

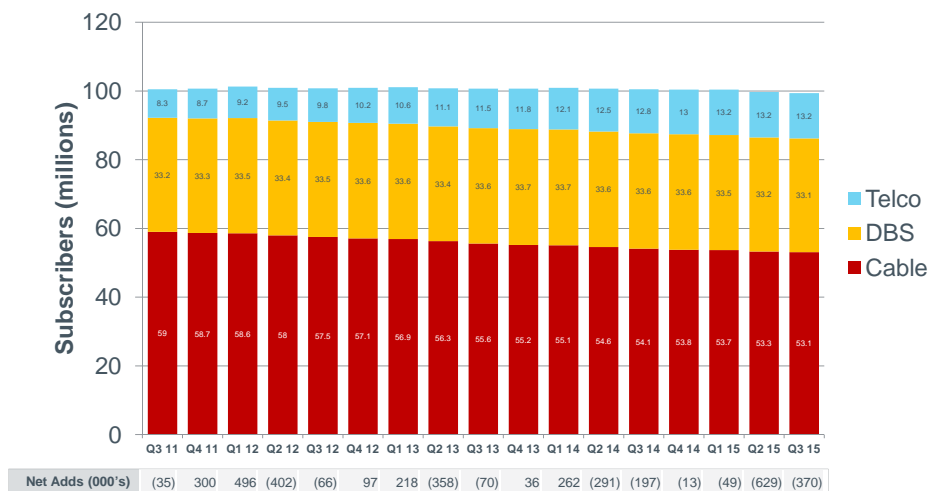
Measuring OTT Operating Cost Savings

January 21, 2016

2016 TFI Asset Valuation Conference

Ruben Miranda, Director, Duff & Phelps

Current State of Multichannel Video Services [1] Total U.S. Subscribers, 2011-15

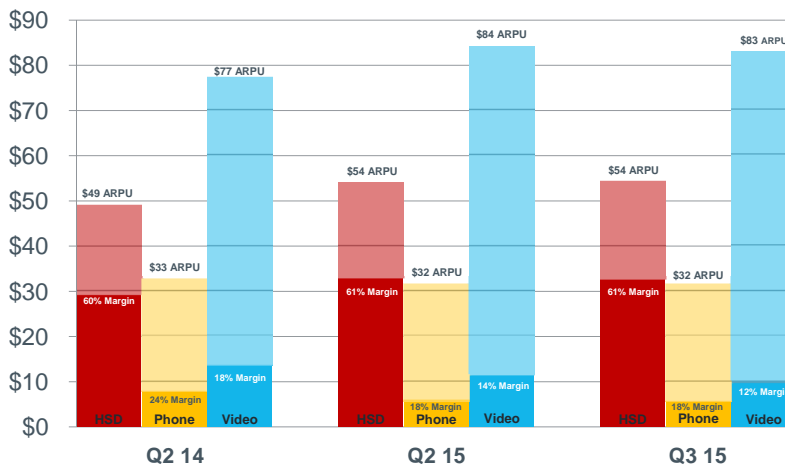


[1] - Source: SNL Cable & Multichannel Overview - Nov 2015

Revenues and EBITDA Margins Per Subscriber Cable Industry Example [1]

[1] – Source: SNL Cable & Multichannel Overview – Nov 2015
 ARPU's from Atlantic Broadband, Cable One, Cablevision, Charter, Comcast, General Communication, Mediacom, Shentel, Suddenlink, Time Warner Cable and WideOpenWest (All Pro forma)
 Segment margins from Charter, Comcast and Time Warner Cable (All Pro forma)

