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## Charter Communications (CHTR)

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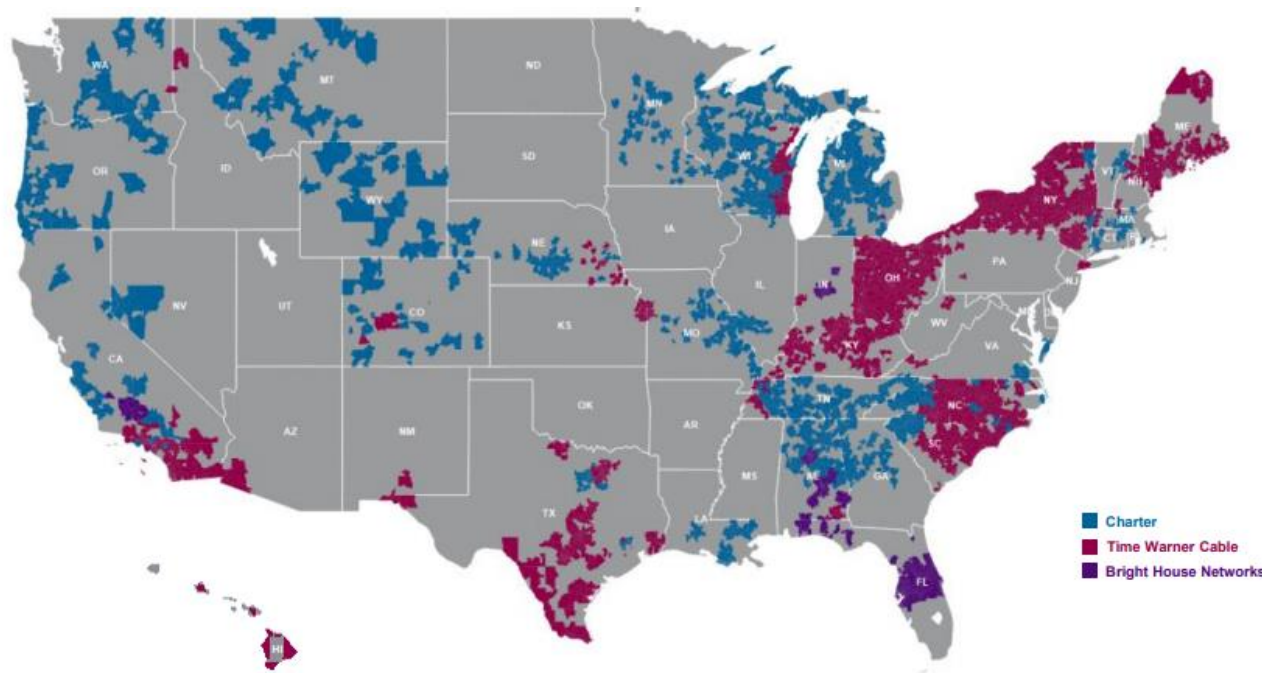
# Charter Communications (CHTR)

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*An Overview*

# About: Charter Communications (CHTR)

- #2 Cable operator in the U.S., with 51.5m homes passed (#1 is Comcast)
- Hybrid/fiber coax infrastructure (HFC), about 750k miles
- Combination of Charter Communication, Time Warner Cable (acq. 2016) and Bright House Networks (acq. 2016) (*map below ~ 2016, largely still relevant*)
- DOCSIS 3.1 technology enables them to provide broadband speeds up to 1 Gbps +



|                       |                |
|-----------------------|----------------|
| Company               | Charter Comm.  |
| Stock Ticker          | CHTR           |
| Sector                | TMT/ Telecom   |
| Industry              | Cable Operator |
| Infrastructure Type   | HFC / Fiber    |
| Homes Passed          | 51.5 million   |
| Plant miles           | ~ 750k         |
| Revenues              | \$45 bn        |
| EBITDA                | \$17bn         |
| Customers             | 29 million     |
| EBITDA Margin         | ~ 38% (cable)  |
| Broadband Subs        | 24.6 million   |
| Broadband Penetration | 51.20%         |

