EXHIBITS TO SEPTEMBER 11, 2014 RESPONSES OF COMCAST CORPORATION TO THE COMMISSION'S INFORMATION AND DATA REQUEST

ALL EXHIBITS REDACTED EXCEPT THOSE THAT FOLLOW

Exhibit 12

Entries to and Exits from Internet Traffic Exchange		
Name and Address of Company	**Services Provided**	**Date of Entry Into and, if Applicable, Exit From the Market**
Global Crossing	Transit and peering links, Virtual Private Network (VPN), Leased lines, Audio and Video conferencing, Long distance telephone, managed services, dialup, colocation and VoIP.	Exit: October 2011
Apple, Inc. 1 Infinite Loop Cupertino, CA 95014	CDN	Entry: 2014
Cotendo	CDN	Exit: 2011
Fastly PO Box 78266 San Francisco, CA 94107	CDN	Entry: 2011
MaxCDN 3575 Cahuenga Blvd. West Suite 330 Los Angeles, CA 90068	CDN	Entry: 2009

Exhibit 12

Entries to and Exits from Internet Access Service	
Name and Address of Company	**Date of Entry Into and, if Applicable, Exit From the Market**
Google Fiber 1600 Amphitheatre Parkway Mountain View, CA 94043	Entry: 2011
Qwest	Exit: 2011
Towerstream Corp. Tech IV 88 Silva Lane Middletown, RI 02842	Entry: 2010
Leap Wireless International, Inc.	Exit: 2014
Clearwire Corporation	Exit: 2013

Exhibit 12

Entries to and Exits from MVPD	
Name and Address of Company	**Date of Entry Into and, if Applicable, Exit From the Market**
Google Inc. (Google Fiber) 1600 Amphitheatre Parkway Mountain View, CA 94043	Entry: 2011
Centurylink Prism TV 100 CenturyLink Drive Monroe, Louisiana 7201	Entry: 2010
Insight Communications	Exit: August 2011
Knology Inc.	Exit: April 2012

Exhibit 12

Entries to and Exits from Online Video Distribution		
Name and Address of Company	**Services Provided**	**Date of Entry Into and, if Applicable, Exit From the Market**
AOL, Inc. 770 Broadway New York, NY 10003	Internet-based video streaming through SlashControl	Entry: 2009
AT&T Inc. 208 S. Akard Street Dallas, TX 75202	Internet-based video streaming through AT&T Entertainment	Entry: September 2009
Clicker Media Inc. 6824 Melrose Avenue Los Angeles, CA 90038	Internet-based programming directory and video streaming at clicker.com	Entry: November 2009
Epix Studio 3 Partners LLC 1515 Broadway New York, NY 10036	Internet-based video streaming, VOD service, cable channel	Entry: October 2009
Home Box Office, Inc. 1100 Avenue of the Americas New York, NY 10036	Made-for-mobile television programming	Entry: February 2010
Ideal Media Financial Ltd. 6 The Coppens Stotfold, Hitchin Herts, SG5 4PJ United Kingdom	Internet-based video streaming at iReel.com	Entry: 2009
Jumpcut	Internet-based video streaming	Exit: June 2009
Vevo 825 8th Avenue, 23rd Floor New York, NY 10019	Internet-based video streaming	Entry: December 2009
Vreel Address Unknown	Internet-based video streaming	Exit: January 2010
National Geographic Channel 1145 17th Street NW Washington, DC 20036	Internet-based video streaming	Entry: March 2010
Better Black TV	Internet-based video streaming	Entry: November 2010
Joost c/o Adconion Media Group Ltd. 131-151 Great Tichfield Street London, W1W 5BB	Internet-based video streaming	Exit: 2012
Mediaflo Technologies 5775 Morehouse Drive San Diego, CA 92121	Internet-based video streaming through video console	Exit: 2011
MLB Advanced Media, LP 40 Hartz Way, Suite 10 Secaucus, NJ 07094	Internet-based video streaming	Entry: January 2009

Entries to and Exits from Online Video Distribution		
Name and Address of Company	**Services Provided**	**Date of Entry Into and, if Applicable, Exit From the Market**
Microsoft (Bing Video) One Microsoft Way Redmond, WA 98052	Internet-based video streaming	Entry: 2009
Net2Vu Harman Enterprises Ltd. C/o Trident Trust P.O. Box 146 Tortola, BVI	Internet-based video streaming	Exit: 2012
ZapmyTV 2207 Concord Pike Suite 619 Willmington, DE 19803	Internet-based video streaming	Entry: 2010
Zillion TV 3131 Jay Street Suite 200B Santa Clara, CA 95054	Internet-based video streaming	Entry: 2009
Oprah Winfrey Network, LLC	Internet-based video streaming	Entry: January 2011
RightNetwork	Internet-based video streaming	Entry: September 2010 Exit: 2011
Better Black TV	Internet-based video streaming	Entry: November 2010
UltraViolet Paramount Pictures 5555 Melrose Ave. Los Angeles, CA 90038	Internet-based video streaming	Entry: January 2012
Facebook 1601 Willow Rd. Menlo Park, CA 94025	Internet-based video streaming	Entry: 2011
DirectTV 2230 E Imperial Hwy El Segundo, CA 90245	Internet-based video streaming	Entry: May 2011
DISH Network 9601 S Meridian Blvd. Englewood, CO 80112	Internet-based video streaming	Entry: March 2012
Barnes & Noble NOOK Video 122 Fifth Avenue New York, NY	Internet-based video streaming	Entry: 2012
Aereo 455 Broadway New York, NY 10013	Internet-based video streaming	Entry: 2012 Exit: (Temporarily Suspended)
Sky Angel	Internet-based video streaming	Exit: 2013

Entries to and Exits from Online Video Distribution		
Name and Address of Company	**Services Provided**	**Date of Entry Into and, if Applicable, Exit From the Market**
Bohemia Visual Music 2328 E Van Buren Street Phoenix, AZ 85006-3949	Internet-based video streaming	Entry: 2011
Discovery Communications One Discovery Place Silver Spring, MD 20910	Internet-based video streaming	Entry: 2013
The Hayzlett Group 101 South Main Avenue, Fourth Floor Sioux Falls, SD 57104	Internet-based video streaming	Entry: 2014
Louisck.net 3 Arts Entertainment Inc. 9460 Wilshire Boulevard Floor 7 Beverly Hills, CA 90212	Internet-based video streaming	Entry: Approximately 2011

Exhibit 12

Entries to and Exits from Video Programming			
Name and Address of Company	**Name of Programming Service**	**Programming Provided**	**Date of Entry Into and, if Applicable, Exit From the Market**
Black Entertainment Television 1235 W Street, NE Washington, DC 20018	Centric	General interest	Entry: September 2009
Discovery Communications One Discovery Place Silver Spring, MD 20910	TestTube	Internet-based educational programming	Entry: 2013
Studio 3 Partners LLC 1515 Broadway New York, NY 10036	Epix	Premium	Entry: October 2009
Liberman Broadcasting, Inc. 1845 Empire Avenue Burbank, CA 91504	Estrella TV	Spanish-language	Entry: September 2009
Fox Entertainment Group 10201 West Pico Boulevard Los Angeles, CA 90035	FOX Reality	Reality TV	Exit: March 2010
MLB Advanced Media, LP 40 Hartz Way, Suite 10 Secaucus, NJ 07094	MLB Network	Sports	Entry: January 2009
National Geographic Channel 1145 17th Street NW Washington, DC 20036	National Geographic Wild	Wildlife	Entry: March 2010
NHL Network 9 Channel Nine Court Scarborough, ON M1S 4B5 Canada	NHL Network	Sports	Entry: October 2007
Next One Interactive 2400 North Commerce Parkway, Suite 105 Weston, FL 33326	Resort & Residence TV	Lifestyle	Entry: November 2009
The Walt Disney Company 500 South Buena Vista Street Burbank, CA 91521	Disney XD	Children's Programming	Entry: February 2009
Oprah Winfrey Network, LLC 5700 Wilshire Blvd. Los Angeles, CA 90036	Oprah Winfrey Network	Entertainment	Entry: January 2011
RightNetwork	RightNetwork	News	Entry: September 2010 Exit: 2011
Better Black TV	Better Black TV	Entertainment	Entry: November 2010
Revolt TV 1800 N. Highland Avenue Los Angeles, CA 90028	Revolt TV	Music	Entry: October 2013
Participant Media 331 Foothill Rd. Beverly Hills, CA 90210	Pivot	Entertainment	Entry: May 2013
Magic Johnson Enterprises 9100 Wilshire Boulevard Suite 700 East Beverly Hills, CA 90212	Aspire	Entertainment	Entry: June 2012
The Walt Disney Company 500 South Buena Vista Street Burbank, CA 91521	Disney Junior	Children's Programming	Entry: February 2011
Discovery Communications 6505 Blue Lagoon Drive, Suite 190 Miami, FL 33126	Hub Network	Children's Programming	Entry: October 2010
Mint Entertainment 1918 N Mendell St. Chicago, IL 60642	Cinémoi	Movies	Entry: February 2009
Studio 3 Partners 1515 Broadway 43rd Floor New York, NY 10036	Epix	Movies	Entry: October 2009

Entries to and Exits from Video Programming			
Name and Address of Company	**Name of Programming Service**	**Programming Provided**	**Date of Entry Into and, if Applicable, Exit From the Market**
Bohemia Visual Music 2328 E Van Buren Street Phoenix, AZ 85006-3949	Bohemia Visual Music	Music	Exit: March 2010
Cool Music Network 641 E. 22nd Street Lawrence, KS 66046	The CoolTV	Music	Entry: March 2009
Al Jazeera Media Network PO Box 23127 Doha - Qatar	Al Jazeera America	News	Entry: August 20, 2013
The Walt Disney Company 500 South Buena Vista Street Burbank, CA 91521	Fusion	News	Entry: October 28, 2013
Herring Networks	One America News Network	News	Entry: July 4, 2013
Weather Nation TV 8101 East Prentice Avenue Suite 700 Greenwood Village, CO 80111	Weather Nation TV	News	Entry: October 2010
Al Jazeera Media Network PO Box 23127 Doha - Qatar	BeIN Sports	Sports	Entry: August 2012
Channel Zero 2844 Dundas St. W Toronto, ON M6P 1Y7	Fight Now TV	Sports	Entry: May 2011
Fox Entertainment Group 10201 West Pico Boulevard Los Angeles, CA 90035	Fox Soccer Plus	Sports	Entry: March 2010
Fox Entertainment Group 10201 West Pico Boulevard Los Angeles, CA 90035	Fox Sports 1	Sports	Entry: August 2013
Fox Entertainment Group 10201 West Pico Boulevard Los Angeles, CA 90035	Fox Sports 2	Sports	Entry: August 2013
ESPN, Inc. ESPN Plaza 935 Middle Street Bristol, CT 06010	Longhorn Network	Sports	Entry: August 2011
Pac-12 Network 360 3rd Street 3rd Floor San Francisco, California 94107 United States	Pac-12 Network	Sports	Entry: August 2011
DIRECTV Sports Networks Seattle, WA 98101 United States	Root Sports	Sports	Entry: April 2011
The Genuine Gemstone Company Eagle Road Studios, Eagle Road Redditch Worcestershire B98 9HF	Rocks TV	Shopping	Entry: July 2012
Soundview Africa	Afrotainment	Movies	Entry: October 2012
Mercury Studios/TheBlaze P.O. Box 143189 Irving, TX 75014	The Blaze	News	Entry: 2012
El Rey Network Tres Pistoleros Studios 4900 Old Manor Road Austin, TX 78723	El Rey	General entertainment	Entry: 2013
The Hayzlett Group 101 South Main Avenue, Fourth Floor Sioux Falls, SD 57104	C-Suite TV	Internet-based news programming	Entry: 2014
TAPP Media LLC	Sarah Palin Channel	Internet-based news programming	Entry: 2014
Louisck.net 3 Arts Entertainment Inc. 9460 Wilshire Boulevard Floor 7 Beverly Hills, CA 90212	Louisck.net	Internet based general entertainment	Entry: approximately 2011

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FCC Information and Data Request, Request 23 – Exhibit 23.1

In Section A of Appendix B of the Comcast-NBCU Order, the Commission used a methodology to calculate "critical departure rates" for both permanent and temporary foreclosure of programming. Using this or similar methodology, determine and state how the current transaction will affect critical departure rates for both permanent and temporary foreclosure, (i) separately for each of the NCBU O&Os, (ii) a bundle consisting of all non-broadcast programming networks distributed on a national basis in which the Company has an interest (or attributable interest) (iii) separately for each of the RSNs in which the Company has an interest (or an attributable interest). Describe in detail the methodology employed and produce the underlying data used to determine the various parameters used to calculate these critical departure rates, including but not limited to the profit margin on MVPD service subscribers, per subscriber license fees, per subscriber advertising revenue, departure rates, diversion rates, and churn rates. If the methodology is not identical to that employed in Section A of Appendix B of the Comcast-NBCU Order, describe in detail the changes made to that methodology.

Response to Item 23:

1. In Section A of Appendix B in the Comcast-NBCUniversal Order (hereinafter, "FCC Appendix B"), the Commission analyzed Comcast's incentives to permanently or temporarily withdraw signals of NBC O&O stations from DBS and telco MVPDs. The Commission's analysis consisted of three steps.

- First, the analysis assumed that, if an MVPD loses access to NBC O&O programming, the MVPD will lose subscribers at a certain rate ("departure rate"), and the departing subscribers will switch to Comcast at a certain rate ("diversion rate"). Under the Commission's theory, the higher the departure rate, the more likely that Comcast's gain of MVPD profit will exceed its loss of programming profit if it withholds programming from the MVPD, controlling for the diversion rate, Comcast's MVPD profit, NBCUniversal programming profit (from advertising revenues and retransmission fees), and other parameters. Thus, the Commission's analysis used a

theoretical foreclosure model to estimate a critical departure rate above which Comcast would have an incentive to foreclose other MVPDs.

- Second, the Commission estimated the actual subscriber departure rate that might occur following a hypothetical temporary loss of NBC O&O programming. The estimation was based on data from the 2008-2009 Fisher-Dish dispute in which programming from Fisher's ABC, CBS, and Fox affiliates in seven DMAs was withheld from Dish during a six-month retransmission consent dispute.

- Third, the Commission compared the theoretical critical departure rate to the estimated actual departure rate. Because the Commission's preferred calibration of the temporary foreclosure model produced a theoretical critical departure rate less than the actual departure rate the Commission estimated from the Fisher-Dish dispute, it concluded that Comcast would likely profit from temporarily withholding NBC O&O programming from rival MVPDs after the Comcast-NBCUniversal transaction.

2. The theoretical model underlying the Commission's permanent and temporary foreclosure analysis has a number of conceptual issues and limitations that undermine the reliability of its results. First, the theoretical model does not capture many important features of real-world negotiations between programmers and MVPDs. The model focuses on trade-offs between short-term programming profits and MVPD profits but ignores how withholding programming from rival MVPDs could harm Comcast/NBCUniversal in the long run. For example, withholding programming from MVPDs could jeopardize the programming's popularity among consumers and give other MVPDs more incentives to purchase competing programming, both of which could harm Comcast's programming revenues (including both license fees and advertising sales) over time but are not accounted for by the model. Foreclosure may also harm the reputation of NBCUniversal and give producers of shows and other programming more incentives to work with other broadcast or cable networks, or OVDs, instead of with NBCUniversal. In addition, the model does not account for the Commission's program access rules or the additional program access conditions adopted in the Comcast-NBCUniversal Order, both of which provide further assurance against any program access concerns about vertical foreclosure and pricing effects.

3. Second, the model relies on a series of assumptions about factors such as the rate at which consumers who leave a rival MVPD may switch to Comcast. For example, the model assumes that the percentage of departing consumers who switch to Comcast (the "diversion rate") is proportional to Comcast's and other MVPDs' shares, and does not take into account that certain programming may be available from non-MVPD outlets. In addition, the model relies on assumptions about the rates at which customers who switch would return to their original MVPD after the foreclosed programming is restored. However, there is little empirical evidence to support these assumptions.

4. Third, the model requires estimates of the actual departure rate that would occur after programming of interest (which was the NBC O&O programming in the Commission's analysis) was withheld from an MVPD. We are aware of no situations where NBC O&O programming has been withheld. Thus, estimating a departure rate applicable to NBC O&O programming requires looking at other retransmission disputes where other programming was withheld and controlling for differences in the programming and MVPDs involved, differences in the characteristics and preferences of customers of different MVPDs, differences in the competitive environment and the specific markets at issue, and differences in other factors that influence subscriber departure rates.[1] Because it is difficult to control for all of these differences, estimates of subscriber departure rates from a particular event when programming was withheld may not provide a reliable benchmark to assess the likelihood of Comcast foreclosure of different programming to a different MVPD in a different time period.

5. Furthermore, because the video programming marketplace has been evolving rapidly in recent years, older events such as the 2008-2009 Fisher-Dish event and the 2004 NewsCorp.-Hughes merger that the Commission relied upon in the NBCUniversal transaction likely do not provide reliable information about MVPD subscriber behavior in 2015 and beyond, the time period relevant for assessing the competitive effects of the current transactions. For example,

[1] As just one example, DirecTV is the exclusive provider of NFL Sunday Ticket, which is highly valued by certain of its subscribers. At the same time, Dish may have more price sensitive subscribers as it markets more low-cost options. Thus, information derived from an event where programming was withheld from Dish may not be particularly informative about what would happen if similar programming were withheld from DirecTV.

access to programming online provides an additional viewing option for consumers and may reduce departure rates even if the MVPD does not carry certain NBCUniversal programming.

6. The Commission requests that critical departure rates be calculated for NBCUniversal cable networks and Comcast and TWC RSNs, as well as for NBC O&Os. In addition to the difficulties outlined above, the lack of proper benchmarks to compare with the theoretical critical departure rates is a serious limitation for applying the Commission's foreclosure analysis to NBCUniversal cable networks and Comcast and TWC RSNs. For NBCUniversal cable networks, there have been no recent blackout events that cover all the programming at issue. Moreover, the wide variation in content available on different cable networks makes it very difficult to identify blackout events for other cable network programming that is sufficiently comparable to NBCUniversal's cable network programming to make it a reasonable benchmark.

7. For Comcast and TWC RSNs, while there are MVPDs not carrying particular RSNs for short or long periods of time, such events may not provide reliable evidence for use as a benchmark for assessing departure rates after a hypothetical foreclosure of the RSNs at issue. The importance of an RSN to a particular MVPD's subscribers may vary greatly depending on factors such as the popularity of the team(s) carried by the RSN, how well the team(s) is doing at a particular point in the season, whether it is during the season or the off-season, other sports (and general) programming available to consumers, and the alternative ways for TV viewers to access programming related to the team(s), such as through local broadcast stations, through national sports networks like ESPN, through the Internet (e.g., MLB.com, NHL.com and NBA.com), or through radio. It is difficult to estimate actual departure rates applicable to the RSNs at issue because controlling for all of these factors across areas and over time leads to large margins of error, not to mention the need to extrapolate beyond the scope of the data.

8. Finally, the Commission's theoretical foreclosure model does not take into account the transaction-related efficiency gains that could benefit consumers and their impact on incentives. Therefore, the model does not provide a full picture of the impact of the proposed transactions.

9. Despite these significant limitations, we have applied the Commission's foreclosure model to NBC O&O stations, NBCUniversal cable networks, and Comcast and TWC RSNs. We

have also compared the computed theoretical critical departure rates to the limited information available regarding actual departure rates when programming was withheld. Our analysis of recent retransmission consent disputes show that estimates of actual departure rates are small and generally far below the theoretical critical departure rates, which means there is no evidence to support arguments that the proposed transactions raise any program access foreclosure concerns.

1. Foreclosure Analysis for NBC O&O Stations

10. As explained in our previous reports filed in this matter,[2] five of the ten NBC O&O stations (Chicago, Miami, Philadelphia, San Francisco, and Washington DC) will not be affected by the transactions because Comcast will acquire no or very few cable systems in the stations' footprints.[3] As a result, the proposed transactions will have zero or close to zero incremental effect on the critical departure rates for these five NBC O&O stations.

11. Comcast will acquire TWC or Charter systems serving a non-trivial number of subscribers in five DMAs where there is an NBC O&O station: Dallas, Hartford-New Haven, Los Angeles, New York, and San Diego. For the New York and Hartford-New Haven DMAs where Comcast is currently present, we compute pre-transaction and post-transaction critical departure rates, with the difference between the pre- and post-transaction rates being the transaction-specific effect on critical departure rates. Because Comcast currently has no cable systems in Dallas, Los Angeles, and San Diego, we calculate only the post-transaction critical departure rates for the NBC O&O stations in those three DMAs to estimate the effect of the transactions.

12. Although we have calculated critical departure rates individually for each NBC O&O as requested by the Commission, **[[**

]].[4] Therefore, we have applied

[2] Declaration of Gregory L. Rosston and Michael D. Topper, "An Economic Analysis of the Proposed Comcast – Time Warner Cable Transaction," April 8, 2014 ("April Report"); Declaration of Gregory L. Rosston and Michael D. Topper, "An Economic Analysis of the Proposed Comcast Divestiture Transactions with Charter," June 2, 2014 ("June Report").

[3] Rosston-Topper April Report, ¶218; Rosston-Topper June Report, ¶37.

[4] It is our understanding that this practice is similar for other major networks and station group owners.

the Commission's foreclosure analysis to an additional scenario: **[[**

]].

13. In the NBCUniversal transaction, the Commission calculated critical departure rates for the temporary foreclosure of DirecTV, Dish, AT&T, and Verizon separately and for the permanent foreclosure of these MVPDs combined.[5] We have done the same here. In addition, we have also run the permanent foreclosure model for each MVPD separately because anti-competitively foreclosing all these MVPDs permanently is highly unlikely in reality as it would be very costly and damaging to Comcast programming and would attract considerable regulatory attention. We have also performed the Commission's foreclosure analysis for RCN because RCN raised vertical program access concerns in its Comments about the current transactions.[6]

14. We present results of the permanent foreclosure analysis for two scenarios: (1) foreclosure of DirecTV, Dish, AT&T, Verizon, and RCN separately; and (2) foreclosure of all five rival MVPDs at the same time. For the temporary foreclosure analysis, we present the results for the foreclosure of each rival MVPD separately. For both the permanent and temporary foreclosure analyses, we calculate theoretical critical departure rates for each NBC O&O station affected by the transactions and for all NBC O&Os as a group. Similar to the Commission's approach in the NBCUniversal Order, we use MVPDs' share of subscribers in each DMA to calculate the diversion ratios. We also adopt similar assumptions to the Commission regarding over-the-air watching, online video viewing, the nonlinearity of advertising revenues, and other parameters. See Appendix (Exhibit 23.2) for further details of our critical departure rate calculation.

15. Below, we show the calculated theoretical critical departure rates and the estimates of actual departure rates, and then compare the two sets of rates.

[5] FCC Appendix B, ¶¶27-29. In its permanent foreclosure analysis, the Commission assumed that each MVPD would be foreclosed as its contract expired and the programming is never restored. Thus, when all MVPDs' contracts expired, the analysis assumed foreclosure would be with respect to the MVPDs combined.

[6] RCN Telecom Services, LLC, Grande Communications Networks, LLC, and Choice Cable TV of Puerto Rico ("Joint Commenters") Petition to Deny Applications or Condition Consent, MB Docket No. 14-57, August 25, 2014, Pages 13-17.

a) Critical departure rates based on the Commission's permanent and temporary foreclosure models

16. Table 23-1A shows the calculated critical departure rates for permanent foreclosure of the five NBC O&O stations at issue. For individual NBC O&O stations in DMA where Comcast is present both pre- and post-transaction, the change in the critical departure rate is around {{ }}% for the Hartford-New Haven NBC O&O and is in the range of approximately {{ }}% to {{ }}% for the New York NBC O&O. For each of the five NBC O&Os, the post-transaction critical departure rate is {{ }} – {{ }}% for the foreclosure of rival MVPDs combined and generally in the range of {{ }}% to {{ }}% for the foreclosure of a single rival MVPD. To put this in context, a critical departure rate of 30%, for example, implies that 30% or more of an MVPD's subscribers would need to leave that MVPD in response to the withholding of NBC O&O programming in order for such withholding of NBC O&O programming to be profitable in theory for Comcast. These critical departure rates show that the actual departure rate in a permanent foreclosure event would have to be very high for the theoretical model to imply that Comcast would have an incentive to foreclose MVPDs. {{

}}

17. For the temporary foreclosure analysis, we calculate critical departure rates for a one-month foreclosure event rather than for a six-month event as the Commission did in the Comcast-NBCUniversal Order. This is because the length of the foreclosure event is determined by the length of the actual event(s) used to estimate the actual departure rates under the Commission's approach.[7] Because of rapid changes in the video marketplace in recent years, the 2008-2009 Fisher-Dish event (which lasted six months) that the Commission relied upon last time may not provide a reliable benchmark for departure rates in 2015 and beyond. Thus, we use two more recent events to estimate the departure rate, a 2013 retransmission consent dispute between Media General and Dish that lasted 46 days and a 2013 retransmission consent dispute between CBS and TWC that lasted 32 days.[8] Since these more recent blackout events lasted one month or so, we use a one-month event window.

18. Table 23-1B shows the critical departure rate calculated for temporary foreclosure of the five NBC O&O stations at issue. The results show that, for NBC O&O stations in DMAs where Comcast is present both pre- and post-transaction, the change in the critical departure rate ranges from **{{ }}**% to **{{ }}**% for the Hartford-New Haven NBC O&O and from **{{ }}**% to **{{ }}**% for the New York NBC O&O. For the five NBC O&Os, the level of post-transaction critical departure rate ranges from around **{{ }}**% to **{{ }}**%. As we show below, these critical departure rates **{{ }}** estimates of actual departure rates, implying that there are no temporary foreclosure issues. **{{**

[7] FCC Appendix B, ¶ 28. "Our temporary foreclosure analysis adopts the Applicants' approach of calculating *d** for a six month temporary foreclosure of the DISH Network rather than the one month foreclosure scenario evaluated in the *News Corp.-Hughes* case. This is done to compare the critical departure rates generated by the model to observed subscriber departure rates during a six month retransmission consent dispute between DISH Network and Fisher Communications."

[8] The Media General-Dish and CBS-TWC disputes are described in more detail below.

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19. As discussed above, current practice is that carriage of NBC O&Os is negotiated jointly for all the NBC O&Os in the footprint of an MVPD. Table 23-2 shows the critical departure rate calculated for permanent and temporary foreclosure of all NBC O&O stations in the footprint of Dish, DirecTV, AT&T, Verizon, and RCN. For individual MVPDs, the transaction-related change ranges from {{ }}% to {{ }}% for the permanent foreclosure model and from {{ }}% to {{ }}% for the temporary foreclosure model. The level of post-transaction critical departure rates range from {{ }}% to {{ }}% for permanent foreclosure and {{ }}% to {{ }}% for temporary foreclosure. For permanent foreclosure of all MVPDs combined, the change in critical departure rate is around {{ }}% and the post-transaction critical departure rate is {{ }}%.

{{

}}

20. As explained above, these theoretical critical departure rates derived from the Commission's foreclosure models should be compared to actual departure rates estimated from comparable actual blackout events to accurately determine whether Comcast would have an incentive to withhold NBC O&O programming. We estimate the actual departure rates in the next section.

b) Actual departure rates

21. In the Comcast-NBCUniversal transaction, the Commission used an actual departure rate estimated based on the Fisher-Dish dispute and compared that rate to the theoretical critical departure rates derived from the Commission's foreclosure models.[9] The departure rate estimate for the Fisher-Dish dispute is confidential and not available to us. Moreover, as we discussed above, the 2008-2009 Fisher-Dish event may not provide a reliable benchmark for departure rates in 2015 and beyond. In addition, we are aware of no situations where NBC O&O programming has been withheld. Thus, we use two more recent events involving Big 4 affiliate stations and other Big 4 O&O stations to estimate the actual departure rate for a temporary

[9] FCC Appendix B, ¶41.

foreclosure of NBC O&O stations: the 2013 retransmission consent dispute between Media General and Dish and the 2013 retransmission consent dispute between CBS and TWC.[10]

22. Among the retransmission blackout episodes since 2012 (tracked by SNL Kagan), the dispute between Media General and Dish (which lasted 46 days from October 1, 2013 to November 16, 2013) is the only one that involved a major rival MVPD of Comcast (i.e., DirecTV, Dish, AT&T, or Verizon), affected more than five DMAs (including some top 50 DMAs), and lasted longer than 30 days.[11] The dispute affected all 17 Big 4 broadcast stations owned by Media General in 17 markets, including eight NBC affiliate stations.[12] See Appendix for details of our selection of blackout events for our analysis.

23. We first examine Dish's subscriber growth rate in the DMAs where it lost access to Media General's broadcast stations (the "treatment DMAs") and in a set of "control DMAs" where Dish did not lose access to Big 4 network affiliate programming. In FCC Appendix B, the Commission stated that it identified control DMAs by matching unaffected DMAs to the treatment DMAs. However, the criteria used for the matching were confidential and not available to us.[13] For the current analysis, we select control DMAs that are similar to the treatment DMAs in size and/or in geographic location, but in which Dish did not lose access to Big 4 broadcast stations.[14] See Appendix for details of our selection of control DMAs.

