Filed by Comcast Corporation
(Commission File No.: 001-32871)
Pursuant to Rule 425 of the Securities Act of 1933
and deemed filed pursuant to Rule 14a-6(b)
of the Securities Exchange Act of 1934

Subject Company: Time Warner Cable Inc.

Commission File No. for Registration Statement
on Form S-4 filed by Comcast Corporation: 333-194698

The following Response to the Federal Communication Commission's Information & Data Request was posted by Comcast on its website:

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

1. Produce, in both (i) PDF and (ii) ESRI Shapefile format, a map showing the location of each cable system owned by, operated by, managed by, or attributed to the Company.

RESPONSE:

Maps responsive to this request have been provided to the FCC as Exhibits 1.1-1.41. Exhibit 1.1 consists of one ESRI Shapefile (.SHP) file and related files containing a national map showing Comcast's cable systems for use with electronic mapping software. Exhibits 1.2-1.40 consists of maps in PDF format of the various states in the United States, with county and Designated Market Area ("DMA") boundaries indicated, that display the cable systems owned by, operated by, managed by, or attributed to Comcast.

2. Identify, as of December 31, 2009, December 31, 2010, December 31, 2011, December 31, 2012, December 31, 2013, and June 30, 2014, each cable system owned by, operated by, managed by, or attributed to the Company, and for each cable system identify the nature of the Company's interests, and state and identify the following:

a. the Community Unit Identifiers (CUID);

b. the Physical System Identifiers (PSID);

c. the name and number of the DMA served by the cable system;

d. the census blocks served by the cable system;

e. the zip codes served by the cable system;

f. the internal Company names and codes that apply to the cable system;

g. the facilities-based competing providers of Internet access service and MVPD service (excluding private cable and wireless cable operators), separately identified by service and provider, and the distribution technology used by the competing provider (e.g., wireless, fiber optic cable, hybrid fiber optic cable, or satellite) for each zip code served;

h. any internal estimates of the percentage of homes passed that are overbuilt by any facilities-based competing provider of MVPD service and Internet access service separately for each such competing provider;

i. the total capacity and the total unused capacity of each of the Company's cable systems by (i) MHz and the spectrum allocated to each cable service and any other service, and (ii) the number of non-broadcast programming networks; and

j. the headends serving each cable system and the number of cable services subscribers served by each headend.

RESPONSE:

Comcast is providing data for each cable system owned by, operated by, managed by, or attributed to the Company.

2(a):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 2.1.

Exhibits 2.1(a)-(f) provide the Community Unit Identifier (CUID) and CUID name for each cable system owned or operated by Comcast, for December 31, 2009; December 31, 2010; December 31, 2011; December 31, 2012; December 31, 2013; and June 30, 2014. In addition, for each cable system and each of the aforementioned dates, Exhibits 2.1(a)-(f) provide the division, region, and sub-region, as well as the cable system name, and cable system code.

2(b):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 2.2.

Exhibits 2.2(a)-(f) provide the Physical System Identifiers (PSID) for each cable system owned or operated by Comcast, for December 31, 2009; December 31, 2010; December 31, 2011; December 31, 2012; December 31, 2013; and June 30, 2014. In addition, for each cable system and each of the aforementioned dates, Exhibits 2.1(a)-(f) provide the division, region, and sub-region, as well as the cable system name, headend name, and cable system code.

2(c):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 2.3.

Exhibits 2.3(a)-(e) provide the DMA name and DMA number for each cable system owned or operated by Comcast, for December 21, 2010; December 21, 2011; December 21, 2012; December 21, 2013; and June 21, 2014. Since monthly reporting at Comcast takes place on the 21st of each month, data responsive to this request are provided as of the 21st rather than as of the 30th or 31st of each requested month. DMA data are not available for 2009 and 2010. In lieu of December 2010 data, DMA data are provided for January 2011.

2(d):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 2.4.

Exhibit 2.4(a)-(f) provide the census block numbers for each cable system owned or operated by Comcast, for December 31, 2010; December 31, 2011; December 31, 2012; December 31, 2013; and June 30, 2014.

2(e):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 2.5. Since monthly reporting at Comcast takes place on the 21st of each month, data responsive to this request are provided as of the 21st

rather than as of the 30th or 31st of each requested month. Zip code data are not available for 2009 and 2010. In lieu of December 2010 data, zip code data are provided for January 2011.

Exhibit 2.5(a)-(e) provide the zip codes owned or operated by Comcast, for January 21, 2011; December 21, 2011; December 21, 2012; December 21, 2013; and June 21, 2014.

2(f):

In response to this subpart, Comcast refers to Exhibits 2.1(a)-(f).