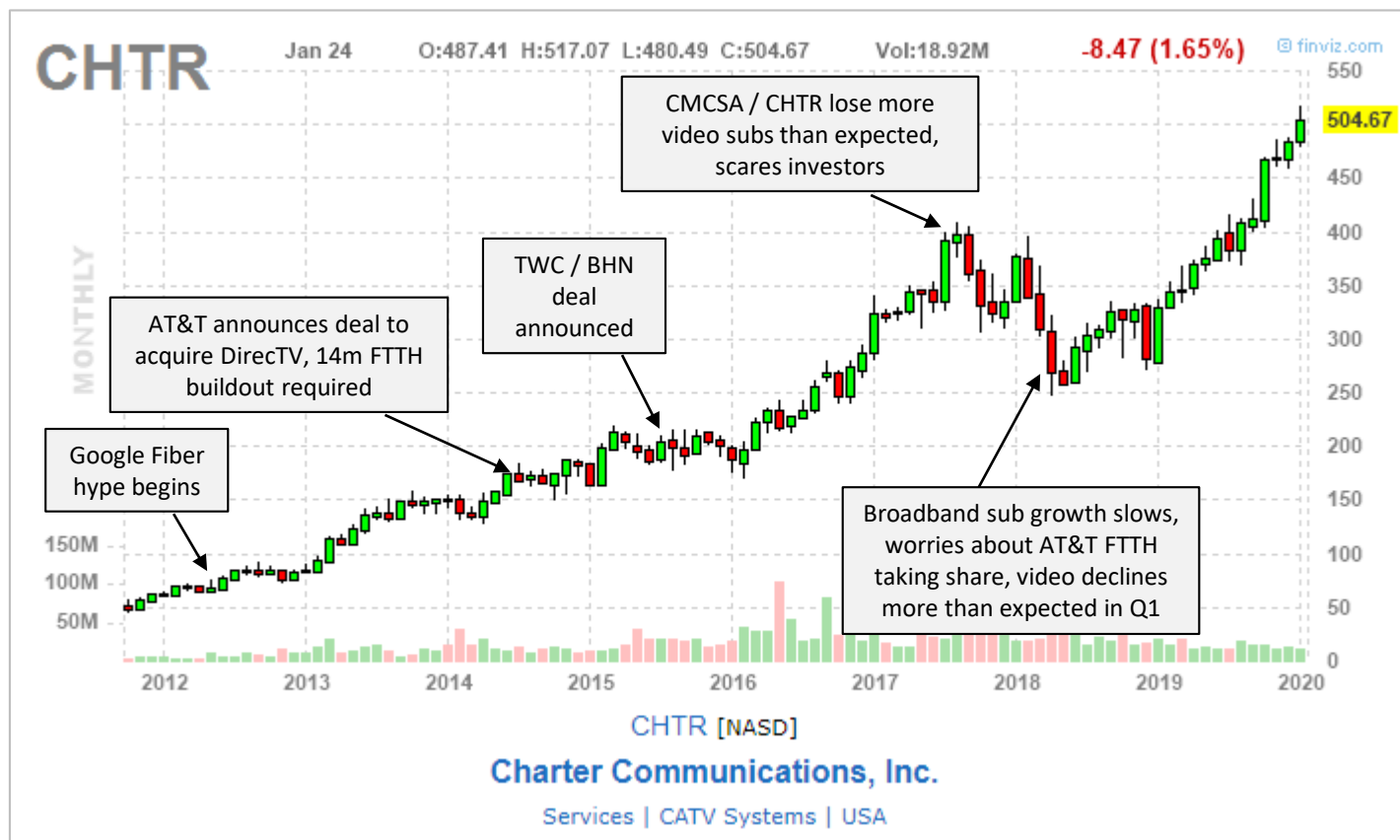
# Stock Information: CHTR (NASD)

## Charter Communications (CHTR)

|                  |    |            |
|------------------|----|------------|
| Stock Price      | \$ | 505.00     |
| S/O (est)        |    | 243.000 ** |
| Market Cap (\$m) | \$ | 122,715    |
| Cash             | \$ | 508        |
| ST Debt          | \$ | 3,509      |
| LT Debt          | \$ | 71,390     |
| Net Debt         | \$ | 74,391     |
| TEV              | \$ | 197,106 *  |