24. Table 23-3 below compares Dish's subscriber growth rates inside Media General's footprint (where Dish lost access to Media General's broadcast stations) to comparable DMAs outside Media General's footprint (where Dish did not lose access to programming) before, during and after the programming dispute. The comparison finds that there was **[[ ]]** in the difference between Dish's subscriber growth rate in the treatment DMAs and that in the control DMAs during the dispute. Specifically, the difference between Dish's subscriber growth rate in the treatment DMA and that in the control DMAs **[[ ]]**

[10] The two disputes are described in more detail below.
[11] SNL Kagan, "Publicized Retrans Blackouts 2000-2014 YTD."
[12] Media General also owned a non-Big 4 broadcast station (CW) in Asheville, NC.
[13] FCC Appendix B, Footnote 27. The footnote cites a declaration by Vincent Kunz. However, the relevant parts of Mr. Kunz's declaration are redacted in the public version of the declaration.
[14] In Footnote 27 of FCC Appendix B, the control DMAs that were matched to the affected DMAs may be in different regions. For example, Eugene was matched to San Antonio, Austin, San Diego, and Kansas City.

during the dispute (4Q2013) relative to the quarter before the dispute (3Q2013), from [[ ]]% to [[ ]]%, and continued to [[ ]] after the dispute ended (to [[ ]]% in 1Q2004). The results are similar if the affected DMAs are limited to those in which Media General operates an NBC station (to test whether there is some NBC effect that differs from the other Big 4 networks). Again, the difference in subscriber growth rates between the treatment and control DMAs [[ ]] during the dispute relative to the quarter before the dispute (from [[ ]]% to [[ ]]%) and continued to [[ ]] after the dispute ended (to [[ ]]% in 1Q2004). Overall, a simple comparison of subscriber growth rates finds no evidence that the dispute had any adverse effect on Dish's subscriber growth in the affected DMAs. [[

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25. Next, to estimate the departure rate in the Media General-Dish event, we follow the Commission's approach in analyzing the Fisher-Dish event in the Comcast-NBCUniversal Order. Specifically, we run a regression of natural logarithm of Dish subscribers on quarterly and DMA fixed effects and an interaction term between a dummy for affected DMAs and the dummy for the quarter of the blackout (4Q2013).[15] The regression uses one year of quarterly data, from 2Q2013 through 1Q2014. According to the Commission's approach, the coefficient for the

[15] FCC Appendix B, ¶ 33: "The model is implemented in a regression model that posits that the natural log of DISH subscribers is a function of DMA-specific fixed effects indicator variables for the quarter of the year and a Fisher event indicator."

interaction term represent the percentage change of Dish subscribers in affected DMAs relative to control DMAs as a result of the blackout.[16]

26. Table 23-4 below shows the regression results. None of the specifications finds a statistically significant effect during the blackout period. Because we only have quarterly subscriber data for the event and the blackout happened in the first half of 4Q2013, it is conceivable that the quarterly subscriber count captured the net effect of subscribers leaving Dish as the result of the blackout and those departing subscribers returning to Dish during the second half of 4Q2013, after the blackout ended. Therefore, the evidence is inconclusive as to whether there is a significant actual departure rate associated with this event. However, to the extent that the net effect of the blackout event was **[[ ]]** by the end of 4Q2013, it implies that the temporary foreclosure of the Media General network affiliates had no lasting effect on Dish subscribers beyond two months. **[[**

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[16] FCC Appendix B, ¶ 34: "Since the natural log of DISH subscribers is used as the dependent variable, the coefficient on the Fisher event indicator variable is approximately equal to the percentage change in DISH subscriber levels in the treatment group DMAs relative to the control DMAs when the programming was unavailable on DISH."

27. We also consider evidence on departure rates from TWC during its August 2013 dispute with CBS that led to a 32-day blackout (from August 2 through September 2, 2013) of the CBS O&O stations in six DMAs (Boston, Dallas-Ft. Worth, Denver, Los Angeles, New York, and Pittsburgh).[17] CBS also blocked all TWC's broadband subscribers' access to CBS.com during the dispute. Around the same time, TWC also had a retransmission consent dispute with Journal Broadcasting that lasted from July 25, 2013 to September 20, 2013 and resulted in blackout of CBS affiliate stations in four DMAs (Green Bay, Wisconsin; Milwaukee, Wisconsin; Omaha, Nebraska; and Palm Spring, California).[18]

28. Despite the significant publicity surrounding the CBS-TWC dispute, its relevance for assessing vertical foreclosure incentives in the current transaction is limited since Comcast does not have even a theoretical anticompetitive incentive to withhold NBC O&O programming from cable MVPDs such as TWC with which it does not compete. In addition, the departure rate from a cable company like TWC in areas including Manhattan may be very different than departure rates from other MVPDs in other areas. This is because TWC is a cable company, while the estimated departure rate of interest would be for DBS companies, telcos, or overbuilders whose subscribers may have different characteristics. In addition, market conditions faced by TWC systems in the areas affected by the dispute may also differ from the areas to which the estimate would be applied. Thus, departure rates from TWC during the CBS-TWC programming dispute may not be informative regarding Comcast's vertical incentives with respect to its rival MVPDs. Despite these limitations, we use this event as an additional estimate of actual departure rates after the withholding of a single Big 4 network.

29. We follow the same steps as we did with the Media General-Dish blackout. Using data on monthly TWC video subscriber counts by DMA, we first compare the changes in subscriber counts in DMAs affected by the blackout and control DMAs. Like the analysis of the Media General-Dish event above, our control DMAs include DMAs that are similar to the affected DMAs in size and/or in geographic location, but in which TWC did not lose access to CBS

[17] CNN Money Staff, "Time Warner Cable and CBS reach deal to end blackout," CNNMoney, September 2, 2013. Available at: http://money.cnn.com/2013/09/02/news/companies/time-warner-cable-cbs-deal.

[18] Mike Reynolds, "Time Warner Cable, Journal Broadcast Finally End Retrans Disconnect," Multichannel News, September 20, 2013. Available at http://www.multichannel.com/news/content/time-warner-cable-journal-broadcast-finally-end-retrans-disconnect/357488.

broadcast stations. Because the DMAs affected in the CBS-TWC event were mostly large DMAs such as New York and Los Angeles, our control DMAs include all Top 50 DMAs in which TWC has a significant presence. For each affected DMA, we also include the two unaffected TWC DMAs closest in size in the Census region of the affected DMA.[19] The control DMAs exclude the four DMAs that were affected by the Journal Broadcasting-TWC dispute. See Appendix for details of our selection of control DMAs for the CBS-TWC event.

Table 23-5 below shows 12 months of subscriber growth rates in the affected and control DMAs, from February 2013, the first month for which we can calculate the growth rate, through January 2014. {{

}} In August 2013, the month of the CBS-TWC dispute, there was a {{ }} in the difference in subscriber growth rates between the affected and control DMAs (from {{ }}% in July to {{ }}% in August). The difference {{ }}% in September, possibly due to a lag in the effect of the blackout. As the blackout ended in early September, the trend in the difference between affected and control DMAs {{ }}% in October and November before {{ }}% in December. The simple comparison of subscriber growth rates suggests that the blackout's effect was likely primarily in September of 2013, with probably some small effect in August of 2013. {{

}}

[19] Even the largest unaffected DMAs in the same region of an affected DMA may be much smaller than the affected DMA. For example, in the Northeast region, there are three affected DMAs (Boston, New York, and Pittsburgh). However, the largest unaffected DMA with TWC systems in the same Northeast region is Buffalo.

30. Next, to estimate the departure rate in the CBS-TWC event, we again follow the Commission's approach in analyzing the Fisher-Dish event. Specifically, we run a regression of the natural logarithm of subscribers on monthly and DMA fixed effects and interaction terms between a dummy for affected DMAs and dummy variables for August and September of 2013 (the period impacted by the blackout). Under the Commission's approach, the coefficients of the interaction terms estimate the percentage change of TWC subscribers in affected DMAs relative to control DMAs as a result of the blackout. The regression uses one year of monthly data, from February 2013 through January 2014. To give DMAs where TWC has more subscribers more weight, we use the subscriber count in January 2013 as the weights. We also show the results of regressions without the weights.

31. Table 23-6 shows the regression results. The unweighted regression finds no statistically significant blackout effect **{{**

}} The weighted regression does not find a statistically significant effect in August, but finds a statistically significant effect in September 2013 – the coefficient estimate for the interaction between September and affected DMAs is **{{ }}**, implying that the subscriber loss rate in the affected DMAs was about **{{ }}** than that in the control DMAs during the window of the CBS blackout. **{{**

[20] The variables are August and September dummies interacted with dummy of affected DMAs, respectively.

}}

32. Overall, our analysis finds no conclusive evidence for a statistically significant actual departure rate for the Media General-Dish programming dispute, but finds a statistically significant estimated actual departure rate ({{ }}%, with a standard error of {{ }}%) in September 2013 for the CBS-TWC programming dispute. As we explained earlier, because, among other things, TWC does not compete with Comcast, the CBS-TWC result may not provide a reliable benchmark departure rate for MVPDs that do compete with Comcast. Nonetheless, we assume that the actual departure rate for NBC O&O stations would be {{ }}%, the same as the rate estimated from the CBS-TWC event.

c) Compare theoretical critical departure rates to actual departure rates

33. The estimated actual one-month temporary departure rate of {{ }}% for NBC O&O stations is {{ }} than all theoretical one-month temporary foreclosure critical departure rates

computed in Section 1.a. Therefore, the Commission's theoretical foreclosure model does not suggest any temporary foreclosure concerns for NBC O&O stations.

2. Foreclosure Analysis for Comcast/NBCUniversal National Cable Networks

34. Next, we apply the Commission's foreclosure model to NBCUniversal national cable networks.[21] Comcast currently has a controlling interest and management right in 17 nationally distributed cable networks including Bravo, Chiller, Cloo (formerly Sleuth), CNBC, CNBC World, E!, Esquire Network (formerly Style), G4, Golf Channel, MSNBC, mun2, NBC Sports Network (formerly Versus), Oxygen Network, Sprout, SyFy, Universal HD, and USA.[22] These networks constitute the set of national cable networks examined in our foreclosure analysis. While Comcast (and TWC) has some interest (or attributable interest) in a few other national networks such as NHL Network and MLB Network, it is our understanding that Comcast does not negotiate the contracts for those networks and is not in a position to withhold the networks from rival MVPDs. Therefore, we do not include these networks in our foreclosure analysis.

35. Similar to our application of the Commission's foreclosure model to NBC O&O stations, we apply the Commission's model to compute critical departure rates for theoretical permanent and temporary foreclosures of DirecTV, Dish, AT&T, Verizon, and RCN separately. For permanent foreclosure, we have also modeled the extremely unlikely scenario of the five MVPDs being foreclosed at the same time. For the temporary foreclosure analysis, we use a one-month event window for the same reasons noted above.

a) Critical departure rates based on the Commission's permanent and temporary foreclosure models

36. Table 23-7 shows the critical departure rate estimates for permanent and temporary foreclosure of the bundle of NBCUniversal national cable networks. For permanent foreclosure, the theoretical critical departure rates **{{ }}** by an amount ranging from **{{ }}**% to **{{ }}**%, but level of post-transaction theoretical critical departure rates are **{{ }}**, ranging

[21] The Commission's Information Request asks us to calculate the critical departure rates for the bundle of NBCUniversal national cable networks.
[22] Comcast also owned FEARnet but it closed operations in July 2014.

from {{ }}% to {{ }}%. For temporary foreclosures, the change in the rates is between {{ }}% and {{ }}%, with the level of post-transaction theoretical critical departure rates ranging from {{ }}% to {{ }}%. {{

}}

b) Actual departure rates

37. In the Comcast-NBCUniversal transaction, the Commission did not use an actual blackout event to estimate an actual departure rate due to the withholding of NBCUniversal cable networks. Instead, the Commission inferred a departure rate by applying a theoretical model proposed by DirecTV's expert Professor Kevin Murphy based on assumptions about the bargaining between NBCUniversal and MVPDs, and observed affiliate fees for NBCUniversal networks. Professor Murphy's model was based on confidential data not available to us.[23] The merging parties' experts Professor Michael Katz and Dr. Mark Israel assumed that the actual departure rate due to the withholding of NBCUniversal cable networks would be half (1/2) of the

[23] FCC Appendix B, ¶42. Kevin Murphy, "Economic Analysis of the Impact of the Proposed Comcast/NBCU Transaction on the Cost to MVPDs of Obtaining Access to NBCU Programming," June 21, 2010 (hereinafter, Murphy Report), ¶23-24. Kevin Murphy, "Response of Professor Kevin Murphy to Reply Report of Mark Israel and Michael Katz," August 19, 2010 (hereinafter, Murphy Reply), ¶15.

departure rate for withholding of NBC O&O stations.[24] Professor Rogerson has suggested that the departure rate due to foreclosure of NBCUniversal cable networks "would be at least comparable in size to the departure for an individual Big 4 broadcast network."[25]

38. The Commission's Comcast-NBCUniversal Order appeared to suggest that it believed NBC O&O stations were more important to consumers than NBCUniversal cable networks. Specifically, in the Commission's analysis of the transaction's vertical price effect, it assumed that NBC O&O stations would receive 2/3 of the surplus from a carriage agreement with MVPDs while NBCUniversal cable networks would receive 1/2 of the deal surplus, the same as MVPDs.[26] While the Commission described this parameter as a measure of relative bargaining skills of negotiating parties, it acknowledged that the parameter reflected the popularity of the programming involved in the negotiation.[27] If so, the difference in the Commission's assumed parameter values for NBCUniversal cable networks and NBC O&Os presumably reflects the difference in the popularity and importance of the programming.

39. Because the actual departure rate is determined in large part by the programming's popularity and importance to consumers, the Commission's assumptions suggests that the actual departure rate for NBCUniversal cable networks is likely lower than that for NBC O&O stations. If the ratio of the Commission's assumed shares of deal surplus that would be received by the two sets of programming reflects the relative importance of the programming and the ratio of departure rates related to the programming, the NBCUniversal cable networks would have a departure rate **{{ }}** that of the NBC O&O stations. In that case, a rough estimate of the actual departure rate for NBCUniversal cable networks would be **{{**

[24] Mark Israel and Michael Katz, Economic Analysis of the Proposed Comcast-NBCU-GE Transaction, *In the Matter of Applications of Comcast Corporation General Electric Company and NBC Universal, Inc. for Consent to Assign Licenses or Transfer Control of Licensees*, MB Docket No. 10-56, July 20, 2010 (hereinafter, Israel-Katz Reply), ¶72.
[25] William Rogerson. "Vertical Mergers in the Video Programming and Distribution Industry: the Case of Comcast-NBCU." The Antitrust Revolution, 6th Edition, Edited by John E. Kwoka, Jr. and Lawrence K. White. New York: Oxford: Oxford University Press, 2013, p. 550.
[26] FCC Appendix B, ¶ 40.
[27] FCC Appendix B, ¶ 40: "To the extent that the content provider obtains carriage of less popular networks rather than a higher price for more popular networks (e.g. USA Network) when negotiating the terms at which an MVPD will accept a bundle of programming, the reported empirical estimates of the bargaining skill of any individual network could be biased. In particular, this dynamic would tend to generate a downward bias for the bargaining skill parameters associated with individual popular networks and an upward bias for the parameters associated with less popular networks."

}} as our estimated actual departure rate for NBC O&O stations is **{{ }}**. See Section 1.b above.

c) Compare theoretical critical departure rates to actual departure rates

40. The assumed actual one-month temporary departure rate of **{{ }}**% for NBCUniversal cable networks is **{{ }}** than all theoretical one-month temporary foreclosure critical departure rates computed in Section 2.a.[28] Therefore, the Commission's theoretical model does not suggest any concern that Comcast will have any incentive to temporarily foreclose its rivals' access to NBCUniversal cable networks.

3. Foreclosure Analysis for Comcast and TWC RSNs

41. Comcast owns interests in nine RSNs that carry major league professional sports. Of these nine Comcast RSNs, CSN New England (carrying the Boston Celtics) is the only RSN for which Comcast's share of subscribers will have a material increase after the transactions. Thus, we apply the Commission's foreclosure model to CSN New England. As explained in the our April and June reports, six of the other RSNs (CSN Chicago, CSN Houston, CSN California, CSN Philadelphia, CSN Mid-Atlantic, and CSN Bay Area) will see zero or minimal change in Comcast's share of subscribers within the core footprint of the RSNs.[29] A seventh RSN, CSN Northwest, is not carried by any of the four major rival MVPDs, so there is not a foreclosure issue. For the eighth RSN, SportsNet New York, Comcast will remain a minority owner after it acquires TWC's interest in the RSN, so it will not gain any ability to withhold SportsNet New York from other MVPDs. Since there is no transaction-specific vertical integration for these other RSNs, we do not apply the Commission's foreclosure model to them.

42. Among the TWC RSNs in which Comcast will have a controlling interest after the TWC transaction, only TWC SportsNet in Los Angeles carries major professional sports (the Lakers) in English. Comcast currently does not have cable systems in Los Angeles, and there is already vertical overlap between TWC SportsNet and TWC's Los Angeles cable systems, so the TWC

[28] Even adopting Professor Rogerson's assumption that the estimated actual departure rate for the bundle of NBCUniversal cable networks should be the same as for a Big 4 network leads to the same conclusion.
[29] Rosston-Topper April Report, ¶225-231; Rosston-Topper June Report, ¶43.

transaction does not raise any transaction-specific vertical issues for TWC SportsNet. However, Comcast will acquire some Charter cable systems in the core footprint of TWC SportsNet. As a result, the theoretical critical departure rates for TWC SportsNet would change post-transaction. Thus, we apply the Commission's foreclosure model to TWC SportsNet.

43. As part of the transactions, Comcast will take over distribution and operational services for SportsNet LA in Los Angeles, which carries the Dodgers. However, because the RSN is currently not carried by any of the major rival MVPDs, there is no transaction-specific foreclosure issue. Therefore, we do not apply the Commission's foreclosure model to SportsNet LA.

a) Critical departure rates based on the Commission's permanent and temporary foreclosure models

44. Table 23-8 shows theoretical critical departure rates for permanent and temporary foreclosure for CSN New England and TWC SportsNet. We consider the scenarios where each rival MVPD individually experiences permanent or temporary foreclosure and the unlikely scenario where all five rival MVPDs are permanently foreclosed at the same time. {{

}}

b) Actual departure rates

45. In the Comcast-NBCUniversal transaction, the Commission did not compute critical departure rates or estimate actual departure rates for RSNs. As we noted earlier, the potential departure rate from an MVPD that loses access to an RSN may vary greatly across different MVPDs and RSNs due to multiple factors. As a result, it is very difficult to find reliable benchmarks for the departure rate from CSN New England and TWC SportsNet. Without a reliable benchmark from empirical data, we assume, for the purposes of this analysis, that each RSN has the same departure rate as the NBCUniversal cable networks.[30] Thus, our calculations assume that the RSNs have a departure rate of **{{ }}**% (with a standard error of **{{ }}**%).

c) Compare theoretical critical departure rates to actual departure rates

46. The estimated actual temporary departure rate of **{{ }}**% is **{{ }}** than all the post-transaction critical departure rates for temporary foreclosure computed in Section 3.a above.[31] Thus, the Commission's theoretical foreclosure model does not provide support for any transaction-specific foreclosure concerns for CSN New England and TWC SportsNet.

[30] We do not have data to quantify the difference in the importance of the two sets of programming to consumers. However, we note that the RSNs at issue generate **{{ }}** per subscriber (affiliate fees and advertising revenues) than the NBCUniversal cable networks examined in the last section. For example, the NBCUniversal cable networks examined in our foreclosure analysis earn approximately $**{{ }}** per subscriber. In comparison, CSN New England earns approximately $**{{ }}** per subscriber while TWC SportsNet earns approximately $**{{ }}** per subscriber.

[31] Again, even assuming that the estimated actual departure rate for the RSNs would be the same as for a Big 4 network leads to the same conclusion.

Appendix : Response to Information Request #23

I. Permanent and Temporary Foreclosure Analysis Using the Commission's Approach in the Comcast-NBCUniversal Order (for Information Request #23)

A. Illustration of Theoretical Critical Departure Rate Calculations

1. In this section, we illustrate the calculation of theoretical critical departure rates for permanent and temporary foreclosures using the Commisson's approach in the Comcast-NBCUniversal Order. Section II below lists mathematical formulas of the calculations for all scenarios.

1. NBC O&Os

a) Permanent foreclosure

2. Consider a permanent foreclosure of the NBC O&O station in DMA *m* to four rival MVPDs (e.g., Dish, DirecTV, AT&T and Verizon) combined.[1] The cost of a permanent foreclosure includes lost retransmission fees and lost advertising revenues (local and national). The former is associated with the rival MVPDs' subscribers who do not leave the MVPDs. The latter is associated with the rival MVPDs' subscribers who do not leave the MVPDs and do not watch NBC programming over-the-air. In addition, we adopt the Commission's assumption that the foreclosure-related decrease in viewership will also reduce Comcast's national and local advertising revenue per viewer.[2] The total cost of foreclosure is given by the following formula:

$$\sum_{i=1}^{4} \boldsymbol{retrans_i} \times (\mathbf{1}-\boldsymbol{d}) \times \boldsymbol{subs_{i,m}} + \left(\boldsymbol{ad_{national}} + \boldsymbol{ad_{local_m}}\right) \times (\mathbf{1}-\boldsymbol{a}-\boldsymbol{d}) \times \sum_{i=1}^{4} \boldsymbol{subs_{i,m}}$$
$$+\boldsymbol{ad_{national}} \times \boldsymbol{b} \times (\mathbf{1}-\boldsymbol{a}-\boldsymbol{d}) \times \frac{\sum_{i=1}^{4} \boldsymbol{subs_{i,m}}}{\boldsymbol{subs_{national}}} \times [\boldsymbol{a} \times \sum_{i=1}^{4} \boldsymbol{subs_{i,m}} + (\boldsymbol{subs_{national}} -$$
$$\sum_{i=1}^{4} \boldsymbol{subs_{i,m}})] + \boldsymbol{ad_{local_m}} \times \boldsymbol{b} \times (\mathbf{1}-\boldsymbol{a}-\boldsymbol{d}) \times \frac{\sum_{i=1}^{4} \boldsymbol{subs_{i,m}}}{\boldsymbol{subs_m}} \times [\boldsymbol{a} \times \sum_{i=1}^{4} \boldsymbol{subs_{i,m}} + (\boldsymbol{subs_m} -$$
$$\sum_{i=1}^{4} \boldsymbol{subs_{i,m}})]$$

3. In this formula, *d* is the proportion of foreclosed MVPD's subscribers who switch to other MVPDs. *a* is the proportion of subscribers who will stay with the foreclosed MVPDs but switch to watch the NBC programming over-the-air.[3] We use 33% for *a*, the same rate the

[1] A similar formula applies to five MVPDs including RCN.
[2] FCC Appendix B, ¶ 20. For ease of calculation, we assume that the reduction in national and local advertising revenue per subscriber does not apply to foreclosed subscribers who switch to other MVPDs.
[3] FCC Appendix B, ¶23.

Commission used in the Comcast-NBCUniversal transaction and the News Corp-Hughes transaction.[4] We also assume that a 1% decline in viewership results in a 0.39% (*b*) reduction in the advertising price per viewer.[5]

4. For retransmission fees, we use the fee each MVPD pays Comcast in 2014. For local advertising revenues, we use the 2014 advertising revenue per subscriber of the relevant NBC O&O station estimated by SNL Kagan. For national advertising revenues, we use 2014 national advertsing revenues per subscriber of the NBC Network estimated by SNL Kagan.

5. Under the Commission's theoretical foreclosure model, the gain from foreclosing a rival MVPD is the additional profit Comcast will earn from subscribers who switch from the rival MVPDs to Comcast due to the loss of NBC O&O programming, which is:

$$\alpha_{MVPDs,m} \times d \times \pi_m \times \sum_{i=1}^{4} subs_{i,m}$$

6. In this formula, $\alpha_{MVPDs,m}$ is the diversion ratio from the foreclosed MVPD to Comcast, i.e., among the subscribers who would leave the MVPD, the share that would switch to Comcast. Following the Commission's approach in the Comcast-NBCUniversal Order, we calculate proportional diversion ratios in each DMA based on 2Q2014 subscriber shares estimated by SNL Kagan.[6] For profit π_m in market *m*, we use the monthly average profit per video subscriber calculated from the 2014 Comcast regional "profit and loss" statements.[7] See Section I.B below for details of the calculation of the profits per video subscriber.

7. Equating the theoretical cost and benefit of the foreclosure, the critical departure rate *d* for permanent foreclosure is given by the following formula:

$$d_{permanent} = \frac{\sum_{i=1}^{4}\left[retrans_i + \left(\widetilde{ad_m} + \widehat{ad_m}\right) \times (1-a)\right] \times subs_{i,m}}{\sum_{i=1}^{4}\left(retrans_i + \widetilde{ad_m} + \widehat{ad_m} + \alpha_{MVPDs,m} \times \pi_m\right) \times subs_{i,m}}$$

8. In the formula, $\widetilde{ad_m} = \left[ad_{national} \times \left(1 - b \times (1-a) \times \frac{\sum_{i=1}^{4} subs_{i,m}}{subs_{national}}\right) + ad_{local_m} \times 1-b \times 1-a \times i=14 subsi, msubsm$ and $adm=adnational \times b+adlocalm \times b$.

[4] FCC Appendix B, ¶23. News Corp Hughes Order, Appendix D, ¶6.
[5] FCC Appendix B, ¶20.
[6] FCC Appendix B, ¶13.
[7] FCC Appendix B, ¶22.

b) Temporary foreclosure

9. The calculation of theoretical critical departure rates for a one-month temporary foreclosure of the NBC O&O station in DMA *m* to a rival MVPD *i* is similar to that for a permanent foreclosure but with a few modifications. First, we adopt the Commission's assumption that a temporary foreclosure will not lead to any reduction in the advertising revenue per viewer ($b = 0$).[8] The cost of a temporary foreclosure is the lost retransmission fee and local and national advertising revenue during the foreclosure, which is

$$Cost = retrans_i \times (1-d) \times subs_{i,m} + \left(ad_{national} + ad_{local,m}\right) \times (1-a-d) \times subs_{i,m}$$

10. Second, unlike in a permanent foreclosure where subscribers are assumed to permanently switch from the foreclosed MVPD, in a temporary foreclosure subscribers are assumed to switch back to the foreclosed MVPD gradually after the programming is restored. Since the subscribers who switch from the foreclosed MVPD have shown a higher tendency to switch MVPDs depending on the MVPDs's carriage of programming, they are also more likely to switch back (or "churn back") to their original MVPD when the programming is restored on the MVPD. We estimate two "churn-back" rates based on Comcast's churn data, one rate for those who are more likely to switch ("movers") and one rate for those who are more likely to stay ("stayers"). Following the Commission's approach, we assume that during the month immediately after the programming is restored, the switchers would churn back to the foreclosed MVPD at a rate about twice the estimated churn rate for movers.[9] Using Comcast's churn data, we estimate the churn rate of the movers to be **{{ }}**%, which implies that the first-month churn back rate is about **{{ }}**% (≈ 2 × **{{ }}**%) according to the Commisson's assumption. For the second month onward, we also follow the Commission's approach and assume the churn back rate is the same as the average customer churn rates in Comcast's subscriber data.[10]

11. Third, Comcast incurs a net acquisition cost including sales and marketing, installation and overhead costs at the time a subscriber switches to Comcast. In addition, the profit for a new subscriber during the first year may be lower due to promotions that reduce revenue. Therefore,

[8] FCC Appendix B, ¶20.
[9] FCC Appendix B ¶ 24. This assumption was originally proposed by Comcast's experts in the Comcast-NBCUniversal transaction (Israel-Katz February 2010 Report, ¶¶ 41, 43) and was adopted by the Commission.
[10] FCC Appendix B ¶ 24. **{{**

}}.

we calculate three average profits for subscribers at three different points in their tenure with Comcast. The first average profit is for new subscribers who have switched to Comcast for less than a month, which takes into account the net acquisition cost. The second average profit is for new subscribers who have been with Comcast for more than one month and up to one year, which takes into account promotional offers. The third average profit is for subscribers who have been with Comcast for at least one year. See Section I.B below for the details of calculation of Comcast profits.