Exhibit 2.1(a)-(f) provide the name ("Cable System") and code ("Cable System GL") for each cable system owned or operated by Comcast, for December 31, 2009; December 31, 2010; December 31, 2011; December 31, 2012; December 31, 2013; and June 30, 2014.

2(g):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibits 2.6 through 2.10.

All data reflected in Exhibits 2.6 and 2.7 have been provided by Centris, a third-party analytics firm. The data includes lists of MVPDs and Internet service providers for each zip code in which Comcast operates. By submitting these data, Comcast does not represent that all providers, or any particular provider, offers services that compete with Comcast. It also does not represent that there are not other competitors in particular zip codes. Each year provided in Exhibit 2.6 and 2.7 contains a zero or a one denoting whether a provider is present (as indicated by a one) or absent (as indicated by a zero) for that month in a particular zip code.[1]

Exhibit 2.6 provides a list of MVPDs for each zip code in which Comcast operates from January 2010 to the present using data from TV Guide/Rovi. The data could not be provided prior to January 2010 and so January 2010 data is provided in lieu of the year-end 2009 figure. The list of MVPDs is illustrative and may be over- or under-inclusive with respect to any particular zip code and any particular provider, and is not broken out between residential and commercial video providers. Moreover, the fact that a provider is listed in the same zip code as Comcast does not necessarily mean that it overlaps with Comcast's footprint in that zip code or that it competes with Comcast.

Providers are identified by a unique ID and name and provider technology where possible, which either originated in the TV Guide data or was provided based on National

[1] There are zip codes identified in each exhibit for which Comcast and Centris were not able to list other providers either because of a lack of information from the data sources or difficulties in translating census blocks to zip codes. These zip codes represented fewer than 1% of Comcast subscribers.

Telecommunications & Information Administration ("NTIA") data for those providers also offering Internet services.[2]

Exhibit 2.7 provides a list of wired Internet service providers for each zip code in which Comcast operates from 2009 to the present. The data are derived from voluntary, semi-annual reporting to the NTIA on serviceable census blocks. The NTIA asks providers to identify the census blocks in which they have serviceable households, but the fact that a provider services some households within a census block does not mean that providers can provide services to all households in a census block, or all households in the zip code(s) in which each census block falls.[3] Moreover, the fact that a provider is listed in the same zip code as Comcast does not necessarily mean that it overlaps with Comcast's footprint in that zip code or that it competes with Comcast. Finally, the data made available by NTIA do not distinguish between types of customers served, and thus the providers listed in Exhibit 2.7 include, and do not distinguish between, residential and commercial Internet service providers.

In addition to the providers listed in Exhibit 2.7, Comcast also notes that mobile wireless telecommunications providers, including Verizon Wireless, AT&T Wireless, Sprint, and T-Mobile, provide high-speed Internet access services to residential and commercial customers that are available throughout the United States (and certainly within all, or nearly all, of Comcast's footprint) and are capable of achieving downstream and upstream speeds that qualify as broadband speeds according to the Commission.

2(h):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibits 2.8, 2.9, and 2.10. These exhibits represent internal estimates of the percentage or share of homes passed overbuilt by fiber Internet and video providers.

Exhibit 2.8 provides estimates of Comcast homes passed overbuilt by AT&T U-verse or Verizon FiOS data services as of the second quarter of 2014. These figures do not include estimates for the number or percentage of homes that are TV serviceable. Exhibits 2.9 and 2.10 provide the Company's internal historical estimates of overbuild from providers offering a package of voice, video, and Internet services in Comcast's footprint and estimates of fiber overbuild from various providers. [4]

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[2] In the list of video providers, there are additional fields provided to indicate those Comcast zip codes in which it is believed that AT&T U-verse Internet or Verizon FiOS Internet is available, which represents the maximum potential availability for AT&T U-verse TV service and Verizon FiOS TV service.

[3] In the relatively few instances in which a census block overlaps two separate zip codes, the census block and providers were attributed to the zip code in which the majority of the census block falls.

[4] The Comcast homes passed figures are sourced from COMET, a marketing database that provides a current snapshot of serviceable addresses from the billing systems.

2(i):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 2.11 and in narrative Word format as Exhibit 2.12. While Comcast is able to provide the details of the current spectrum allocation for its cable systems, historical spectrum allocation data is not available. In lieu of historical spectrum allocation data, Comcast is providing a narrative description of the history of spectrum allocations.

Exhibit 2.11 provides the current total capacity of each of Comcast's cable systems (as of June 30, 2014), expressed in MHz and in EIA Channel Count. It also provides the allocation of the spectrum over broadcast services, non-broadcast services, and other services (DOCSIS, VOD, and non-programming services).