\* Exclude NOLs of \$10.2bn as run through CF St. & Operating Leases

\*\*FDSO estimated based on current verus end of Q3 2019



# CHTR + TWC + BHN = “new Charter”

- Charter *acquired* Time Warner Cable (TWC) and Bright House Networks (BHN) in 2015, **completed** in May 2016
- Two separate deals:
  - TWC for \$78.7 Bn
  - BHN for \$10.4 Bn
- The deal added Advance/Newhouse (“A/N”) as investors, owned 13% of new CHTR in the deal
- Liberty Broadband (LBRDA / John Malone) invested \$5.0 bn, owned 19% of new CHTR
- Time Warner Cable (TWC) and BHN underinvested, and TWC wasn’t operated very efficiency – goal was to give a proven operator (Tom Rutledge) the opportunity to implement the legacy Charter operational playbook on larger assets
- The integration is now complete, as TWC + BHN + CHTR is now the #2 cable operator in the US, behind Comcast

## New Charter: At a Glance

|                                   | Customers in Millions/ \$ in Billions | Charter<br>COMMUNICATIONS | Time<br>Warner<br>Cable | bright house<br>NETWORKS | New Charter |
|-----------------------------------|---------------------------------------|---------------------------|-------------------------|--------------------------|-------------|
| 2014<br>Customers <sup>1)</sup>   | Passings <sup>2)</sup>                | 12.9                      | 30.5                    | 4.7                      | 48.0        |
|                                   | Customer Relationships                | 6.2                       | 15.2                    | 2.5                      | 23.9        |
|                                   | Video                                 | 4.3                       | 11.0                    | 2.0                      | 17.3        |
|                                   | Internet                              | 5.1                       | 12.3                    | 2.1                      | 19.4        |
|                                   | Voice                                 | 2.6                       | 5.6                     | 1.2                      | 9.4         |
| 2014<br>Penetration <sup>3)</sup> | Customer Relationships                | 48%                       | 50%                     | 54%                      | 50%         |
|                                   | Video                                 | 33%                       | 36%                     | 44%                      | 36%         |
|                                   | Internet                              | 40%                       | 40%                     | 44%                      | 41%         |
|                                   | Voice                                 | 22%                       | 19%                     | 25%                      | 20%         |
| 2014<br>Financials <sup>4)</sup>  | Revenue                               | \$9.1B                    | \$22.8B                 | \$3.8B                   | \$35.7B     |
|                                   | Adj. EBITDA                           | \$3.2B                    | \$8.4B                  | \$1.4B                   | \$12.9B     |
|                                   | Capital Expenditures                  | \$2.2B                    | \$4.1B                  | \$0.6B                   | \$6.9B      |
|                                   | Adj. EBITDA – Capex                   | \$1.0B                    | \$4.3B                  | \$0.8B                   | \$6.1B      |

# CEO Thomas M. Rutledge

- Became CEO of CHTR in February 2012
- Unexpectedly resigned as COO of Cablevision December 2011, saying he clashed with Cablevision executive James Dolan
- Considered a pioneer in developing the “triple play”
- Began his career in 1977 at American Television and Communications (ATC)

## Career History

| TITLE                                  | COMPANY                       | TENURE          |
|--|-------------------------------|-----------------|
| <b>Chairman/CEO</b>                    | Charter Communications Inc    | 07/2016–PRESENT |
| <b>Chairman/President/CEO</b>          | Charter Communications Inc    | 05/2016–07/2016 |
| <b>President/CEO</b>                   | Former Charter Communications | 02/2012–05/2016 |
| <b>President/CEO</b>                   | Cch I LLC                     | 02/2012–05/2016 |
| <b>Chief Operating Officer</b>         | Cablevision Systems Corp      | 04/2004–12/2011 |
| <b>Pres:Cable &amp; Communications</b> | Cablevision Systems Corp      | 01/2002–04/2004 |
| <b>President</b>                       | Time Warner Cable Inc         | 08/2001–10/2001 |
| <b>Senior Exec Vice President</b>      | Time Warner Cable Inc         | 04/1999–08/2001 |
| <b>Executive Vice President</b>        | Time Warner Cable Inc         | 01/1996–04/1999 |
| <b>Senior Vice President</b>           | Time Warner Cable Inc         | 01/1994–12/1996 |
|  | American Television & Comms   | 01/1977–UNKNOWN |