HSD	Margin	Costs
Phone	Margin	Costs
Video	Margin	Costs



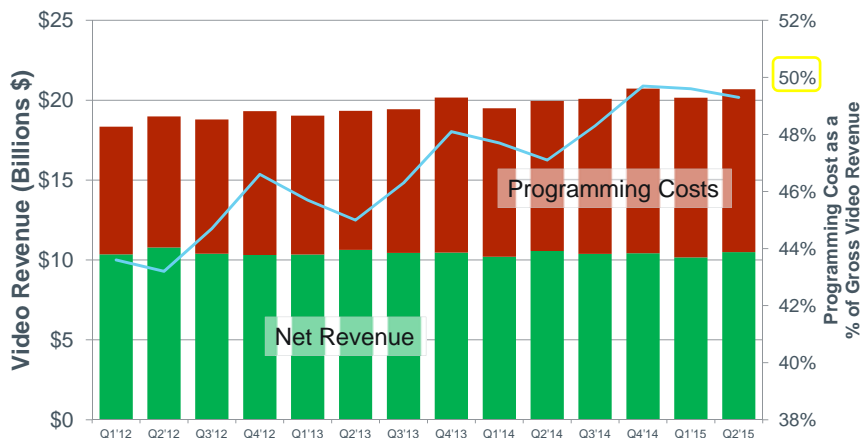
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Current State of Multichannel Video Services [1] Pro forma Revenue and Programming Costs, 2012-15

Cablevision, Charter, Comcast, DIRECTV, DISH Network, Suddenlink, and Time Warner Cable



[1] – Source: SNL Cable & Multichannel Overview – Nov 2015

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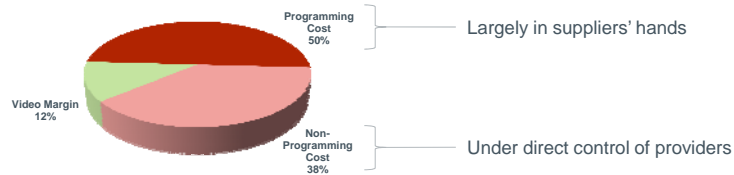
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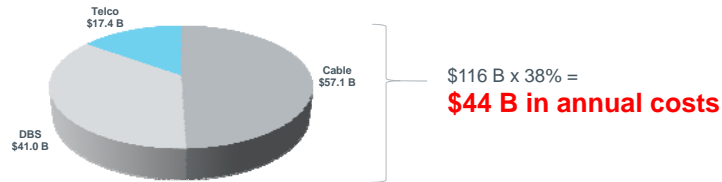
Current State of Multichannel Video Services

Non-Programming Costs

- Assuming the economics of video are similar across all multichannel...



- Extrapolating to the **\$116 B** Multichannel industry...



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Non-Programming Costs Breakout

- Non-Programming Costs can include:
 - Recurring costs
 - Direct: Operations & Maintenance ("O&M")
 - Indirect: Other allocated corporate costs
 - One-time costs
 - Labor
 - Materials (subject to capitalization policy)

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Non-Programming Costs

One-Time Costs

- Fundamentally, one-time costs are associated with a **truck roll**.
 - Dispatching a technician to the customer premise to perform an initial connection, upgrade, repair, or disconnection
 - “Telecom industry analysts estimate the cost of the average truck roll at anywhere from **\$150 to \$600**, depending on your location, the work being done at the site, and the technician’s skill level and salary. The bulk of that price tag is the personnel cost of paying a trained telecommunications technician to drive from Point A to Point B. It gets more expensive if the truck roll is at night and the technician is paid overtime. Union contracts sometimes specify a minimum number of hours that on-call technicians are paid for every truck roll, regardless of how long the site visit actually takes.” (Bob Berry, Road to Nowhere, OSP Magazine, July 2005)