12. Overall, the theoretical gain from a temporary foreclosure is given by:

$$\alpha_{i,m} \times d \times subs_{i,m}$$
$$\times \left[\left(\pi_{1,m} - Acqcost\right) + \pi_{1,m} \right.$$
$$\times \left((1-c_1) \times \frac{1}{1+r}^{1} + (1-c_1)(1-c_2) \times \frac{1}{1+r}^{2} + (1-c_1)(1-c_2)^2 \right.$$
$$\left. \times \frac{1}{1+r}^{3} + \cdots + (1-c_1)(1-c_2)^{10} \times \frac{1}{1+r}^{11} \right) + \pi_{2,m}$$
$$\times \left((1-c_1)(1-c_2)^{11} \times \frac{1}{1+r}^{12} + (1-c_1)(1-c_2)^{11}(1-c_3) \times \frac{1}{1+r}^{13} + \cdots \right.$$
$$+ \ (1-c_1)(1-c_2)^{11}(1-c_3)^{12} \frac{1}{1+r}^{24}$$
$$\left. \left. + (1-c_1)(1-c_2)^{11}(1-c_3)^{12}(1-c_4) \times \frac{1}{1+r}^{25} \ldots \right) \right]$$

13. In this formula, $\alpha_{i,m}$, the diversion ratio, represents the proportion of subscribers departing foreclosed MVPD *i* that would switch to Comcast. We compute the proportional diversion ratios using 2Q2014 subscriber shares. To account for the fact that DBS subscribers are more likely to switch to other DBS providers than to Comcast, the Commission used a diversion ratio from DBS to Comcast at an undisclosed percentage of the rate implied by the proportional diversion ratio.[11] Since the Commission's rate is redacted, we assume the diversion

[11] FCC Appendix B, ¶13-16.

rate for DBS MVPDs to be 1/2 of the rate implied by the proportional diversion ratio and the diversion rate for telco MVPDs to be the same as proportional diversion ratio.

14. We assume subscribers churn back to the foreclosed MVPD at a rate of c_1 during the first month after the programming is restored, at c_2 during the second month up to one year, at c_3 during the second year, and at c_4 after the second year. We assume that r, the annual discount rate, is 10%. The monthly profit of a new subscriber in DMA m is $\pi_{1,\mathrm{m}} - Acqcost$ during the first month, $\pi_{1,\mathrm{m}}$ during the second month up to one year, and $\pi_{2,\mathrm{m}}$ after the second year.

15. With the assumptions above, we derive the critical departure rate that would equate the cost and benefit of a temporary foreclosure.

$$d_{temporary} = \frac{retrans_i + \left(ad_{national} + ad_{local,m}\right) \times (1 - a)}{retrans_i + \alpha_{i,m} \times (\pi_{1,\mathrm{m}} - Acqcost) + \alpha_{i,m} \times \pi_{1,\mathrm{m}} \times \tilde{c} + \alpha_{i,m} \times \pi_{2,\mathrm{m}} \times \hat{c} + (ad_{national} + ad_{local_m})}$$

16. In this formula,

$$\hat{c} = \left(\frac{1-c_2}{1+r}\right)^{12}\left(\frac{1-c_1}{1-c_2}\right) + \sum_{t=13}^{24}\left(\frac{1-c_3}{1+r}\right)^{t}\frac{(1-c_1)(1-c_2)^{11}}{(1-c_3)^{12}} + \left(\frac{1-c_4}{1+r}\right)^{25}\frac{(1-c_1)(1-c_2)^{11}(1-c_3)^{12}}{(1-c_4)^{24}} \times \frac{1+r}{c_4+r}$$

and $\tilde{c} = \sum_{t=2}^{11}\left(\frac{1-c_2}{1+r}\right)^{t}\left(\frac{1-c_1}{1-c_2}\right) + \frac{1-c_1}{1+r}$

2. NBCUniversal Cable Networks

17. The Commission's permanent and temporary foreclosure model for NBCUniversal national cable networks is similar to that for NBC O&Os with a few modifications. First, Comcast loses affiliate fees instead of retransmission consent fees. Second, the advertising revenue Comcast loses in a foreclosure is national cable network advertising.

18. We calculate affiliate fees and advertising revenue per subscriber per month for the set of NBCUniversal cable networks at issue based on Comcast's data on affiliate fee revenue, advertising revenue and cable network subscribers for the first half of 2014. Diversion ratios are calculated using 2Q2014 subscribers estimated by SNL Kagan.

3. RSNs

19. The permanent and temporary foreclosure model for an RSN is also similar to that for NBC O&Os with a few modifications. First, the advertising revenue Comcast loses in a foreclosure involving RSNs is regional advertising. Second, the diversion ratio is calculated based on the shares of RSN subscribers. For example, Dish does not carry TWC SportsNet, so

the model assumes that if a subscriber leaves DirecTV due to foreclosure of TWC SportsNet, she would not switch to Dish.[12]

20. As explained in the main text, we calculate critical departure rates for two RSNs: CSN New England and TWC SportsNet. For CSN New England, we calculate affiliate fees, advertising revenue per subscriber per month, and diversion ratios using Comcast data for the first half of 2014.[13]

21. For TWC SportsNet, we obtain the affiliate fees from TWC and calculate the advertising revenue per subscriber per month from SNL Kagan estimates. Diversion ratios are calculated based on subscriber counts from SNL Kagan in Los Angeles, the home DMA of the LA Lakers.[14]

B. Model Inputs

1. Comcast's Monthly Profit from an Additional Residential Video Subscriber

22. To estimate the monthly profit Comcast would earn from an additional residential video subscriber, we first identify revenue and cost items for video service from Comcast's "2014 budgeted Profit and Loss (P&L) Statements," (hereinafter "Comcast P&L Statements"), which were provided to us for Comcast's 16 business regions.[15]

23. Revenues from an additional residential video subscriber include recurring video revenue (including monthly video subscription revenues and video equipment rentals) and Pay-Per-View revenue on the Comcast P&L statements.

$$Video\ Revenue = Recurring\ Video\ Revenue + Pay\ Per\ View\ Revenue$$

24. **{{**

[12] We note that this assumption is problematic. Suppose a consumer chooses among Comcast, DirecTV, Dish and AT&T based on the value of each MVPD to her. Dish does not carry the RSN programming while the other three MVPDs do. Suppose the value ranking of the four MVPDs is DirecTV, Dish, AT&T, and Comcast, from the highest to lowest, so the subscriber chooses DirecTV. Assume that if DirecTV loses the RSN programming, its value to the subscriber declines to just below the value of Dish and the value ranking changes to Dish, DirecTV, AT&T and Comcast. In that case, the subscriber will choose Dish even though it does not carry the RSN programming while AT&T and Comcast do. While we do not have the data to estimate such an effect, this example shows that if the diversion ratio calculation excludes an MVPD not carrying the programming at issue, it may overstate the diversion ratio to Comcast and overstate Comcast's incentive for permanent or temporary foreclosure.

[13] Comcast Exhibit 8.2 (b), Comcast Exhibit 8.6 (a-c).

[14] We exclude Dish's subscribers as Dish does not carry TWC SportsNet.

[15] These regions include Beltway Region, Big South Region, California Region, Chicago Region, Florida Region, Freedom Region, Greater Boston Region, Heartland Region, Houston Region, Keystone Region, Mile High Region, Mountain Region, Portland Region, Seattle Region, Twin Cities Region, and Western New England Region.

[16] Comcast, "Customer Lifetime Value", October 2013, P11.

}}. Since these expenses include expenses for both residential and commercial subscribers, we adjust these expenses by the share of residential video subscribers in total video subscribers, which is estimated to be **{{ }}**%.[17]

$$\begin{aligned} &Recurring\ Video\ Expenses \\ &= \{programming\ expense \\ &+ (\{\{ \\ &\qquad\qquad\qquad\qquad\qquad\qquad \}\}) \\ &* \%\ of\ residential\ subscribers\ who\ are\ video\ subscribers\} \\ &\times \%\ of\ subscribers\ who\ are\ residential\ subscribers \end{aligned}$$

25. Second,**{{**

}}[18] Because a subscriber will typically return equipment if his or her service is discontinued, we **{{**

}}[19] That is:

$$Amortized\ Capital\ Expense = \frac{capital\ expense\ for\ video\ sub}{\sum_{t=0}^{119}\left(\frac{1}{1+r}\right)^{t}}$$

26. With the video expenses identified above, we subtract recurring video expenses from video revenue, divide the difference by the number of residential video subscribers and 12 months, and then subtract the amortized capital expense to calculate profit per video subscriber per month in a given region.

$$\begin{aligned} &Profit\ per\ video\ sub\ per\ month \\ &= \frac{Recurring\ Video\ Revenue - Recurring\ Video\ expenses}{residential\ video\ subscribers \times 12} \\ &- Amortized\ Capital\ Expense \end{aligned}$$

[17] Comcast Exhibit 4.7 (e).
[18] Comcast, "Customer Lifetime Value", October 2013, P22.
[19] Comcast, "Customer Lifetime Value", October 2013, P22&23. **{{**

}}

27. Third, Comcast incurs a net acquisition cost at the time a subscriber switches to Comcast, **{{** **}}**[20] Note that even if the foreclosure drives a subscriber to leave her current MVPD, Comcast still needs to incur the cost to compete with other MVPDs to attract the subscriber. For sales and marketing expense associated with a new video subscriber, we use the **{{** **}}**[21] We subtract the installation revenue from the installation and overhead costs to calculate the net installation costs and **{{** **}}**[22]

$$\begin{aligned} &Net\ acquisition\ cost\ per\ video\ sub \\ &= regional\ cost\ per\ connect + national\ marketing\ expense \\ &+ \frac{installation\ cost + overhead - installation\ revenue}{3} \end{aligned}$$

28. In addition, as described above, the profit for a new subscriber during the first year is usually lower due to promotional offers. Therefore, we calculate separately an average profit for a new subscriber during the first month that takes into account the net acquisition cost, an average profit for a new subscriber after the first month up to one year that takes into account promotional offers, and an average profit for a subscriber with at least one year of tenure.

$$\begin{aligned} &Video\ Profit\ per\ sub_{first\ year} \\ &= Video\ Revenue\ per\ sub * \%\ of\ First\ year\ ARPU^{23} \\ &- Video\ Expense\ per\ sub \end{aligned}$$

$$\begin{aligned} &Video\ Profit\ per\ sub_{second\ year\ and\ beyond} = \\ &= Video\ Revenue\ per\ sub * \%\ of\ Second\ year\ and\ beyond\ ARPU^{24} \\ &- Video\ Expense\ per\ sub \end{aligned}$$

$$\begin{aligned} &Video\ Profit\ per\ sub_{first\ month} \\ &= Video\ Profit\ per\ sub_{first\ year} - Net\ acquisition\ cost\ per\ video\ sub \end{aligned}$$

[20] Comcast, "Customer Lifetime Value", October 2013, P22.
[21] Comcast's Response to the DOJ 2nd Request, Exhibit 4.13(a).
[22] Comcast, "Customer Lifetime Value", October 2013, P22.
[23] Comcast, "Customer Lifetime Value", October 2013, P6. We estimate first year ARPU by averaging 0-6 months and 7-12 months monthly recurring charge (MRC) and second-year-beyond ARPU by averaging 1-2 years, 2-3 years, 3-5 years, and >5 years MRC.

$$\%\ of\ First\ year\ ARPU = \frac{First\ year\ ARPU}{First\ year\ ARPU * \%\ of\ 1st\ year\ subs + Second\ year\ and\ beyond\ ARPU * \%\ of\ subs\ with\ tenure\ longer\ than\ 2\ years}$$

[24]

$$\%\ of\ Second\ year\ and\ beyond\ ARPU = \frac{Second\ year\ and\ beyond\ ARPU}{First\ year\ ARPU * \%\ of\ 1st\ year\ subs + Second\ year\ ARPU * \%\ of\ subs\ with\ tenure\ longer\ than\ 2\ years}$$

2. Other Inputs

29. The values of various other parameters used in the calculations are listed below:

- Share of over-the-air watching: a = **{{ }}**
- Percentage reduction in advertising revenue per sub due to loss of one percent viewership: b = **{{ }}**
- Churn back rates after programming is restored:
  - Month 1: c_1 = **{{ }}**%
  - Month 2 – Month 12: c_2 = **{{ }}**%
  - Month 13 – Month 24: c_3 = **{{ }}**%
  - Month 25 onwards: c_4 = **{{ }}**%
- Monthly discount rate: r = **{{ }}**%

3. Estimation of Actual Departure Rates Using Data from Programming Disputes

a) Selection of programming disputes

30. In order to estimate the actual departure in a hypothetical foreclosure of NBC O&O programming, we examine retransmission consent blackouts between a broadcaster or O&O carrying Big 4 networks and one of the four major non-cable MVPDs (Dish, DirecTV, AT&T, or Verizon). As explained in the main text, due to rapid changes in the video programming marketplace, we focus on recent retransmission blackouts since 2012 tracked by SNL Kagan.[25] To make sure that the dispute lasted long enough to have an effect and we have enough data to estimate the effect, we also limit the disputes to those affecting more than 5 DMAs (including some Top 50 DMAs) and lasting more than 30 days.

31. Based on the criteria above, the programming dispute between Media General and Dish (which lasted 46 days from October 1, 2013 to November 16, 2013) is the only one that involved a major rival MVPD of Comcast in more than five affected DMAs (including some Top 50 DMAs) and lasted longer than 30 days.[26] To supplement the Media General-Dish dispute, we

[25] SNL Kagan, Publicized Retrans Blackouts 2000-2014 YTD.

[26] There was also a dispute between Bonten Media and Dish that led to a blackout in 7 small DMAs for 36 days from December 7, 2013 to January 12, 2014 where the affected DMAs ranged in size ranging from 97 to 195 in 2013-2014

also used SNL Kagan data to identify retransmission consent blackouts between a broadcaster or O&O carrying Big 4 networks and a cable MVPD since 2012. The dispute between CBS and TWC (which lasted 32 days from August 2, 2013 to September 2, 2013) is the only one that lasted more than 30 days and affected more than five DMAs.

b) Selection of control DMAs for the analysis of the Media General – Dish programming dispute

32. The dispute between Media General and Dish affected 17 big 4 broadcast stations in 17 DMAs. To select control DMAs similar in size and/or geographic location to the affected DMAs, we first limit the set of potential control DMAs to unaffected DMAs in the same census regions of each affected DMA and then select the two DMAs closest to the affected DMA in 2013-2014 Nielsen ranking of DMAs by number of TV households.[27] Table 23-A-1 below shows the affected DMAs and the control DMAs.

Table 23-A-1

Media General-Dish Dispute
Affected DMAs and Control DMAs

Affected DMAS	Control	
Augusta, GA-A ken, SC	Montgomery-Selma	Lafayette, LA
Birmingham (Anniston and Tuscaloosa), AL	Norfolk-Portsmth-Newpt Nws	Greensboro-H.Point-W.Salem
Charleston, SC	Chattanooga	Waco-Temple-Bryan
Columbus, GA (Opelika, AL)	Corpus Christi	Amarillo
Columbus, OH	Kansas City	Milwaukee
Greenville-New Bern-Washington, NC	Ft. Smith-Fay-Sprngdl-Rgrs	Tallahassee-Thomasville
Greenville-Spartanburg, SC-Asheville, NC-Anderson, SC	San Antonio	West Palm Beach-Ft. Pierce
Hattiesburg-Laurel, MS	Abilene-Sweetwater	Clarksburg-Weston
Jackson, MS	Shreveport	Harlingen-Wslco-Brnsvl-McA
Mobile, AL-Pensacola (Ft. Walton Beach), FL	Tulsa	Knoxville
Myrtle Beach-Florence, SC	Tyler-Longview(Lfkn&Ncgd)	Macon
Providence, RI-New Bedford, MA	Buffalo	Wi kes Barre-Scranton-Hztn
Raleigh-Durham (Fayetteville), NC	Charlotte	Baltimore
Roanoke-Lynchburg, VA	Lexington	Charleston-Huntington
Savannah, GA	Huntsville-Decatur (Flor)	Paducah-Cape Girard-Harsbg
Tampa-St. Petersburg (Sarasota), FL	Miami-Ft. Lauderdale	Orlando-Daytona Bch-Melbrn
Tri-Cities, TN-VA	El Paso (Las Cruces)	Baton Rouge

Nielsen size ranking ("Nielsen, Local Television Market Universe Estimate"). In comparison, the DMAs involved in the Media General-Dish dispute are bigger, with a Nielsen size ranking ranging from 14 to 167, and the DMAs at issue in this transaction (those with NBC O&Os) have a Nielsen size ranking ranging from 1 to 30. Due to the small size of the DMAs involved in the Bonten dispute, we choose not to use it for estimating actual departure rates.

[27] Nielsen, Local Television Market Universe Estimate (Estimates as of January 1, 2014 and used throughout the 2013-2014 television season).

c) Selection of control DMAs for the analysis of the CBS – TWC programming dispute

33. The dispute between CBS and TWC affected six CBS O&O stations in Boston, Dallas-Ft. Worth, Denver, Los Angeles, New York, and Pittsburgh. Because most of these DMAs are very large, our set of control DMAs include all unaffected DMAs among the top 50 DMAs in the nation if TWC has a significant presence in the DMAs.[28] In addition, like in our analysis of the Media General-Dish dispute, we select two control DMAs in the footprint of TWC for each affected DMA based on census region and 2013-2014 Nielsen ranking of DMAs by TV households. Table 2 below lists the control DMAs selected for the CBS-TWC dispute.

Table 23-A-2

Control DMAs in the CBS-TWC Dispute

Albany-Schenectady-Troy, NY	Honolulu, HI	Rochester, NY
Austin, TX	Houston, TX	San Antonio, TX
Buffalo, NY	Kansas City, MO	San Diego, CA
Charlotte, NC	Louisville, KY	Spokane, WA
Cincinnati, OH	Norfolk-Portsmouth-Newport News, VA	Syracuse, NY
Cleveland-Akron (Canton), OH	Portland-Auburn, ME	Wilkes Barre-Scranton-Hazleton, PA
Columbus, OH	Raleigh-Durham (Fayetteville), NC	Yuma, AZ-El Centro, CA
Greensboro-High Point-Winston Salem, NC		

II. List of Formulas

34. This section shows the mathematical formulas for deriving the critical departure rates under the Commission's permanent and temporary foreclosure models. The notations in the formulas are listed at the end of the section.

A. Permanently withholding signal of the NBC O&O station in market *m* from MVPD *i*

$$d_{permanent} = \frac{retrans_i + (\widetilde{ad_m} + \widehat{ad_m}) \times (1 - a)}{\alpha_{i,m} \times \pi_m + retrans_i + \widetilde{ad_m} + \widehat{ad_m}}$$

[28] We exclude DMAs where TWC's presence is less than 1,000, as well as four DMAs affected by a dispute between Journal Broadcasting and TWC (Green Bay, Wisconsin; Milwaukee, Wisconsin; Omaha, Nebraska; and Palm Springs, California).

where $\widetilde{\boldsymbol{ad_m}} = \boldsymbol{ad_{national}} \times \left(\mathbf{1} - \boldsymbol{b} \times (\mathbf{1} - \boldsymbol{a}) \times \frac{\boldsymbol{subs_{i,m}}}{\boldsymbol{subs_{national}}}\right) + \boldsymbol{ad_{local_m}} \times \left(\mathbf{1} - \boldsymbol{b} \times (\mathbf{1} - \boldsymbol{a}) \times \frac{\boldsymbol{subs_{i,m}}}{\boldsymbol{subs_m}}\right)$

B. Permanently withholding signal of all NBC O&O stations in the footprint of MVPD *i*

$$\boldsymbol{d_{permanent}} = \frac{\sum_{m=1}^{10}\left[\boldsymbol{retrans_i} + \left(\widetilde{\boldsymbol{ad_m}} + \widehat{\boldsymbol{ad_m}}\right) \times (\mathbf{1} - \boldsymbol{a})\right] \times \boldsymbol{subs_{i,m}}}{\sum_{m=1}^{10}\left\{(\boldsymbol{\alpha_{i,m}} \times \boldsymbol{\pi_m} + \boldsymbol{retrans_i} + \widetilde{\boldsymbol{ad_m}} + \widehat{\boldsymbol{ad_m}}) \times \boldsymbol{subs_{i,m}}\right\}}$$

where $\widetilde{\boldsymbol{ad_m}} = \boldsymbol{ad_{national}} \times \left(\mathbf{1} - \boldsymbol{b} \times (\mathbf{1} - \boldsymbol{a}) \times \frac{\sum_{m=1}^{10} \boldsymbol{subs_{i,m}}}{\boldsymbol{subs_{national}}}\right) + \boldsymbol{ad_{local_m}} \times \left(\mathbf{1} - \boldsymbol{b} \times (\mathbf{1} - \boldsymbol{a}) \times \frac{\boldsymbol{subs_{i,m}}}{\boldsymbol{subs_m}}\right)$

C. Permanently withholding signal of the NBC O&O station in market *m* from four major MVPDs.

$$\boldsymbol{d_{permanent}} = \frac{\sum_{i=1}^{4}\left[\boldsymbol{retrans_i} + \left(\widetilde{\boldsymbol{ad_m}} + \widehat{\boldsymbol{ad_m}}\right) \times (\mathbf{1} - \boldsymbol{a})\right] \times \boldsymbol{subs_{i,m}}}{\sum_{i=1}^{4}\left(\boldsymbol{retrans_i} + \widetilde{\boldsymbol{ad_m}} + \widehat{\boldsymbol{ad_m}} + \boldsymbol{\alpha_{MVPDs,m}} \times \boldsymbol{\pi_m}\right) \times \boldsymbol{subs_{i,m}}}$$

where $\widetilde{\boldsymbol{ad_m}} = \left[\boldsymbol{ad_{national}} \times \left(\mathbf{1} - \boldsymbol{b} \times (\mathbf{1} - \boldsymbol{a}) \times \frac{\sum_{i=1}^{4} \boldsymbol{subs_{i,m}}}{\boldsymbol{subs_{national}}}\right) + \boldsymbol{ad_{local_m}} \times \left(\mathbf{1} - \boldsymbol{b} \times (\mathbf{1} - \boldsymbol{a}) \times \frac{\sum_{i=1}^{4} \boldsymbol{subs_{i,m}}}{\boldsymbol{subs_m}}\right)\right]$

D. Permanently withholding signal of all NBC O&O stations in the footprint of each of the four major MVPDs

$$d_{permanent} = \frac{\sum_{i=1}^{4}\sum_{m=1}^{10}\left[retrans_i + \left(\widetilde{ad_m} + \widehat{ad_m}\right) \times (1 - a)\right] \times subs_{i,m}}{\sum_{i=1}^{4}\sum_{m=1}^{10}\left(retrans_i + \widetilde{ad_m} + \widehat{ad_m} + \alpha_{MVPDs,m} \times \pi_m\right) \times subs_{i,m}}$$

where $\widetilde{\boldsymbol{ad_m}} = \boldsymbol{ad_{national}} \times \left(\mathbf{1} - \boldsymbol{b} \times (\mathbf{1} - \boldsymbol{a}) \times \frac{\sum_{i=1}^{4}\sum_{m=1}^{10} \boldsymbol{subs_{i,m}}}{\boldsymbol{subs_{national}}}\right) + \boldsymbol{ad_{local_m}} \times \left(\mathbf{1} - \boldsymbol{b} \times (\mathbf{1} - \boldsymbol{a}) \times \frac{\sum_{i=1}^{4} \boldsymbol{subs_{i,m}}}{\boldsymbol{subs_m}}\right)$

E. Temporarily withholding signal of the NBC O&O station in market *m* from MVPD *i* for one month

$$d_{temporary} = \frac{\boldsymbol{retrans_i} + \left(\boldsymbol{ad_{national}} + \boldsymbol{ad_{local_m}}\right) \times (\mathbf{1} - \boldsymbol{a})}{\boldsymbol{retrans_i} + \boldsymbol{\alpha_{i,m}} \times \boldsymbol{\pi_{1,m}} \times \tilde{\boldsymbol{c}} + \boldsymbol{\alpha_{i,m}} \times (\boldsymbol{\pi_{1,m}} - \boldsymbol{Acq}) + \boldsymbol{\alpha_{i,m}} \times \boldsymbol{\pi_{2,m}} \times \hat{\boldsymbol{c}} + (\boldsymbol{ad_{national}} + \boldsymbol{ad_{local_m}})}$$

F. Temporarily withholding signal of all NBC O&O stations in the footprint of MVPD *i* for one month

$$d_{temporary} = \frac{\sum_{m=1}^{10}\left\{\left[retrans_i + \left(ad_{national} + ad_{local_m}\right) \times (1-a)\right] \times subs_{i,m}\right\}}{\sum_{m=1}^{10}\begin{bmatrix} retrans_i + \alpha_m \times \pi_{1,m} \times \tilde{c} + \alpha_m \times (\pi_{1,m} - Acqcost) \\ +\alpha_m \times \pi_{2,m} \times \hat{c} + \left(ad_{national} + ad_{local_m}\right) \end{bmatrix} \times subs_{i,m}}$$

G. Permanently withholding signal of NBCUniversal national cable networks in the footprint of MVPD *i*

$$\boldsymbol{d_{permanent} = \frac{fee_i + \widetilde{ad}}{\alpha_i \times \pi_{national} + fee_i + \widetilde{ad}}}$$

where $\boldsymbol{\widetilde{ad} = ad \times \left(1 + b - b \times \frac{subs_i}{subs_{national}}\right)}$

H. Permanently withholding signal of NBCUniversal national cable networks in the footprint of each of the four major MVPDs

$$\boldsymbol{d_{permanent} = \frac{\sum_{i=1}^{4}\left[fee_i + \widetilde{ad}\right] \times subs_i}{\sum_{i=1}^{4}\left\{\left(fee_i + \widetilde{ad} + \alpha_{MVPDs} \times \pi_{national}\right) \times subs_i\right\}}}$$

where $\boldsymbol{\widetilde{ad} = ad \times \left(1 + b - b \times \frac{\sum_{i=1}^{4} subs_i}{subs_{national}}\right)}$

I. Temporarily withholding signal of NBCUniversal national cable networks in the footprint of MVPD *i* for one month

$$d_{temporary} = \frac{fee_i + ad}{fee_i + \alpha_i \times \pi_1 \times \tilde{c} + \alpha_i \times (\pi_1 - Acqcost) + \alpha_i \times \pi_2 \times \hat{c} + ad}$$

J. Permanently withholding signal of a Comcast RSN from MVPD *i* in market *m*

$$\boldsymbol{d_{permanent} = \frac{fee_i + \widetilde{ad_m}}{\alpha_{i,m} \times \pi_m + fee_i + \widetilde{ad_m}}}$$

where $\boldsymbol{\widetilde{ad_m} = ad \times \left(1 + b - b \times \frac{subs_{i,m}}{subs_m}\right)}$

K. Permanently withholding signal of a Comcast RSN from four major MVPDs in market *m*

$$\boldsymbol{d_{permanent} = \frac{\sum_{i=1}^{4}\left[fee_i + \widetilde{ad_m}\right] \times subs_{i,m}}{\sum_{i=1}^{4}\left\{\left(fee_i + \widetilde{ad_m} + \alpha_{MVPDs,m} \times \pi_m\right) \times subs_{i,m}\right\}}}$$

where $\widetilde{ad_m} = ad \times \left(1 + b - b \times \frac{\sum_{i=1}^{4} subs_{i,m}}{subs_m}\right)$

L. Temporarily withholding signal of a Comcast RSN from MVPD *i* in market *m* for one month

$$d_{temporary} = \frac{fee_i + ad}{fee_i + \alpha_{i,m} \times \pi_{1,m} \times \tilde{c} + \alpha_{i,m} \times (\pi_{1,m} - Acqcost) + \alpha_{i,m} \times \pi_{2,m} \times \hat{c} + ad}$$

Notation:

a: Proportion of foreclosed MVPD who will switch to watch NBC programming over the air.

$Acqcost$: One-time net acquisition cost incurred when Comcast acquires a new subscriber.

$ad_{local,m}$: Advertising revenue per sub per month of the NBC O&O in market m.

$ad_{national}$: Advertising revenue per sub per month of the NBC network.

$\widehat{ad_m} = ad_{national} \times b + ad_{local_m} \times b$

α_i: Diversion ratio from foreclosed MVPD i to Comcast in the footprint of MVPD i nationally.$\alpha_{i,m}$: Diversion ratio from foreclosed MVPD i to Comcast in market m.

$\alpha_{MVPDs,m}$: Diversion ratio from foreclosed MVPDs to Comcast in market m.

α_{MVPDs}: Diversion ratio from foreclosed MVPDs to Comcast nationally.

b: Percentage reduction in average advertising revenue per sub given 1% of decrease in local or national viewership.

c_1: Churn rate during the first month after the programming is restored.

c_2: Churn rate between the second and the 12th month after the programming is restored.

c_3: Churn rate between the 13th and the 24th month after the programming is restored.

c_4: Churn rate beyond 25th month after the programming is restored.

$$\hat{c} = \left(\frac{1-c_2}{1+r}\right)^{12}\left(\frac{1-c_1}{1-c_2}\right) + \sum_{t=13}^{24}\left(\frac{1-c_3}{1+r}\right)^{t}\frac{(1-c_1)(1-c_2)^{11}}{(1-c_3)^{12}} + \left(\frac{1-c_4}{1+r}\right)^{25}\frac{(1-c_1)(1-c_2)^{11}(1-c_3)^{12}}{(1-c_4)^{24}} \times \frac{1+r}{c_4+r}$$

$$\tilde{c} = \sum_{t=2}^{11}\left(\frac{1-c_2}{1+r}\right)^{t}\left(\frac{1-c_1}{1-c_2}\right) + \frac{1-c_1}{1+r}$$

d: Departure rate.