# The “Quick Pitch” For Charter’s Stock

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Charter (CHTR) is the #2 cable operator in the US, but is the largest pure play cable operator, as Comcast is more vertically integrated. Cable historically sold a triple play product – TV, home phone, and internet, but things are changing. TV used to be a ubiquitous product across the US, but with cord cutting occurring (thanks to high priced TV products, Netflix, and other streaming), customers are dropping the big bundle. While this has created uncertainty over the last 3-5 years, and will likely create some uncertainty over the next 1-2 years, the trade-off of customers cutting the cord has been a net positive for CHTR. TV was getting expensive for the consumer, and cable companies were heavily promoting and discounting the bundle as they held on to legacy beliefs about the cable business model. TV was also expensive to provide, as cable networks passed through affiliate fee price increases yearly, and thus the gross margin for TV eroded from over 50% 5 years ago to mid/low 30% now. As customers cut the cord, they still consumed video, just not in the traditional way, and this has been a huge benefit to cable companies as customers are electing to purchase home broadband from cable due to their speed advantages over legacy Telco (DSL). As proof, cable Co's has acquired over 100% of the broadband growth over the last few years+ in the US. This trend is likely to continue as Telco is slowing its fiber build outs, and cable continues to have scale advantages across most of the country. From a financial perspective, broadband has >95% gross margins, is sticky product to provide, and has much less equipment CapEx vs. TV. As broadband subscribers grow for CHTR, while their revenue may not grow as much due to losing more video subscribers, their operating margins will see faster growth. CHTR also have about \$10bn in NOLs and shouldn't pay cash taxes until 2021 at the earliest. Given the de facto capital allocator is Dr. John Malone (Liberty Broadband owns 21.2% on full diluted basis) and the strength of their broadband subscribers, CHTR will likely run a fairly highly levered business, and will use free cash flow and incremental debt issuance to massively shrink the equity, as they have done already with retiring 23.4% of stock since Sept 2016. At about 19x 2019 FCFE/sh. (excluding mobile), investors are getting a business that should grow FCFE/sh. low-to-mid teens for at least the foreseeable future 3-5 years. Additional upside is their agreement with Verizon to sell a mobile product, which the market gives little to no value currently.



# Liberty's Investment in CHTR

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*Implementing the John Malone Model*

*Add: Advance/Newhouse via BHN Acquisition*

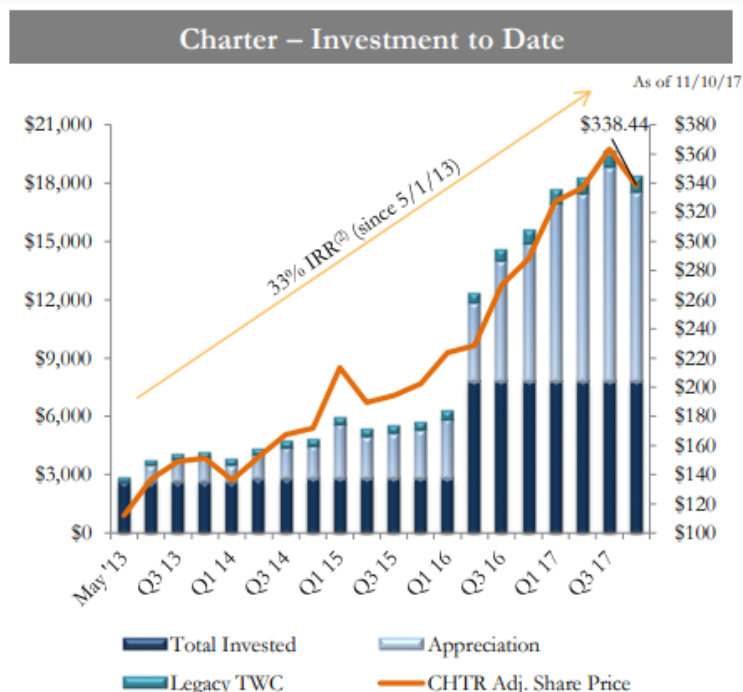
# Liberty Investment in “CHTR”

From 2017 Liberty Broadband Investor Day

## Charter Investment Seeing Outstanding Returns

### Charter investment timeline:

- **May 2013:** Initial \$2.6b purchase for 24.3m<sup>(1)</sup> shares at price of \$105.62/share<sup>(1)</sup>
- **May – Nov 2014:** Acquired 1.8m<sup>(1)</sup> Charter shares
  - Additional shares purchased plus exercise of 1.1m warrants
- **Nov 2014:** Liberty Broadband spun-off from Liberty Media
- **May 2016:**
  - Purchased 22.0m shares as part of Charter / Time Warner Cable (“TWC”) merger at price of \$195.70<sup>(1)</sup>
  - Purchased 3.6m shares as part of Charter acquisition of Bright House (“BH”) at price of \$191.33<sup>(1)</sup>
  - Existing 2.4m TWC shares converted to Charter shares
- **Total: 54.1m Charter shares**