Non-Programming Costs

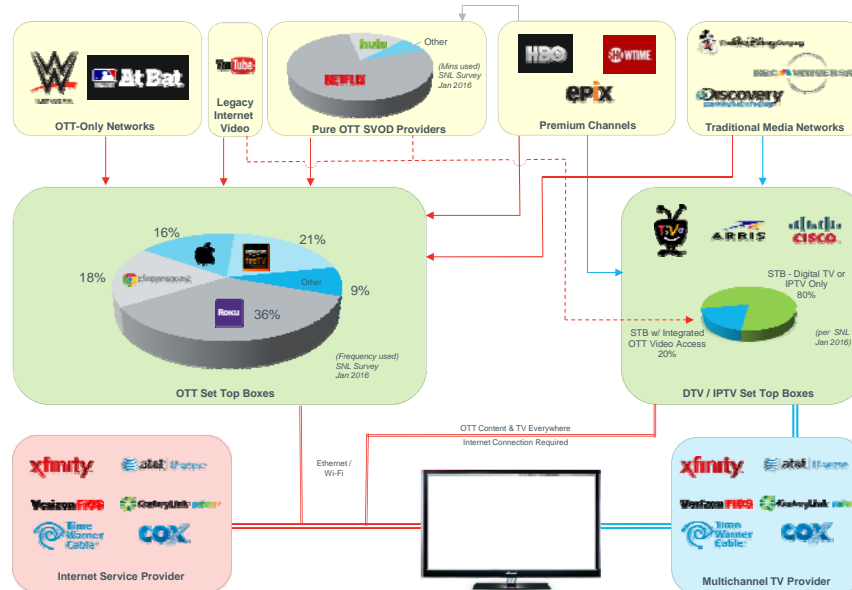
Truck Roll

- Avoiding a truck roll has a direct impact on profitability!
- Ways for providers to avoid truck rolls:
 - Don’t come out
 - Offer more reliable equipment
 - Proactive upgrades while on site
 - Remote diagnosis and repair tools
 - Self-installation
 - » Set top box shipped via courier
 - » “Plug-and-play” with existing home network
 - » Only works economically if failure rate for self-install is low
 - High return rate could outweigh the truck roll cost
 - » Lowest self-install failure rates are on IP-based set top boxes
 - Diagnosis and interactive step-by-step menus

Types of IP-Based Set Top Boxes Truck Roll

- Types of IP-based set top boxes
 - IPTV:** operates in a closed system via a dedicated, managed network controlled by the provider; it replaces traditional circuit switched analog or digital television channels with digital channels which happen to use packet-switched transmission, but whose packets never travel over the public Internet. Local bandwidth for each customer's needs is guaranteed.
 - Over-the-Top ("OTT"):** delivered through the open, unmanaged Internet, with the "last-mile" telecom company acting only as the Internet service provider. Third-party dedicated OTT boxes are most common, such as Apple TV, Roku, and Amazon Fire.
- IPTV boxes require further authentication and provisioning within the closed network to function correctly, while OTT boxes simply require an Internet connection. This simplicity eliminates much of the transaction "friction."

Video Content, Providers, and Set Top Boxes



CenturyLink Announcement

- Stewart Ewing, CFO of CenturyLink, announced at the UBS 43rd Annual Global Media and Communications Conference (12/8/15):
 - “We are looking at an over the top product that we could deliver either some of or all the content we have today. This is a product [...] that we believe **we can get to the customer without a truck roll** so it could help us decrease the cost of delivering the video to the customer.”
 - Seeking to provide video service to any customer in the Prism market with a minimum 10 Mbps broadband
 - Other implications besides expense reduction
 - » Longer-term play for a wider video footprint
 - » End of franchises?

See also <http://www.fierceinstaller.com/story/centurylinks-ewing-ott-video-could-reduce-truck-roll-costs-expand-service-a/2015-12-08>

Reasons to Quantify Operational Cost

- Profitability on Existing or Future Video Customer Base
 - Deployment of OTT to qualified customers over IPTV boxes
 - Capital cost differences → known when available commercially
 - Operational cost differences → capitalized on after-tax basis over the remaining useful life of the legacy equipment
 - Once technology is proven, a prudent investor would choose the deployment with the lowest total cost of ownership
- Key Questions to Address
 - Adherence to company’s capitalization and expense policies
 - » Some providers capitalize wiring, others expense it
 - » Some capitalize portions of labor based on specific job codes
 - » Care to avoid double-counting or missed expenses

Example of Nonrecurring Expenses per IPTV Customer

Nonrecurring Expense - Non-Capitalized Costs to Connect an IPTV Video Customer

To receive video, a customer needs:

1. Drop and NID/ONT
2. Set Top Box(es) and Remote Gateway
3. Labor, Materials, Other Overhead

Included in replacement network RCN even for non-working lines
Capitalized in accordance with Company accounting policies for terminal equipment
<<< expensed; need to quantify here

Components for Expensed Items:

- a. Labor Provider dispatches premises technician; tech travels to site, enters premises, connects RG to NID & network, and STBs to TVs, and returns
- b. Materials Provider leaves behind Ethernet, HDMI cables, remotes, etc - all owned by consumer for consumer's use
- c. Overhead Add'l burden of ancillary equipment, primarily truck costs (maintenance and fuel)

