE**

NETFLIX **NFLX**

NORDSTROM **JWN**

PAYPAL **PYPL**

PELOTON INTERACTIVE **PTON**

PLANET FITNESS **PLNT**

PVH CORP. **PVH**

ROSS STORES **ROST**

SALLY BEAUTY HOLDINGS **SBH**

SNAP **SNAP**

SUNDIAL GROWERS **SNDL**

THE CRONOS GROUP **CRON.CN**

THE TJX COMPANIES **TJX**

TIFFANY & CO. **TIF**

TWITTER **TWTR**

UBER TECHNOLOGIES **UBER**

ULTA BEAUTY **ULTA**

VISA **V**

VF CORPORATION **VFC**

WALMART **WMT**

## SELECTED EVENTS

### 5<sup>TH</sup> ANNUAL FUTURE OF THE CONSUMER CONFERENCE

April 2, 2019 | New York, NY

### 47<sup>TH</sup> ANNUAL TECHNOLOGY, MEDIA & TELECOM CONFERENCE

May 29-30, 2019 | New York, NY

### 7<sup>TH</sup> ANNUAL INTERNET BUS TOUR

August 12-14, 2019 | Seattle & West Coast

### 4<sup>TH</sup> ANNUAL CONSUMER BUS TOUR

August 20, 2019 | Seattle, WA

### 5<sup>TH</sup> ANNUAL FINTECH BUS TOUR

November 7, 2019 | Atlanta, GA



# ESG

ESG initiatives and the physical risks imposed by climate change are increasingly important investment considerations, resulting in a growing focus on the externalities supporting transition to a lower carbon economy. In the coming years, we expect ESG and climate change to play a material role in assessing the risks and overall attractiveness of portfolio investments, potentially bolstered by financial regulators. Meanwhile, these factors continue to gain momentum in driving consumption and purchasing decisions, even prompting strategic changes around supply chain and working capital. Asset managers will continue to pressure valuation multiples for companies that are out of step.



## WHAT WE'RE WATCHING

- EVs
- Re-commerce
- Ride-sharing
- Supply chain evolution
- Renewable energy growth





1/4

INVESTMENT DOLLARS  
DEPLOYED IN US USING  
ESG SCREENING  
METHODOLOGIES

\$12T

SUSTAINABLE, RESPONSIBLE  
AND IMPACT INVESTING  
ASSETS IN THE US

70

POUNDS OF CLOTHING AND  
TEXTILES THROWN AWAY BY  
AVERAGE US CITIZEN EACH  
YEAR

72%

SURVEY RESPONDENTS AGE 18-34  
INDICATING SOCIAL IMPACT &  
SUSTAINABILITY AS AN  
IMPORTANT PART OF BRAND  
PURCHASING DECISIONS

REPRESENTATIVE **RESEARCH**

**AHEAD OF THE CURVE®** SERIES  
**ESG PRIMER - ASSESSING CLIMATE CHANGE RISK ON VARIOUS INDUSTRIES**  
February 14, 2019  
Cowen Analysts: Jeffrey Osborne, Vivien Azer, Charles Neivert, Jason Gabelman, Gautam Khanna, Joseph Giordano, CFA, Helane Becker, Chris Krueger

**AHEAD OF THE CURVE®** SERIES  
**TIGHTER EU CO2 EMISSIONS TARGETS TO DRIVE EV ADOPTION**  
January 9, 2019  
Cowen Analyst: Jeffrey Osborne

**AHEAD OF THE CURVE®** SERIES  
**SUSTAINABLE ENERGY & INDUSTRIAL TECHNOLOGY PRIMER**  
May 14, 2019  
Cowen Analysts: Jeffrey Osborne, Joseph Giordano, CFA, Jason Gabelman, David Deckelbaum, CFA

**AHEAD OF THE CURVE®** SERIES  
**SEEING SOME MIXED SIGNALS IN US MUNI SPENDING**  
July 1, 2019  
Cowen Analyst: Joseph Giordano, CFA

**AHEAD OF THE CURVE®** SERIES  
**GEN Z + MILLENNIALS REACH FOR SUSTAINABILITY, VALUE**  
October 4, 2019  
Cowen Analysts: John Kernan, CFA, Oliver Chen, CFA

**AHEAD OF THE CURVE®** SERIES  
**PART 1: AIRLINES FOCUSED ON REDUCING THEIR CARBON FOOTPRINT**  
May 15, 2019  
Cowen Analyst: Helane Becker

COWEN **ANALYSTS**

<b>JEFFREY</b> OSBORNE	<b>GAUTAM</b> KHANNA
<b>JOSEPH</b> GIORDANO, CFA	<b>JOHN</b> KERNAN, CFA
<b>HELANE</b> BECKER	<b>OLIVER</b> CHEN, CFA
<b>CHARLES</b> NEIVERT	<b>JASON</b> GABELMAN
<b>VIVIEN</b> AZER	<b>DAVID</b> DECKELBAUM, CFA

COWEN **COMPANY COVERAGE**

ACCENTURE <b>ACN</b>	KOHL'S CORPORATION <b>KSS</b>
ACUITY BRANDS <b>AYI</b>	LAM RESEARCH <b>LRCX</b>
ADOBE SYSTEMS <b>ADBE</b>	MACY'S <b>M</b>
AGILENT TECHNOLOGIES <b>A</b>	MICROSOFT <b>MSFT</b>
ALASKA AIR GROUP <b>ALK</b>	NVIDIA CORPORATION <b>NVDA</b>
ALLIANCE DATA SYSTEMS <b>ADS</b>	ORACLE <b>ORCL</b>
ALPHABET <b>GOOG</b>	ORMAT TECHNOLOGIES <b>ORA</b>
APPIAN CORPORATION <b>APPN</b>	PVH CORP. <b>PVH</b>
APPLIED MATERIALS <b>AMAT</b>	ROCKWELL AUTOMATION <b>ROK</b>
APTIV <b>APTV</b>	SALESFORCE.COM <b>CRM</b>
AT&T <b>T</b>	SERVICENOW <b>NOW</b>
ATLASSIAN <b>TEAM</b>	STARBUCKS CORPORATION <b>SBUX</b>
BORGWARNER <b>BWA</b>	TARGET <b>TGT</b>
CENTURYLINK <b>CTL</b>	TERADATA <b>TDC</b>
CISCO SYSTEMS <b>CSCO</b>	TESLA <b>TSLA</b>
DANAHER CORPORATION <b>DHR</b>	THE REALREAL <b>REAL</b>
DELTA AIR LINES <b>DAL</b>	TPI COMPOSITES <b>TPIC</b>
DXC TECHNOLOGY <b>DXC</b>	UBER TECHNOLOGIES <b>UBER</b>
FARFETCH <b>FTCH</b>	UNITED PARCEL SERVICE <b>UPS</b>
FIRST SOLAR <b>FSLR</b>	VERIZON COMMUNICATIONS <b>VZ</b>
FLOWERVE <b>FLS</b>	VF CORPORATION <b>VFC</b>
HANNON ARMSTRONG <b>HASI</b>	WORKDAY <b>WDAY</b>
HUBSPOT <b>HUBS</b>	XILINX <b>XLNX</b>
INGERSOLL-RAND PLC <b>IR</b>	XYLEM <b>XYL</b>
ITRON <b>ITRI</b>	YUM! BRANDS <b>YUM</b>

SELECTED **EVENTS**

**5<sup>TH</sup> ANNUAL FUTURE OF THE CONSUMER CONFERENCE**  
April 12, 2019 | New York, NY

**SUSTAINABILITY TRACK – 47<sup>TH</sup> ANNUAL TECHNOLOGY, MEDIA & TELECOM CONFERENCE**  
May 29-30, 2019 | New York, NY

**12<sup>TH</sup> ANNUAL GLOBAL TRANSPORTATION CONFERENCE**  
September 4-5 | Boston, MA

**4<sup>TH</sup> ANNUAL INDUSTRIAL INNOVATION & TECHNOLOGY CONFERENCE**  
November 19, 2019 | New York, NY



# FOOD TECH

The restaurant industry is undergoing a broad technological renaissance that spans digital ordering for pick-up, third-party delivery and point of sale software. Further, we are seeing technology extend to menu innovation, as plant-based proteins have emerged as the greatest disruptor to the restaurant industry in 2019. With consumers paying a premium for products and services improving sustainability, speed, convenience and wellness, food technology is a disruptive theme that is bolstering sales, spurring innovation and ripe for M&A.