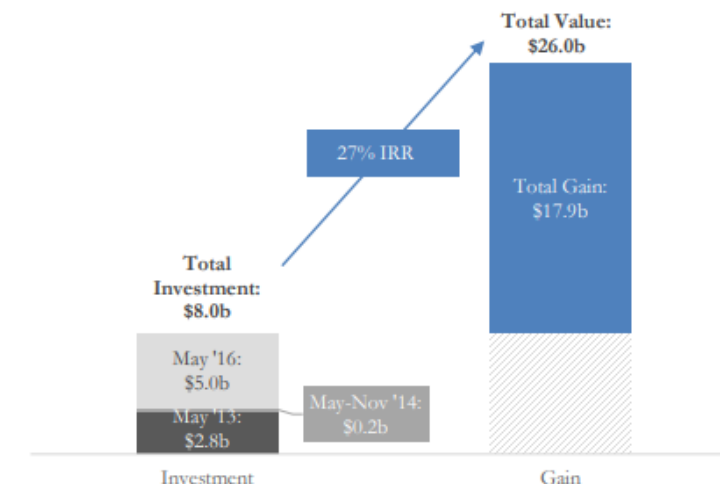
(1) Adjusted for the May 2016 reorganization of Charter into New Charter.

(2) IRR since closing our initial purchase of CHTR stock at \$105.62/share (also includes impact of ~1.1m warrants) and TWC shares at market value in May 2013, as well as the follow-on purchases of 897k CHTR shares for \$153.52/share in May 2014 and 25.6m CHTR shares for \$195.08/share in May 2016. See footnote (1) regarding adjustments.

From 2019 Liberty Broadband  
Investor Day

## LBRD Investment to Date

- 54.1m CHTR shares acquired from May 2013 – May 2016



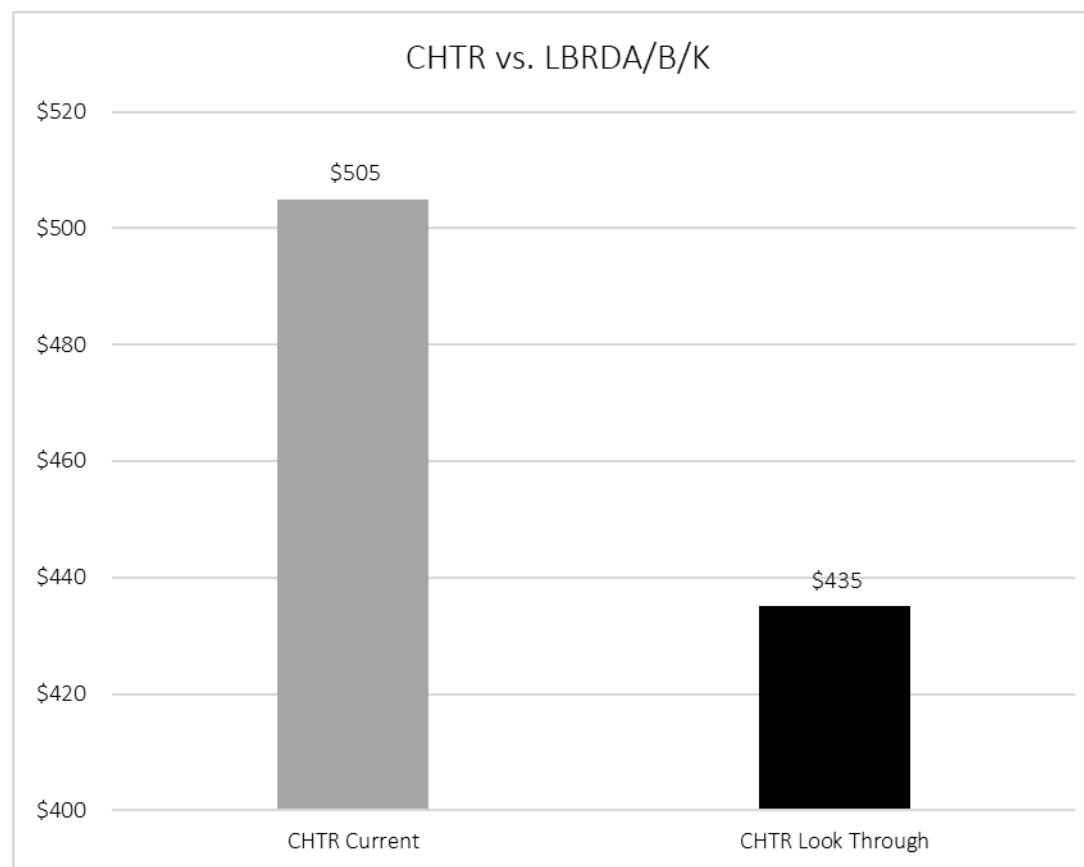
# Liberty Broadband (LBRDA/B/K)