$\boldsymbol{fee_i}$: Affiliate fee per sub per month MVPD i pays to Comcast for RSNs or bundle of cable networks.

$\boldsymbol{\pi}$: Comcast's profit per sub per month nationally.

$\boldsymbol{\pi_m}$: Comcast's profit per sub per month in market m.

$\boldsymbol{\pi_1}$: Comcast's profit per sub per month of a first-year subscriber nationally.

$\boldsymbol{\pi_{1,m}}$: Comcast's profit per sub per month of a first-year subscriber in market m.

$\boldsymbol{\pi_2}$: Comcast's profit per sub per month of a subscriber with at least one year of tenure nationally.

$\boldsymbol{\pi_{2,m}}$: Comcast's profit per sub per month of a subscriber with at least one year of tenure in market m.

$\boldsymbol{retrans_i}$: Retransmission fee per sub per month MVPD i pays to Comcast for NBC O&Os.

$\boldsymbol{subs_i}$: Subscribers of MVPD i nationally. $\boldsymbol{\pi_{national}}$: Comcast's profit per sub per month nationally.

$\boldsymbol{subs_{i,m}}$: Subscribers of MVPD i in market m.

$\boldsymbol{subs_m}$: Subscribers in market m.

$\boldsymbol{subs_{national}}$: Subscribers of MVPD services in the US.

FCC Information and Data Request, Request 24 – Exhibit 24.1

In Section B of Appendix B in of the Comcast-NBCU Order, the Commission used a methodology to calculate the magnitude of vertical price rises that would be caused by the transaction. Using this or a similar methodology, calculate the vertical price increases that will be caused by this transaction (i) separately for each NBCU O&O, (ii) a bundle consisting of all non-broadcast programming networks distributed on a national basis in which the company has an interest (or attributable interest), and (iii) separately for each of the RSNs in which the Company has an interest (or an attributable interest). Describe in detail the methodology employed and produce the underlying data used to determine the various parameters needed to calculate these price increases, including but not limited to the profit margin on MVPD service subscribers, the departure rates and diversion rates. If the methodology is not identical to that employed in Section B of Appendix B of the Comcast-NBCU Order, describe in detail the changes made to that methodology.

Response to Request 24:

1. In Section B of Appendix B in the Comcast-NBCUniversal Order (hereinafter, "FCC Appendix B"), the Commission adopted a Nash bargaining model for analyzing the potential price effect of vertical integration between Comcast's MVPD service and NBCUniversal's programming assets.[1] The model assumed that vertical integration would increase Comcast's opportunity cost for selling programming to rival MVPDs and, therefore, increase Comcast's incentive and ability to charge rival MVPDs higher programming prices.

2. The magnitude of the price increase predicted by the model depends on several factors, including the bargaining skill of Comcast relative to the rival MVPD (μ); the rate at which the rival MVPD's subscribers would leave the MVPD if it lost access to Comcast's programming (the "departure rate" d); the share of those departing subscribers who would switch to Comcast (the "diversion ratio" α); and the MVPD profit that Comcast would earn from an additional

[1] FCC Appendix B, ¶39. Note that the wording of this information request uses the phrase, "Using this or a similar methodology, calculate the vertical price increases that *will* be caused by this transaction…" (emphasis added). We disagree with the notion that the simple theoretical model adopted by the Commission and replicated here can reliably predict what price increases "will" occur as a result of the transaction.

subscriber (π). Specifically, the predicted price increase was calculated using the following formula:

$$\Delta P = (1 - \mu) \times d \times (\alpha_{post} - \alpha pre \ \ ) \times \pi$$

In the formula above, α_{pre} and α_{post} represent the diversion ratios before and after the proposed transactions.

3. The theoretical model underlying the Commission's vertical price effect analysis shares the conceptual issues and limitations of the Commission's foreclosure models. For example, the vertical price effect model does not capture many important features of real-world negotiations between programmers and MVPDs. The model relies on a series of assumptions that have limited empirical support, including assumptions about factors such as the rate at which consumers who leave a rival MVPD may switch to Comcast and the likely departure rate if Comcast programming is not accessible to an MVPD. The model also does not take into account the transaction-related efficiencies and other gains that could benefit consumers. See a more detailed discussion of these issues in our response to Information Request #23. Moreover, by design, the model predicts a price increase for all increases in MVPD share by a vertically integrated MVPD, regardless of the programming involved, the viewing options available to consumers, or the size of the share increase. Because of these limitations, the Commission's theoretical model does not provide a reliable benchmark for assessing the price effect of vertical integration in the current transactions.

4. Despite these limitations of the Commission's model, we have updated the model and applied it to Comcast-NBCUniversal programming affected by the proposed transactions. As explained in our response to the Commission's Information Request #23, a number of NBC O&O stations and RSNs are either not affected or minimally affected by the current transactions, so the theoretical Nash bargaining model would predict a zero or minimal price effect from the proposed transactions. Thus, we have computed the theoretical price effect predicted by the Commission's Nash bargaining model for the following Comcast and TWC programming where there is a material change in the extent of vertical integration: (1) five NBC O&O stations (Dallas, Hartford-New Haven, Los Angeles, New York, and San Diego); (2) the national cable

networks in which Comcast has a controlling interest, and (3) CSN New England (Celtics) and TWC SportsNet (Lakers) in Los Angeles. Also, as in our response to Information Request #23, we calculated results for DirecTV, Dish, AT&T, Verizon, and RCN separately.

5. In the calculation of the theoretical price effect, one needs to make an assumption about the departure rate at which a rival MVPD's subscribers would leave the MVPD if it lost access to Comcast's programming. Based on the recent Media General-Dish and CBS-TWC disputes, which involved blackouts of Big 4 broadcast stations, we use an estimate of the actual departure rate for a one-month temporary foreclosure of **{{ }}**% for NBC O&O stations. Based on the Commission's assumption in the NBCUniversal Order, we assume an actual departure rate of **{{ }}**% for the set of NBCUniversal cable networks, and for each of the two RSNs affected by the transactions, CSN New England and TWC SportsNet. See our response to Information Request #23 for additional details.

6. Table 24-1 and Table 24-2 below show the theoretical price increases calculated using the Commission's vertical price effect model. All calculated price increases account for a small or moderate percentage of what the MVPDs currently pay. In the Commission's *Adelphia Order*, the Commission found that a vertical price effect would not be a concern if the price increase were less than 5% of the current price.[2] Table 24-1 and Table 24-2 show that there is no theoretical price effect **{{ }}** the Commission's 5% criterion, with all but one of the calculated price increases **{{ }}** the criterion. **{{**

[2] *In re Applications for Consent to the Assignment and/or Transfer of Control of Licenses Adelphia Communications Corporation (and Subsidiaries, Debtors-In-Possession), Assignors, to Time Warner Cable Inc. (Subsidiaries), Assignees, Adelphia Communications Corporation, (and Subsidiaries, Debtors-In-Possession), Assignors and Transferors, to Comcast Corporation (Subsidiaries), Assignees and Transferees*, Memorandum Opinion and Order, 21 FCC Rcd 8203 (FCC Adelphia Order), ¶143

}}

7. As discussed above, the Commission's vertical price effect model has many significant limitations and relies upon a large number of assumptions for the values of parameters in the model, many of which are based on no or very little market evidence. Therefore, the vertical price effects resulting from the Commission's model and the large number of assumptions and parameters underlying the model cannot provide any reliable assessment of the impact of the proposed transactions. Even ignoring the conceptual problems and lack of market evidence for all other inputs, the departure rate estimate also has a considerable margin of error that should be considered if the estimate is to calculate theoretical price increases and to assess whether those calculated increases raise any concerns. As a result, the Commission's vertical price effect model, even with no consideration of procompetitive efficiencies, provides no basis for the conclusion that the proposed transactions are likely to result in retransmission consent or affiliate fee increases to rival MVPDs.

FCC Information and Data Request, Request 25 – Exhibit 25.1

> In Section E of Appendix B in of the Comcast- NBCU Order, the Commission used a methodology to investigate whether Comcast favors its own networks and, to the extent this occurs, whether or not this is due to vertical efficiencies or foreclosure incentives. Using this or a similar methodology, provide an analysis of whether Comcast/NBCU favors its own networks and, to the extent this occurs, whether or not this is due to vertical efficiencies or foreclosure incentives. Describe in detail the methodology employed and produce the underlying data on which the analysis is based. If the methodology is not identical to that employed in Section E of Appendix B of the Comcast-NBCU Order, describe in detail the changes made to that methodology.

Response to Request 25:

1. In Section E of Appendix B in the Comcast-NBCUniversal Order (hereinafter, "FCC Appendix B"), the Commission performed econometric analyses of program carriage based on a regression model originally proposed by Professor Austan Goolsbee (the "Goolsbee analysis" or "Goolsbee regression").[1] The Commission's implementation of the Goolsbee analysis used channel lineup data to estimate the correlation between Comcast's carriage, relative to other MVPDs, of its affiliated programming on each of its headends and the customer share of "DBS and telco MVPDs" in the DMA containing the headend. Because the Commission's regression specification found a statistically significant negative correlation (i.e., that Comcast was more likely to carry its affiliated programming, relative to other MVPDs, in DMAs with lower DBS and telco customer shares), the Commission concluded that Comcast favored its affiliated programming and that it did so for anticompetitive reasons.[2] The Goolsbee analysis, however, is ill-suited for assessing Comcast's incentives and ability to engage in anticompetitive program carriage because it has conceptual and econometric flaws (at least as applied by the Commission in this context). In any event, running the Goolsbee regression using current data with a specification analogous to that used by the Commission in its Order in the Comcast-

[1] Austan Goolsbee, "Vertical Integration and the Market for Broadcast and Cable Television Programming," research paper commissioned by the Federal Communications Commission, April 2007 ("Goolsbee (2007)").
[2] FCC Appendix B, ¶ 70. Although the analysis by the economists retained by the Applicants did not find such a correlation, the Commission did after it made changes to the regression specifications submitted by the Applicants' economists.

NBCUniversal transaction does not provide any evidence that Comcast favors its own programming for anticompetitive reasons.

A. Conceptual and Econometric Issues with Goolsbee Regressions

2. The Goolsbee analysis has several conceptual and econometric flaws that render it unreliable for reaching a conclusion about anticompetitive program carriage. One key conceptual flaw is the interpretation of a *correlation* between Comcast's carriage of some of its affiliated networks and the share of competing MVPDs as an indication of the latter's having a *causal* effect on the former. But the correlation does not necessarily imply causation because other variables could explain why Comcast's carriage of affiliated programming may appear higher in areas where competing MVPDs' market share is lower. For example, in geographic areas that have a strong demand for broadband service and HD channels due to factors not controlled for by the Goolsbee analysis, Comcast might allocate more bandwidth to broadband services and HD channels. As a result, Comcast may be less likely to carry some of its own channels (as well as some unaffiliated channels). At the same time, telco MVPDs may aggressively enter these areas, leading to a higher combined DBS and telco market share. In this example, the Goolsbee analysis would show a negative correlation between Comcast's carriage of its affiliated programming and the share of DBS and telco MVPDs, even though Comcast neither favors its affiliated programming nor discriminates against unaffiliated programming.

3. Compounding these conceptual issues, there are several empirical and econometric flaws with the Commission's implementation of the Goolsbee analysis. First, the empirical specification adopted by the Commission attempts to measure the competition faced by Comcast at each headend using the share of DBS and telco MVPDs across the entire DMA in which a headend is located. In other words, the analysis assumes that Comcast faces the same level of competition at each headend located within a particular DMA. However, the share of DBS and telco MVPD competitors measured at the DMA-wide level does not necessarily reflect the level of competition faced by a particular cable system/headend within that DMA. There are many

cable headends in each DMA,[3] and the share of DBS and telco MVPDs (and even the availability of telco MVPD services) can vary considerably across these headends. For example, the Salt Lake City DMA has a **[[ ]]** DBS share of **[[ ]]**% (**[[ ]]**), but that DMA is geographically very large (encompassing the area from eastern Nevada to southwest Wyoming) and includes areas that are very sparsely populated. However, in the zip codes within the Salt Lake City DMA that are served by Comcast headends, the DBS share is only **[[ ]]**%. The fact that many households in remote areas choose to subscribe to DBS is not necessarily indicative of the level of competition faced by a cable system that operates only in the Salt Lake City metropolitan area.

4. Second, an MVPD's market share is presumably affected by, among other things, the programming carried by the MVPD and its in-market competitors. Thus, the share of DBS and telco MVPDs is affected by Comcast's channel lineup, which means the combined DBS + telco market share is *endogenous*. It is well known in econometrics that using an endogenous variable as a regressor will bias the estimated coefficients.[4] Therefore, regression specifications using the combined DBS + telco market share as a regressor are not reliable.

5. Third, the Goolsbee analysis performed in the Comcast-NBCUniversal transaction used the number of channels to control for the "capacity" of a headend. However, variation in the number of channels at a headend for Comcast, and likely for other MVPDs, may be affected by a variety of factors, including an MVPD's allocation of bandwidth between SD and HD channels (HD channels require more bandwidth) and between linear video channels and other advanced services like VOD and broadband, as well as the availability of local and regional programming at the headend's location.[5] Therefore, the variation in the observed number of channels does not necessarily imply variation in capacity. Incorrectly controlling for capacity may lead to the

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[3] There are an average of 67 traditional cable company headends in each of the top 50 DMAs, each serving a completely different set of potential subscribers.

[4] For example, see Peter Kennedy, *A Guide to Econometrics*, 6th Ed., pp. 139–141.

[5] For example, consider the Comcast headend in Chicago (Area 2&3) and the Comcast headend in Turnersville, NJ. Both of these headends have a raw capacity of **[[ ]]** MHz of bandwidth. However, the Chicago headend has **[[ ]]** channels in its digital lineup while the Turnersville headend has only **[[ ]]** channels in its digital lineup in the Rovi data. This difference is due in part to a difference in the number of broadcast channels carried (the Chicago headend has **[[ ]]** broadcast stations compared to Turnersville's **[[ ]]** and **[[ ]]** low power stations compared to Turnersville's **[[ ]]**), but is also due to a difference in cable channels such as "Windy City TV."

appearance of a statistically significant correlation between the carriage of affiliated programming and the combined DBS + telco share when in fact none exists.

B. Goolsbee Regressions Find No Evidence of Program Carriage Issues

6. Putting aside the myriad problems with the Goolsbee regression, to respond fully to the Commission's request, we have run the Goolsbee regression using current data with a specification analogous to that used by the Commission in its Order in the Comcast-NBCUniversal transaction.[6] However, Comcast currently has more affiliated programming assets than it did prior to the Comcast-NBCUniversal transaction, so we applied the analysis to several sample network sets. We considered four sets of Comcast-affiliated national cable networks: (1) networks in which Comcast has a controlling interest and management rights and that have carriage rates of 5% to 90% across all MVPDs' headends; (2) all networks in which Comcast has a controlling interest and management rights; (3) Comcast-affiliated networks with between 5% and 90% carriage across all MVPDs' headends; and (4) all Comcast-affiliated networks.[7] See Table 25-2 for a list of the networks included in each of the four sets.

7. None of the regression results shows any evidence that Comcast is more likely to carry its own affiliated programming in areas where the combined share of DBS and telco MVPDs is lower (or vice versa). In fact, Tables 25-1A and 25-1B below show that Comcast is slightly *less* likely to carry its own affiliated programming in areas where the market share of DBS and telco MVPDs is lower, as indicated by the positive coefficient on the interaction term between the Comcast indicator and the DBS + telco share in the DMA. Table 25-1A shows the unweighted regression results, while Table 25-1B shows the results of regressions weighted by the population of the zip codes served by each headend. For both the unweighted and weighted regressions, the coefficient of interest is estimated to be positive in all cases (in the unweighted

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[6] We have attempted to mimic the set of control variables identified in footnote 93 of FCC Appendix B as closely as possible.

[7] We consider Comcast-controlled and Comcast-affiliated networks with between 5% and 90% carriage because Goolsbee (2007) suggested that such networks with intermediate levels of carriage would provide the greatest incentives for strategic behavior and he restricted his analysis to networks with between 5% and 90% carriage. In FCC Appendix B, the Commission followed a similar approach and considered national cable networks in which Comcast had a controlling interest and that were carried on "some but not most cable systems." The Commission excluded E! Entertainment Television from its analysis because it was "carried on nearly all systems." FCC Appendix B, ¶ 68.

regression the positive estimate is also statistically significant). This is the opposite of the negative and significant coefficient that formed the basis of the Commission's conclusion in the Comcast-NBCUniversal Order that Comcast "currently favors its affiliated programming and that it does so for anticompetitive reasons."[8]

C. Methodology

8. The regression specification in Tables 25-1A and 25-1B uses the same methodology that was used by the Commission in its Comcast-NBCUniversal Order. We used data from the Rovi Corporation on channel lineups at every MVPD headend as of May 1, 2014. We estimated a logit model of the probability that a headend carries a Comcast network with the control variables listed in Tables 25-1A and 25-1B. Robust standard errors are clustered by MVPD.

9. Accordingly, even ignoring the significant conceptual flaws in the Goolsbee methodology, updating the data provides no basis to conclude that Comcast favors its own programming for anticompetitive reasons. **[[**

[8] FCC Appendix B, ¶ 70.

Exhibit 50

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SVP, Legal Regulatory Affairs
Senior Deputy General Counsel
Comcast Corporation

July 31, 2014

VIA ELECTRONIC FILING

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 Twelfth Street, S.W.
Washington, D.C. 20554

Re: *In the Matter of Applications of Comcast Corporation, General Electric Company, and NBC Universal Inc. for Consent to Assign Licenses and Transfer Control of Licensees,* MB Docket No. 10-56

Dear Ms. Dortch:

In accordance with the Memorandum Opinion and Order adopted in the above-referenced proceeding, Comcast Corporation hereby submits its third Annual Compliance Report on *Internet Essentials*, the Comcast Broadband Opportunity Program. A copy of this report is also available as of today at http://corporate.comcast.com/news-information/nbcuniversal-transaction.

Please do not hesitate to contact me should you have any questions.

Sincerely yours,

Lynn R. Charytan
Senior Vice President, Legal Regulatory Affairs,
Senior Deputy General Counsel
Comcast Corporation

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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C.

In the Matter of	)	
	)	
Applications of Comcast Corporation,	)	
General Electric Company,	)	
and NBC Universal, Inc.	)	MB Docket No. 10-56
	)	
For Consent to Assign Licenses and	)	
Transfer Control of Licensees	)	

THIRD ANNUAL COMPLIANCE REPORT ON *INTERNET ESSENTIALS*, THE COMCAST BROADBAND OPPORTUNITY PROGRAM

Comcast Corporation
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July 31, 2014

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and NBC Universal, Inc.	)	
	)	
For Consent to Assign Licenses and	)	
Transfer Control of Licensees	)	

July 31, 2014

THIRD ANNUAL COMPLIANCE REPORT ON *INTERNET ESSENTIALS*, THE COMCAST BROADBAND OPPORTUNITY PROGRAM

Comcast Corporation ("Comcast") submits this report regarding the third year (June 22, 2013 through June 28, 2014) of its *Internet Essentials* offering, the Comcast Broadband Opportunity Program required by Condition XVI.2 of Appendix A to the *Transaction Order*[1] (the "Condition").

Because Comcast has completed the final year of the Condition, this report is structured slightly differently from the prior annual reports. Part I provides a high level overview of Comcast's satisfaction of each of the Condition's requirements. Part II provides a more detailed discussion of how *Internet Essentials* has met, and in many cases significantly exceeded, each component of the Condition. Parts III and IV provide the specific information required by sub-part XVI.2.m of the Condition: the results of the program to date and an analysis of its effectiveness, including the results of a landmark study conducted by the leading researcher on broadband adoption issues, Dr. John B. Horrigan, head of research for the National Broadband Plan and a former research director with Pew Research Center's Internet and American Life Project. Lastly, the report summarizes the many enhancements Comcast has made to continue improving *Internet Essentials* above and beyond any of its original commitments.[2]

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[1] *In the Matter of Applications of Comcast Corporation, General Electric Company, and NBC Universal, Inc. for Consent to Assign Licenses and Transfer Control of Licensees*, Memorandum Opinion and Order, 26 FCC Rcd 4238 (2011) ("*Transaction Order*").

[2] As required by Condition XVI.2.m, a copy of this report will be posted on the Comcast corporate site (http://corporate.comcast.com/news-information/nbcuniversal-transaction).

I.

SUMMARY OF COMCAST'S FULFILLMENT OF THE CONDITION

As voluntarily proposed by Comcast and adopted by the Commission, Comcast agreed to offer a broadband adoption program with the following components:

- It would provide participants with the Economy version of Comcast's broadband service (then 1.5 Mbps downstream) for $9.95 a month with no installation or modem charges or fees;

- The program would be offered to low-income households in the Comcast footprint if (i) at least one child is eligible to receive free lunches through the National School Lunch Program ("NSLP"); (ii) the household is not the subject of a current Comcast collections activity; and (iii) the household has not subscribed to a Comcast Internet service within 90 days prior to installation.

- Participation would be solicited through school districts' NSLP enrollment processes, and Comcast would rely on that enrollment process to determine eligibility;

- Prospective participants would be directed to a dedicated call center that would verify NSLP eligibility;

- In addition to the low-priced service, the program would include the option to purchase an Internet-ready computer at a subsidized price below $150;

- Comcast and its community partners would provide free access to web-based, print, and classroom-based digital literacy training;

- Comcast would implement the program in coordination with state education departments and local school districts;

- Comcast would publicize the availability of the program, in coordination with community partners, to areas with high concentration of low-income residents; and

- Comcast would offer the program for three school years (although the program would continue to provide the price-capped service to households that qualify during the three-year program for as long as they have a student in the household who qualifies).

The Condition did not include any specific requirements regarding the marketing of and publicity for *Internet Essentials* to the eligible population, define the objectives and scope of the digital literacy training requirements, or address how the program would accommodate the Spanish-speaking population with no Internet access at home. All these matters were left to Comcast's discretion.

Comcast's *Internet Essentials* offering not only satisfied the Condition, but also was, and continues to be, an unparalleled success.

- It is the nation's largest and most comprehensive broadband adoption program;

- Participation in the program has now surpassed 350,000 homes or 1.4 million low income Americans;

- Surveys of *Internet Essentials* customers reflect very high user satisfaction and engagement:

    - 90% are "highly satisfied" with the service
    - 98% would recommend *Internet Essentials* to others (84% have already done so)
    - 97% said their children needed it for school work
    - 84% said that either they or others in the household use the Internet at home using their *Internet Essentials* service at least occasionally, and 63% use it every day;

- Comcast voluntarily expanded and improved upon the program's initial design in multiple ways every year. With input from thousands of partners, including major service organizations like Big Brothers/Big Sisters, Easter Seals, the NAACP, and NCLR, Comcast increased the speed of the service, expanded eligibility, created an instant approval process, and made dozens of other enhancements;

- Comcast's marketing and outreach effort and investments in support of the program have gone far beyond any expectations that the Commission had in accepting Comcast's voluntary commitment;

- And, as has been publicly announced, Comcast has extended the program indefinitely – even though the Condition has now been fully satisfied.

The table below illustrates in summary fashion how Comcast has satisfied, and in so many cases exceeded, the Condition's requirements:

What the Condition Requires	**How Comcast Met and Surpassed the Requirement**
Launch the program within nine months of the Closing of the Transaction (*i.e.*, by October 28, 2011).	Over-delivered. Comcast launched *Internet Essentials* ahead of schedule in May 2011 in an effort to engage educators and community groups to help publicize the program in time for the back-to-school season.
Offer eligible households Comcast's Economy broadband service for $9.95 per month.	Over-delivered. Comcast offered its 1.5 Mbps Economy broadband service tier as part of the initial *Internet Essentials* offering, but voluntarily increased the speed of the service to 3 Mbps in April 2012 and to 5 Mbps in August 2013, which is faster than Comcast's entry-level Economy service in most markets (and no lower than it is in any market), for $9.95 a month.

What the Condition Requires	How Comcast Met and Surpassed the Requirement
No installation or modem charges or fees.	Over-delivered. Comcast not only exempted *Internet Essentials* customers from installation or modem charges or fees, but also expanded on this no-hassle sign up approach by allowing enrollment without credit checks and without having to sign any contracts to take the service for a specified period of time. This enhancement to the Condition has been in place since inception of the program.
Offer a reduced-price computer for less than $150.	Done. Comcast has supplied nearly 30,000 low-cost computers since launch. Originally offered as netbooks, earlier this year Comcast replaced the netbooks with a larger-screen laptop model and broadened the computer choices to include either the laptop or a family-oriented desktop, all at the same low price of $149.99.
Provide free access to web-based, print and classroom-based digital literacy training programs.	Over-delivered. Although the Condition did not specify the components of the program's training requirement, Comcast went to great lengths to develop best-in-class digital literacy training options and invested millions in cash and in-kind support to train people through the program's non-profit digital literacy partners. Training options designed for *Internet Essentials* participants – and made available to the general public at no charge – included in-print guides on digital literacy and online safety, an innovative online Learning Center (revamped in 2012 to include a virtual guided tour for easier navigation, a social media section, and new digital literacy education videos), and classroom-based training sessions designed and conducted by community partners who are experts in delivering their own digital literacy curricula. In-person training sessions were offered in both English and Spanish, another program feature that exceeded the Condition's requirements. Comcast also awarded over $1 million to community partners across the country to create *Internet Essentials* Learning Zones that will host additional training opportunities.
Offer the program for a total of 36 months (i.e., through the end of the 2013-2014 school year) across the Comcast footprint.	Over-delivered. This requirement has been completed. On March 4, 2014, near the completion of the third and last school year period required by the Condition, Comcast announced that it was extending *Internet Essentials* indefinitely.

What the Condition Requires	How Comcast Met and Surpassed the Requirement
Implement the program in coordination with state education departments and local school districts.	Done. Comcast met this general condition by aggressively pursuing such coordination throughout its service area: the company made information about the program available at 30,000 schools and 4,000 school districts in the 39 states, plus the District of Columbia, and continues to do so today.
Require participants to have a child that is eligible to receive free lunches through the NSLP.	Over-delivered. Although the Condition originally required that families be eligible to receive free lunches through the NSLP, Comcast acted in the first year to expand the eligibility criteria to a broader range of low-income families. Specifically, in April 2012, Comcast extended eligibility to families with children eligible to receive a NSLP reduced-price school lunch, and then in April 2013 expanded the eligibility criteria yet again to families with homeschooled, private, and parochial students who otherwise meet the NSLP reduced-price eligibility criteria.
Rely on the established NSLP certification process to qualify participants.	Over-delivered. Although Comcast complied with the requirement that all applicants must submit proof of NSLP eligibility, in January 2012, Comcast created an instant approval process so that families with children who attend schools with high NSLP participation would not need to submit proof of eligibility for *Internet Essentials*. Instant approvals account for 56% of all *Internet Essentials* orders received from December 22, 2013 through June 28, 2014.
Request that school districts include program information with their first communication to families in advance of the school year and in each NSLP communication, using collateral materials provided by Comcast.	Over-delivered. Comcast more than satisfied this requirement, collaborating with thousands of schools to send literature to families before and during each school year. And notwithstanding the absence of any such requirement, Comcast also conducted a "spread the word" campaign featuring collateral created by Comcast in English, Spanish, and 12 other languages. Collateral is redesigned at least once a year to keep the content up-to-date and focus on the messaging theme chosen for each campaign.

What the Condition Requires	How Comcast Met and Surpassed the Requirement
Educate school professionals who work closest with NSLP-eligible families about Internet Essentials.	Over-delivered. Comcast engaged educators leading up to and through each back-to-school season through continued personal engagement and a direct mail campaign targeting superintendents and principals in the school districts in the Comcast footprint with the greatest NSLP participation. Understanding that 97% of *Internet Essentials* customers recognize that schoolwork is the main driver for subscribing to broadband access at home, *Internet Essentials*' promotional campaign has featured testimonials from teachers who have witnessed first-hand the many advantages of having Internet access at home. Teachers also receive access to the Partner Portal on the *Internet Essentials* website so they can sign up for program updates and newsletters, as well as download form notices to parents and other collateral. Comcast also engaged dozens of national education organizations to collaborate on best practices in student and educator engagement and to get their membership involved in publicizing the benefits of *Internet Essentials*.
Direct prospective participants to a Comcast phone number dedicated to this program to verify eligibility.	Over-delivered. Here too Comcast met and exceeded the Condition's requirements. The requirements of the Condition were met through the establishment of a dedicated call center reachable by toll-free number, as required. But Comcast also established a toll-free number staffed by Spanish-speaking customer representatives and translated most collateral to Spanish – exceeding the Condition's requirements. It also launched a dedicated website that has acted as a program information conduit to nearly 2.2 million visitors. Comcast recently added an online application tool to the *Internet Essentials* website so that eligible families can apply for the program from anywhere, including mobile devices. Comcast has received over 428,000 applications to date, including 10,000 through the online application tool.