## WHAT WE'RE WATCHING

- Plant-based proteins
- Restaurant POS
- Pay Fac
- Delivery



SURVEY DATA LEAD US TO BELIEVE THAT PLANT-BASED PROTEINS ARE AN ENDURING SALES DRIVER RATHER THAN A FAD

ANDREW CHARLES, CFA  
RESTAURANTS SHOULD ROOT FOR PLANT-BASED PROTEINS

WE PROJECT DELIVERY TO ACCOUNT FOR 16% OF ‘19-’23 INDUSTRY SALES GROWTH

ANDREW CHARLES, CFA  
DIGITAL DELIVERY: SURVEY SAYS INFLECTION UNDERWAY

REPRESENTATIVE RESEARCH

AHEAD OF THE CURVE® SERIES  
DIGITAL DELIVERY: SURVEY SAYS INFLECTION UNDERWAY  
January 11, 2019  
Cowen Analysts: Andrew Charles, CFA, Thomas Champion

AHEAD OF THE CURVE® SERIES  
RESTAURANTS ARE HUNGRY FOR POS TECHNOLOGY  
May 22, 2019  
Cowen Analysts: George Mihalos, Andrew Charles, CFA, Thomas Champion

AHEAD OF THE CURVE® SERIES  
RESTAURANTS SHOULD ROOT FOR PLANT-BASED PROTEINS  
October 1, 2019  
Cowen Analysts: Andrew Charles, CFA, Steve Scala, R.Ph., CFA, Charles Neivert

RESTAURANT DELIVERY EXTRAVAGANZA: F.O.C. CONFERENCE & COWEN F.O.C. TAKEAWAYS  
April 8, 2019  
Cowen Analyst: Andrew Charles, CFA

A DISCUSSION WITH KITCHEN UNITED’S CEO  
October 10, 2019  
Cowen Analysts: Andrew Charles, CFA, Thomas Champion

COWEN ANALYSTS

ANDREW CHARLES, CFA  
JOHN BLACKLEDGE  
THOMAS CHAMPION  
GEORGE MIHALOS

COWEN COMPANY COVERAGE

AMAZON AMZN  
CHIPOTLE MEXICAN GRILL CMG  
DOMINO’S PIZZA DPZ  
DUNKIN’ BRANDS DNKN  
FRESHII FRII.CN  
GLOBAL PAYMENTS GPN  
GRUBHUB GRUB  
HABIT RESTAURANTS HABT  
JACK IN THE BOX JACK  
MCDONALD’S MCD  
RESTAURANT BRANDS INTERNATIONAL QSR  
SHAKE SHACK SHAK  
SQUARE SQ  
THE WENDY’S COMPANY WEN  
STARBUCKS CORPORATION SBUX  
UBER TECHNOLOGIES UBER  
WINGSTOP WING  
YELP YELP  
YUM! BRANDS YUM

SELECTED EVENTS

5TH ANNUAL FUTURE OF THE CONSUMER CONFERENCE  
April 2, 2019 | New York, NY  
47TH ANNUAL TECHNOLOGY, MEDIA & TELECOM CONFERENCE  
May 29-30, 2019 | New York, NY



# 5G

5G is expected to meaningfully expand the use-case for wireless networks, creating a new set of possibilities for automation and efficiency in nearly every industry. As the path toward ‘true’ 5G unfolds, risks and capital intensity come into focus, raising issues of national security, international competition and trade, and the substantial investments required for the potential of 5G to be realized. Beginning in 2022-23, we expect to see new investment opportunities emerge around enterprise / industrial 5G, which will still be in the early stages of a long-term secular move toward further advancement of the cloud, data analytics and IA revolution.



## WHAT WE'RE WATCHING

- Release 16
- Carrier rollouts
- Small cells / fiber



# CABLE COULD ENJOY > \$1.5B IN THIRD-PARTY BACKHAUL REVENUE PER ANNUM, WITH AN IMPLIED ~\$20B OF VALUE CREATION FOR BACKHAUL SUPPLIERS

GREGORY WILLIAMS, CFA

CABLE AND 5G: OPPORTUNITY WITH SMALL CELL BACKHAUL, RISK WITH FIXED WIRELESS

# 5G HAS THE POTENTIAL TO ADD 36% GROWTH IN OPERATOR GLOBAL REVENUES IN 2026

COLBY SYNESAE

ONE VISION, MANY PATHS; DEFINING “TRUE” 5G

## REPRESENTATIVE RESEARCH

**AHEAD OF THE CURVE®** SERIES  
**ONE VISION, MANY PATHS; DEFINING “TRUE” 5G**  
May 6, 2019  
Cowen Analysts: Colby Synesael, Greg Williams, CFA, Krish Sankar, Joseph Giordano, CFA, Karl Ackerman, CFA, Matthew D. Ramsay, Paul Silverstein

**AHEAD OF THE CURVE®** SERIES  
**COHERENT TECHNOLOGY’S BEST DAYS STILL AHEAD**  
October 14, 2019  
Cowen Analysts: Paul Silverstein, Colby Synesael, Greg Williams, CFA, Matthew D. Ramsay, Karl Ackerman, CFA

**CABLE AND 5G: OPPORTUNITY WITH SMALL CELL BACKHAUL, RISK WITH FIXED WIRELESS**  
May 6, 2019  
Cowen Analysts: Greg Williams, CFA, Colby Synesael

**5G TECH WAR: TRUMP EO SIGNALS TO ALLIES TO SPURN HUAWEI**  
May 16, 2019  
Cowen Analysts: Roman Schweizer, Paul Gallant

**TAKEAWAYS FROM COMM. INFRA. SUMMIT; VERIZON KEYNOTE + VIDEO**  
August 16, 2019  
Cowen Analysts: Colby Synesael, Greg Williams, CFA

**AHEAD OF THE CURVE®** SERIES  
**BEGUN, THE STREAMING WARS HAVE**  
November 20, 2019  
Cowen Analysts: Greg Williams, CFA, John Blackledge, Doug Creutz, CFA, Matthew D. Ramsay, Colby Synesael, Krish Sankar

## COWEN ANALYSTS

COLBY SYNESAE  
GREGORY WILLIAMS, CFA  
PAUL SILVERSTEIN  
PAUL GALLANT  
ROMAN SCHWEIZER  
JOSEPH GIORDANO, CFA  
MATTHEW D. RAMSAY  
KARL ACKERMAN, CFA  
KRISH SANKAR  
JEFFREY OSBORNE

## COWEN COMPANY COVERAGE

ACACIA COMMUNICATIONS **ACIA**  
ADTRAN **ADTN**  
ALTICE **ATUS**  
AMERICAN TOWER **AMT**  
AMPHENOL **APH**  
APPLE **AAPL**  
AT&T **T**  
CALIX **CALX**  
CEVA **CEVA**  
CHARTER **CHTR**  
CIENA **CIEN**  
CISCO **CSCO**  
COMCAST **CMCSA**  
CREE **CREE**  
CROWN CASTLE **CCI**  
EQUINIX **EQIX**  
ERICSSON **ERIC**  
II-VI INCORPORATED **IIVI**  
INPHI **IPHI**  
INTEL **INTC**  
INTELSTAT **I**  
JUNIPER NETWORKS **JNPR**  
MARVEL TECHNOLOGIES **MRVL**  
NEOPHOTONICS **NPTN**  
NOKIA **NOK**  
QORVO **QRVO**  
QUALCOMM **QCOM**  
ROCKWELL AUTOMATION **ROK**  
SBA COMM. **SBAC**  
SKYWORKS SOLUTIONS **SWKS**  
SPRINT **S**  
TE CONNECTIVITY **TEL**  
TERADYNE **TER**  
T-MOBILE **TMUS**  
UNITI GROUP **UNIT**  
VERIZON **VZ**  
XILINX **XLNX**  
XYLEM **XYL**  
ZAYO **ZAYO**

## SELECTED EVENTS

**DC DAY: TMT POLICY**  
February 19, 2019 | Washington, DC  
**47<sup>TH</sup> ANNUAL TECHNOLOGY, MEDIA & TELECOM CONFERENCE**  
May 29-30, 2019 | New York, NY  
**5<sup>TH</sup> ANNUAL COMMUNICATIONS INFRASTRUCTURE SUMMIT**  
August 12-13, 2019 | Boulder, CO  
**4<sup>TH</sup> ANNUAL NETWORKING & CYBERSECURITY SUMMIT**  
December 10-11, 2019 | New York, NY