Labor

Premises Technician Hourly Rate	\$18.00	nationwide average is \$18 (capped at \$20/hr) w/ annual raises
Multiplied By: Benefit Loading Factor	1.20x	
Multiplied By: Cost of Living Adjustment	0.93x	Adjusted to Texas
Multiplied By: Average Dispatch Time (hrs)	3	2 hour time at location + 30 minute prep/commute each way
Labor Cost	\$60.13	

Materials

Cabling (2.5 HDMI cables and/or coax)	\$12.50	survey of online wholesale vendors, used \$5/ea
Ethernet - 1 for RG, 2.5 for STBs = 3.5	\$22.27	Retail cost of 6' cabling, less 10% OH
2.5 Remotes	\$45.45	Retail cost of remote from provider, less 10% OH
Materials Cost	\$80.23	

Overhead

Truck Roll Avg Round Trip	30	15 miles each way
Cost per Mile	\$0.56	http://www.irs.gov/2014-Standard-Mileage-Rates-for-Business,-Medical-and-Moving-Announced
Burden	\$16.80	

TOTAL NONRECURRING EXPENSES **\$157.16**

Example of Nonrecurring Expenses per OTT Customer

Nonrecurring Expense - Non-Capitalized Costs to Connect an OTT Video Customer

To receive video, a customer needs:

1. Drop and NID/ONT
2. Set Top Box(es) and Remote Gateway
3. Labor, Materials, Other Overhead

Included in replacement network RCN even for non-working lines
Capitalized in accordance with Company accounting policies for terminal equipment
<<< expensed; need to quantify here

Components for Expensed Items:

- a. Labor Provider fulfills order, ships capitalized equipment via courier
- b. Materials Provider also ships expensed items - Ethernet, HDMI cables, remotes, etc
- c. Overhead No truck roll costs

Labor

Fulfillment Technician Hourly Rate	\$18.00	using same as Premises Technician
Multiplied By: Benefit Loading Factor	1.20x	
Multiplied By: Cost of Living Adjustment	0.93x	Adjusted to Texas
Multiplied By: Average Fulfillment Time (hrs)	0.25	15 mins to process and ship
Labor Cost	\$5.01	
Plus: Shipping Cost	\$25.00	2-Day courier cost (FedEx, UPS, etc)
	\$30.01	

Materials

Cabling (2.5 HDMI cables and/or coax)	\$12.50	survey of online wholesale vendors, used \$5/ea
Ethernet - 1 for RG, 2.5 for STBs = 3.5	\$22.27	Retail cost of 6' cabling, less 10% OH
2.5 Remotes	\$45.45	Retail cost of remote from provider, less 10% OH
Materials Cost	\$80.23	

Overhead

\$0.00 No truck roll

Contingency for Failed Self-Install

Labor for Truck Roll (Use IPTV Labor Cost)	\$60.13
Overhead for Truck Roll (Use IPTV Labor Cost)	\$16.80
Truck Roll Cost (excluding Materials)	\$76.93
Times: Failure Rate	5%
	\$3.85

TOTAL NONRECURRING EXPENSES **\$89.09**

Operating Cost Savings

Metrics

Video Subs as of Valuation Date	1,000,000
Times: % of Subs Not on OTT Boxes	95%
Times: % of Subs Also On Provider's Broadband	80%
Times: % of Subs With Minimum 10 Mbps	60%
Eligible Video Subs	456,000
Divided By: Rollout Period / RUL of Existing Boxes	5
Video Subs Upgraded Per Year	91,200
Nonrecurring Expenses Required for IPTV Boxes	\$157
Nonrecurring Expenses Required for OTT Boxes	\$89
Cost Savings Per Sub	\$68
Times: Taxes	(\$27)
Cost Savings Per Sub (After Tax)	\$42

Present Value Calculation:

Video Subs Upgraded Per Year	91,200
Times: Savings Per Sub	\$42
Annual Expense Savings	\$3,787,231 (PMT)
Number of Years	5 (N)
Discount Rate:	10% (I/YR)
Obsolescence:	\$14,356,584 (PV)