What the Condition Requires	How Comcast Met and Surpassed the Requirement
Publicize the availability of the program, in coordination with community partners, to areas with high concentration of low-income residents and especially through vehicles that are targeted to eligible households.	Over-delivered. Comcast zealously pursued this requirement. The company invested millions in promoting *Internet Essentials* in paid media, including tens of thousands of radio and print ads in local media, and by holding dozens of launch events across the country at the beginning of each school year. Most events featured high-profile guests whose involvement raised the profile of the program and helped schools drive awareness and interest from students and their parents, including U.S. Secretary of Education Arne Duncan, several FCC Commissioners, and *Internet Essentials* spokesperson coach Tony Dungy. These events have generated over 3 billion earned media impressions for *Internet Essentials*. Comcast has also run special promotional campaigns, including membership drives offering free months of *Internet Essentials* service, laptop giveaways, and pre-paid service via *Internet Essentials* Opportunity Cards.
Promote *Internet Essentials* through public service announcements ("PSAs"), as well as through segments of Comcast Newsmakers.	Over-delivered. Comcast easily satisfied this requirement, going beyond anything that the Condition could have been reasonably construed to required. Comcast aired nearly 4 million PSA spots in English and Spanish with a value of more than $51 million and produced 49 "Comcast Newsmakers" public affairs segments in support of *Internet Essentials*.
Distribute *Internet Essentials* materials to its partners who work with low-income communities.	Done. Comcast satisfied this requirement by again going above and beyond expectations. It built a unique Partner Portal that allows *Internet Essentials* partner organizations to download program materials directly or order materials, which are shipped for free regardless of the quantity ordered. Nearly 25,000 individuals and organizations registered for the Partner Portal and requested nearly 37 million pieces of promotional collateral. All promotional collateral was delivered to program partners at no cost to them.
At the time of installation, each participating household shall receive basic instructional materials and a phone number for a dedicated support desk.	Done. The self-install kit sent to every *Internet Essentials* customer included printed guides on how to connect to the Internet, plus a toll-free support number where customers can obtain 24/7 support for any questions or issues about using their XFINITY Internet service.

What the Condition Requires	How Comcast Met and Surpassed the Requirement
Each low-cost computer offered by the program shall ship with Norton security pre-installed.	Over-delivered. Comcast met this requirement by ensuring that each computer included the Constant Guard all-in-one security dashboard (a $360 value), at no additional charge. Constant Guard includes the Norton Security Suite's top-rated tools for core protection against viruses and other cyber threats.

II.

COMPLIANCE WITH THE SPECIFIC REQUIREMENTS OF THE BROADBAND ADOPTION CONDITION

A. Eligibility Criteria *(Condition XVI.2.f)*

As proposed by Comcast in connection with the NBCUniversal transaction and set forth in the Condition, Comcast initially offered the program based on the eligibility criteria outlined in Condition XVI.2.f: a household was eligible to participate in *Internet Essentials* if it (1) is located where Comcast offers Internet services (over 99% of the Comcast service area); (2) has at least one child eligible for a free school lunch through the National Lunch School Program ("NSLP"); (3) has not subscribed to Comcast Internet service within the last 90 days; and (4) does not have an overdue Comcast bill or unreturned equipment.

As described in last year's report, Comcast went beyond the initial eligibility criteria outlined in the Condition and, in 2012, extended eligibility to families with children eligible to receive *reduced*-price school lunches. This enhancement made close to 300,000 additional households in Comcast's service area eligible for *Internet Essentials* – raising the total number of *Internet Essentials*-eligible households to an estimated 2.3 million families. In April 2013, Comcast expanded the eligibility criteria yet again to include families with homeschooled, private, and parochial students who otherwise meet the NSLP eligibility criteria. This enhancement made nearly 200,000 additional families eligible for *Internet Essentials* in Comcast's service area – bringing the total to nearly 2.6 million eligible families, which is 30% more than the initial estimated eligible population.

1. Reliance on NSLP Eligibility *(Condition XVI.2.g)*

To determine eligibility for the *Internet Essentials* program, Comcast proposed, and the Condition requires, that eligibility for the program be based on the well-established certification processes for participation in the NSLP.

2. Eligibility Verification *(Condition XVI.2.j)*

Third party verification specialist Solix continues to assist Comcast with eligibility verification of *Internet Essentials* applicants. Solix's experience with income-based

qualification programs like NSLP allows it to expeditiously handle verification requests, including any customer care issues that may arise during the verification process.

To help expedite the eligibility verification process, in 2012 Comcast implemented the *Internet Essentials* instant approval process at schools that qualify as "Provision 2" schools (generally those with a high percentage of low income students) and for all schools with 70% or more NSLP participation based on National Center for Education Statistics (NCES) data, irrespective of their Provision 2 status. This means that families of students attending the tens of thousands of schools across the Comcast footprint that are either Provision 2 or NCES-validated can be instantly approved for the program and are not required to submit eligibility verification. Instant approvals significantly reduce the amount of time it takes to provision the service after the application is submitted – averaging just 5 days from the moment the application is received to shipment of the self-install kit to the customer.

Instant approvals are another voluntary enhancement to the *Internet Essentials* application process that goes far beyond Comcast's original commitment. The enhancement has facilitated participation for many families: instant approvals account for a majority (56%) of all *Internet Essentials* orders,[3] a share that has been steadily increasing since the instant approval process was launched in 2012, when it captured 39% of all orders for that year.

B. Launch and Duration of the Program *(Conditions XVI.2.a; XVI.2.d)*

In March 2014, Comcast announced that the *Internet Essentials* program had been extended indefinitely, meaning that eligible households will be able to enroll in the program beyond the three school year period originally proposed by Comcast and adopted by the Condition. Enrolled households will remain eligible for the program so long as at least one child in the household continues to meet the program's NSLP eligibility requirements (including the eligibility enhancements made by Comcast).

C. *Internet Essentials'* Principal Components

The *Internet Essentials* program has three principal components:

1. Low Cost Internet Service *(Conditions XVI.2.c.i; XVI.2.c.ii)*

Internet Essentials provides eligible low-income families in the Comcast service area affordable access to high-speed Internet service from their homes. For just $9.95 per month, plus tax, eligible families receive Comcast's XFINITY Internet service with speeds up to 5 Mbps downstream and up to 1 Mbps upstream. Downstream speeds for all *Internet Essentials* customers have been increased twice since the launch of the program, first from 1.5 Mbps to 3 Mbps in 2012, and then from 3 Mbps to 5 Mbps in 2013.

[3] Percentage of total *Internet Essentials* orders for the period beginning on December 22, 2013 and ending on June 28, 2014.

Participants do not have to pay monthly modem or other equipment fees, installation charges, or activation fees for as long as the family remains eligible and maintains the service. In addition, *Internet Essentials* families are not subject to standard credit checks or asked to sign any contracts to take the service for a specified period of time.

2. Discounted Computers *(Condition XVI.2.c.iii)*

Working with the program's partners, Comcast offers *Internet Essentials* families the opportunity to purchase an Internet-ready computer at a discounted price of $149.99 plus tax. *Internet Essentials* families now have the option to purchase a family-oriented desktop or a mobile-friendly laptop. Both options include Microsoft Office, a 90-day limited warranty, and all the hardware needed to connect to the Internet right out of the box. Computers offered through the program come with web browser and security software. As described in the "Ordering the Discounted Computer" section below, the Welcome Kit sent to new program participants includes a voucher with instructions on how to purchase the discounted computer.

3. Digital Literacy Training *(Condition XVI.2.c.iv)*

The third pillar of *Internet Essentials* addresses the need to increase the program participants' digital and computer skills to help them understand the value, the relevance, and the ease of using the Internet. Since 2011, Comcast has invested more than $200 million in cash and in-kind support to help close the digital divide, reaching more than 1.75 million people through the program's non-profit digital literacy partners and special initiatives like the Comcast Digital Connectors program.

Internet Essentials customers have multiple options to access free digital literacy training in print, online, and in-person. For in print training, Comcast designed detailed guides on digital literacy topics such as avoiding online threats and safeguarding personal information online. Hard copies of these guides are included in every Welcome Kit that is mailed to each new *Internet Essentials* customer and are available on the *Internet Essentials* website for download.

As described in last year's report, the concept and execution of the program's online and classroom-based training components has been significant enhanced since launch. In compliance with Comcast's original commitment to feature "web-based" training, the *Internet Essentials* website featured video tutorials on fundamental digital literacy topics. Last year's re-launch of a completely revamped online Learning Center on the *Internet Essentials* website enhanced Comcast's central hub of online digital literacy training materials. The Learning Center is available in both English and Spanish, and features tutorials on how to set up e-mail, guard against viruses and other malware, keep children safe on the Internet, and locate useful resources. And, in March 2014, Comcast announced that it was bolstering *Internet Essentials*' digital literacy component by partnering with the Khan Academy and its world-class online educational website (www.khanacademy.org). By providing unprecedented promotion and support, this partnership aims to expose millions of students to the acclaimed video lessons available for free at Khan.

The program's in-person training model has also dramatically changed since launch. In the first six months of the program, Comcast developed a best-in-class digital literacy training curriculum and worked with its local CBOs to deliver the modules. In 2012, the program was improved through moving to a sponsorship model and worked with local partners who were experts in the field in delivering their own digital literacy curricula. Comcast sponsored partners in major markets where it provides service, and after six months of implementing the new model, attendance had increased by 65% compared to the previous six months. This is the model that continues today, and Comcast's training partners include numerous public libraries, Boys & Girls Clubs, LIFT, LULAC, city recreation centers, local affiliates of the National Urban League, technology learning centers, and many more. To facilitate attendance, the *Internet Essentials* website features a lookup tool that allows users to search and sign up for training sessions in their area. Users can also sign-up to receive e-mail alerts when a class is scheduled to be held nearby.

D. Operationalizing *Internet Essentials* *(Condition XVI.2.j)*

The experience obtained since the launch of the program has allowed Comcast to further refine the application and intake processes to ensure a smooth customer experience and efficient, timely sign-ups. The process involves the following elements:

1. Avenues to Get Information and Request an Application

a. Dedicated *Internet Essentials* phone numbers and branded website

Comcast operates dedicated phone numbers for English and Spanish speaking consumers – 1.855.8.INTERNET (1.855.846.8376) and 1.855.SOLO.995 (1.855.765.6995) – which connect participants to customer account executives ("CAEs") at a dedicated call center specifically trained to assist with *Internet Essentials* enrollment and answer questions about the program. These dedicated phone lines continue to be the central tool that Comcast uses to ensure that interested consumers get the information they need.

In addition, Comcast operates InternetEssentials.com to promote the service, inform potential customers of application requirements, and serve as a portal to information about the program, including the Partner Portal and the online Learning Center. And, as described in section II.D.1(c)(2) *infra*, Comcast has enhanced the application process by deploying an online application tool on the *Internet Essentials* website.

b. General customer service support

Customers can find *Internet Essentials* information through other contacts with Comcast, including training regular CAEs to redirect *Internet Essentials* applicants to the dedicated toll-free number. Customers who visit Comcast.com can find information about the program by searching for "*Internet Essentials"* or using other descriptive terms (*e.g.*, "low-cost broadband") on the site's search tool.

c. The application process

Comcast's objective is to make the application and intake processes as simple and efficient as possible, providing applicants with clear instructions, guidance, and regular reminders throughout the process. For example, Comcast made students at tens of thousands of schools eligible for instant approval, an enhancement that is benefiting a majority of current applicants. To complement the dedicated toll-free number, this year Comcast deployed an online application tool to ensure that eligible families can apply from anywhere, even mobile devices.

(1) Dedicated phone numbers

The primary signup mechanism used by *Internet Essentials* customers continues to be the dedicated toll-free numbers that are staffed by the program's specially-trained CAEs. As of June 28, 2014, *Internet Essentials*' dedicated call center had processed close to 420,000 applications.

After a customer calls to enroll, Comcast sends an application – by regular mail or email, based on the customer's preference – that is pre-populated with information provided by the caller. The pre-populated application is generated in either English or Spanish, printed, and sent to the customer within one business day from the initial call date. Comcast tracks the application and follows up on its completion through a "remind and resend" procedure: if the completed application is not received within 30 days, Comcast sends a replacement application to the home, and a second notice is sent if a response is not received within 60 days.

Next, customers send their completed *Internet Essentials* application and supporting documentation by mail, email, or fax to Solix for verification. Verified applications are forwarded to a Comcast order entry center for provisioning of the new *Internet Essentials* account. Comcast will then mail a Welcome Kit with everything needed to set up the household's Internet service and receive the program's free Internet training. As a general matter, customers can expect to receive their *Internet Essentials* equipment within 7-10 days after Comcast receives the required documentation. Applicants can check the status of their application on the *Internet Essentials* website by entering the phone number associated with the application or calling the dedicated toll-free line.

As described in the "Eligibility Verification" section, above, Comcast has simplified the application process for families with children that attend one of the tens of thousands of instant approval schools. As a result, applicants in qualifying school districts can now complete the *Internet Essentials* application over the phone and be instantly approved for the program without having to send eligibility documentation to Solix.

(2) Online application tool

Comcast launched an online application tool available in English and Spanish in August 2013.[4] Depending on the school information entered in the online form, the applicant will receive a message confirming instant approval or information about how to complete the application process via mail or email. Customers who cannot or do not wish to complete the online form may contact the dedicated toll-free numbers in order to obtain personalized assistance and answer any questions about the signup process. In order to accommodate the growing use of smartphones and other mobile devices, Comcast optimized the online application form so that families can complete the form easily via a mobile device. Comcast will soon enhance the online application tool to allow customers from non-instant approval schools to upload eligibility documentation through the website. As of June 28, 2014, Comcast had processed close to 10,000 applications originated through the online tool since the application's launch.[5]

(3) Additional signup mechanisms

Eligible households may also receive *Internet Essentials* through a bulk registration program which allows non-profits, community-based organizations ("CBOs"), faith-based organizations, school districts, and community colleges to make bulk purchases of *Internet Essentials* service for households that are "sponsored" by each organization.

To further enhance bulk purchasing opportunities, Comcast started selling *Internet Essentials* Opportunity Cards so non-profit partners and others can purchase up to a year of *Internet Essentials* service for qualified families. Comcast's partners have purchased more than $30,000 or approximately 3,000 months' worth of Opportunity Cards for distribution to eligible families. In addition to making them available for bulk purchase, Comcast has allocated over $130,000 or approximately 13,000 months' worth of Opportunity Cards for distribution at the public events in which the company convenes the program's school and community partners.

2. Service Activation

The service activation process remains unchanged since last reported: once a household has been approved for *Internet Essentials* service, Comcast ships a self-install kit that includes the broadband service modem, cabling, and a self-install guide. Customers who require assistance with the activation process may contact the support line indicated in the installation materials and a service visit will be scheduled at no charge to the customer. Comcast contacts new *Internet Essentials* customers to promptly schedule an installation visit in those cases where the Company's records suggest that the customer's home is not pre-wired for Comcast service,

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[4] Comcast also created direct URLs to the application in both English (https://apply.internetessential.com) and Spanish (https://aplicar.internetbasico.com).

[5] Comcast expects that the proportion of online applicants will remain low considering that many of the program's prospective customers have no broadband access at home.

since this suggests that the customer would not be able to use the self-install process without assistance.

3. Ordering the Discounted Computer

The Welcome Kit sent to each *Internet Essentials* participating household includes a voucher with a unique code and instructions on how to obtain the discounted computer. To place an order, *Internet Essentials* customers must call the toll-free number indicated on the voucher and use one of the vendor's payment methods to complete the purchase. The vendor also provides end-to-end customer service including sales, technical support, and warranty coverage for the discounted computer. Organizations participating in the bulk registration program also have the option of purchasing discounted computers for *Internet Essentials* participants during the initial enrollment.

E. Publicizing *Internet Essentials* to Eligible Families *(Condition XVI.2.k)*

Comcast continues to undertake significant efforts and investments to publicize the program, and in doing so, has gone well beyond the original commitment. The components of this broad and ongoing promotional campaign are described below.

1. *Internet Essentials* Website and Partner Portal

The *Internet Essentials* outreach plan includes a dedicated website which serves as a one stop destination for information, resources, and collateral on *Internet Essentials*. Built into this website is a Partner Portal that allows *Internet Essentials* partner organizations to download program materials directly or order materials which are shipped for free regardless of the quantity ordered. Registered partners also receive program updates, including regular newsletters and other announcements. As of June 28, 2014, the dedicated website, including the *Internet Essentials* Learning Center, had received nearly 2.2 million visits, with nearly 25,000 individuals and organizations registered for the Partner Portal, and partners requested and received nearly 37 million pieces of promotional collateral – all at no charge.

2. "Hyper-local" Paid Media

By the end of 2014, Comcast will have placed close to 24,000 radio spots and 1,500 print advertisements in hyper-local media to promote *Internet Essentials* among NSLP-eligible families. The 2013 campaign placed more than 6,100 spots on local radio stations and more than 410 print ads in 93 community and minority-owned print publications in 12 metropolitan areas. For 2014, the paid media campaign has been expanded to 15 metropolitan areas and will feature an estimated 6,400 radio spots, print ads in104 community and minority-owned publications, 87 local community events, and a broader mobile and social media presence. In addition, Comcast utilized PSAs running on its cable systems to promote the program, as discussed in section II.F.4, below.

3. Earned Media

Through June 28, 2014, Comcast has generated more than 3 billion media impressions for *Internet Essentials* through sustained media efforts across print, online, broadcast, and radio outlets. *Internet Essentials* launch events marking the start of the 2013-2014 school year were once again the centerpiece of the earned media strategy, galvanizing a broad range of stakeholders around the mission of urging as many eligible families as possible to enroll. Comcast held 30 launch events across the country, including events in Washington D.C., Chicago, Miami, Atlanta, Denver, Pittsburgh, and Sacramento. The estimated 500 million media impressions generated by coverage of these launch events continued generating millions of dollars' worth of earned media for *Internet Essentials* during the rest of the school year.

Each event featured a speaker from Comcast describing the program and included public officials, school superintendents, community leaders, and special guests like Coach Tony Dungy – all helping to drive the message of the importance of broadband. For example, Comcast Executive Vice President David L. Cohen was joined by FCC Commissioner Jessica Rosenworcel and other civic and community leaders to kick off year three of *Internet Essentials* during a special event held on September 24, 2013 at Neval Thomas Elementary School in Washington, D.C. In addition to re-launching *Internet Essentials* in the Washington, D.C. area, Comcast and the DC Promise Neighborhood Initiative (DCPNI) announced a partnership to help increase digital literacy and connect more families to the Internet in the Kenilworth-Parkside neighborhood in the Northeast section of the District. As part of the partnership, families with children who attend Neval Thomas Elementary School, the Parkside Campus of Cesar Chavez Public Charter Schools for Public Policy, and Educare of Washington, D.C. were eligible to receive a free computer upon enrollment in the *Internet Essentials* program.[6]

In addition to hosting launch events, Comcast attended close to 75 community events held in low-income areas during 2013 and will have a presence at nearly 90 additional events before the end of 2014.

4. Public Service Announcements ("PSAs") and Comcast Newsmakers

Comcast also conducted a bilingual PSA campaign promoting the availability of *Internet Essentials* across its service area. Since August 2011, the Company has aired nearly 4 million PSA spots with a value of more than $51 million. In addition, Comcast has produced 49 "Comcast Newsmakers" public affairs segments in support of *Internet Essentials*, 17 of those in

[6] Comcast Voices, *Comcast's Internet Essentials Forges Neighborhood Partnership in D.C.* (Sep. 24, 2013), http://corporate.comcast.com/comcast-voices/comcasts-internet-essentials-creates-opportunities-in-d-c-through-neighborhood-partnership.

the last year.[7] Segments produced this year included interviews with key stakeholders, plus coverage of launch events.

5. Comcast Employees

Comcast empowered its employees to directly connect eligible families in their communities through its *Internet Essentials* Ambassadors Program. Interested employees could call on existing relationships with schools, libraries, or CBOs in their neighborhoods and help these organizations prepare for the 2014 *Internet Essentials* back-to-school season. Since May 2012, the *Internet Essentials* Ambassadors Program has been replicated and launched in almost every market across the Comcast footprint. The program counts nearly 1,300 Ambassadors across the country working with Comcast's Government Affairs representatives to connect with schools, community organizations, and religious institutions. *Internet Essentials* Ambassadors have reached over 647 organizations, distributed over 208,000 pieces of *Internet Essentials* materials, attended more than 630 events which drew in more than 1,275,000 members of the public, and offered over 2,150 volunteer hours.

F. Comprehensive Stakeholder Campaign *(Conditions XVI.2.g-i)*

Comcast's 8,000 *Internet Essentials* partners are the cornerstone of the program. These non-profit organizations, CBOs, libraries, school districts, members of faith-based organizations, as well as federal, state, and local elected officials have helped build the digital literacy infrastructure of the communities served by *Internet Essentials*. Comcast worked with these partner organizations to help educate eligible families about *Internet Essentials*, distribute promotional materials, and spread the word about the benefits of this broadband adoption opportunity.

1. Schools

Thousands of schools helped promote *Internet Essentials* to eligible families by allowing Comcast to send literature to students and families at the start of the 2013-2014 school year and will continue to help promote the program during the upcoming back-to-school season. The campaign consisted of extensive outreach to students in private, parochial, online, and charter schools, as well as public schools, to ensure that our newly-eligible families were aware of the program. Direct mail campaigns, emails to school officials, and distribution of promotional materials were all leveraged to build program awareness.

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[7] Comcast Newsmakers is a five minute public affairs program that aired on various platforms, including HLN (f/k/a CNN Headline News) on Comcast Cable systems at 24 and 54 minutes past the hour, on Comcast's video on demand platform – with both national and local placement – as well as on the Newsmakers website, www.comcastnewsmakers.com. HLN has begun phasing down these cut-ins, thus reducing segment availability on the network, and has informed Comcast that the six minute windows will no longer be available for preemption by Comcast cable systems as of November 2014.

Schools also have access to a full range of *Internet Essentials* promotional materials ranging from professional-looking posters to simple letters – and all of them are available through the online Partner Portal in English, Spanish, and 12 other languages, including: Arabic, Oromo, Somali, Tibetan, Chinese Mandarin, Haitian Creole, Portuguese, Hmong, Korean, Vietnamese, Polish, and Russian.

Comcast will be distributing redesigned consumer and partner-facing marketing campaign for the 2014 back-to-school season which will focus on demonstrating the ultimate value of home broadband through best-in-class educational content and the myriad of digital tools available to prepare high school students for college, including financial aid resources. *See* Appendix A. Comcast will continue to engage educators leading up to and through the upcoming back-to-school season with continued outreach and a hybrid e-mail and direct mail campaign targeting all program partners.

2. Community Partners

More than 4,000 CBOs, including churches, libraries, and parent-teacher associations have partnered with Comcast to help spread the word about *Internet Essentials*. Comcast continues to work with CBOs that have both strong national and local presences to facilitate the growth of partnerships across the nation, including the Boys & Girls Clubs, the National Urban League, United Way, LIFT, LULAC, and Easter Seals. These partners helped create an atmosphere of support and excitement around *Internet Essentials* by leveraging their relationships with the education community, sharing "best practices" with Comcast and each other, and by driving other organizations to register at the Partner Portal.

The success of *Internet Essentials* would not have been possible without the tireless support of hundreds of community partners nationwide. To honor the efforts of these community partners, Comcast awarded more than $1 million in grants to non-profit organizations in 15 communities across the country whose school districts have done the most to the close the digital divide. The grants are part of the Comcast Gold Medal Recognition Program and they will enable these communities to create *Internet Essentials* Learning Zones. Each Learning Zone will feature: (1) enhanced public Internet access, including indoor Wi-Fi service at community-based organizations; (2) digital literacy training programs in community settings designed to teach parents and children how to use the Internet effectively and safely, and parents how to monitor their children's online activity and school work; and (3) events designed to inform parents about *Internet Essentials* and how they can enroll. The Learning Zones will bring together partners and institutions to create a continuum of connectivity that begins online in the classroom, extends to libraries, computer labs, and after-school programs, and then ends in the home.

To further celebrate the success of the Gold Medal communities, Comcast offered an opportunity for all eligible families in all 15 Gold Medal communities, plus five additional communities that were deemed "most improved", to receive free *Internet Essentials* service for six months if they registered with the program during a three-week period in March 2014. Comcast gave Opportunity Cards to cover six months of service to each of the more than 4,300 households who signed up for *Internet Essentials* under this promotion, a donation worth close to

$260,000. The free service promotion was in addition to the hundreds of free laptop computers that Comcast has given away to families at community events, more than 200 laptops in the last year.

3. Federal, State, and Local Officials

Public officials continue to play an essential role in promoting awareness of *Internet Essentials*. As of June 28, 2014, Comcast had delivered the *Internet Essentials* message to more than 3,000 federal, state, and local elected or appointed officials.

4. Education Associations

Comcast continues to engage national education organizations to collaborate on best practices in student and educator engagement and to get their membership involved with publicizing the benefits of *Internet Essentials*, including the National Parent Teacher Association, National School Boards Association, American Association of School Administrators, Consortium for School Networking, Council of the Great City Schools, State Education Technology Directors Association, National Alliance for Public Charter Schools, and the American School Counselor Association.

G. More Than Just Broadband Service

1. Computer Setup Support *(Conditions XVI.2.l.i-iii)*

The self-install kit sent to every *Internet Essentials* customer includes printed guides on how to connect to the Internet, plus a toll-free support number where customers can obtain 24/7 support for any questions or issues about using their XFINITY Internet service. *Internet Essentials* customers can also take advantage of the comprehensive support tools available online, including live chat with CAEs and comprehensive online self-help tools.

2. Free Security Software *(Condition XVI.2.l.iv)*

To ensure that *Internet Essentials* users have a secure online experience, all *Internet Essentials* subscribers enjoy access to the Constant Guard all-in-one security dashboard (a $360 value), at no additional charge. Constant Guard includes the Norton Security Suite's top-rated tools for core protection against viruses and other cyber threats, plus powerful tools to help protect passwords, secure credit card information, and setup safe, one-click access to online accounts. The service also includes a Safe Search feature that provides safety ratings that clearly identify dangerous and malicious sites before customers visit them.

3. Digital Literacy Training *(Condition XVI.2.c.iv and XVI.2.l.v)*

As described in the "Digital Literacy Training" section, above, *Internet Essentials* participants have the choice of using the comprehensive printed digital literacy guides included in the service Welcome Kit mailed to each new *Internet Essentials* customer (copies of which are accessible on the *Internet Essentials* website), accessing the courses featured in the online

Learning Center, or attending an in-person training session hosted by one of Comcast's community-based digital literacy partners.

III.

YEAR THREE RESULTS

As of June 28, 2014, *Internet Essentials* has connected more than 350,000 households to the power of the Internet – a number that represents more than 1.4 million children and their families. The program also sold nearly 30,000 low-cost computers.

IV.

ANALYSIS OF THE PROGRAM'S EFFECTIVENESS

As in previous reports, Comcast has conducted analyses of *Internet Essentials'* effectiveness as measured by application process statistics and customer satisfaction results. Year three's analysis is supplemented by the findings of a March 2014 study published by the leading researcher on broadband adoption issues, Dr. John B. Horrigan. The survey "explored what drew [*Internet Essentials*] customers to the service and what has engaged them in becoming active (or not) online users, yielding lessons on how to accelerate the process of drawing non-users to broadband."[8]

A. "The Essentials of Connectivity" Study

The Horrigan report was based on an in-depth survey of nearly 2,000 *Internet Essentials* customers who signed up for the service in the latter part of 2013. To understand the survey respondents' reasoning for subscribing to *Internet Essentials*, Horrigan surveyed "why people bought service, the influential factors behind the decision, and whether outside expectations played a role."[9]

The results showed that institutions are "important drivers in encouraging non-broadband users to purchase service, with schools having a preeminent role". In fact, almost all (98%) *Internet Essentials* customers had signed up because their children needed it for school.[10] Among those who had not had home Internet service in the past, 93% said their children drove the decision to get home Internet service through *Internet Essentials* and 64% cited a child's

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[8] *See* John B. Horrigan, Ph.D., *The Essentials of Connectivity: Comcast's Internet Essentials Program and a Playbook for Expanding Broadband Adoption and Use in America* (Mar. 2014) ("Horrigan"), at 5 (attached hereto as Appendix B).

[9] *Id.*, at 17.

[10] *Id.*, at 5.

teacher.[11] Community institutions came into play as well. Overall, 31% of respondents cited either a public library or a CBO as an influential factor behind getting *Internet Essentials* – a figure on par with the influence of family and friends. These findings validate Comcast's strategy of engaging school districts and its CBO partners to help spread the word about the program and the benefits of broadband Internet access at home.