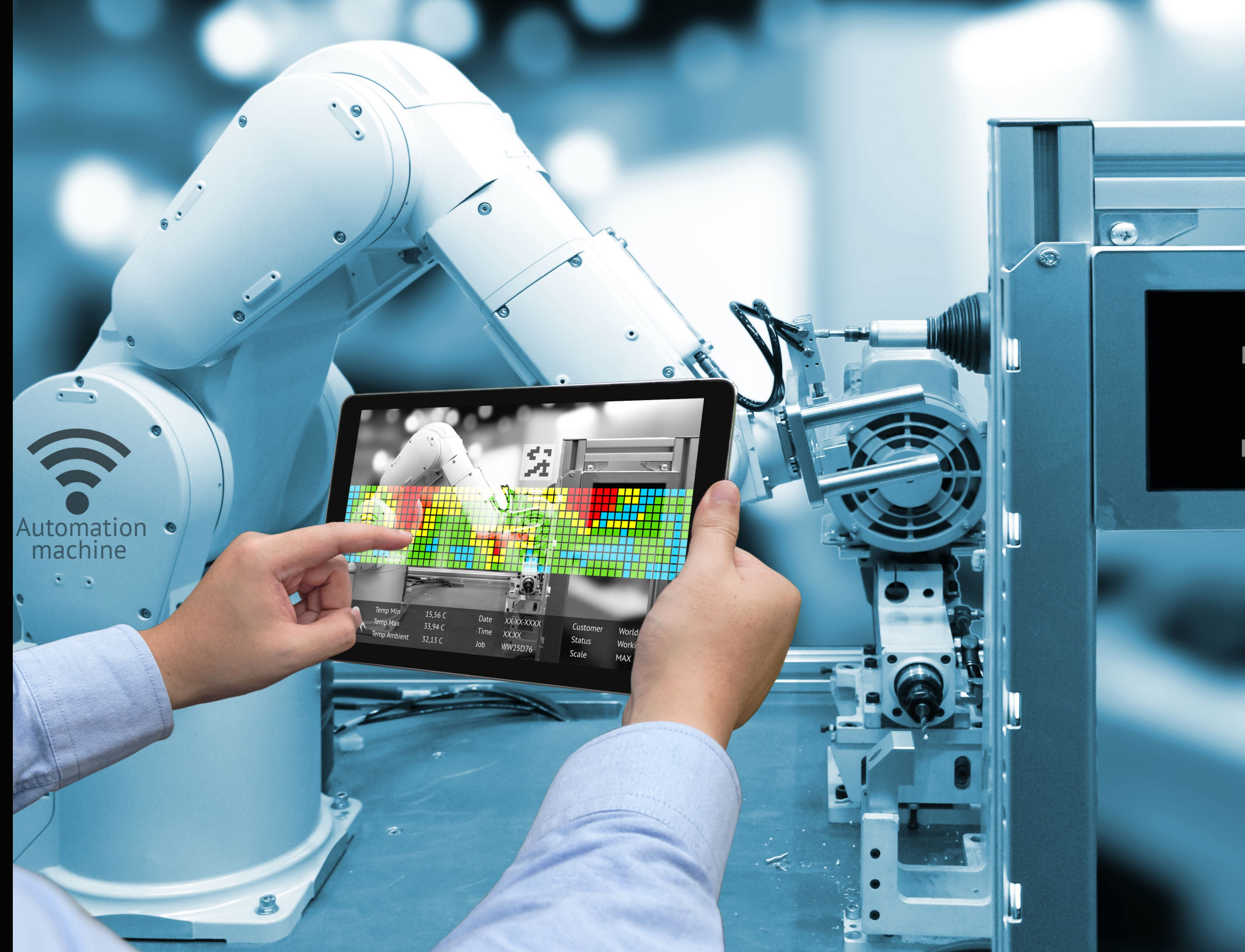
# DEV OPS / RPA

The \$2 trillion spent annually on traditional software development is increasingly avoiding labor-oriented processes and focusing on an emerging digital supply chain that is unleashing demand for a new class of software vendors. Robotic Process Automation (RPA) offers ease and scalability of business process automation that presents a direct threat to traditional BPO and IT services providers. DevOps serves as the foundation for companies to build, test, and deploy software more quickly, reliably and securely, driving more software adoption and creating new markets. With a new ability to make hundreds of software updates per day versus a rigid quarterly release cycle, companies must embrace this new paradigm or face share loss. We estimate a TAM of \$24 billion by 2023, spanning development, deployment and monitoring.



## WHAT WE'RE WATCHING

- TEAM vs NOW
- Developer buying power
- Convergence of APM, metrics and logs
- Vendor consolidation



EVERY 12 SECONDS / 7,000 TIMES PER DAY  
—AVERAGE PACE OF NEW SOFTWARE CODE RELEASES TO PRODUCTION AT AMAZON

MANY REFER TO DEVOPS AS THE INDUSTRIALIZATION  
OF SOFTWARE DEVELOPMENT, MUCH LIKE WHAT THE  
MANUFACTURING SECTOR WENT THROUGH A HALF A  
CENTURY AGO

J. DERRICK WOOD, CFA  
DEVOPS: THE NEXT FRONTIER OF AUTOMATION

## REPRESENTATIVE RESEARCH

### AHEAD OF THE CURVE® SERIES

#### DEVOPS: THE NEXT FRONTIER OF AUTOMATION

May 23, 2019

Cowen Analysts: J. Derrick Wood, CFA, Bryan Bergin, CFA

### AHEAD OF THE CURVE® SERIES

#### PUBLIC CLOUD VII: DATA SUGGESTS STRONG GROWTH

May 28, 2019

Cowen Analysts: J. Derrick Wood, CFA, Bryan Bergin, CFA, John Blackledge,  
Nick Yako, Matthew D. Ramsay

#### DEVOPS PANEL TAKEAWAY FROM COWEN'S TMT CONFERENCE + COWENVISION VIDEO

June 24, 2019

Cowen Analyst: J. Derrick Wood, CFA

#### JFROG SWAMPUP CONFERENCE; THE EMERGING “DATABASE OF DEVOPS” VENDOR

July 2, 2019

Cowen Analyst: J. Derrick Wood, CFA

#### DEVOPS WORLD CONFERENCE & CLOUDBEES' SOFTWARE DELIVERY MGMT (SDM) STRATEGY

August 27, 2019

Cowen Analyst: J. Derrick Wood, CFA

#### HASHICORP CONFERENCE; BRINGING AUTOMATION TO THE MULTI- CLOUD DATA CENTER

September 22, 2019

Cowen Analyst: J. Derrick Wood, CFA

#### RPA/IA INSIGHTS VOL 22: AUTOMATION ANYWHERE NABS \$6.8B VALUATION; BP SNAPS BACK

November 22, 2019

Cowen Analyst: Bryan Bergin, CFA

## COWEN ANALYSTS

J. DERRICK WOOD, CFA  
BRYAN BERGIN, CFA

JOHN BLACKLEDGE  
MATTHEW D. RAMSAY

NICK YAKO

## COWEN COMPANY COVERAGE

ACCENTURE **ACN**

ADOBE SYSTEMS **ADBE**

ALTERYX **AYX**

APPIAN CORPORATION **APPN**

ASURE SOFTWARE **ASUR**

ATLASSIAN **TEAM**

COGNIZANT TECHNOLOGY SOLUTIONS CORP. **CTSH**

DOMO **DOMO**

ENDAVA **DAYA**

EPAM SYSTEMS **EPAM**

HUBSPOT **HUBS**

MICROSOFT **MSFT**

NEW RELIC **NEWR**

ORACLE **ORCL**

RIMINI STREET **RMNI**

SALESFORCE.COM **CRM**

SAP (ADR) **SAP**

SERVICENOW **NOW**

SPLUNK **SPLK**

TERADATA **TDC**

WORKDAY **WDAY**

ZENDESK **ZEN**

## SELECTED EVENTS

### 47<sup>TH</sup> ANNUAL TECHNOLOGY, MEDIA & TELECOM CONFERENCE

May 29-30, 2019 | New York, NY

### 5<sup>TH</sup> ANNUAL SOFTWARE BUS TOUR

September 11-12, 2019 | San Francisco, CA

### 6<sup>TH</sup> ANNUAL NETWORKING & CYBERSECURITY SUMMIT

December 10-11, 2019 | New York, NY

### PRIVATE COMPANY SOFTWARE SUMMIT

May 14, 2019 | Half Moon Bay, CA

October 24, 2019 | Boston, MA



# ROBOTICS

We see a highly fragmented, largely private, North American-centric robotics landscape that is ripe for consolidation across verticals as diverse as grocery/ consumables, health care and medical devices, and warehouse/logistics. We estimate the robotics industry overall will grow at a ~25% CAGR from \$15 billion in 2017 to \$135 billion by 2027, with anti-globalization trends likely to continue fostering US development and leadership. Warehouse/logistics robotics is a growing focus vertical, expected to grow from ~\$4 billion today to over \$22 billion by 2022 and representing a younger, more dynamic market than traditional robotics.



## WHAT WE'RE WATCHING

- Warehouse robotics
- Warehouse and transport job trends
- Retail automation





\$800M  
TO \$8B+

GROWTH OF PRIVATE  
INVESTMENT IN ROBOTICS  
FROM 2014-2019

1/4

STRYKER ARTIFICIAL KNEES  
IMPLANTED THROUGH  
ROBOTIC SURGICAL  
PROCEDURE

91%

PRODUCTION OF GLOBAL  
LOGISTICS ROBOTS  
ORIGINATING FROM THE US



Cowen and MassRobotics are collaborating to bring together our extensive market knowledge to advance research into the emerging Robotics and Artificial Intelligence industry. MassRobotics is a global hub in Robotics, representing engineers, rocket scientists and entrepreneurs focused on the needs of the Robotics community.

## REPRESENTATIVE RESEARCH

### AHEAD OF THE CURVE® SERIES

#### DEUS EX MACHINA, PART II

November 14, 2019

Cowen Analysts: Joseph Giordano, CFA, John Blackledge, Chris Krueger

### AHEAD OF THE CURVE® SERIES

#### CURBSIDE, CONNECTED, & ROBOTIC RETAIL REVOLUTION

March 26, 2019

Cowen Analysts: Oliver Chen, CFA, Helane Becker, Bryan Bergin, CFA, John Blackledge, Thomas Champion, Andrew Charles, CFA, Joseph Giordano, CFA, John Kernan, CFA, Jason Seidl

### MAKING THE AUTOMATION AND ROBOTICS ROUNDS

February 19, 2019

Cowen Analyst: Joseph Giordano, CFA

### RPA/IA INSIGHTS VOL20: UIPATH/CAPG/MRK PANEL & BLUEPRISM-THOUGHTONOMY M&A + VIDEO

June 20, 2019

Cowen Analyst: Bryan Bergin, CFA

### RECAP OF PANEL DISCUSSION WITH SYK AND CVRS: ROBOTICS 2025 AND BEYOND

July 9, 2019

Cowen Analyst: Joshua Jennings, M.D.