Exhibit 2.12 provides a narrative description of the changes in capacity and spectrum allocation of Comcast's cable systems over time.

2(j):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 2.13. Since monthly reporting at Comcast takes place on the 21st of each month, data responsive to this request are provided as of the 21st rather than as of the 30th or 31st of each requested month.

Exhibit 2.13(a) provides the headends serving each cable system, as well as the number of video, HSD, and voice subscribers for each headend, for December 21, 2010; December 21, 2011; December 21, 2012; December 21, 2013; and June 21, 2014. Exhibit 2.13(b) provides the same categories of data for December 21, 2009.

3. For each zip code identified in response to Request 2(e), and from January 1, 2009, to the present, describe each of the Company's bundled services plans and standalone services plans offered through any sales channel, and for each plan, describe the (i) MVPD service, including each service tier or programming package offered and the channels (both standard definition and high definition) on each tier or package; (ii) Internet access service, including each tier or package offered and the upload and download speed associated with each such tier or programming package, explaining how the upload speed is calculated if no advertised speed is available; and (iii) telephone services.

RESPONSE:

Comcast will produce predominant rate cards that list each available Comcast service for Comcast's sub-regions to the FCC in response to this request. **{{ }}** rate cards will be provided for each year from 2009 through 2014.

[[ ]]. Comcast will also produce a table listing the document identification numbers for the rate cards corresponding to each sub-region.

4. For each zip code identified in Request 2(e) and for the Company as a whole, separately for residential subscribers and other subscribers, and for each month for the period beginning January, 2009, to the present, state and produce in CSV or Excel format:

a. the number of customer locations to which cable services are available, separately for residential customer locations and other customer locations, and the penetration rate;

b. the number of standalone services and bundled services subscribers as of the last day of the month;

c. the average revenue per subscriber in the month for standalone services and bundled services;

d. the number of subscribers who first began subscribing to any of the Company's standalone services and bundled services in the specified month who were not subscribers to any of the Company's cable services in the prior month;

e. the average revenue per new subscriber described in subpart (d) to standalone services and bundled services, and that churned from a competing provider, separately for each competing provider;

f. the number of subscribers discontinuing all subscriptions to the Company's cable services;

g. the average revenue per departing subscriber described in subpart (f) for standalone services and bundled services, and the number of subscribers that churned to competing provider, separately for each competing provider;

h. the number of the Company's current subscribers who first began subscribing to any of the Company's other standalone services or bundled services in the specified month;

i. the number of subscribers discontinuing their subscription to one or more of the Company's standalone services or bundled services, but who remain a subscriber to one or more of the Company's cable services at the end of the specified month;

j. the churn rate for standalone services and bundled services;

k. the per-subscriber acquisition cost or cost per gross addition for standalone services and bundled services and an explanation of how these values were calculated;

l. the cost per subscriber to the Company's MVPD service of acquiring video programming distribution rights and an explanation of how these values were calculated;

m. the cost per subscriber to the Company's MVPD service of acquiring VOD and PPV distribution rights and an explanation of how these values were calculated;

n. the average gross and net advertising revenue per subscriber to the Company's MVPD service and an explanation of how these values were calculated;

o. other variable costs per subscriber for standalone services and bundled services and an explanation of how these values were calculated; and

p. the value of each additional subscriber to the Company for standalone services and bundled services and an explanation of how these values were calculated.

RESPONSE:

Information and data responsive to Request 4 have been provided for residential and commercial subscribers. Comcast does not have customers within a third category of "other customers."

As discussed with the FCC, Comcast is providing data for subparts (a) through (j) at a zip code[5] level from January 2011 to the present. **[[ ]]**[6] The data for each subpart are provided in separate exhibits for primary subscribers and bulk subscribers. A subset of Comcast's subscribers are bulk billed accounts, that is, customers who reside in properties that are billed under bulk contracts, rather than individually.[7] The zip code

[5] Data is provided by five-digit U.S.P.S. zip codes.

[6] **[[ ]]**. Therefore, the first month for which data is provided for connecting and disconnecting subscribers and churn is February 2011, as these metrics require the prior month's figures to provide such data.