When asked to rate how much the Internet has helped them or their household, school work leads, "with an overwhelming majority (84%) saying broadband has helped with school work a lot."[12] The results also established a clear correlation between having received training and saying that the Internet helps "a lot" for a greater range of activities (*e.g.*, job searches and access to government services). "[T]raining makes a difference in how people engage with the Internet, but there needs to be a variety of training resources to 'meet users where they are' in their Internet adoption process."[13] For example, nearly half (48%) of respondents said that the most helpful way to learn new things is to teach themselves through reading or online videos. Accordingly, Dr. Horrigan recommends that "broadband adoption programs should collaborate with online training resources such as those available at Khan Academy."[14] As with *Internet Essentials'* training resources, the survey revealed that purchasing a low-cost computer through the program generated higher rates of respondents saying the Internet helps "a lot" for school work, job search, staying touch with others, accessing entertainment, and learning about government services.[15]

The study also validated Comcast's outreach strategy to the *Internet Essentials* eligible population. Horrigan's research found that the population of *Internet Essentials* customers is more Latino than the population at-large without broadband at home.[16] One of Comcast's priorities has been to rollout new features like the online application tool in both English and Spanish. Indeed, the availability of Spanish language information and signup mechanisms, bilingual CAEs, and the Learning Portal are proving vital to a significant number of program participants.

Horrigan's "playbook", along with Comcast's ongoing research on *Internet Essentials* effectiveness and customer satisfaction, will continue to guide the planning and execution of the company's broadband adoption strategy.

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[11] *Id.*, at 17.

[12] *Id.*, at 20.

[13] *Id.*, at 3.

[14] *Id.*

[15] *Id.*, at 28.

[16] *Id.*, at 15.

B. Usage Statistics

The program is having a real and meaningful impact on families and the communities in which they live. In a survey of *Internet Essentials* customers conducted on May 22, 2014, 63% of respondents said they use the service every day; an even higher percentage said they use it periodically (84%). School work is the most prevalent use (97%), followed by finding general information (91%), and email (80%). Regarding the impact that *Internet Essentials* has had on their children's education, 94% of respondents felt the service helped improved school grades. For those using the service for job hunting, nearly two-thirds claimed it helped in their search.

C. Application Process Statistics

Key metrics of the program's effectiveness include the call statistics tracked by the dedicated *Internet Essentials* call center. Since launching *Internet Essentials* in the 2011 back-to-school season, the call center has received nearly 2,315,000 phone calls inquiring about the program. Call center statistics through June 28, 2014 break-down as follows:

- 364,488 calls were ineligible for *Internet Essentials* (15.8% of the total and 19.2% of the callers who did not request applications).

- 243,304 calls were follow-ups to previous orders (10.5% of the total and 12.9% of the callers who did not request applications).

- 147,107 were dropped calls or hang ups (6.4% of the total and 7.7% of the callers who did not request an application).

- 1,140,784 were calls requesting general information about the program (49.3% of the total and 60.2% of the callers who did not request applications).

- 419,075 were calls that resulted in applications (18% of the total). Of those:

  – 77.7% or 325,660 were submitted and accepted (includes instant approvals); 2.4% or 10,030 were submitted but returned to the customer for correction. Comcast followed up with these families by providing a replacement application and asking them to correct the application and then resubmit it for approval.

  – 19.9% or 83,385 were never returned by the customer. Comcast's "resend and remind" program followed up with these families by providing a replacement application and asking them to complete the application and return it for approval.

D. General Satisfaction

Satisfaction with *Internet Essentials* continues to be very high. The results of the May 2014 survey of *Internet Essentials* customers cited above showed high satisfaction ratings consistent with those obtained during the program's first two years: 90% of *Internet Essentials* customers surveyed are "highly satisfied" with the service, and 98% of these surveyed customers

would recommend *Internet Essentials* to others (and 84% have already done so). The priority that Comcast has placed on customer care also received high marks from survey participants: 90% stated that they were "highly satisfied" with Comcast's customer service and 94% of those who required an on-site Comcast technician to install their *Internet Essentials* service indicated they were satisfied with the installation. In addition, a very high number (86%) of survey respondents also said they were "highly satisfied" with the reliability of their *Internet Essentials* broadband connection.

V.

SUMMARY OF ENHANCEMENTS TO THE PROGRAM

The implementation of *Internet Essentials* has gone far beyond Comcast's voluntary commitment. As Comcast has gained insights from hands-on experience, it has implemented significant enhancements to *Internet Essentials* along the way. Enhancements made to the program since launch include:

- Extending the program indefinitely – beyond Comcast's initial three-year commitment.

- Expanding the eligibility criteria for *Internet Essentials* twice, first by extending eligibility to families with children eligible to receive reduced-price school lunches, and then by including parochial, private, cyberschool, and homeschooled students.

- Increasing the broadband speeds for *Internet Essentials* customers twice in less than two years; *Internet Essentials* now offers up to 5 Mbps downstream, which is triple the speed offered at the beginning of the program, and faster than Comcast's entry-level service (3 Mbps) in most of its markets.

- Expanding an instant approval process for families whose students attend schools with 70 percent or more NSLP participation (previously, the threshold was 75 percent), which enhanced participation rates.

- Creating an online application tool on the *Internet Essentials* website to make it easier and faster for a family to apply for *Internet Essentials*. The online application form is now available in English and Spanish, and is optimized for use on mobile devices.

- Enabling Comcast's community partners to help connect low-income families to the Internet by purchasing Opportunity Cards that can be used toward the cost of paying for *Internet Essentials* service.

- Launching an enhanced version of its online Learning Center to provide families with enhanced and dynamic content, including interactive content in Spanish.

– Creating the Gold Medal Recognition Program to award grants to communities that have done the most to help close the digital divide and create *Internet Essentials* Learning Zones.

Appendix A

Sample Promotional Materials

2014 Back-to-School Campaign

INTERNET ESSENTIALS from Comcast

With Internet at home, their opportunities can grow as fast as they do.

Now your family has an easier way to do homework, look for a job and keep in touch.

With Internet Essentials℠ from Comcast, your family can:

- Do homework
- Email teachers
- Look for jobs
- Pay bills
- Find doctors
- Get online tutoring
- Take online classes
- Research colleges

Enrolled families may also purchase a low-cost computer. Anyone can access our free online Learning Center, with a library of videos and other resources that help you create a safe, secure and fun online experience for your family. Just visit InternetEssentials.com/learning.

To qualify for Internet Essentials, your household must meet all of these criteria:

- Is located where Comcast offers Internet service
- Has at least one child eligible to participate in the National School Lunch Program
- Has not subscribed to Comcast Internet service within the last 90 days
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COMCAST

John B. Horrigan, Ph.D., *The Essentials of Connectivity*

March 2014

March 2014

The Essentials of Connectivity

Comcast's Internet Essentials Program and a Playbook for Expanding Broadband Adoption and Use in America

John B. Horrigan, PhD

Research Funded by the Comcast Technology Research & Development Fund

The Comcast Technology Research & Development Fund, launched in March 2013, offers funding for researchers at leading academic institutions. The Fund is designed to be a significant investment in the future of technology by supercharging research and development into innovations that will shape the Internet industries for years to come. A wide range of research is funded, including research that focuses on public policy issues that go to enabling communities to take advantage of that innovation and growth. Funding is also provided to support open source development efforts.

Researchers who are selected to participate in the program have access to resources ranging from financial support and hands-on support from Comcast's extensive and experienced network of engineers and other experts. To date, the Fund has funded Georgia Institute of Technology, University of California San Diego, Villanova University, University of Connecticut and other research institutions.

More information about the Fund can be found at http://techfund.comcast.com/.

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Executive Summary

Low levels of broadband adoption among some groups remain a stubborn problem in the United States. One particularly at-risk group is families with school age children. Given that digital resources are increasingly critical to education, families without Internet access are at a severe disadvantage. Comcast's Internet Essentials (IE) is targeted at low-income families with school-age children who do not have home broadband service.

This report explores how homes that have recently signed up for Comcast's IE service travel the path to becoming engaged online users. It does this in a unique way: an in-depth survey of 1,969 Comcast IE users who signed up for the service in the latter part of 2013. The survey found that the population of IE customers is relatively poorer, more Latino, more female, and somewhat better educated than the population at-large without broadband at home.

This landmark survey offers lessons for all of America on how to increase broadband adoption and use. The key findings are:

Institutions are important drivers in encouraging non-broadband users to adopt broadband, with schools having a preeminent role.

- Children and teachers are highly influential in encouraging families to get broadband:
  - 98% of families said they got IE because their kids needed it for school.
  - 91% said their children influenced their decision to get IE.
  - 60% said teachers at their child's schools influenced their decision to get IE.
- Other institutions exerted influence through expectations:
  - 83% said their child's school expected that students have online access at home.
  - 65% said that banks and financial institutions expect them to have home Internet access.
  - 53% said that health insurance companies expect that they have home Internet access.
  - 50% said that government agencies expect that they have home Internet access.
  - 49% said that their job or employer expects that they have home Internet access.
- Recommendation: Institutions should partner with the full spectrum of broadband adoption initiatives to encourage broadband adoption among client populations.

Social networks are an important ingredient to broadband adoption and engaged use.

- 50% say that all or most of the people in their community have Internet access at home.
- 40% say that all or most of the people in their community have "on the go" mobile access.
- Those who say that most of the people they know have home access are *much more* likely to use the Internet several times a day than those who do not – by a 66% to 51% margin.
- Those who have many home Internet users in their community are more likely to say the Internet helps "a lot" in most areas of their lives, such as staying in touch with family, looking for work, or accessing government services.
- Recommendation: Libraries, schools, and non-profits should create spaces where new users can find the "social effect" that hastens the path to engaged online use.

Training makes a difference in how people engage with the Internet, but there needs to be a variety of training resources to "meet users where they are" in their Internet adoption process.

- 29% took advantage of *either* Comcast IE's in-person *or* online training resources, and these users are significantly more likely to say the Internet helps their kids with school work, how they access government services, and look for or apply for jobs.
- 48% say that the most helpful way to learn new things is to teach themselves through reading or online videos and another 30% say it is through their children.
- Recommendation: Broadband adoption programs should collaborate with online learning resources such as those available at Khan Academy or PowerMyLearning.org that can help with education and digital skills.

Broadband adoption programs are an important resource for economic advancement for new home Internet users.

- 68% said a reason for getting broadband access at home was to get health and medical information online.
- 62% said they needed it to look for or apply for jobs.
- 90% said the Internet helps them "a lot" or "somewhat" to do schoolwork.
- 69% said the Internet helps them "a lot" or "somewhat" to stay in touch with family, friends, and neighbors.
- 59% said the Internet helps them "a lot" or "somewhat" to get access to government services.
- 57% said the Internet helped them "a lot" or "somewhat" for job searches.
- Recommendation: Stakeholders focused on economic and community development must make appropriate investments to facilitate broadband adoption at home.

The technology context of new home Internet users is important to understand in program design.

- New Comcast IE customers have experience with technology:
  - 72% have used the Internet from places other than home before getting IE.
  - 50% once had home Internet service at some point in the past.
  - 85% have desktop or laptop computers.
  - 57% have smartphones.
  - 36% have tablet computers.
- 34% said they had given no consideration to getting home Internet service in the 12 months prior to getting service through IE.
- Recommendation: Stakeholders should undertake periodic community and user needs assessments to facilitate dialogue on what strategies work to close broadband adoption gaps.

Part I

A Playbook for Broadband Adoption and Use

In 2010, the National Broadband Plan (NBP) challenged stakeholders in the public and private sectors to tackle a stubborn problem — closing the remaining gap in home broadband adoption in the United States. The puzzle the NBP identified was clear: Why, when 95% of Americans have access to at least one wireline broadband provider, did just 65% actually take service?[1] To address this 30 percentage point puzzle, the NBP recommendations focused on capacity-building. Public-private partnerships were to use public awareness campaigns to help non-users understand the benefits of service. Government agencies were, as they transitioned to digital service delivery, to use that as a lever to draw non-broadband users online. The National Telecommunications and Information Administration (NTIA), as it began its broadband adoption programs, was also to develop resources to improve the digital literacy of non-users.

In this context, the Comcast Internet Essentials (IE) program emerged as a large-scale initiative to address the broadband adoption gap for an especially at-risk population: low-income families with school-age children who qualify for free- or reduced-priced school lunches. The creation of IE was a voluntary commitment in the 2011 acquisition by Comcast of NBCUniversal. IE was first offered on May 11, 2011 and this commitment applied for a period of three school years. IE as it is offered today gives qualifying families a $9.95 broadband Internet service plan, access to training resources on how to use the Internet, and the chance to purchase a $150 computer. Today's IE is different from the initial offering in 2011 because Comcast has expanded speeds and eligibility several times and made a number of other enhancements to the program. On March 4, 2014, Comcast announced that it has extended IE beyond the three school years of its voluntary commitment.

After several years of operation, IE offers a unique opportunity to see how, in practice, the process of trying to get people online works. This report investigates the issue through a landmark survey of 1,969 Comcast IE customers who signed up for service in the latter part of 2013. This survey is unique because it focuses exclusively on individuals and families who have moved from being non-adopters to adopters and it assesses their adoption and engagement pathways. This is one of the only, if not the only, surveys on broadband adoption to do that. The survey explored what drew IE customers to service and what has engaged them in becoming active (or not) online users, yielding lessons on how to accelerate the process of drawing non-users to broadband.

The research, in other words, serves as a playbook for all of America on how to connect a greater share of the population with high-speed Internet at home.

The elements of the playbook are:

I. Institutions are important drivers in encouraging non-broadband users to purchase service, with schools having a preeminent role.

With school age children as IE's priority, it is no surprise that nearly all respondents (98%) said they the purchased IE service because their children needed it for school. A similar number (91%) say that their children played an influential role the decision to get IE service. Schools — teachers specifically — were important too, as 60% of IE users said a teacher at their child's school influenced their decision to get service. Some 83% of IE users said they believed their child's school *expected* that students have online access at home. Other community institutions mattered too; 31% said either their local public library or another community organization influenced their decision to get service.

Expectations from other institutions are part of the equation as well. Among IE users:

- 65% said that banks or other financial institutions expect them to have Internet access at home;
- 53% said that health insurance companies expect that they have home Internet access.
- 50% said that government agencies expect that they have home Internet access.
- 49% said that their job or employer expects that they have home Internet access.

These expectations suggest that these institutions see benefits to having a connected population of the clients and citizens they serve.

Recommendation for Action

As institutions increasingly integrate online means into how they deliver their services, they should partner with existing broadband adoption initiatives, such as Comcast IE, to encourage service adoption among client populations. This means ensuring that training is available for users to learn how to take advantage of online service delivery.

II. Social networks are an important ingredient to broadband adoption and engaged use.

When families purchase IE high-speed service at home, they become one more node on the Internet in communities, neighborhoods, and broader contexts of extended families and friends. Whether others in their social universe have broadband turns out to matter a great deal in how IE customers engage with the Internet.

- 50% of respondents say that all or most of the people in their community have Internet access at home and 40% say that all or most of the people in their community have "on the go" online access on a mobile device.
- The half of respondents who say most of the people they know have home access are *much more* likely to use the Internet several times a day than those who do not — by a 66% to 51% margin.
- IE customers who have many home Internet users in their community are more likely to say the Internet helps "a lot" in most areas of their lives, such as staying in touch with family and friends, looking for work, or accessing government services.

Recommendation for Action

Exposure to other people in their communities who have access to broadband at home will facilitate more engaged use of broadband by recent adopters. Although stakeholders cannot snap a finger to increase the pool of online users in adopters' lives, community organizations can serve as a bridge. Trusted community organizations such as libraries, schools, non-profits, and governments should create spaces where new broadband users can find the "social effect" that hastens the path to engaged online use, especially in relation to functions that empower personal economic well-being. This is one of the ways in which broadband adoption can drive community-level economic development.

III. Training makes a difference in how people engage with the Internet, but there needs to be a variety of training resources to "meet users where they are" in their Internet adoption process.

The IE offer comes with in-person and online training resources and the data show that the training helps users become more frequent and engaged users. Some 17% of IE customers said they have used in-person training and 23% used the Internet Essentials Online Learning Center; this means 29% of IE customers used at least one of the two training resources offered by IE. Among those who use the training, they are significantly more likely to say the Internet has improved how their children do school work, how they stay in touch with family and friends, and how it helps them look for or apply for jobs.

Yet all learning does not take place in a formal training environment. Half (48%) of IE respondents say that when they want to learn new things online, the most helpful way is for them to teach themselves through reading or online videos. Another 30% rely on their children.

Recommendation for Action

When broadband access is coupled with targeted training, adopters are more likely to transition from being mere adopters to those who use broadband to empower personal economic and social well-being. Broadband adoption programs should incorporate digital literacy and other training to ensure adopters become more empowered in that way. Since recent broadband adopters show a preference for online training and half like to learn on their own, a priority on Web-based resources, such as Khan Academy or PowerMyLearning.org, makes sense. Training should also involve working with place-based institutions — such as schools and community organizations — to ensure that they can direct users to curated online learning resources.

IV. Broadband adoption programs are an important resource for economic advancement for new home Internet users.

With its emphasis on reaching families with school-age children, IE is at its core about education. But in important ways, this serves as a conduit to opening up IE families to the skills to participate in the 21st century economy. When asked why they started using the Internet:

- 62% of respondents said they needed it to look for or apply for jobs;
- 57% said the Internet helped them "a lot" or "somewhat" for job searches.

Online access at home also permits families to communicate with institutions that help in their everyday lives, such as health care and government.

- 68% of respondents said a reason they got broadband at home was to get health and medical information online;
- 59% said the Internet has helped them "a lot" or "somewhat" to get access to government services.

Recommendation for Action

Stakeholders interested in economic and community development must prioritize the role of online access for all citizens in carrying out their missions. Investments in initiatives to facilitate broadband adoption and use are key complements to programs aimed broadly at economic and community development. This opens up to low-income communities the same kinds of economic and social benefits to which so many others have access.

V. The technology context of new home Internet users is important to understand in program design.

A key takeaway from the survey of IE users is the variety of backgrounds with information and communications technologies (ICTs) that they bring to the program:

- 72% of respondents said they used the Internet from someplace other than home before getting IE service; 27% did not.
- Half of respondents said they had home Internet service at some point in the past prior to getting IE service, while the other half said they had *never* had Internet service at home before having IE service.
- 34% of IE customers said they had given no consideration to getting home Internet service in the 12 months prior to getting service through IE.
- At the same time, many have access to modern ICT gadgets. Some 85% have desktop or laptop computers, 57% have smartphones, and 36% have tablet computers.

These differences impact what users need from broadband adoption programs. Those who have not had home Internet service in the past, or who have not recently given any consideration to getting service, are more likely to use — and need — digital literacy and other training. They are also less likely to say they prefer to learn about the Internet on their own (40% say this) and are more likely than those who had service once to say they turn to a child to learn about the Internet.

Recommendation for Action

Stakeholders should undertake periodic community and user needs assessments to understand the technology perspectives of communities that require interventions to encourage broadband adoption and use. This will not only help improve program design, but also facilitate ongoing dialogue among providers and communities on how ICTs can positively impact the economic and social prospects for low-income communities.

Survey Methodology

This report is based on a January 2014 telephone survey of 1,969 Comcast Internet Essentials customers who have started IE service in the prior six months. The survey was conducted by Princeton Survey Research Associates International; respondents had the option of having the interview conducted in English or Spanish. The margin of error for results based on the entire sample is +/- 2.2 percentage points.

Author's Preface

For the author, this report reflects continuation of work started more than four years ago, when he worked at the Federal Communications Commission on the development of the National Broadband Plan. One of the memorable phrases from the NBP is that the Plan is "in beta and always will be." For those interested in the National Broadband Plan's key objectives — increasing broadband adoption and use, improving deployment of the nation's broadband infrastructure, using broadband for national purposes — this means periodically revisiting and revising what the plan recommended.

It is in that spirit that this research is undertaken — looking at what is happening in the broadband environment, drawing lessons, and suggesting improvements. Comcast's IE program represents an important — and large — pillar of how America is going about getting all households online. NTIA's Broadband Technology Opportunities Program (BTOP), which was funded by the 2009 American Reinvestment and Recovery Act and built out a "broadband adoption infrastructure" that has reached hundreds of thousands of homes is another example. NTIA's indispensable "Broadband Adoption Toolkit" had drawn together important lessons from BTOP.

Now, with more than two years of work under its belt and its extension beyond the voluntary commitment already announced, IE is an example of how public and private action can be brought to bear on a problem that has important implications for low-income communities and the nation's economic and social health. It is also an opportunity to deepen understanding of how to increase broadband adoption and use, and utilize that understanding for the benefit of all others engaged in this endeavor. The objectives here are to:

- Develop a data-driven record for understanding how to address a key challenge in the broadband ecosystem — how to move the dial on home broadband adoption for the poorest families in society.
- Improve on how, as a nation, we get more homes online using the Internet in ways to improve their lives and in particular, give Americans who have the greatest challenges in participating in the 21st century economy the tools and the support to help do that.

In developing recommendations to promote broadband adoption and use, the NBP recognized that government could not alone tackle the problem — public-private partnerships are necessary. Internet Essentials is one example of that. This report offers a playbook for all stakeholders in the public and private sectors to continue to make investments on how to connect more Americans with broadband at home and help them to use it in their economic, educational, and personal lives. Consider this report, at least with respect to the broadband adoption and use, as Broadband Plan 2.0.

Part II

Introduction: The Path to Internet Essentials

The year 2010 marked the release of the U.S. National Broadband Plan (NBP), an ambitious effort to chart a future course for the use of high-speed Internet to improve societal and economic outcomes in the United States. The NBP focused on the quality and reach of broadband networks, how the country could use them for so-called national purposes (e.g., better health care and education), and how to increase rates of broadband adoption and use.

That year also marked a distinct point in the adoption path for broadband-at-home in the United States as home broadband adoption reached 68%.[2] After a decade of rapid adoption in the general population, data indicated that growth in home broadband subscriptions had slowed. Part of that was due to the severe economic downturn the country was experiencing. Additionally, the natural course of adoption rates of new technologies had something to do with it; typically when two-thirds of the population has a new technology, reaching the last third of "hard to reach communities" is a more protracted path.

The other part of the broadband story at that time was an inflection point on how our society thought about broadband and other information and communications technologies (ICTs). By 2010, plenty of telecom and Internet policymakers and stakeholders were accustomed to touting the economic benefits of broadband and the need to increase broadband adoption for equity reasons. What changed around 2010 was the understanding of how the Internet could improve performance and efficiencies in nearly every corner of our society, particularly when it comes to contributing to economic growth. High speed networks and powerful, portable computing devices could improve how we educate children. These same digital assets could help people manage their health better and governments deliver services more cheaply and effectively. Stakeholders came to see broadband as having a more central role to many key functions, making it problematic to have a significant portion of the population not using it.

It was this evolving context that new initiatives have emerged to draw more Americans to broadband adoption and use. The American Recovery and Reinvestment Act of 2009 invested $450 million in public computing centers and sustainable broadband adoption initiatives through the Commerce Department's National Telecommunications and Information Administration. These grants, which attracted additional funding from partners in the private and non-profit centers, have reached more than 500,000 people through community-based initiatives.[3] Comcast's IE program developed in this context too, aiming to draw online households with school-age children that are eligible for the free or reduced-price school lunch program.

This report examines how recent Comcast IE customers have traveled the path to having high-speed Internet service at home. The IE program was a voluntary commitment in the 2011 acquisition by Comcast of NBCUniversal, with the commitment being that the IE program run for three school years starting on May 11, 2011. The concept of industry-led efforts to reach non-broadband adopting populations including IE originated in 2009 with the cable industry's "Adoption Plus" initiative.[4] IE provides for eligible households:

- A $9.95 per month Internet connection at 5 megabits per second downstream and 1 Mbps upstream.
- A $149.99 computer.
- Free Internet training online, in-person, or in print.

Since its inception, IE has signed up 300,000 families for service or about 1.2 million people. For more history on IE and in particular how it has evolved from the program that was announced as part of the NBCUniversal transaction, please see Appendix I for an overview that Comcast has produced.

Closing Access Gaps: Understanding the Role of Poverty in Online Access

Just as so many stakeholders have updated their understanding of how broadband can impact society, the debate about the digital divide has evolved — and must continue to do so. Research and scholarship in the past dozen years has pushed stakeholders to see online access as about more than just access and fairness, as important as they continue to be. The discourse has expanded to view the digital divide as a difficult — though not intractable — problem that requires sustained interventions and widespread participation from stakeholders in the public and private sectors. It also calls for deep understanding of the circumstances of non-users that drive non-adoption. To see why, some background on the evolution of the digital divide debate will help.

The digital divide debate inherited a universal service policy framework that placed the social dimensions of the issue in terms of access to service. From the early days of the Bell Telephone System, universal service was about ensuring widespread network deployment and, later, making telephone service affordable to Americans. In establishing the Federal Communications Commission in 1934, the Communications Act stated as its goal "to make available, so far as possible, to all the people of the United States, a rapid, efficient, Nation-wide, and world-wide wire and radio communication service with adequate facilities at reasonable charges."[5] Elaborate regulatory mechanisms developed to make sure the price for telephone would be low enough so that more and more Americans would purchase service.

As discussion of the National Information Infrastructure (NII) unfolded in the 1990s, traditional universal service values shaped how policymakers talked about the need for available and affordable advanced information tools. Discussion of the information "haves" and "have nots" from the Clinton Administration's 1993 Information Infrastructure Task Force (IITF) focused on closing gaps in network access and end-user devices for individuals and, importantly, for public institutions such as schools and libraries. Although initiatives of that era did discuss the need to train teachers on how to use the Internet in the classroom, a good deal of policy discourse involved watching metrics on device adoption (back then desktop computers) and consumer purchases of modems to connect to the Internet.[6]

By the turn of the 21st century, community-based efforts in many parts of the country sought to close the digital divide by reaching into mainly low-income neighborhoods. The Community Technology Center (CTC) movement created places in communities where people could go for services that many could not afford at home. Libraries and schools were also part of the equation in this era as access points. CTCs had the dual advantage of opening access to many people who might otherwise not have ways to get online, but also exposing stakeholders behind these initiatives to the challenges and nuances of introducing new technology to largely low-income populations.

From this work came an appreciation that adoption of ICTs had more dimensions than simply ensuring the availability of networks, inexpensive service offerings, and cheap access devices.

An early call for reformulation of the digital divide debate came in the early 2000s from Lisa Servon, now of the New School for Social Research. She argued that measures to address the digital divide had to include training on how to use the technology, since the problem is "much more complex than a mere lack of computers." Servon noted that access gaps would close, with falling prices for electronic devices and services resulting in more low-income people purchasing these goods. Yet "entrenched gaps" in usage would remain unless training programs and content were developed for specific groups.[7] Qualitative research that the Social Science Research Council (SSRC) conducted for the National Broadband Plan noted that, among poor Americans not using broadband, lack of high-speed service adoption at home "tracks closely with socio-economic inequality" and that access barriers tend to be multiple in nature.[8] More recent research from scholars at Temple University

centers on the structural barriers poor women in Philadelphia face to Internet access. Gilbert and Masucci find that contextual factors such as sexism, inequality, and challenges in poor women's daily lives are all crucial in devising approach to draw them to sustained technology use.[9]

Empirical research also demonstrates the role of poverty and broader social context in explaining the adoption of broadband, computers, and the Internet. In study of computer adoption using 1997 data, Goolsbee and Klenow found that people were more likely to have a computer at home if they live in areas where others have adopted and if a large share of family and friends had a computer.[10] A Gates Foundation study in 2003 found that, even when controlling for income, people living in low-income areas are less likely to be computer or Internet users. That is, a low-income person who happens to live in a middle income area with high uptake is more likely to use the Internet than a person at the same low level of income that lives in a poor (low adopting) area.[11] This same neighborhood effect has been found more recently in Chicago and in a survey conducted by the Joint Center for Political and Economic Studies.[12] Finally, research from the mid-2000s found that, in the relatively early stages of broadband's rollout as a consumer service, socio-economic factors (particularly income) explained broadband uptake more than price sensitivity, even when controlling for service availability.[13] This research indicates how problems with broadband adoption in low-income communities are intimately bound up in other problems that are markers of poverty, such as low high school graduation rates and health outcomes. Efforts to increase broadband adoption in these communities must understand the structural problems of poverty.