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- Spun out of Liberty Media in May 2014
- Through prior years of transactions, LBRDA owns 54.1m shares of CHTR stock, a total investment of \$8.0bn
  - Invested \$2.8bn in May 2013
  - May – Nov 2014 – purchased an addition \$0.2bn
  - Invested \$5.0bn in May 2016 to help facilitate the TWC / BHN acquisitions
- Ownership is ~ 21.2% on a fully diluted basis (including dilutive impact of A/N convertible preferred)
- Voting interest is 25.02%, including A/N and GCI proxies
- Ownership of CHTR capped at 26.00% ownership, or 25-35% of voting rights depending on A/N equity reduction
- John Malone owns 4.9% of LBRDA shares, but it represents 49.0% of voting rights. Greg Maffei owns 2.8% of LBRDA shares, 1.6% of voting power.
- John Malone owns 96.3% of the B shares
- Overall, Malone owns 49% voting of LBRDA / B / K shares, and LBRDA (through LBRDA, GCI, A/N) has 25.01% voting of CHTR

# Liberty Broadband (LBRDA/B/K): NAV

| Liberty Broadband (LBRDA/B/K) (1/27/2020) |           |           |         |        |
|---|-----------|-----------|---------|--------|
| 54.1, CHTR shares                         | \$        | 27,321    |         |        |
| Cash                                      | \$        | 47        |         |        |
| Zero Strike Call Option Derivative        | \$        | 46        |         |        |
| Margin Loan Debt                          | \$        | (573)     |         |        |
| Liberty Broadband NAV                     | \$        | 26,840    |         |        |
| Liberty Broadband NAV / Share             | \$        | 147.84    |         |        |
| Current LBRDA/B/ K Price / Share          | \$        | 129.64    |         |        |
| Current LBRDA/K Mkt Value                 | \$        | 23,536    |         |        |
| Discount (%)                              |           | -12.3%    |         |        |
| Discount (\$)                             | \$        | (3,304)   |         |        |
| CHTR "Look Through Price"                 | \$        | 435.00    |         |        |
| Outstanding Shares (mln)                  |           |           |         |        |
|   | Q3 2019   | 1/27/2020 | Mkt Val |        |
| LBRDA                                     | 26.375    | \$ 128.40 | \$      | 3,387  |
| LBRDB                                     | 2.453     | \$ 123.60 | \$      | 303    |
| LBRDK                                     | 152.723   | \$ 129.95 | \$      | 19,846 |
| Total S/O                                 | 181.551   | \$ 129.64 | \$      | 23,536 |
| Charter Share Price (1/27/2020)           | \$        | 505.00    |         |        |
| Liberty Investments in CHTR:              |           |           |         |        |
| TWC Deal (May 2016)                       | \$ 195.70 | \$ 4,300  | 22.0    |        |
| BHN Deal (May 2016)                       | \$ 191.33 | \$ 700    | 3.6     |        |
| May - Nov 2014                            |           |           | 1.8     |        |
| May 2013 Open Market                      | \$ 105.62 | \$ 2,600  | 24.3    |        |