### KEY TAKEAWAYS FROM THE 8TH ANNUAL MEDTOOLS UNLOCKED CONFERENCE: MEDICAL DEVICES

September 30, 2019

Cowen Analyst: Joshua Jennings, M.D.

## COWEN ANALYSTS

**JOSEPH** GIORDANO, CFA

**BRYAN C.** BERGIN, CFA

**OLIVER** CHEN, CFA

**JEFFREY** OSBORNE

**J. DERRICK** WOOD, CFA

**JOSHUA** JENNINGS, M.D.

**JOHN** BLACKLEDGE

**THOMAS** CHAMPION

**ANDREW** CHARLES, CFA

**JOHN** KERNAN, CFA

**JASON** SEIDL

**CHRIS** KRUEGER

**HELANE** BECKER

**MATTHEW** D. RAMSAY

## COWEN COMPANY COVERAGE

ACCENTURE **ACN**

ALPHABET **GOOG**

AMAZON **AMZN**

AMBARELLA **AMBA**

APTIV **APTIV**

COGNEX **CGNX**

FEDERAL EXPRESS **FDX**

LYFT **LYFT**

MEDTRONIC **MDT**

STRYKER CORP. **SYK**

TARGET **TGT**

TERADYNE **TER**

UBER TECHNOLOGIES **UBER**

UNITED PARCEL SERVICE **UPS**

WALMART **WMT**

XPO LOGISTICS **XPO**

ZIMMER BIOMET HOLDINGS **ZBH**

## SELECTED EVENTS

### ROBOTICS REINVENTS RETAIL SERIES: AUTONOMOUS STORE OF THE FUTURE WITH BRAIN CORP

March 11, 2019

### 5TH ANNUAL FUTURE OF THE CONSUMER CONFERENCE

April 2, 2019 | New York, NY

### 47TH ANNUAL TECHNOLOGY, MEDIA & TELECOM CONFERENCE

May 29-30, 2019 | New York, NY

### 4TH ANNUAL FUTUREHEALTH CONFERENCE

June 25, 2019 | New York, NY

### 8TH ANNUAL MEDTOOLS UNLOCKED

September 24, 2019 | New York, NY

### 4TH ANNUAL INDUSTRIAL INNOVATION & TECHNOLOGY CONFERENCE

November 19, 2019 | New York, NY

### COWEN'S RETAIL AUTOMATION DAY WITH LEADING ROBOTICS CEOS

December 10, 2019 | Boston, MA



# CYBER & HOMELAND SECURITY

The security software market is projected to rise from ~\$135 billion in 2019 to nearly \$200 billion by 2024, representing one of the fastest growing segments in global technology. In parallel, we see an evolving geopolitical and defense landscape adding to a security focus on digital risks and technological weapons, benefiting cybersecurity service providers. Our proprietary survey of Chief Information Security Officers representing \$30 billion in IT spending suggests the security software market will change radically over the next 3-5 years, with more investment in cloud-based security. This is likely to drive further government emphasis on all-new technology platforms, with R&D spanning new weapon paradigms and threat management from non-traditional vulnerabilities.



## WHAT WE'RE WATCHING

- Joint Enterprise Defense Infrastructure (JEDI)
- Allocation of wallet to cloud-based security
- Automation of security tasks



# DOD IS PLACING GREATER EMPHASIS ON DEVELOPING ALL-NEW TECHNOLOGY AND PLATFORMS THAN AT ANY TIME IN THE PAST 30-PLUS YEARS

ROMAN SCHWEIZER

BRAVE NEW WORLD: ARE DEFENSE STOCKS AT A PEAK?

# CLOUD'S SHARE OF SECURITY BUDGETS IS EXPECTED TO RISE TO 38% OF BUDGETS BY THE END OF 2020

NICK YAKO

EVOLUTION OF SECURITY CREATES OPPORTUNITY

## REPRESENTATIVE RESEARCH

AHEAD OF THE CURVE® SERIES

EVOLUTION OF SECURITY CREATES OPPORTUNITY

May 23, 2019

Cowen Analyst: Nick Yako

AHEAD OF THE CURVE® SERIES

PUBLIC CLOUD VII: GROWTH REMAINS STRONG IN 2019

May 28, 2019

Cowen Analysts: Cowen TMT Team, John Blackledge, J. Derrick Wood, CFA, Nick Yako, Bryan C. Bergin, CFA, Matthew D. Ramsay

AHEAD OF THE CURVE® SERIES

BRAVE NEW WORLD A PLUS FOR DEFENSE SERVICES

November 26, 2019

Cowen Analysts: Cai Von Rumohr, CFA, Roman Schweizer, Gautam Khanna, Bryan C. Bergin, CFA

AHEAD OF THE CURVE® SERIES

BRAVE NEW WORLD: ARE DEFENSE STOCKS AT A PEAK?

October 2, 2019

Cowen Analysts: Cai von Rumohr, CFA, Roman Schweizer, Gautam Khanna

TECH WAR: NEW CHINA ENTITY LIST HIT OVER NATSEC CONCERNS ADDS TO SERVER RISKS

June 24, 2019

Cowen Analyst: Roman Schweizer

HYPERSONIC HYSTERIA: BIG Q2 UPDATES ON WINNERS

August 6, 2019

Cowen Analysts: Roman Schweizer, Cai von Rumohr, CFA

## COWEN ANALYSTS

NICK YAKO

JOHN BLACKLEDGE

J. DERRICK WOOD, CFA

ROMAN SCHWEIZER

CAI VON RUMOHR, CFA

GAUTAM KHANNA

BRYAN C. BERGIN, CFA

MATTHEW D. RAMSAY

## COWEN COMPANY COVERAGE

ACCENTURE **ACN**

BOOZ ALLEN **BAH**

CACI INTERNATIONAL **CACI**

CHECK POINT SOFTWARE **CHKP**

CYBERARK **CYBR**

FORTINET **FTNT**

GENERAL DYNAMICS **GD**

HUNTINGTON INGALLS INDUSTRIES **HII**

JACOBS ENGINEERING GROUP **JEC**

KBR **KBR**

L-3 HARRIS TECHNOLOGIES **LHX**

LEIDOS HOLDINGS **LDOS**

LOCKHEED MARTIN **LMT**

MANTECH INTERNATIONAL **MANT**

MICROSOFT **MSFT**

MIMECAST LIMITED **MIME**

NORTHROP GRUMMAN **NOC**

OKTA **OKTA**

PALO ALTO NETWORKS **PANW**

PARSONS CORPORATION **PSN**

PERSPECTA **PRSP**

PROOFPOINT **PFPT**

QUALYS **QLYS**

RAPID7 **RPD**

RAYTHEON **RTN**

SAIC **SAIC**

TENABLE HOLDINGS **TENB**

ZIX CORPORATION **ZIXI**

ZSCALER **ZS**

## SELECTED EVENTS

40<sup>TH</sup> ANNUAL AEROSPACE & DEFENSE CONFERENCE

February 6, 2019 | New York, NY

47<sup>TH</sup> ANNUAL TECHNOLOGY, MEDIA & TELECOM CONFERENCE

May 29-30, 2019 | New York, NY

COWEN SECURITY BUS TOUR

September 11-12, 2019 | San Francisco, CA

COWEN PRIVATE COMPANY SOFTWARE SUMMIT

October 24, 2019 | Boston, MA

GOVERNMENT SERVICES BUS TOUR

November 11-13, 2019 | Washington, DC

DC DEFENSE DAY

December 10, 2019 | Arlington, VA

6<sup>TH</sup> ANNUAL NETWORKING & CYBERSECURITY SUMMIT

December 10-11, 2019 | New York, NY



# ANTI-TRUST & PRIVACY

Big Tech (Google, Facebook, Amazon and Apple) face meaningful governmental risk, with both US mainstream political parties seeking to gain advantage by targeting issues of antitrust, privacy and platform liability. Antitrust investigations raise the potential for divestitures and ongoing regulatory obligations as well as protracted uncertainty and distraction in multi-year litigation. We see a greater than 50% chance that antitrust lawsuits are brought against Google and Facebook, in part due to the autonomy of state AGs. However, the role of Big Tech in US national security and competition with China could be an important driver of outcomes after the 2020 presidential election.