Research conducted for the National Broadband Plan extended understanding of non-adoption by examining in detail the barriers to non-adoption. That work found adoption barriers to be multiple in nature, while also determining, in the midst of multiple reasons for non-adoption, which factors loomed largest. In "Broadband Adoption and Use in America," the methodological approach to asking non-broadband users why they do not have service essentially let them check more than one box on a menu of possible reasons for not having broadband. That approach found that, among non-broadband users, when asked to choose more than one reason for not having broadband, 51% say the monthly cost is too expensive, 32% say they are not comfortable using a computer, 35% say they worry about bad things that can happen online, 32% say they cannot afford a computer, 25% say there is nothing online they want to see, and 24% say the Internet is a waste of time.[14]

When asked subsequently to identify the main reason they do not have broadband, reasons for non-adoption sort into three categories:

- Cost: 36% of non-broadband adopters cited a cost-related reason, such as 15% who cited monthly access fee, 10% who cited computer cost, 9% who cited activation fee, and 2% who cited a combination of reasons.
- Digital Literacy: 22% cited factors pointing to digital literacy including 10% who said they were worried about bad things that could happen online, and 12% who said they were not comfortable with computers.
- Lack of relevance: 19% of non-adopters said they did not find online content compelling enough to purchase service. This means they thought the Internet was a "waste of time," that there was nothing worth seeing online, or that offline alternatives for getting information sufficed for them.[15]

Since the NBP, research on non-broadband adoption has continued to find these same patterns for non-adoption. Research conducted for the Partnership for Connected Illinois in 2012 found that, for Illinois residents, non-broadband users cited multiple reasons for not having service and, when asked about the main reason, 29% of non-broadband adopters cited a cost related reason (16% cited the monthly access fee and 9% cited the cost of the computer), 17% cited the lack of relevance and 13% cited digital literacy.[16] NTIA's large-scale surveys on non-Internet use find that, when asked only to cite the main reason they do not have the Internet at home, 48% of respondents cite broadband's lack of relevance to them, 28% say it is too expensive, and 13% say they do not have a computer (or an adequate one).[17] The Pew Research Center, in asking the question in a way similar to NTIA, finds that 34% of non-internet users cite lack of relevance, 32% cite usability issues, and 19% cite cost which was made up of 13% saying they do not have a computer and 6% saying it is too expensive.[18]

Beyond shaping discourse about drivers to non-broadband adoption, the FCC research showed the complex nature behind the decision not to have service. The plural nature of reasons for non-adoption was most striking. Respondents could, and did, identify a main reason for not having service, but that was in the context of

multiple reasons (most designated three) they cited. Expected reasons for not having service, such as the cost (which included different cost elements), relevance and digital literacy clearly came into play. Non-broadband users, it turned out, occupied a range of different terrains when pressed for reasons underneath their choice not to have service. The research showed that, particularly to those hoping that pulling a single lever (such as lowering prices or offering free computers) would accelerate broadband adoption, the problem was indeed multi-dimensional.

This report builds on the FCC's 2010 and subsequent research but, importantly, extends it beyond issues such as consumer preference or even levels of skills. Although those things shape ICT adoption choices, the social context for non-broadband using Americans is important too. For the population of (mostly) poor non-broadband users, poverty understandably influences decisions on what services to purchase, the means of gathering information, and how to address day-to-day needs. Broadband can help in many ways, but it is often just not a realistic option.

By understanding non-adoption a problem nested in the context of the larger ones many low-income families face, initiatives to address non-adopters' needs have to focus on building their capacity for sustained adoption and use, not one-off efforts to procure service. This means "meeting people where they are" as opposed to top-down approaches that seem to demand that non-adopters conform to a single solution.[19] Worthwhile broadband adoption programs should foster not just digital skills, but also the wherewithal for clients to engage in:

- Problem-solving: to troubleshoot household and personal technology.
- Deepening engagement: so that people use digital resources to address issues in their lives pertaining to education, health care, and many others.
- Ongoing learning: The willingness to adapt to and be participants in discourse about a rapidly changing Internet environment that calls for high levels of trust that goes with sharing personal data with emerging applications.

A final element in considering Internet use among non-adopting population is that, in many cases, the digital divide is less an impenetrable barrier and more of a line that people cross from time-to-time. Research has shown that there is churn in the population of broadband users, that is, broadband service is something some have had in the past but have given up for some reason. A 2009 Pew Research Center study found that, at the onset of the recession, some 17% of low-income respondents had cut back on Internet service due to tight home finances. This finding is consistent with other research that shows that, during the Great Recession, there was a dramatic decline in all consumption components including (unlike past recessions), non-durable goods such as broadband.[20] Similarly, the 2010 FCC national survey found that 17% of non-broadband users had had home Internet service in the past; among non-broadband users with school age children *and* low-incomes, that figure was 35%. SSRC's qualitative study of low-income people without Internet access at home used the term "un-adopters" to describe the 24% of people in the SSRC focus groups who had broadband service at home at some point, but had to disconnect service (usually for financial reasons).[21]

The survey on which this report is based sought to understand not just who IE customers are or whether they like the service. It also explores the context of their lives, their past experience (if any) with broadband and other ICTs, their reasons for subscribing to broadband through IE, and their attitudes about broadband's usefulness to them. In approaching the research this way, the objective is to develop actionable insights for all stakeholders interested in increasing broadband adoption and use in the United States.

IE Customers: Reaching Low-Income Families through Their Kids' Schools and Connecting — and Reconnecting Many — to Home Internet Service

Finding One: Demographic Overview. The population of IE customers is relatively poorer, more Latino, more female, and more educated than the population at-large without broadband at home.

Because the IE program targets families with school age children who are eligible for free or reduced priced lunches (meaning their household income does not exceed 130% of the poverty level), IE customers are going to be poorer and younger than the general population. The survey conducted for this report interviewed 1,969 Comcast IE customers who had signed up for home broadband service via IE in the prior 6 months. Appendix II contains a detailed methodological account of the survey. This makes the sample gathered for this report truly

Table 1: Comparing IE customers to national data on families with school-age children lacking home broadband

	Comcast IE customers	Families with school age children without broadband at home
Gender		
Male	24%	44%
Female	76	56
Race/Ethnicity		
White	19%	25%
African American	20	21
Latino	52	38
Age		
18-29	20%	24%
30-49	68	56
50-64	10	15
65+	1	4
Income		
Under $20K	54%	35%
$20K to $50K	35	28
$50 to $75K	2	10
$75K to $100K	*	5
Over $100K	*	5
Education		
High school grads or less	60%	70
Some college	26	21
College +	13	9

* = less then 1%

distinctive — one of the only, if not *the* only — sample of recent broadband adopters who have been part of a structured program to bring them online.

Demographically, IE customers look very different from the typical family with school age children without broadband. In the table below, it is worth noting that the column labeled "families with school age children without broadband at home" includes families whose household incomes exceed 130% of the poverty level. Data in that column is based on combining publicly available Pew Research Center data from 2012-13 to have enough cases (239) of families with school age children without broadband to permit comparisons.

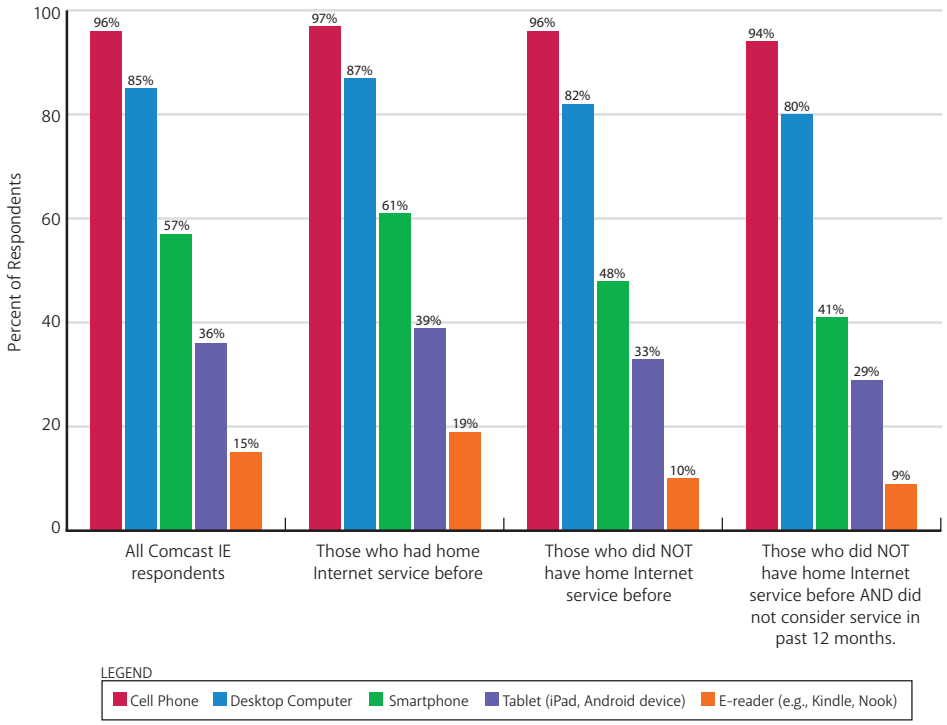
The average household size for respondents in the Comcast IE survey is four, which means the typical respondent has a household income under $20,000 per year to support four people. This compares to the U.S. government's definition of the poverty level for a family of four, which is approximately $23,000 per year.

Finding Two: Half of IE customers had home Internet in the past and a substantial share have smartphones or tablet computers.

When thinking about IE customers' circumstances as they have become home broadband users, it is important to understand the differences in online experience and assets that they bring. Past experience with home Internet use is a first marker. Half (50%) of respondents said that, before they had Comcast IE service, they had Internet service at home at some point in the past. Many Comcast IE users interviewed for this survey also had thought about getting broadband at home in the previous 12 months. When asked whether they had considered subscribing to broadband in the past 12 months:

- 28% considered it very seriously.
- 26% considered it somewhat seriously.
- 6% considered it not too seriously.

Table 2: Technology assets of IE customer



- 1% considered it not at all seriously.
- 34% said they had not considered it.

Of the one-third (34%) of respondents who had not at all considered getting service in the prior 12 months, 59% had never had broadband service before. This means that 20% of all respondents, before Comcast IE, had *never* had Internet service at home *and* had not considered subscribing in the past year.

Even with these differences in prior online experience, Comcast IE customers in this study are not disconnected from modern ICT gear.

Finding Three: IE customers overwhelmingly got service for kids and their school work, but expectations from other parts of society helped drive the adoption decision.

To understand respondents' reasoning for subscribing to Comcast IE, the survey asked directly why people bought service, the influential factors behind the decision, and whether outside expectations played a role. Given that IE is targeted to educators and families with children eligible for free or reduced-price lunches, it is not surprising that education tops the list of reasons cited for getting Comcast IE. When asked their reasons for getting service:

- 98% said their children needed it for school work.
- 68% said to get health and medical information online.
- 63% said they wanted access to music, movies, news, and entertainment like online games.
- 62% said they needed the Internet to find jobs and apply for them.
- 62% said they wanted the Internet to stay in touch with people via email or social media.
- 61% said they needed the Internet to get government and social service information.

As to what groups influenced their decision to get home Internet service through the IE program:

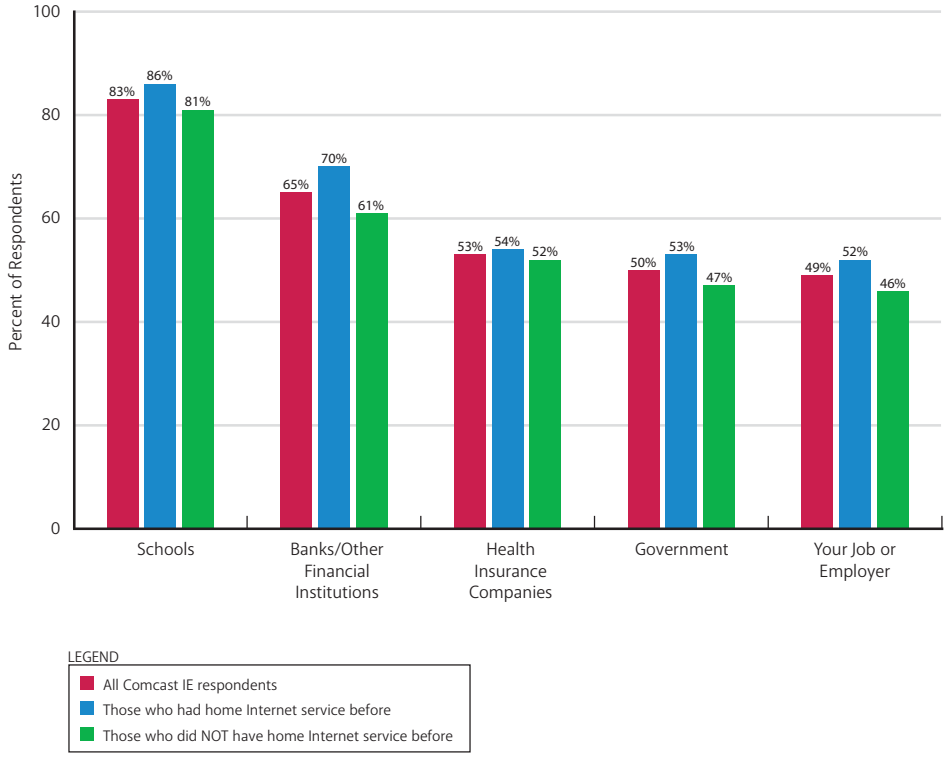
- 91% said their children influenced their decision.
- 60% said teachers at their child's school.
- 34% said family members or friends.
- 23% said public libraries.
- 18% cited community organizations.
- 16% said co-workers.

Those who had *not* had home Internet service in the past were somewhat more likely to say that their children or their teachers had something to do with the decision, with 93% saying their children drove the decision and 64% citing a child's teacher.

The other part of the equation was expectations. The survey probed whether Comcast IE customers had encountered people or institutions who presumed they had online access readily available at home. Again education rose to the top; 83% of respondents said that they believed that schools expected them to have online service at home. But other institutions had expectations about home Internet access for respondents, particularly in the financial sector. Whether a respondent had had online service in the past before IE or not shaped the degree to which respondents said they encountered the expectation that they should have online access from home.

In sum, Comcast IE customers have education in mind when asked about their motivation for and reasoning behind subscribing to broadband through IE. At the same time, other reasons are important. People see health care information as an important reason to have home broadband service, and that is in part driven by expectations that health insurance providers expect this. A similar dynamic is at work for government and social services, with consumer desire buttressed by institutional expectations. Comcast IE customers also share the same motivations for online access that so many of us take for granted, such as communicating with family and friends and using the Internet for entertainment.

Table 3: Institutions' expectations that people have home Internet
For each of the following groups, do they expect to be able to communicate at home via the Internet? (% yes)



Even though educational purposes are the main drivers behind getting access, it is important to note other factors that come into play for many IE users. One-third (34%) said family and friends influenced their decision to get service and 16% of co-workers did. Community institutions came into play as well. Nearly one-quarter of IE respondents (23%) said a public library influenced their decision to purchase broadband service via IE and 18% said community organizations had an influence. Overall, 31% of IE respondents cited *either* a public library *or* a community organization as an influential factor behind getting IE — a figure on par with the influence of family and friends.

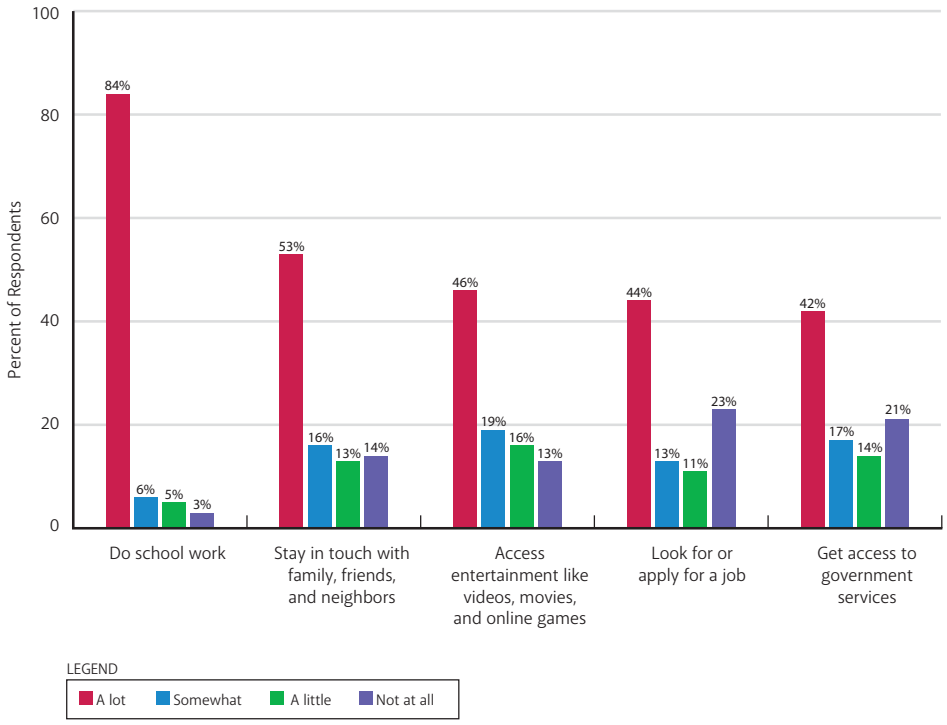
What Engages IE Customers with Broadband Once They Have Service

Finding Four: Users find the Internet helps children a lot with school work — and in other ways too.

Once people have made the decision to subscribe to broadband through the IE program, the questions become how much they use it and what fosters an important goal of any effort to promote broadband adoption — a pool of new broadband users who take advantage of broadband's benefits.

For the most part, once people get broadband via IE they use it; 84% of respondents said that either they or others in the household use the Internet at home using their IE service at least occasionally, with 15% saying they do not, at least occasionally, use the service. The 15% who say they do not use IE is not an insignificant minority of users; a section below explores in detail this group of users who use the service infrequently. Among those who use IE, however, use tends to be frequent. Three in five (59%) say they access the Internet several times a day and another 22% say they do so about once a day.

Table 4: Customers perspectives on how home access impacts their lives
Since you have had Comcast's Internet Essentials high-speed service at home, how much, if at all, do you think the Internet has helped you or someone in your household with each of the following?

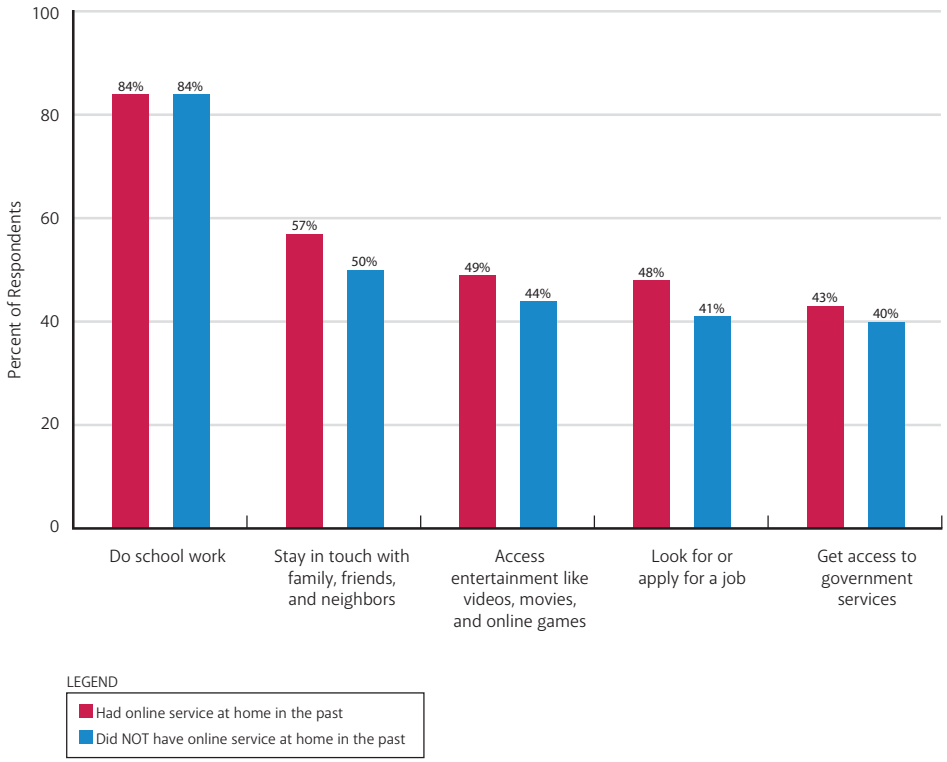


When asked to rate how much the Internet has helped them or their household in various areas in their lives, it is not a surprise that school work leads, with an overwhelming majority of 84% saying broadband has helped with school work a lot.

Yet the Internet has been helpful to households in more ways than school work. More than half say it has helped them a lot in staying in touch with others, and four in nine respondents rate the Internet very highly when thinking about its impact on access to entertainment, job search, or accessing government services. As Table 5 below shows, those who had home Internet access in the past reported, with exception of school work, somewhat higher levels of impacts of IE on different aspects of their lives.

Table 5: Customers perspectives on how home access impacts their lives — comparing past home online users to those without

Since you have had Comcast's Internet Essentials high-speed service at home, how much, if at all, do you think the Internet has helped you or someone in your household with each of the following?



Finding Five: The Role of Training. Relatively few use it, but it is effective for those who do, and those who do not use it are more likely to have had Internet access at home in the past or people close to them have Internet or mobile Internet access. Those who took advantage of training are more likely to help them a lot in utilizing the Internet in various activities.

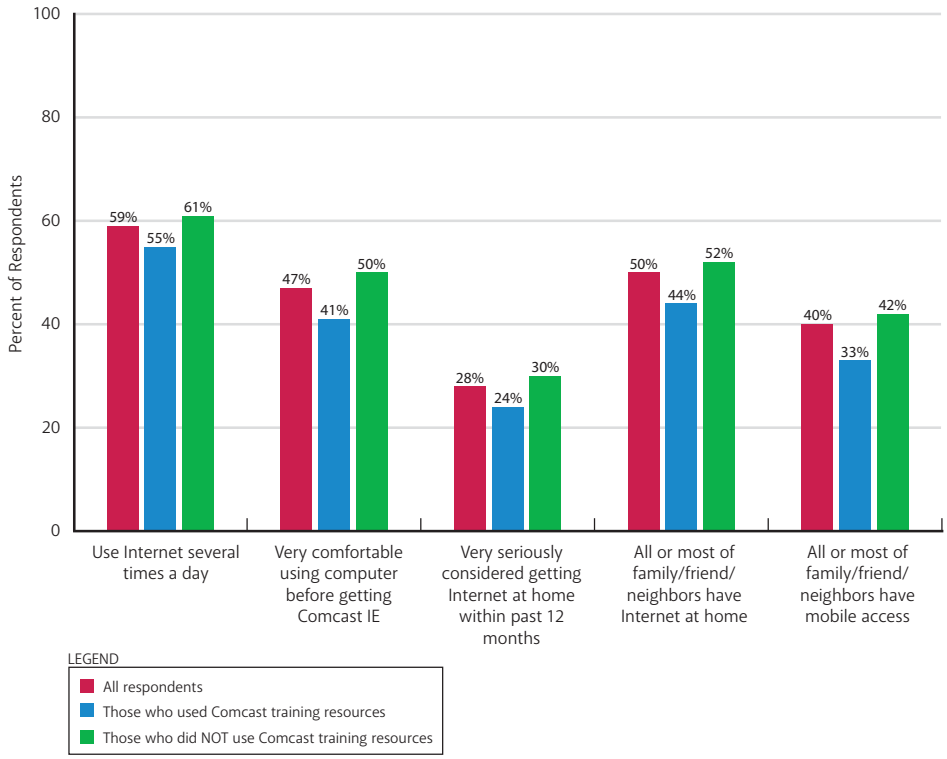
Customers who qualify for the IE offer can take advantage of several features in addition to the $9.95 monthly price for service. They can receive in-person training, online training at the Internet Essentials Online Learning Center, and the low-cost ($150) computer available at initial enrollment in the program. Among all respondents:

- 23% used the Internet Essentials Online Learning Center.

- 17% purchased the low-cost computer.
- 13% took advantage of in-person training on how to use the Internet.

Combining the two modes of training, 29% of IE customers received some training on how to use the Internet after signing up for IE (that is, they *either* used the online learning center *or* had in-person training through IE). On the survey's measures of intensity of online use or comfort with the Internet, those who sought out training from Comcast rated lower than those who did not seek training. Prior online experience is the main reason behind this. For the 29% who received Comcast Internet training, 41% had Internet service at home in the past, compared with 53% for remaining respondents. Table 6 shows results for all respondents, those who used Comcast training, and those who did not.

Table 6: The impact of training on measures of online capability and engagement

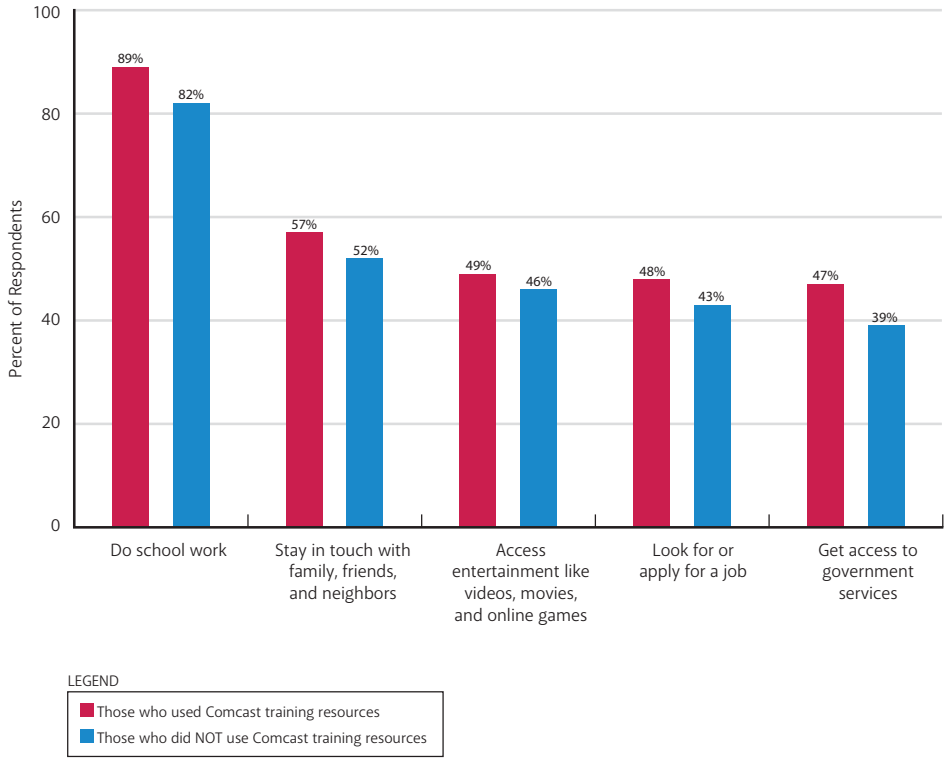


As the table shows, IE customers who did not take advantage of Comcast training are somewhat more distant from the Internet by all the measures — less frequency of use, lower comfort with computers, less likely to have considered getting broadband, and somewhat fewer people around them with access.

The picture changes when inquiring about people's attitudes about whether the Internet helps them in various facets of their lives.

Table 7 shows that, down the line, those who took advantage of the training that Comcast offers are more likely to help them a lot in the listed areas of their lives. Although the size of the differences vary, collectively they are statistically significant. The correlation between having received training and saying that the Internet helps a lot for a greater range of activities is significant, even when holding constant other respondent attributes, such as past home Internet service, level of education, gender, family size, and income. This pattern does not mean that the training is the causal factor behind the higher perceived level of the Internet's impact for those who took advantage of Comcast IE training programs. Nonetheless, the pattern clearly indicates that the training has an impact, whether by giving people the skills to put the Internet to work for them or by simply sparking enthusiasm for the Internet among some respondents who might already have that disposition.

Table 7: Online training and users' perspectives of Internet's impact on their lives
Since you have had Comcast's Internet Essentials high-speed service at home, how much, if at all, do you think the Internet has helped you or someone in your household with each of the following? (% who says Internet helps "a lot")



This analysis shows that people who take advantage of Comcast IE training need it and benefit from it. Their need is evident by their relative distance from the Internet. They are less likely to have had Internet service in the past and begin online service with IE less comfortable with computers. Those who sought training also have fewer people around them with online access than others IE customers. Importantly, however, the training has payoffs through its positive impacts on their attitudes toward the Internet.

Finding Six: The Social Effect. Those with lots of Internet users around them do more online and are more likely to say the Internet helps them with job search, community engagement, and accessing government services.

One objective of this research was to put online access in the context of where people live and their circumstances. For most part, respondents said they were satisfied with their neighborhood, its safety, and its public services. Fully 83% were satisfied with their neighborhood, 88% were satisfied with the quality of their libraries, hospitals, and transportation services, and 88% were satisfied with the safety of their children's schools.

In terms of online access and people they know, IE customers said that online access at home was common for people they knew. When asked whether all or most of the people in their community (including family, friends, and neighbors) had online access at home:

- 50% said that all or most of them did.

- 25% said that some of them did.
- 17% said that only a few or none did.