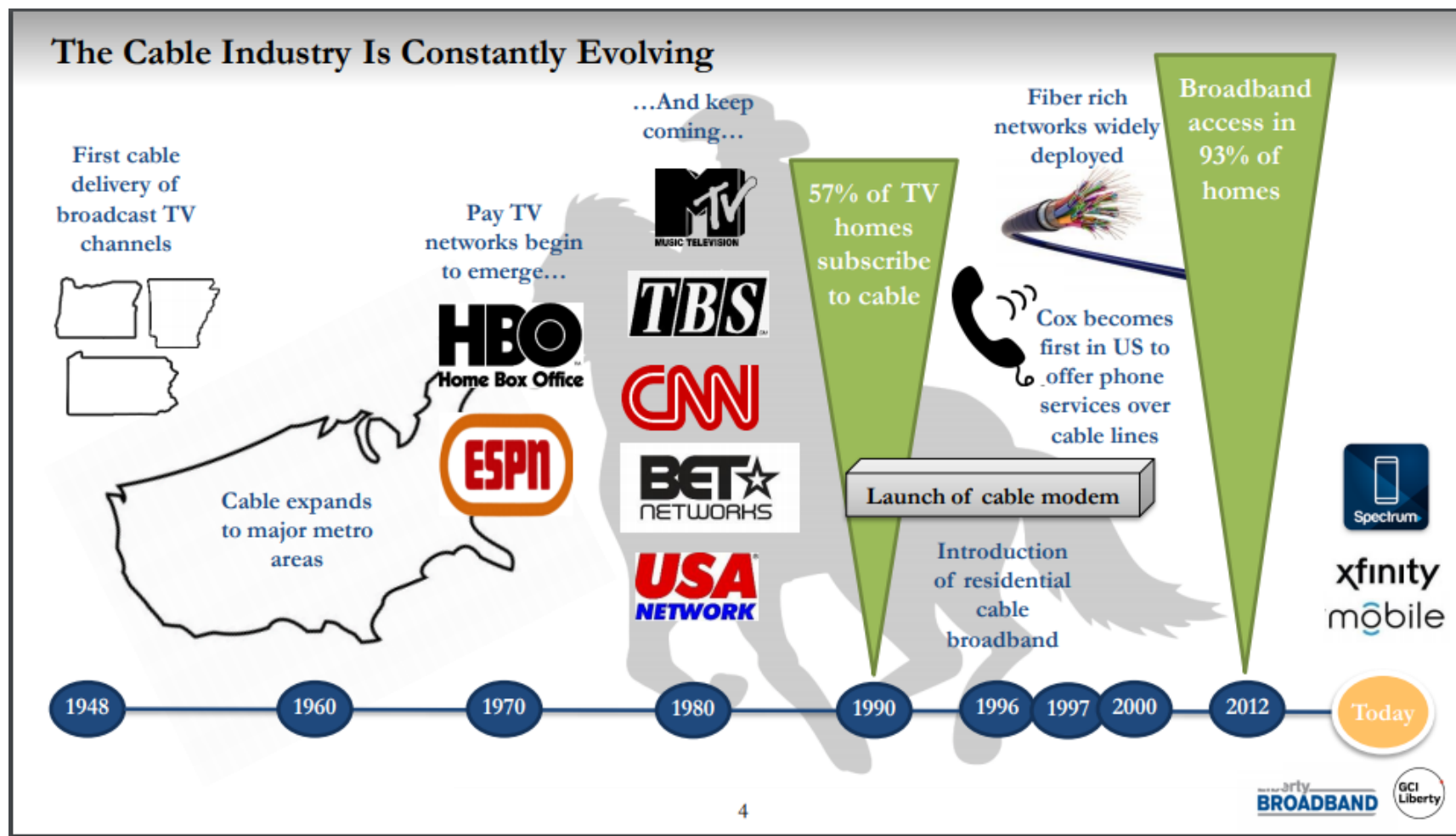
# The Cable Infrastructure and Technology

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*HFC: “Hybrid Fiber Coax”*

*DOCSIS*

# Quick Overview of Cable Industry Evolution



# HFC: Hybrid-Fiber-Coaxial cables

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- Crisscross most of the US, reaching over 90% of US households
- Combines optical fiber and coaxial cable, thus then term HFC
- Employed by cable since the early 1990s
- Current speeds up to 1 Gbps up, but DOCSIS 3.1 apparently can get up to 10 Gbps downstream / 2 Gbps upstream
- Next evolution of technology for cable is DOCSIS 4.0 FD, symmetrical speeds up to 10 Gbps
- It would support high speeds by tapping into cable HFC plant's available RF spectrum
  - Could use more than **1.2 GHz** of plant spectrum that can now be leverage for DOCSIS 3.1 or **1.8 GHz** for DOCSIS 4.0 FD
  - Note: plenty of cable operators aren't even using 1 GHz yet, CHTR uses 750 MHz, with a path up to 3 GHz (see below)
- The coaxial cable physical limit is around 10 GHz
- CHTR Q3/2019 transcript:

We also remain focused on opportunities to continue to develop our core asset, our hybrid fiber coax wireline network and its capacity. And we have a cost-efficient pathway to do that. Our infrastructure today delivers low-latency service and superior capacity and speed. And we have a scalable, relatively low-cost upgrade path that allows for further low-latency superiority, 10-gig symmetrical speeds with DOCSIS 4.0, also called Full Duplex, and expanded network throughput. Specifically, over time, we can expand our network from 750 megahertz to up to 3 gigahertz to meaningfully increase our total throughput and capacity, all of which positions us to continue to be the network of choice for a wide array of application such as gaming, 8K video, developing high-capacity, low-latency product, such as virtual reality, and medical and educational use cases. And we're doing that on a development path that is faster and more cost efficient than can be achieved by our competitors.