## WHAT WE'RE WATCHING

- FTC and House Judiciary
- Committee reports
- Democratic presidential nominee
- State Attorneys General
- CCPA implementation



47

STATES THAT HAVE  
ANNOUNCED FORMAL  
ANTITRUST INVESTIGATIONS  
OF GOOGLE AND FACEBOOK

3

NUMBER OF YEARS FROM  
FILING OF LAWSUITS TO  
RULING BY DC DISTRICT  
COURT OF APPEALS IN  
US v. MICROSOFT

4%

AMAZON'S SHARE OF THE US  
RETAIL MARKET

\$0

FEEs CHARGED TO CONSUMERS  
FOR USE OF ADVERTISING-  
SUPPORTED SEARCH AND  
SOCIAL MEDIA PLATFORMS

## REPRESENTATIVE **RESEARCH**

**AHEAD OF THE CURVE®** SERIES

**THE ROAD AHEAD FOR BIG TECH & ANTITRUST**

November 8, 2019

Cowen Analysts: Paul Gallant, John Blackledge, Krish Sankar

**ANTITRUST NOISE LEVEL RISES AROUND FACEBOOK AND GOOGLE**

November 19, 2019

Cowen Analyst: Paul Gallant

**STATE AGs JUMP INTO BIG TECH ANTITRUST / PRIVACY INVESTIGATIONS**

September 9, 2019

Cowen Analyst: Paul Gallant

**FTC'S "PRIVACYCON" A FORCING EVENT FOR FACEBOOK RULING?**

June 14, 2019

Cowen Analyst: Paul Gallant

**FTC LEVIES RECORD BREAKING FINE AGAINST FACEBOOK OVER USER  
PRIVACY VIOLATIONS**

July 12, 2019

Cowen Analyst: John Blackledge

**IS DC BREAKING UP WITH BIG TECH?**

June 4, 2019

Cowen Analyst: Paul Gallant

## COWEN **ANALYSTS**

**PAUL** GALLANT

**JOHN** BLACKLEDGE

**KRISH** SANKAR

## COWEN **COMPANY COVERAGE**

ALPHABET INC **GOOG**

AMAZON **AMZN**

APPLE **APPL**

FACEBOOK **FB**

## SELECTED **EVENTS**

**DC DAY: TMT POLICY**

February 19, 2019 | Washington, DC

**47<sup>TH</sup> ANNUAL TECHNOLOGY, MEDIA & TELECOM CONFERENCE**

May 29-30, 2019 | New York, NY

**7<sup>TH</sup> ANNUAL INTERNET & MEDIA BUS TOUR**

August 12-14, 2019 | Seattle & West Coast

**DC DAY: TMT POLICY**

September 25, 2019 | Washington, DC



# TRADE, TARIFFS & ANTI-GLOBALIZATION

While trade disruption has been the focus of markets and exerted substantial drag on US investment and growth, the longer-term stakes may be higher over the high-tech arms race between China and the US. We expect investment restrictions, capital controls, industrial policy, supply chain de-linkage, and export controls to emerge as new weapons of choice. We also anticipate tension between the US and Europe to increase as regionalization replaces globalization, with technology, agriculture, currency and autos all creating new fronts. Recent developments expanding CFIUS involvement in markets, FCC bans on Chinese equipment purchases and Entity List designations all underscore an evolving paradigm shift that is blurring traditional trade policy lines.



## WHAT WE'RE WATCHING

- USMCA
- Supply chains
- Export controls
- Currency wars / capital controls
- Industrial policy





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COWEN WASHINGTON  
RESEARCH GROUP  
REPORTS PUBLISHED ON  
TRADE-RELATED ISSUES  
FROM JANUARY THROUGH  
NOVEMBER 2019

46

COWEN WASHINGTON  
RESEARCH GROUP  
REPORTS ANALYZING  
CRITICAL TRADE ISSUES  
THROUGH USE OF  
CLASSIC SONG TITLES



TOP 10

COWEN WASHINGTON RESEARCH GROUP  
US-CHINA 2019 JUKEBOX HITS

ALL Xi WANTS TO DO IS DANCE  
CALL Xi MAYBE  
DON'T YOU WANT Xi  
DON'T LET THE SUN GO DOWN ON Xi  
DON'T YOU (FORGET ABOUT Xi)

Xi's A RAINBOW  
Xi DRIVES ME CRAZY  
TAKE A CHANCE ON Xi  
LEAN ON Xi  
SAY YOU, SAY Xi

## REPRESENTATIVE RESEARCH

### AHEAD OF THE CURVE® SERIES

#### VALUE CREATION IN THE FACE OF DISRUPTION + VIDEO

January 22, 2019

Cowen Analysts: John Kernan, CFA, Oliver Chen, CFA, Chris Krueger

### AHEAD OF THE CURVE® SERIES

#### DOWNGRADE: MULTIPLE HEADWINDS LEAVE LITTLE ROOM FOR UPSIDE

February 6, 2019

Cowen Analyst: Charles Neivert

### COVER XI: HONG KONG/CHINA TRIPWIRES

November 18, 2019

Cowen Analyst: Chris Krueger

### TIME AFTER TIME: TIKTOK ON THE CLOCK - WAKE UP CALL FOR US-CHINA SUPPLY CHAINS

November 5, 2019

Cowen Analyst: Chris Krueger

### HE SAID, XI SAID: CHINA CAPITAL CONTROLS - WHAT, WHERE, WHY & HOW

October 2, 2019

Cowen Analysts: Chris Krueger, Jaret Seiberg

### A WIDE AND UNCERTAIN RANGE OF FINANCIAL OUTCOMES AS TARIFFS RISE + VIDEO

May 14, 2019

Cowen Analysts: John Kernan, CFA, Chris Krueger

## COWEN ANALYSTS

CHRIS KRUEGER

JARET SEIBERG

JOHN KERNAN, CFA

PAUL GALLANT

CHARLES NEIVERT

OLIVER CHEN, CFA

KARL ACKERMAN, CFA

KRISH SANKAR

MATTHEW D. RAMSAY

PAUL SILVERSTEIN

CAI VON RUMOHR, CFA

## COWEN COMPANY COVERAGE

ADIDAS AG **ADS.GR**

ADVANCED MICRO DEVICES **AMD**

ADVANSIX **ASIX**

AK STEEL HOLDING CORP. **AKS**

ALLEGHENY TECHNOLOGIES **ATI**

AMBARELLA **AMBA**

APPLE **AAPL**

ARCONIC **ARNC**

BOEING **BA**

BROADCOM **AVGO**

CALLAWAY GOLF **ELY**

CARTER'S **CRI**

CELANESE CORP. **CE**

COLUMBIA SPORTSWEAR **COLM**

COMMERCIAL METALS CO **CMC**

CYPRESS SEMICONDUCTOR **CY**

DICK'S SPORTING GOODS **DKS**

DOW **DOW**

EASTMAN CHEMICAL CO. **EMN**

G-III APPAREL GROUP LTD **GIII**

GCP APPLIED TECHNOLOGIES **GCP**

GUESS? **GES**

INTEL **INTC**

LAM RESEARCH **LRCX**

LULULEMON ATHLETICA **LULU**

LYONDELLBASELL INDUSTRIES **LYB**

METHANEX CORP. **MEOH**

MICRON **MU**

MOTOROLA SOLUTIONS **MSI**

NIKE **NKE**

NUCOR CORP. **NUE**

OLIN CORP **OLN**

PUMA GR **PUM.GR**

PURE STORAGE **PSTG**

PVH CORP. **PVH**

QUALCOMM **QCOM**

QUORVO **QRVO**

RALPH LAUREN **RL**

SCHNITZER STEEL INDUSTRIES **SCHN**

SEAGATE TECHNOLOGY **STX**

SEMTECH **SMTC**

SKECHERS **SKX**

SKYWORKS **SWKS**

STEEL DYNAMICS **STLD**

U.S. STEEL CORP. **X**

UNDER ARMOUR **UAA**

VF CORPORATION **VFC**

WESTERN DIGITAL **WDC**

WESTLAKE CHEMICAL CORP. **WLK**

XILINX **XLNX**

YETI HOLDINGS **YETI**

## SELECTED EVENTS

### COWEN WASHINGTON RESEARCH GROUP DC DAY: CHINA, TRADE, HEALTH CARE, DEBT CEILING AND 2020

February 11, 2019 | Washington, DC

### COWEN CONFERENCE CALL: CALL WITH ED HERTZMAN SUMMARIZING FINDINGS FROM THE HONG KONG SOURCING SUMMIT

May 17, 2019

### COWEN WASHINGTON RESEARCH GROUP DC DAY: MACRO DAY

November 4, 2019 | Washington, DC



# VIDEO

The battle for the living room is still early in what could be a Thirty Years War in the shift away from traditional linear consumption. We expect the overall video subscription market to reach \$121 billion by 2024, representing only modest revenue growth, even as consumers devote increasing time to video consumption. The growing competition for market share puts significant pressure on OTT platforms that lack global scale, while increases in content spend dilute margin for traditional media companies. Platforms such as Amazon and Apple may be insensitive to rising content costs as they use video to retain and grow their core businesses, potentially covering the cost of OTT investments over time.