[7] Beginning in 2014, Comcast revised its methodology for counting and reporting on bulk billed customers. For bulk billed properties whose residents have the ability to receive additional cable services, such as additional programming choices or high-definition ("HD") or DVR services, Comcast now counts and reports customers in these types of properties based on the number of contracted units. For bulk billed properties whose residents are not able to receive additional cable services, the property is now counted as a single customer. Previously, Comcast had counted and reported these customers on an equivalent billing unit basis by dividing monthly revenue received under a bulk contract by the standard monthly residential rate where the property was located (the equivalent bulk unit or "EBU method"). The billable customers method is consistent with the methodology used by other companies in the cable industry, including Time Warner Cable, to count and report customers.

data from 2011 to the present exclude customers that have any courtesy products.[8] Bulk accounts that are the master account holders may have substantial monthly recurring charges (in the thousands of dollars per month) while bulk subservient accounts will have a low monthly recurring charge because the master account pays some or all of the service charges. Therefore, the bulk accounts were broken out separately so as not to affect the monthly recurring charge calculations. Nevertheless, primary and bulk accounts represent total subscriber accounts, less courtesy accounts.

For 2009 to the present, Comcast has provided the data it maintained on standalone and bundled service subscribers at a sub-region level in response to subpart (b) of this Request, which is the number of ending subscribers by product mix. The data were not maintained or provided separately for residential and commercial subscribers for this period. Further, Comcast does not maintain historical data on activity (connects, disconnects, and churn) for standalone and bundled service subscribers at any level prior to 2011.

4(a):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 4.1(a) and Exhibit 4.1(b). The number of homes passed by product and by customer type is provided in Exhibit 4.1(a) for each of Comcast's sub-regions, which is the manner in which Comcast maintains homes passed data historically. As discussed with the FCC, Comcast does not maintain the number of homes passed at a zip code level historically. However, Comcast has prepared an estimate of homes passed by zip code as of June 2014, which has been provided in machine-readable Excel spreadsheet format as Exhibit 4.1(b). **[[ ]]**

Finally, "percent penetration" in Exhibit 4.1(a) has been calculated by dividing the number of continuing Comcast subscribers of each requested service or bundle in each sub-region by the number of households to which that service is available in that sub-region.

4(b):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet or CSV format as Exhibit 4.2(a) through Exhibit 4.2(d), which provide the number of continuing Comcast subscribers – separately for primary and bulk subscribers – for each standalone and bundled service by zip code from 2011 to the present. In addition, in Exhibit 4.2(e), Comcast provides the number of standalone and bundled subscribers at a sub-region level from 2009 to the present. These data, which are the only historical data the Company maintains for customers by product mix (i.e., standalone and bundled services), are not available separately for residential and commercial subscribers.

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8 **[[ ]]**.

4(c):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 4.3(a) through Exhibit 4.3(d), which provide the average monthly recurring charge for continuing subscribers for each standalone and bundled service by zip code from 2011 to the present. As discussed with the FCC, **[[ ]]**

In addition, Exhibits 4.3(e)-(f) provide the average revenue per user ("ARPU") by product for residential and commercial subscribers for each of Comcast's sub-regions from January 2009 to the present. This is the most granular level at which Comcast maintains ARPU figures, and it maintains these figures by product and not by product mix (i.e., standalone and bundled services).

4(d):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 4.4(a) and Exhibit 4.4(b), which provide the number of new connecting subscribers – separately for primary and bulk subscribers – for each standalone and bundled service by zip code from 2011 to the present.

4(e):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 4.5(a) and Exhibit 4.5(b), which provide the average MRC for new connecting subscribers – separately for primary and bulk subscribers – for each standalone and bundled service by zip code from 2011 to the present. As discussed with the FCC, Comcast does not maintain data in the ordinary course as to which provider a new customer churned from.

4(f):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 4.6(a) and Exhibit 4.6(b), which provide the number of subscribers discontinuing all subscriptions to the Company's cable services separately for primary and bulk subscribers. The data are provided for each standalone or bundled service from which the customer disconnected by zip code from 2011 to the present.

4(g):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 4.7(a) and Exhibit 4.7(b), which provide the average MRC for subscribers that discontinued services altogether – separately for primary and bulk subscribers – for each standalone and bundled service by zip code from 2011 to the

present. The data are provided for each standalone or bundled service from which the customer disconnected. As discussed with the FCC, **[[ ]]**.[9]

4(h):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 4.8(a) and Exhibit 4.8(b), which provide the number of existing subscribers that upgraded by adding one or more new services – separately for primary and bulk subscribers – by zip code from 2011 to the present. The data are provided for the bundle of services to which the subscriber upgraded in that month.

4(i):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 4.9(a) and Exhibit 4.9(b), which provide the number of existing subscribers that downgraded by removing one or more services but remaining a customer of the Company – separately for primary and bulk subscribers – by zip code from 2011 to the present. The data are provided for the bundle of services from which the subscriber downgraded – i.e., if a customer subscribed to a video and voice bundle the previous month and disconnected either service, they will appear in the data as a downgrade from the video and voice bundle.