# HFC: How Does it Work?

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- TV channels are sent from cable distribution facility (“headend”) to local communities through optical fiber
- At the local community, a box called a “node” translates the signal from a light beam to radio frequency (RF)
- It sends the RF over coaxial cables for distribution
- Typical node serves around 25 – 2000 homes
- DOCSIS “Data Over Cable Service Interface Specification” – transparent ethernet bridge over a hybrid fiber coax network (HFC)
  - Cable modem (CM) on the customer/subscriber side
  - CMTS in the headend or hub site (cable plant)



# Cable Infrastructure Advantaged Over Telco

## The Power of the Pipe



- Cable infrastructure advantaged
  - Ability to offer multiple products through cable pipe drives margin and connects and reduces churn
- Huge investments in technology and network upgrades paying off
  - Charter expects to offer minimum speeds over 100Mbps in nearly all passings by year-end
    - Legacy DSL working to get over 25Mbps threshold
  - Completed all-digital conversion at legacy Charter at end of 2014; legacy TWC / BH networks expected to be all-digital by approximately end of 2018
  - Launching gigabit speed offerings in key markets using DOCSIS 3.1
- Existing network has long runway to satisfy increasing bandwidth demands
  - Upgrade path enabled by DOCSIS 3.1 supports 10Gbps symmetrical performance
  - Modest incremental cost to achieve

# The History of DOCSIS

## The Evolution of DOCSIS

For mobile users, scroll left to view the table.

|                                | DOCSIS 1.0   | DOCSIS 1.1                                     | DOCSIS 2.0   | DOCSIS 3.0                                       | DOCSIS 3.1  | DOCSIS 4.0  |
|--------------------------------|--|--|--|--|---|---|
| Highlights                     | Initial cable broadband technology, high speed internet access | Added voice over IP service, gaming, streaming | Higher upstream speed, capacity for symmetric services | Greatly enhances capacity, channel bonding, IPv6 | Capacity and efficiency progression, OFDM, wideband channel | Symmetrical streaming and increased upload speeds |
| Downstream Capacity            | 40 Mbps  | 40 Mbps  | 40 Mbps  | 1 Gbps   | 10 Gbps   | 10 Gbps   |
| Upstream Capacity              | 10 Mbps  | 10 Mbps  | 30 Mbps  | 100 Mbps   | 1-2 Gbps  | 10 Gbps   |
| First Specification Issue Date | 1996   | 1999   | 2001   | 2006   | 2013  | 2019*   |

\*Full Duplex DOCSIS was originally introduced in 2017 as part of DOCSIS 3.1.

# DOCSIS 3.0 (2006 release)

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- Announced in 2006, 5 years after DOCSIS 2.0
- Support for 160 Mbps down / 120 Mbps up
- In 2011, Comcast offered 105 Mbps “Extreme-tier”, compare to 1 Gbps now (~8-9 years later)
- Comcast began initial deployment of DOCSIS 3.0 “wideband” in 2008
  - Initial speed offering was up to 50 Mbps, at the time they offered speeds up to 24 Mbps

## Per Comcast (2008 comments)

- 3.0 channel bonding where their 15m HSD subs, a \$6bn business, is powered by one 6 MHz channel, so out of 750 MHz they use 6 MHz, less than 1% of capacity they have
- Per byte is about half as expensive as old DOCSIS 2.0 equipment, but need to buy new equipment in head end, need to get new cable modems to take advantage of it
- Were finally catching up to telco DSL, which was in 90% of their footprint
- 3.0 modems were twice as much, so 2.0 was about \$25, and 3.0 was about \$50-\$60, but will shrink
- Estimated spend of about \$400 - \$500m on DOCSIS 3.0 and all-digital efforts

This is the end of the trial view for the CHTR slide deck

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