## WHAT WE'RE WATCHING

- Content spend
- Margins
- Viability of OTT models among traditional media players





# \$11B

ESTIMATED AMAZON  
GLOBAL CASH CONTENT  
SPEND IN 2024

# 17%

ESTIMATED OTT VIDEO  
SUBSCRIPTION CAGR  
2019 - 2024

# 26%

COWEN INTERNET / NEW  
MEDIA TRACKER SURVEY  
RESPONDENTS USING  
NETFLIX AS PRIMARY MEANS  
OF WATCHING VIDEO  
CONTENT ON TV

# 2.7%

ESTIMATED LINEAR VIDEO  
CONSUMPTION REVENUE  
CAGR 2019 - 2024

## REPRESENTATIVE **RESEARCH**

### **AHEAD OF THE CURVE®** SERIES

#### **BEGUN, THE STREAMING WARS HAVE**

November 19, 2019

Cowen Analysts: Greg Williams, CFA, John Blackledge, Doug Creutz, CFA,  
Colby Synesael, Krish Sankar, Paul Gallant

### **AHEAD OF THE CURVE®** SERIES

#### **SEEING IS BELIEVING: GROWTH OPPORTUNITIES IN DISPLAY**

November 22, 2019

Cowen Analyst: Krish Sankar

#### **AD BUYER SURVEY VII: MORE BULLISH ON 2019 AD SPEND, LED BY DIGITAL VIDEO ASCENDANCY**

January 10, 2019

Cowen Analyst: John Blackledge

#### **ADWEEK TAKEAWAYS: BULLISH ON ADV. TRENDS & MOBILE VIDEO**

September 30, 2019

Cowen Analyst: John Blackledge

#### **NFLX 2Q19 PREVIEW: ORIGINAL HRS +52% Y/Y; >50% PLAN TO WATCH STRANGER THINGS S3**

July 9, 2019

Cowen Analyst: John Blackledge

## COWEN **ANALYSTS**

**JOHN** BLACKLEDGE  
**DOUG** CREUTZ, CFA  
**GREG** WILLIAMS, CFA

**COLBY** SYNESAEL  
**KRISH** SANKAR  
**PAUL** GALLANT

## COWEN **COMPANY COVERAGE**

AKAMAI TECHNOLOGIES **AKAM**

ALPHABET **GOOG**

ALTICE USA **ATUS**

AMAZON **AMZN**

AMC NETWORKS **AMCX**

APPLE **AAPL**

AT&T **T**

CBS CORPORATION **CBS**

CHARTER COMMUNICATIONS **CHTR**

COMCAST CORP. **CMCSA**

DISCOVERY COMMUNICATIONS **DISCA**

DISH NETWORK CORP. **DISH**

FACEBOOK **FB**

LIMELIGHT NETWORKS **LLNW**

LIONS GATE ENTERTAINMENT CORP. **LGF/A**

NETFLIX **NFLX**

SNAP **SNAP**

T-MOBILE US **TMUS**

TWITTER **TWTR**

UNIVERSAL DISPLAY **OLED**

VERIZON COMMUNICATIONS **VZ**

VIACOM **VIAB**

WALT DISNEY COMPANY **DIS**

## SELECTED **EVENTS**

### **4<sup>TH</sup> ANNUAL NETWORKING BUS TOUR**

March 13, 2019 | Silicon Valley, CA

### **47<sup>TH</sup> ANNUAL TECHNOLOGY, MEDIA & TELECOM CONFERENCE**

May 29-30, 2019 | New York, NY

### **7<sup>TH</sup> ANNUAL INTERNET & MEDIA BUS TOUR**

August 12-14, 2019 | Seattle & West Coast



# ELECTION 2020

We expect the 2020 US general election to be decided by a few counties, in keeping with recent precedent. We believe a win for President Trump could stem from one of two scenarios: (1) low-turnout race with multiple candidates to fracture anti-Trump sentiment, and/or (2) successful branding of a “choice” election between “America First vs. Socialism.” If the election is a straight referendum on the President, as were the 2018 midterms, we would expect him to lose. However, a Senate majority will be critical to the advancement of any President’s agenda in 2021, and we will be laser-focused on the Senate races in the Electoral College swing states, which will be highly competitive and likely voted in concert with the Presidential ticket.



## WHAT WE'RE WATCHING

- Senate races in Electoral College swing states
- Fortress America/China
- Tech lash
- Income inequality





170+

LIFETIME FEDERAL JUDGES  
NOMINATED & CONFIRMED  
BY PRESIDENT TRUMP AND  
GOP SENATE MAJORITY

53+

MINIMUM NUMBER OF  
SENATORS NEEDED FOR  
PASSAGE OF CONTROVERSIAL  
LEGISLATION

25%

PERCENTAGE OF SITTING  
CIRCUIT COURT APPELLATE JUDGES  
NOMINATED AND CONFIRMED BY  
PRESIDENT TRUMP AND SENATE  
GOP MAJORITY

~\$40T

ESTIMATED COST OF PROPOSED  
WARREN M4A PROGRAM

## REPRESENTATIVE RESEARCH

### AHEAD OF THE CURVE® SERIES

#### BERNING DOWN THE HOUSE: 2020 DEMOCRATIC PLATFORM

December 5, 2019

Cowen Analysts: Chris Krueger, Rick Weissenstein, Eric Assaraf,  
Jaret Seiberg, Paul Gallant, Roman Schweizer

### AHEAD OF THE CURVE® SERIES

#### THE ROAD AHEAD FOR BIG TECH & ANTITRUST

November 8, 2019

Cowen Analysts: Paul Gallant, John Blackledge, Krish Sankar

### AHEAD OF THE CURVE® SERIES

#### THE FUTURE OF MEDICAID

February 28, 2019

Cowen Analysts: Rick Weissenstein, Eric Assaraf, Charles Rhyee

### AHEAD OF THE CURVE® SERIES

#### THE OTHER ONE: TRUMP REGULATORY PENDULUM SHIFT, VOLUME 3

April 12, 2019

Cowen Analysts: Chris Krueger, Eric Assaraf, Paul Gallant, Roman Schweizer,  
Jaret Seiberg, Rick Weissenstein

### AHEAD OF THE CURVE® SERIES

#### SHELTER FROM THE STORM: TRUMP IN HISTORICAL CONTEXT, VOL 3

March 28, 2019

Cowen Analyst: Chris Krueger

## COWEN ANALYSTS

CHRIS KRUEGER

JARET SEIBERG

PAUL GALLANT

RICK WEISSENSTEIN

ERIC ASSARAF

ROMAN SCHWEIZER

## SELECTED EVENTS

### FUTURE OF HOUSING FINANCE: WHAT IS WASHINGTON THINKING?

February 6, 2019 | Washington, DC

### COWEN WASHINGTON RESEARCH GROUP DC DAY: CHINA, TRADE, HEALTH CARE, DEBT CEILING AND 2020

February 11, 2019 | Washington, DC

### TMT POLICY DAY

February 19, 2019 | Washington, DC

### COWEN WASHINGTON RESEARCH GROUP DC DAY: HEALTH CARE

May 6, 2019 | Washington, DC

### FINANCIAL POLICY FORUM

June 20, 2019 | Washington, DC

### CANNABIS POLICY: WHAT IS WASHINGTON THINKING?

July 11, 2019 | Washington, DC

### TMT POLICY DAY

September 25, 2019 | Washington, DC

### COWEN WASHINGTON RESEARCH GROUP DC DAY: CHINA, TRADE, HEALTH CARE, IMPEACHMENT & 2020

November 4, 2019 | Washington, DC

### HE SAID, XI SAID –TRADE, IMPEACHMENT & ELECTION TAKEAWAYS: LATEST & GREATEST – CONFERENCE CALL

November 8, 2019

### DC DEFENSE DAY

December 10, 2019 | Washington, DC

### WASHINGTON POLICY RISK: WHAT ARE THE BIGGEST 2020 THREATS?

December 18, 2019 | New York, NY



# TARGETED THERAPY

As tumor genomic profiling is becoming more common, investment in the capabilities to develop precision medicines against new targets and mechanisms of resistance should strengthen oncology strategy. Significant acquisitions and promising data fueled investor sentiment in 2019, and we expect continued focus on targeted therapy into 2020. Increasingly robust understanding of the genetic mutations driving certain cancers partially de-risks the development of targeted oncology, which appeals to many investors and potential acquirers. Moreover, there will be catalysts in 2020, including potential approval and launch of a new drug in Triple Negative Breast Cancer, which alone could exceed \$1 billion in sales over the next few years, in our view.



## WHAT WE'RE WATCHING

- Capmatinib
- KRAS
- Sacituzumab
- Selpercatinib
- M&A





\$100B

EXPECTED OVERALL SALES  
OF TARGETED THERAPIES  
IN 2023

2X

AVERAGE OVERALL RESPONSE  
RATE OF PATIENTS TREATED  
WITH TARGETED THERAPIES  
IN 1L, 1L ALK+, 1L EGFR+, 1L  
ROS+ AND 1L RET+ SETTINGS vs  
CHEMO OR IMMUNO THERAPIES

\$2.8B

ESTIMATED TAM FOR KRAS  
G12C INHIBITORS IN 2022

25%

PERCENTAGE OF HUMAN  
CANCERS ACTIVATED BY RAS  
MUTATION

## REPRESENTATIVE RESEARCH

### THERAPEUTIC CATEGORIES OUTLOOK

March 5, 2019

September 17, 2019

Cowen Analysts: Cowen Health Care Team

### BIG CAP PHARMA HIGHLIGHTS FROM COWEN'S 39TH ANNUAL HEALTH CARE CONFERENCE

March 18, 2019

Cowen Analyst: Steve Scala, R.Ph, CFA

### LOXO ACQUISITION: GREAT ASSET AT FULL PRICE

January 7, 2019

Cowen Analyst: Steve Scala, R.Ph, CFA

### PFE: ARRAY ACQUISITION COMPLEMENTS PFIZER'S PORTFOLIO AND CONSISTENT WITH STRATEGY

June 17, 2019

Cowen Analyst: Steve Scala, R.Ph, CFA

### DRUGGING KRAS: THIS TIME IT'S PERSONALIZED

May 15, 2019

Cowen Analysts: Chris Shibutani, M.D., Yaron Werber, M.D.