When asked whether people in their community had "on the go" access using a mobile device:

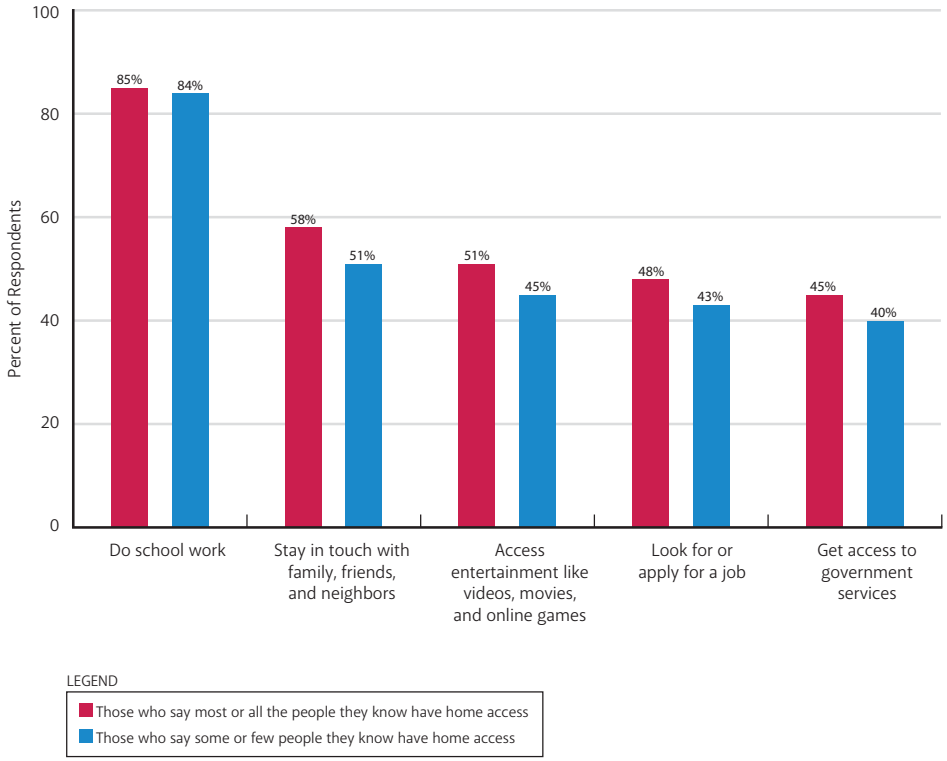
- 40% said that all or most of them did.
- 27% said some did.
- 22% said only a few or none did.

Whether respondents say most or all of people in their community have home access turns out to have a strong influence on measures of online use and impacts. For those who say all or most people they know have home access, 66% say they use the Internet through home IE service several times a day. For those who say that only some or very few of the people they know have home access, 51% use the Internet several times a day.

The pattern repeats itself when looking at how respondents view the Internet's impact on their lives now that they have service at home, as Table 8 shows.

Table 8: Past home service and users' perspectives on Internet's impacts

Since you have had Comcast's Internet Essentials high-speed service at home, how much, if at all, do you think the Internet has helped you or someone in your household with each of the following? (% who says Internet helps "a lot")



The "social effect," that is, being surrounded by many people who also have home Internet access, has significant impacts on the frequency with which respondents use the Internet and how they see its impacts. The notable exception pertains to school work, suggesting the strong educational orientation of IE is successful in overcoming social factors that may influence impacts. The social effect is embedded in other factors as well.

For instance, among those who report the "social effect" are more likely to have had home Internet service in the past than those who did not by a 56% to 43% margin. That said, the "social effect" is statistically significant when holding other factors constant, such as past Internet use, household income, education, whether the household had Comcast in-person or online training, race, and employment status. Unquestionably, then, the results indicate that the nature of people's social networks factors into the IE adoption proposition, just as prior research cited above found in other contexts.

It is worth noting that mobile has the same positive association with frequency of online use and perceptions of the Internet's impacts; those who say most or all of the people they know have mobile Internet access are more likely to say they use the Internet several times a day and say it impacts their lives "a lot" in areas noted. The size of the effect is somewhat smaller than that for home Internet access.

The Hardest-to-Reach IE Users

We found that 15% of the poorest and least educated IE customers are less engaged with the Internet. For these users, poverty weighs heavily on online engagement patterns, suggesting that broad-based interventions from stakeholders are needed for this "hardest to reach" group.

Even though they have gone to the effort to get Comcast IE service, 15% of respondents say, when asked if they or any members of their households access the Internet using Comcast IE at least occasionally, that they do not. This suggests that they are at best infrequent users of their home Internet service. They are also, on measures of socio-economic status and online behaviors and attitudes, different from the 84% of IE customers who answered the question affirmatively.

Although the group of self-identified infrequent IE users is somewhat more Latino than others, the notable differences are education and poverty. Nearly two-thirds of infrequent IE users live in homes whose annual

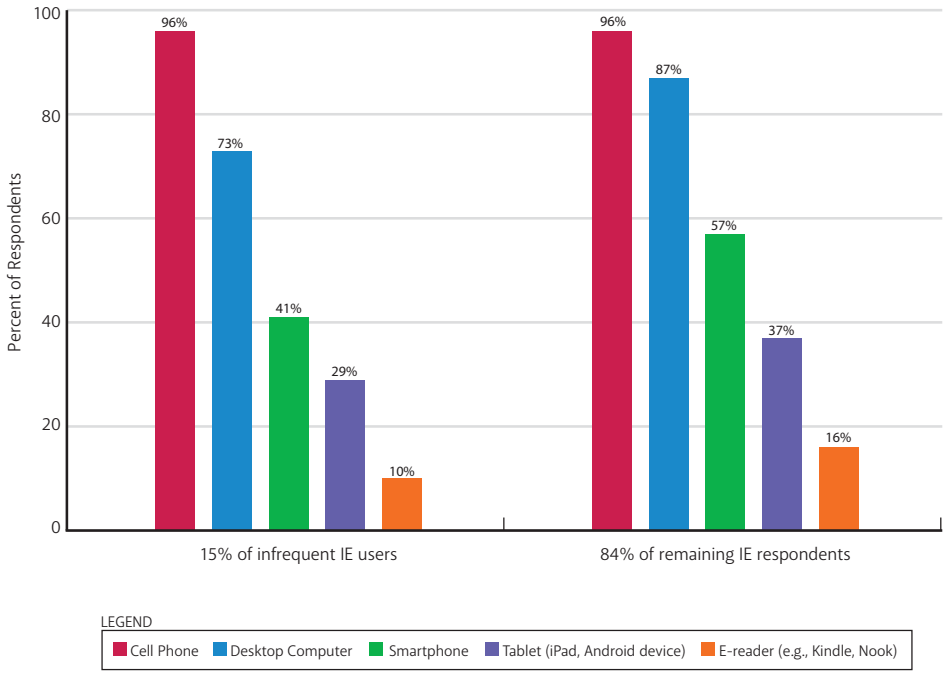
Table 9: Demographic comparisons by frequency of online use

	15% of infrequent IE users	84% of remaining IE respondents
Gender		
Male	23%	24%
Female	77	76
Race/Ethnicity		
White	12%	20
African American	21	20
Latino	56	51
Age		
18-29	19%	21
30-49	67	68
50-64	10	10
65+	2	1
Income		
Under $20K	64%	52%
$20K to $50K	26	36
$50 to $75K	1	2
$75K to $100K	1	1
Over $100K	*	*
Education		
High school grads or less	74%	58%
Some college	14	28
College +	9	14

* = less then 1%

incomes are $20,000 or below compared with half for IE-users. Three quarters (74%) have no more than a high school degree compared with 58% of others. Nonetheless, infrequent IE users do have access devices, though at significantly lower rates (cell phones excepted) than others.

Table 10: Tech assets by frequency of online use



Infrequent IE users are by other measures also less engaged with the Internet than other respondents. Some 42% had Internet service at home at some point in the past, against the 50% average, and 61% used the Internet someplace other than home in the past versus the 72% average. Three in eight (37%) said they were very comfortable with computers before getting IE (48% of all respondents said this) and 44% said they had not thought about getting home Internet service in the year prior to IE compared with 34% of all respondents.

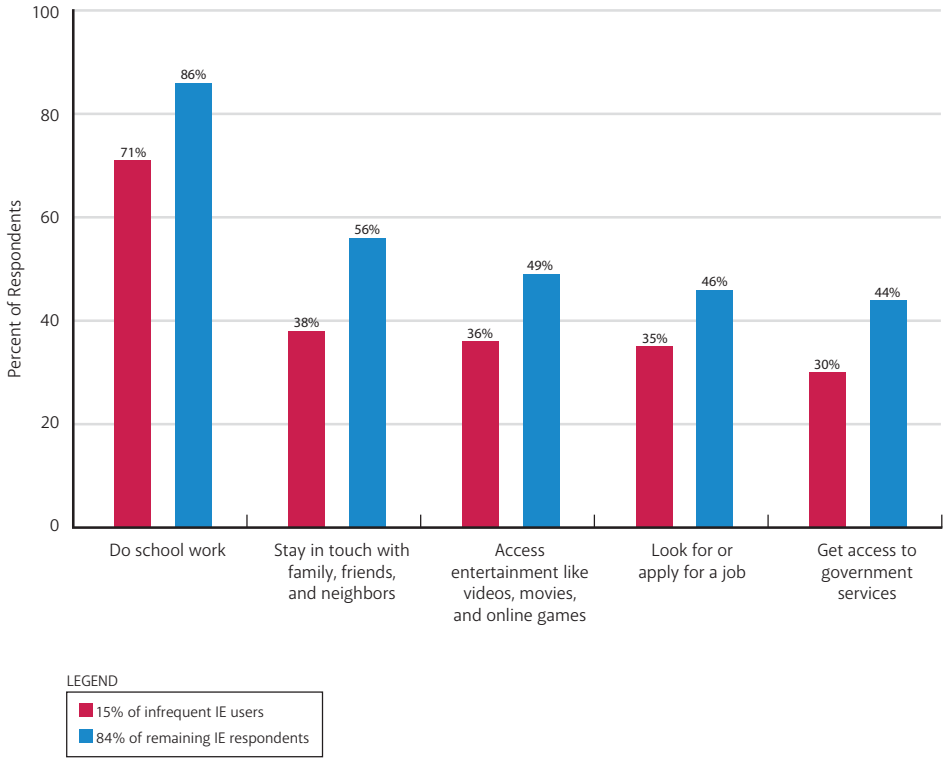
Lower levels of Internet use translate into lower-than-average responses when it comes to what drew them to online use and how they view the Internet's impacts. When asked why they decided to subscribe to home service through IE, the group of infrequent users that said they do not use it for access answered as follows:

- 97% said their children needed it for school work.
- 61% said it was to help them get health or medical children online.
- 61% said it was to get access to entertainment.
- 60% said it was to look for or apply for jobs.
- 54% said it was to get access to government information.
- 52% said it was to stay in touch with others via email or social media.

With the exception of their child's need for the Internet for school work and their need to look for or apply for jobs, infrequent IE users lag the average by several percentage points in the each of the remaining motives.

Significantly larger gaps are evident when comparing how IE users and infrequent users rate the impact of the Internet on different aspects of their lives.

Table 11: Users' perspectives on Internet impacts — by frequency of online use
Since you have had Comcast's Internet Essentials high-speed service at home, how much, if at all, do you think the Internet has helped you or someone in your household with each of the following? (% who says Internet helps "a lot")



Other Key Findings

Finding Seven: Comcast IE computer offer. Few use the computer they had a chance to purchase at the initial IE offer.

The third pillar in the Comcast IE program is a low-cost computer offer of $150. Some 17% of Comcast IE customers in this survey said they used a computer purchased as part of the Comcast IE program to go online. Note that this is different from what percentage of respondents *purchased* the computer. This rate of usage of the computer is the same whether a respondent had home Internet service before IE or not, or say they do not use IE to go online at home. For many of the households who use the computer purchased in connection with IE, this adds to their access assets. For these households, nearly half (47%) have a smartphone (compared to 57% of all respondents), one-third (35%) of those who purchased a computer with their IE package also have a tablet computer (compared to 36% for everyone), and 15% have an e-reader (matching the responses for everyone). As with Comcast IE training resources, the low-cost computer is associated with higher rates of respondents saying the Internet helps "a lot" for school work, job search, staying touch with others, accessing entertainment, and learning about government services.

Finding Eight: How they learn online. People mostly prefer to learn on their own, though people who never had service often call on their children to learn new things.

Although the in-person and online training that Comcast IE offers plays an important role for nearly one-third of IE customers, understanding the ways in which people learn to do things online is also important. When asked to identify the *most helpful* way for them to learn new things online, here is what IE customers said:

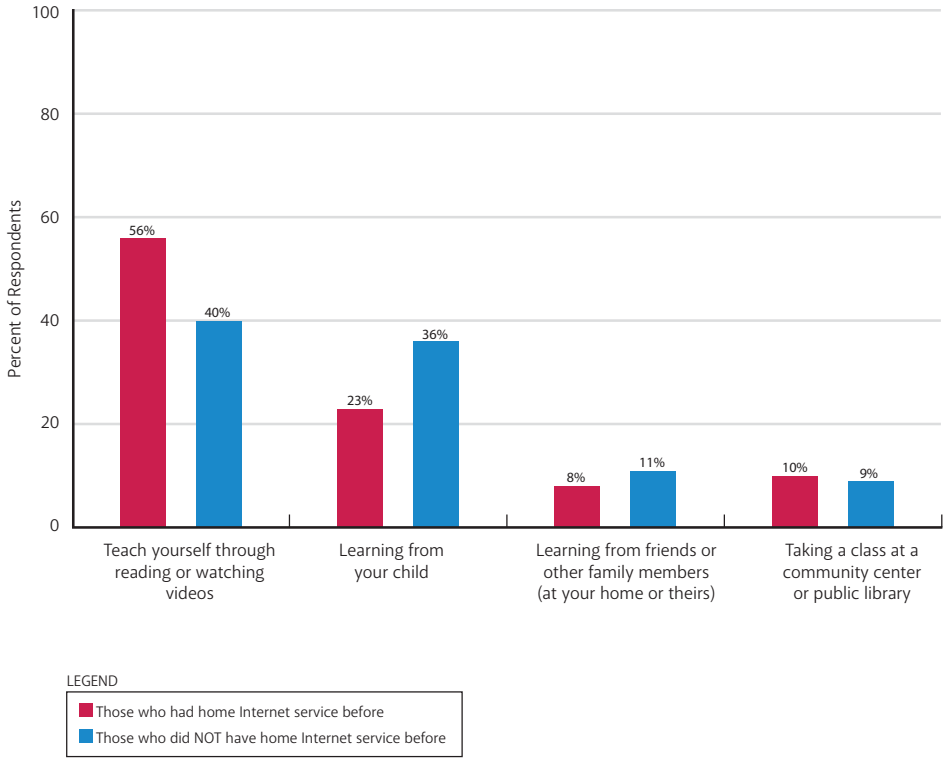
- 48% said it was teaching themselves by reading or watching videos online.
- 30% said they learned from their child.
- 9% said they learned from friends.
- 9% pointed to classes from a community center or public library.

There were sharp differences in responses to this question depending on whether respondents had online service at home in the past or not. A majority of those who have had Internet service at home in the past say they find learning on their own most helpful. Those who have not had Internet service at home in the past also say this, but at a significantly lower rate. But these respondents also rely on children a great deal; some 36% say they find it most helpful to find out about new things to do online from their child.

Finding Nine: Use of Internet from other places. Three-quarters of IE users have logged on from someplace other than home to use the Internet.

It is common for people who do not have Internet access at home to use the Internet elsewhere. As national surveys show, approximately 10% of Internet users do not have a home Internet subscription. They consider themselves Internet users in spite of not having home access because they use the Internet at a community center, library, work, or some other place. Use of the Internet from so-called "third places" such as libraries, community centers, or other public access points is frequent among the general population; some 26% of

Table 12: How users prefer to learn to do new things online
When learning to do new things online, which ONE of the following is the most helpful way for you to learn?



Americans say they have used the Internet from libraries, with low-income Americans and communities of color especially likely to do this. [22]

When asked whether, before they had IE, they had gone online to use the Internet at least occasionally from someplace other than their home, 72% of respondents said they had done this and 27% said they had not. This means that, before getting IE service, just more than one-quarter of all respondents were not using the Internet at least occasionally.

Finding Ten: Training on Internet and computers before having IE service. One-quarter had some prior training before having the IE service but its impact on users is not great.

The survey asked about past experience with Internet or computer training, not just whether they had taken advantage of training services offered through the IE program. When asked whether they had, before receiving the IE service, had ever had Internet or computer training:

- 23% said they had computer training.
- 16% said they had received Internet training.

Overall, 26% of respondents had past training, that is, either computer or Internet training. As noted earlier, analysis showed a positive and significant correlation between that Comcast training resources and greater reported levels of the Internet's positive impacts. The impact of past training on reported levels of impact, though positive, is not significant from a statistical perspective. This suggests that Comcast training, since it has occurred within the past six months for respondents in the survey, is helpful in part because people have had the training recently.

Giving Life to the Playbook

Since 2010, there has been steady progress in home broadband adoption rates. NTIA placed home broadband adoption at 68% in 2010, rising to 72.4% at the end of 2012. As this research shows, the persistence of this gap has to do with poverty among remaining non-adopters. Interventions, whether from IE, BTOP programs, or other initiatives can move the dial, but they too take sustained investment. That is what makes Comcast's announcement that it is continuing IE beyond the time specified in the 2011 voluntary commitment so important. Yet the scope of the non-adoption problem — over one-quarter of U.S. households at the end of 2012 — is greater than any single program.

This is why the "playbook" called for here is important. Next-generation Internet applications will impact more and more corners of our lives and many of them — such as education, job training, and government services — have inherently public purposes. The first step to giving life to the playbook is leadership. This must come not only from government — at all levels — but also the private and philanthropic sectors. As a nation, it is time to fully engage in increasing broadband adoption among our nation's poorest households. The research in this report shows the problem is solvable with the right resources directed at it.

Appendix I: Background on Internet Essentials

Context

As the nation's largest residential broadband service provider, Comcast is dedicated to bridging the digital divide by narrowing the broadband opportunity gap. We have wired over 99% of our service area for broadband, ensuring that families have access to the Internet no matter where they live. We have invested, and continue to invest, substantially in digital literacy training and increasing public access to broadband in the local communities we serve, including Boys & Girls Clubs of America, the League of United Latin American Citizens (LULAC) Tech Center, FIRST Robotics Competition, Easter Seals, and most recently, Khan Academy.

In the summer of 2011, Comcast launched its own broadband adoption program for low-income families in the United States. While Internet Essentials was one of our voluntary commitments in connection with the Comcast-NBCUniversal transaction, that commitment grew out of a multi-year internal project that had identified low-income broadband adoption as Comcast's most important community investment priority.

Internet Essentials is the largest and most comprehensive broadband adoption program anywhere in America, providing low-cost broadband service for $9.95 a month; the option to purchase a full-service, Internet-ready computer for under $150; and multiple options for digital literacy training in print, online, and in-person.

Research consistently has shown that the barriers to broadband adoption involve a complex mix of low digital literacy, perceived lack of relevance of online content, and the need for low-cost, good quality computers and Internet service. Internet Essentials was designed to address all of these critical hurdles to broadband adoption.

Core Program Enhancements

The implementation of Internet Essentials has gone far beyond our letter of voluntary commitment to the Federal Communications Commission (FCC). We have expanded and strengthened the program so many times, and in so many different ways, that it barely resembles our initial vision. In two and a half years since the launch, we have connected more than 300,000 families, or 1.2 million low-income Americans, to the Internet at home. We continue to make core enhancements to the program based on feedback from our customers and our school and community partners. These enhancements include:

- **Expanded Eligibility** — Expanded the eligibility criteria twice, first by extending eligibility to families with children eligible to receive free or reduced price school lunches (initial launch was free lunches only), and then by including parochial, private, cyberschool, and homeschooled students. As a result, nearly 2.6 million families in the Comcast footprint nationwide are eligible for Internet Essentials, which is 30% more than the initial estimated eligible population.
- **Increased Speed** — Increased the broadband speeds twice for Internet Essentials customers, from 1.5 Mbps to 3 Mbps in January 2012, and then again to 5 Mbps downstream in September 2013.
- **Streamlined Enrollment** — Implemented an instant approval process for families whose students attend any of the Provision 2 or NCES-validated schools with 70% or more NSLP participation across the Comcast footprint.
- **Created an Online Application** — Created a convenient online application on InternetEssentials.com and InternetBasico.com in English and Spanish that can be accessed through any Internet-enabled computer, tablet, or smartphone. Since the launch of our online application, we have found that 60 percent of visitors to InternetEssentials.com and InternetBasico.com are from a mobile device. In order to

accommodate the growing use of smartphones and other mobile devices, we will be optimizing the English and Spanish online application form so that families can complete the Internet Essentials online application form easily via a mobile device and upload eligibility documentation through the website, for a streamlined enrollment process.

- **Bulk and On-Site Registration** — Launched a program that gives third parties, such as schools and CBOs, the ability to purchase Internet Essentials service and equipment in bulk for families in their community. Comcast also held on-site registration during Internet Essentials events all over the country.
- **Introduced Internet Essentials Opportunity Cards** — Comcast's community partners are now able to help connect low-income families to the Internet by purchasing Opportunity Cards that can be used toward the cost of paying for Internet Essentials service. We have given away opportunity cards, in addition to notebooks, to hundreds of families across our footprint at nearly every public event in which we convene our school and community partners.
- **Enhanced e-Learning Tools** — Launched a revamped version of our online Learning Center to provide families with enhanced and dynamic content, including new interactive content in Spanish.
- **More Language Options** — Translated several Internet Essentials materials (e.g., one-page flyer, tri-fold flyer, poster, consumer brochure, and letter to parents) into 12 languages beyond English and Spanish, including: Arabic, Oromo, Somali, Tibetan, Mandarin Chinese, Haitian Creole, Portuguese, Hmong, Korean, Vietnamese, Polish, and Russian.
- **Easier Account Transfers** — Updated the "transfer of service" process for Internet Essentials customers to allow them to have their service transferred to a new home address in a Comcast service area without having to re-apply for Internet Essentials.

Internet Essentials-sponsored Digital Literacy Training

The third pillar of our broadband adoption program addresses the need to increase the set of digital and computer skills through in-person training at public computing centers and non-profits in the digital literacy, education and technology space. Since 2011, we have invested more than $165 million in cash and in-kind support to help close the digital divide, reaching more than 1.6 million people through our non-profit digital literacy partners.

Our training model has also dramatically changed since the launch of the Internet Essentials, which has been informed by experience, feedback from attendees, and subject matter expertise from our partners. In the first six months of the program, we developed a curriculum based on what we believed was best-in-class digital literacy training, and worked with our local community based organizations to deliver the modules. Attendance at these initial training sessions was limited, as most people didn't expect to receive digital literacy training from these partners.

In 2012, we moved to a sponsorship model and worked with local partners who were experts in the field in delivering their own digital literacy curricula. We sponsored partners in major markets where we provide service, and after six months of implementing the new model, attendance had increased by 65% compared to the previous six months. This is the model that continues today, and our 64 community-based organizations include numerous public libraries, Boys & Girls Clubs, city recreation centers, local affiliates of the Urban League, technology learning centers and many more.

Program Milestones

Internet Essentials has grown into a nationwide collaborative centered on connecting families to the Internet at home and supporting non-profit partners that build the digital literacy infrastructure of the communities we serve. Our more than 8,000 partners are the cornerstone of our success and include: non-profit organizations, community-based organizations, other technology companies, libraries, school districts, teachers and superintendents, members of faith-based organizations, mayors, congress people, governors, senators, and state and locally elected officials. Our other program milestones through the end of 2013 include:

- Comcast and its community partners have provided support for free digital literacy training and education for more than 1.6 million people.

- Broadcast more than 3.6 million PSA spots, valued at nearly $48 million.
- Sold more than 23,000 subsidized computers at less than $150 each.
- Distributed more than 33 million Internet Essentials brochures for free.
- Welcomed more than 1.8 million visitors to the Internet Essentials websites in English and Spanish and the Online Learning Center
- Fielded more than 1.9 million phone calls to our Internet Essentials call center.
- Offered the program in more than 30,000 schools and 4,000 school districts, in 39 states and the District of Columbia.

Appendix II: Methodology

The Comcast Internet Essentials Wave 1 Survey obtained telephone interviews with a representative sample of 1,969 recent subscribers to the Comcast Internet Essentials program, which provides low-cost home Internet to parents of school-age children who receive free or reduced price lunch. The survey was conducted by Princeton Survey Research Associates International (PSRAI). Interviews were done in English and Spanish by Princeton Data Source from January 8 to February 1, 2014. The margin of sampling error for the complete set of data is ±2.2 percentage points. Details on the design, execution and analysis of the survey are discussed below.

Sample and Contact Procedures

Sample was provided by Comcast and included 12,000 records. Four records were identified as duplicates and dropped by PSRAI. From the remaining records, PSRAI drew a simple random sample of 10,000.

Interviews were conducted from January 8 to February 1, 2014. As many as five attempts were made to contact every sampled telephone number. Sample was released for interviewing in replicates, which are representative subsamples of the larger sample. Using replicates to control the release of sample ensures that complete call procedures are followed for the entire sample. Calls were staggered over times of day and days of the week to maximize the chance of making contact with potential respondents. Each phone number received at least one daytime call when necessary.

Statistical Inference

The survey's margin of error is the largest 95% confidence interval for any estimated proportion based on the total sample — the one around 50%. For example, the margin of error for the entire sample is ±2.2 percentage points. This means that in 95 out every 100 samples drawn using the same methodology, estimated proportions based on the entire sample will be no more than 2.2 percentage points away from their true values in the population. It is important to remember that sampling fluctuations are only one possible source of error in a survey estimate. Other sources, such as respondent selection bias, questionnaire wording and reporting inaccuracy, may contribute additional error of greater or lesser magnitude.

Response Rate

Table A.1 reports the disposition of all sampled telephone numbers ever dialed from the original sample. The response rate estimates the fraction of all eligible sample that was ultimately interviewed. At PSRAI it is calculated by taking the product of three component rates:[25]

- Contact rate — the proportion of working numbers where a request for interview was made;
- Cooperation rate — the proportion of contacted numbers where a consent for interview was at least initially obtained, versus those refused;
- Completion rate — the proportion of initially cooperating and eligible interviews that were completed.

Thus the response rate was 27 percent.

Table A.1: Sample Disposition

9997	Total Numbers Dialed
39	Non-residential
34	Computer/Fax
1142	Other not working
8782	Working numbers
87.8%	**Working Rate**
123	No Answer / Busy
2845	Voice Mail
13	Other Non-Contact
5801	Contacted numbers
66.1%	**Contact Rate**
1866	Callback
1496	Refusal
2439	Cooperating numbers
42.0%	**Cooperation Rate**
79	Language Barrier
354	Screen out/Not an IE customer
2006	Eligible numbers
82.2%	**Eligibility Rate**
37	Break-off
1969	Completes
98.2%	**Completion Rate**
27.3%	**Response Rate**

Endnotes

1. The 95% figure is an estimate developed by the National Broadband Plan, see "Connecting America: The National Broadband Plan," Federal Communications Commission 2010, at p. 20 for availability of terrestrial, fixed broadband infrastructure at speeds of at least 4 Megabits per second. The FCC's subsequently released "Eight Broadband Progress Report" (August 2012) finds that 94% of Americans have access to at least one wireline broadband provider at 4 Mbps. See: http://www.fcc.gov/reports/eighth-broadband-progress-report.
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    See also, Mossberger, K. & Tolbert, C. (2009). Digital Excellence in Chicago: A Citywide View of Technology Use. Available at: http://www.cityofchicago.org/dam/city/depts/doit/supp_info/DEI/Digital_Excellence_Study_2009.pdf

13. Kenneth Flamm and Anindya Chaudhuri, "An Analysis of the Determinants of Broadband Access." Telecommunications Policy, Volume 31, Issue 6-7, July 2007.
14. The data underlying these figures are from the 2010 FCC survey conducted in connection with the NBP. The author has combined findings from the three categories of non-adopters identified in the 2010 report: non-Internet users (22%), dial-up users (6%), and people who do not have home Internet service but go online from other places such as libraries (6%). The combined figures were not reported in the 2010 FCC report, but were in John B. Horrigan, "Adoption of Information and Communication Service in the United States: Narrowing Gaps, New Challenges." Knight Foundation, August 2013. Available online at: http://knightfoundation.org/media/uploads/media_pdfs/DigitalAccessUpdateFeb2014.pdf, page 23.
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17. "Exploring the Digital Nation: America's Emerging Online Experience." National Telecommunications and Information Administration and Economic and Statistics Administration, p. 36. Available online at: http://www.ntia.doc.gov/files/ntia/publications/exploring_the_digital_nation_-_americas_emerging_online_experience.pdf. Please note that the "too expensive" question as determined by the NTIA is the sum of: (a) cost of the computer and/or hardware; (b) cost of installing Internet service; (c) cost of monthly Internet service; and (d) some other cost. The NTIA does not provide separate metrics on these factors and therefore, the "too expensive" question is the sum of the impact of all four factors.
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25. PSRAI's disposition codes and reporting are consistent with the American Association for Public Opinion Research standards.

About the Author

John B. Horrigan, PhD, is an independent communications and technology policy consultant. Horrigan's work focuses on consumers' adoption and use of information and communications technologies, as well as ICTs' impacts on states and localities.

Horrigan has served in senior positions at the Pew Research Center, the Joint Center for Political & Economic Studies, and TechNet. At the Federal Communications Commission in 2009-10, he led development of the broadband adoption and usage portion of the National Broadband Plan. Among his recent work is the report: "Broadband and Jobs: African Americans Rely Heavily on Mobile Access and Social Networking in Job Search" and "Adoption of Information and Communication Service in the United States: Narrowing Gaps, New Challenges." At TechNet, he authored "Preparing America's 21st Century Workforce" and the 2012 "State Broadband Index."

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