### RESUBMISSION OF SACITUZUMAB'S BLA ON TRACK FOR LATE NOV/EARLY DEC; REPORTS Q3

October 3, 2019

Cowen Analysts: Phil Nadeau, Ph.D., Joseph Thome, Ph.D.

### NVS: CONVICTION IN OUTLOOK STRENGTHENED POST MEETINGS WITH MANAGEMENT

October 25, 2019

Cowen Analysts: Steve Scala, R.Ph, CFA, Yaron Weber, M.D.

## COWEN ANALYSTS

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**STEVE** SCALA, R.PH., CFA  
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**JOSEPH** THOME, PH.D.  
**YARON** WERBER, M.D.

## COWEN COMPANY COVERAGE

ABBVIE **ABBV**  
ACCELERON PHARMA **XLRN**  
ADURO BIOTECH **ADRO**  
AGIOS PHARMACEUTICALS **AGIO**  
ALKERMES **ALKS**  
AMGEN **AMGN**  
ASTRAZENECA PLC (ADR) **AZN**  
BAVARIAN NORDIC **BAVA**  
BEIGENE **BGNE**  
BLUEBIRD BIO **BLUE**  
BLUEPRINT MEDICINES **BPMC**  
BRISTOL-MYERS SQUIBB **BMJ**  
CYTOMX THERAPEUTICS **CTMX**  
DICERNA PHARMACEUTICALS **DRNA**  
ELI LILLY **LLY**  
EPIZYME **EPZM**  
ESPERION THERAPEUTICS **ESPR**  
EXELIXIS **EXEL**  
FIVE PRIME THERAPEUTICS **FPRX**  
G1 THERAPEUTICS **GTHX**  
GLAXOSMITHKLINE PLC (ADR) **GSK**  
IMMUNOGEN **IMGN**  
IMMUNOMEDICS **IMMU**  
INCYTE **INCY**  
JOHNSON & JOHNSON **JNJ**  
JOUNCE THERAPEUTICS **JNCE**  
KURA ONCOLOGY **KURA**

MACROGENICS **MGNX**  
MERCK **MRK**  
MERSANA THERAPEUTICS **MRSN**  
MIRATI THERAPEUTICS **MRTX**  
NEKTAR THERAPEUTICS **NKTR**  
NOVARTIS (ADR) **NVS**  
PFIZER **PFE**  
PIERIS PHARMACEUTICALS **PIRS**  
PORTOLA PHARMACEUTICALS **PTLA**  
PUMA BIOTECHNOLOGY **PBYI**  
REGENERON PHARMACEUTICALS **REGN**  
ROCHE HOLDING LTD (ADR) **RHHBY**  
ROCKET PHARMACEUTICALS **RCKT**  
SANOFI (ADR) **SNY**  
SEATTLE GENETICS **SGEN**  
SPRINGWORKS **SWTX**  
STEMLINE THERAPEUTICS **STML**  
SUNESIS **SNSS**  
SUTRO BIOPHARMA **STRO**  
SYNDAX PHARMACEUTICALS **SNDX**  
SYROS PHARMACEUTICALS **SYRS**  
TAKEDA PHARMACEUTICAL **TAK**  
THE MEDICINES COMPANY **MDCO**  
UNITED THERAPEUTICS **UTHR**  
VIELA BIO **VIE**  
X4 PHARMACEUTICALS **XFOR**  
Y-MABS THERAPETUICS **YMAB**

## SELECTED EVENTS

### 39<sup>TH</sup> ANNUAL HEALTH CARE CONFERENCE

March 11-13, 2019 | Boston, MA

### COWEN'S PRE-ASCO KRAS WEBINAR

May 2019

### 22<sup>ND</sup> ANNUAL THERAPEUTICS CONFERENCE

September 25-26, 2019 | New York, NY

### 3<sup>RD</sup> ANNUAL IO NEXT SUMMIT

November 8, 2019 | Washington, DC



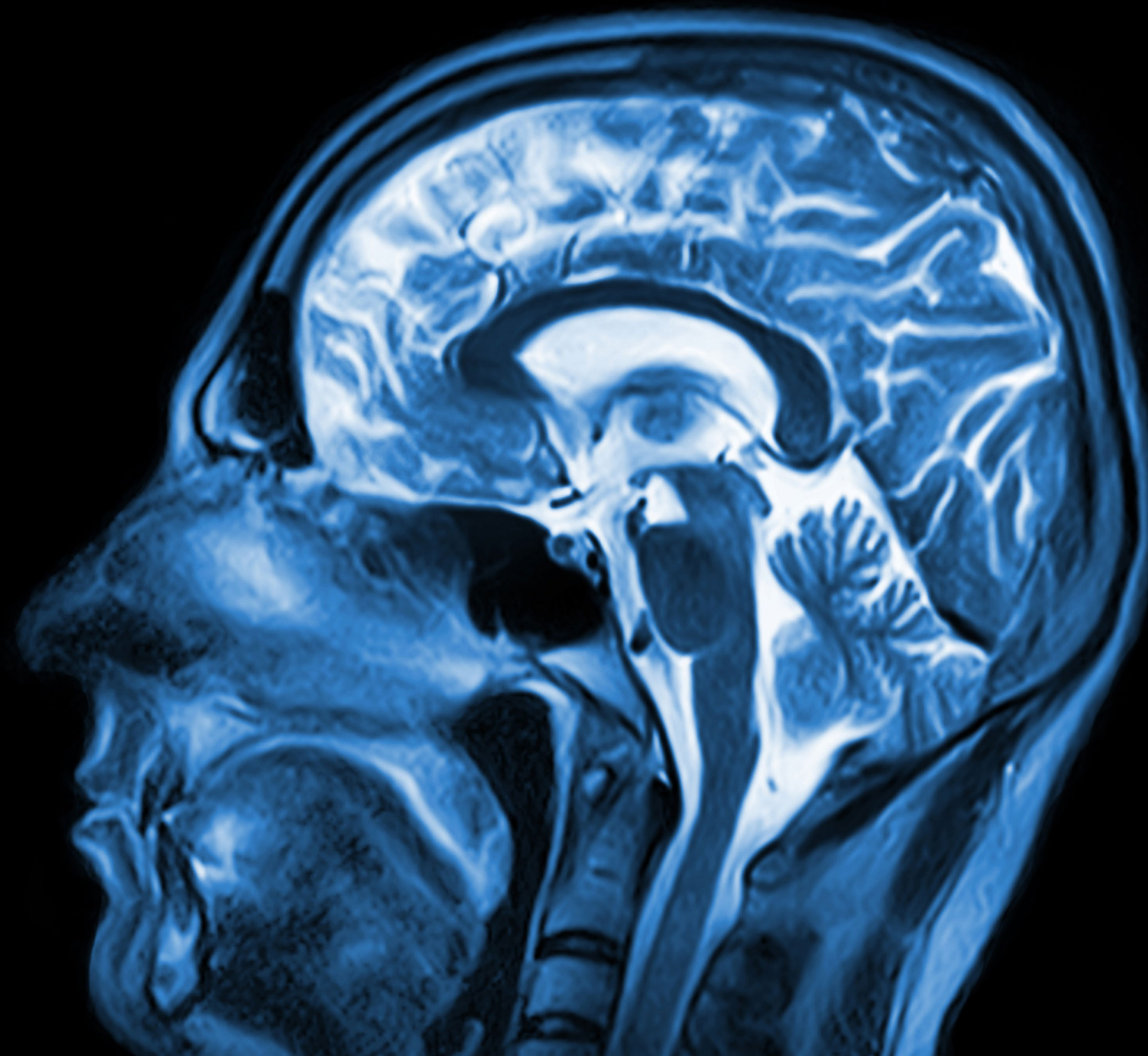
# THE CENTRAL NERVOUS SYSTEM

The greatest biotech treatment advances of the next five or ten years are expected to occur in neuroscience, with novel treatments under development in SMA, Huntington's, Autism, ALS, DMD, Parkinson's and Alzheimer's. Recent reorganization of the FDA includes establishment of an Office of Neuroscience, driven by FDA's focus on the great unmet need in this area, and an upcoming wave of new high-technology drug candidate reviews. Given the paucity of treatment options for diseases such as Alzheimer's, any safe and effective therapy that makes it to market would be widely adopted.



## WHAT WE'RE WATCHING

- Biogen's aducanumab data
- Roche's gantenerumab and anti-tau trials
- FDA regulatory flexibility
- FDA Office of Neuroscience



5.8M

PEOPLE IN US SUFFERING  
FROM ALZHEIMER'S

ZERO

MEETINGS OF FDA'S  
PERIPHERAL CENTRAL  
NERVOUS SYSTEM DRUGS  
ADVISORY COMMITTEE IN 2019

\$7.2B

ESTIMATED US TAM FOR  
ADUCANUMAB IF APPROVED

100+

ALZHEIMER'S DRUGS THAT  
HAVE FAILED IN PREVIOUS  
CLINICAL TRIALS

## REPRESENTATIVE RESEARCH

### ADUCANUMAB'S FDA REVIEW WILL TEST THE EXTENT OF FDA'S REGULATORY FLEXIBILITY

November 20, 2019

Cowen Analysts: Rick Weissenstein, Phil Nadeau, Ph.D., Joseph Thome, Ph.D.

### SRPT: 3Q19: EXONDYS SALES SOLID YET AGAIN AS INVESTORS FOCUS ON EOY20 DMD GTX DATA

November 8, 2019

Cowen Analyst: Ritu Baral

### NVS: CONVICTION IN OUTLOOK STRENGTHENED POST MEETINGS WITH MANAGEMENT

October 25, 2019

Cowen Analysts: Steve Scala, R.Ph, CFA, Yaron Weber, M.D.

### ZOLGENSMA HAS STRONG SHOWING AT WMS; RISDIPLAM ON TRACK FOR FILING/APPROVAL

October 7, 2019

Cowen Analyst: Steve Scala, R.Ph., CFA

### WMS SUNFISH AND FIREFISH UPDATES IN LINE WITH RISDIPLAM'S ESTABLISHED PROFILE

October 6, 2019

Cowen Analysts: Joseph Thome, Ph.D., Ritu Baral

### DC FIELD REPORT: FDA ENCOURAGEMENT OF RARE DISEASE DRUG DEVELOPMENT CONTINUES

September 9, 2019

Cowen Analyst: Ritu Baral

### THERAPEUTIC CATEGORIES OUTLOOK

March 5, 2019

September 17, 2019

Cowen Analysts: Cowen Health Care Team

## COWEN ANALYSTS

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STEVE SCALA, R.PH., CFA

JOSEPH THOME, PH.D

MARC FRAHM, PH.D.

## COWEN COMPANY COVERAGE

ACADIA PHARMACEUTICALS **ACAD**

AGIOS PHARMACEUTICALS **AGIO**

ALECTOR **ALEC**

ALEXION **ALXN**

ALKERMES **ALKS**

ALNYLAM **ALNY**

AMICUS THERAPEUTICS **FOLD**

APTINYX **PTX**

ATARA BIOTHERAPEUTICS **ATRA**

AUDENTES **BOLD**

AVROBIO **AVRO**

AXOVANT **AXGT**

BIOGEN **BIIB**

GW PHARMA **GWPH**

IONIS PHARMACEUTICALS **IONS**

NOVARTIS (ADR) **NVS**

ORCHARD THERAPEUTICS (ADR) **ORTX**

OVID THERAPEUTICS **OVID**

PREVAIL THERAPEUTICS **PRVL**

PTC THERAPEUTICS **PTCT**

ROCHE HOLDING LTD (ADR) **RHHBY**

SAGE THERAPEUTICS **SAGE**

SAREPTA THERAPEUTICS **SRPT**

STOKE THERAPEUTICS **STOK**

UNIQUE **QNIQUE**

VIELA BIO **VIE**

VOYAGER **VYGR**

WAVE LIFE SCIENCES **WVE**

## SELECTED EVENTS

### 39<sup>TH</sup> ANNUAL HEALTH CARE CONFERENCE MARCH 11-13, 2019

March 11-13, 2019 | Boston, MA

### \*HOT WHEELS\*

July 31- Aug 2, 2019 | New York, NY

### 22<sup>ND</sup> ANNUAL THERAPEUTICS CONFERENCE

September 25-26, 2019 | New York, NY



# LIQUID BIOPSY

Liquid Biopsies are blood-based tests for three major uses: early detection of cancer in high-risk individuals, optimization of a clinician's drug treatment decision based on specific genetic information, and monitoring of responses in patients undergoing treatment, along with detection of cancer recurrence as quickly as possible in cancer survivors. In 2020, we expect more data, pre-approvals, more products and more growth in a significant market opportunity even in the US alone. We estimate that roughly 50% of cancer trials today include some components of personalized medicine and liquid biopsy tools representing a substantial actionable part of that trend.



## WHAT WE'RE WATCHING

- Clinical data and validations
- Reimbursement progress
- Biopharma partnership agreements



# 15M

CANCER SURVIVORS IN  
THE US

# > 300M

PEOPLE IN THE US THAT  
COULD BENEFIT FROM EARLY  
CANCER SCREENING TOOLS

# 1.5M

NEW CANCER DIAGNOSES IN  
THE US EACH YEAR

# < 5%

ESTIMATED CURRENT  
PENETRATION OF PATIENTS  
ELIGIBLE TO USE LIQUID  
BIOPSY TOOLS AS A CANCER  
COMPANION DIAGNOSTIC

## REPRESENTATIVE **RESEARCH**

### **GUARDANT INITIATES 10,000 PATIENT CRC SCREENING STUDY**

October 27, 2019

Cowen Analyst: Doug Schenkel

### **NTRA RECAPS YTD PROGRESS WITH SIGNATERA LIQUID BIOPSY PLATFORM**

October 10, 2019

Cowen Analyst: Doug Schenkel

### **KEY TAKEAWAYS FROM THE 8TH ANNUAL MEDTOOLS CONFERENCE: LS & DIAGNOSTICS TOOLS**

September 27, 2019

Cowen Analyst: Doug Schenkel

### **ADPT: UNIQUELY POSITIONED AS EMERGING LEADER IN IMMUNE PROFILING**

July 22, 2019

Cowen Analyst: Doug Schenkel

### **2019 AACR WRAP-UP NOTE: LIQUID BIOPSY AND IMMUNE PROFILING IN FOCUS**

April 4, 2019

Cowen Analyst: Doug Schenkel

## COWEN **ANALYSTS**

**DOUG** SCHENKEL

**STEVE** SCALA, R.PH., CFA

## COWEN **COMPANY COVERAGE**

ADAPTIVE BIOTECHNOLOGIES **ADPT**

EXACT SCIENCES **EXAS**

GUARDANT HEALTH **GH**

ILLUMINA **ILMN**

INVITAE CORP **NVTA**

NATERA **NTRA**

PERSONALIS **PSNL**

QIAGEN **QGEN**

ROCHE **RHHBY**

THERMO FISHER SCIENTIFIC **TMO**

## SELECTED **EVENTS**

### **39<sup>TH</sup> ANNUAL HEALTH CARE CONFERENCE**

March 11-13, 2019 | Boston, MA

### **22<sup>ND</sup> ANNUAL THERAPEUTICS CONFERENCE**

September 25-26, 2019 | New York, NY

### **8<sup>TH</sup> ANNUAL MEDTOOLS CONFERENCE**

September 27, 2019 | New York, NY



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## SELECT **2020 COWEN CONFERENCES**

**41<sup>ST</sup> ANNUAL AEROSPACE/DEFENSE CONFERENCE**  
February 2020 | New York, NY

**40<sup>TH</sup> ANNUAL HEALTH CARE CONFERENCE**  
March 2020 | Boston, MA

**48<sup>TH</sup> ANNUAL TECHNOLOGY, MEDIA & TELECOM CONFERENCE**  
May 2020 | New York, NY

**5<sup>TH</sup> ANNUAL FUTUREHEALTH CONFERENCE**  
June 2020 | San Francisco, CA

**6<sup>TH</sup> ANNUAL COMMUNICATIONS INFRASTRUCTURE SUMMIT**  
August 2020 | Boulder, CO

**8<sup>TH</sup> ANNUAL INTERNET & MEDIA BUS TOUR**  
August 2020 | Seattle, WA, San Francisco, CA

**13<sup>TH</sup> ANNUAL GLOBAL TRANSPORTATION CONFERENCE**  
September 2020 | Boston, MA

**23<sup>RD</sup> ANNUAL THERAPEUTICS CONFERENCE**  
October 2020 | New York, NY

**9<sup>TH</sup> ANNUAL MEDTOOLS UNLOCKED CONFERENCE**  
October 2020 | New York, NY

**5<sup>TH</sup> ANNUAL INDUSTRIAL INNOVATION & TECHNOLOGY SUMMIT**  
November 2020 | New York, NY

**4<sup>TH</sup> ANNUAL IO NEXT SUMMIT**  
November 2020 | Washington, DC

**10<sup>TH</sup> ANNUAL ENERGY & NATURAL RESOURCES CONFERENCE**  
December 2020 | New York, NY

**4<sup>TH</sup> ANNUAL BOSTON CANNABIS CONFERENCE**  
November 2020 | Boston, MA

**7<sup>TH</sup> ANNUAL NETWORKING & CYBERSECURITY SUMMIT**  
December 2020 | New York, NY

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