4(j):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 4.10(a) and Exhibit 4.10(b), which provide the churn rate – separately for primary and bulk subscribers – for each standalone and bundled service from which the customer disconnected altogether by zip code from 2011 to the present. The rate of "churn" has been calculated by dividing the number of subscribers that disconnected all services in a given month by the total number of subscribers of that standalone service or bundle of services at the beginning of the same month.

4(k):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 4.11(a) (residential) and Exhibit 4.11(b) (commercial). The data provided are the cost per new connect ("CPC"), which is the amount Comcast spends in advertising, marketing, and related sales efforts for each new connect. The data are tracked and provided per connected unit (e.g., video, Internet, or voice service). Thus, a new customer that signs up for two services (e.g., video and Internet services) would have approximately twice the cost per connect provided in Exhibits 4.11(a) and (b). Sales, marketing, and advertising expenditures are not tracked or allocated by product or service. Cost per connect is calculated by dividing the total

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9 **{{ }}** Presentations reflecting those surveys will be provided to the Commission as part of Comcast's reply to the petitions to deny.

amount that Comcast spends in advertising, marketing, and related sales efforts to acquire a new connect by total connects, which is the sum of services added for each new subscriber (i.e., new "connect") and each subscriber who upgrades to a new or different service (i.e., "upgrade"). **[[ ]]**

The data are provided for each of Comcast's regions, which is the most granular level at which Comcast maintains the data. The data are provided for residential cost per connect from January 2011 to the present and for commercial cost per connect from January 2010 to the present. Comcast does not maintain data on cost per connect prior to those periods.

4(l):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 4.12. These data contain total video programming cost per subscriber for each of Comcast's sub-regions, which is the most granular level at which Comcast maintains the data. In addition to the total video programming costs per subscriber, the data are provided for the following video tiers: B1 (Basic), B2 (Digital Starter or Expanded Basic), D1 (Digital Preferred), and Economy (Digital Economy). The total video cost per subscriber is the total cost of video programming divided by the average number of video subscribers during that month. The data are provided for residential and commercial subscribers combined; programming packages and rates generally do not vary for residential and commercial subscribers.

[[ ]] These costs are generally additive as one moves up to a broader tier of service, i.e., the total cost for subscribers to Comcast's B2 service is the sum of the costs of the B1 tier and the B2 tier. **[[ ]]**

4(m):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 4.13. These data provide the expenses Comcast incurred monthly from January 2009 to the present at a sub-region level for transactional video on demand ("TVOD"), subscription video on demand ("SVOD"), and pay-per-view ("PPV"), which is the most granular level at which Comcast maintains the data. The expenses incurred for SVOD reflect payments Comcast makes for standalone SVOD offerings; they do not include any allocation of licensing fees Comcast pays to distribute the linear feed of a programming network that also contains a VOD component. Those fees, which typically cover VOD rights, are reflected in the video programming expenses set forth in response to subpart (l) of this Request and provided in Exhibit 4.12.

4(n):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 4.14. These data provide the net and gross advertising revenue for each DMA in which Comcast offers cable services, **[[ ]]**.

4(o):

See Appendix.

4(p):

As discussed with the FCC, **[[ ]] {{ }}**

[[ ]] Comcast designates these materials as its response to subpart (p) of this request.

5. Separately for (i) every zip code identified in 2(e), and (ii) every DMA for where the Company provides MVPD service, and separately for every subscription VOD service offered by the Company, for every month from January, 2009, to the present, state:

a. the number of subscribers to the service at the end of the month;

b. the number of subscribers that added the service;

c. the number of subscribers that added the service at the same time that they added MVPD service from the Company;

d. the number of subscribers that cancelled the service;

e. the number of subscribers that cancelled the service at the same time that they cancelled MVPD service from the Company;

f. the total subscription revenues;

g. the total cost of video programming distribution rights;

h. the total number of hours viewed; and

i. the price of the service and a description of all discounts or promotions that were in effect.

RESPONSE:

As discussed with the FCC, Comcast is providing information and data responsive to this Request for its Streampix service, which it launched in February 2012. Streampix is available to Comcast customers for a la carte purchase, as well as being an included feature in connection with Comcast's MVPD and/or Internet service.

Comcast licenses programming networks in which such licenses include the right to distribute on demand content for that network. Comcast does not regard this on demand content as a distinct SVOD service. Comcast does offer SVOD services such as Disney Family Movies, Bollywood, and the Jewish Channel. Such services have a relatively small number of subscribers and the revenue and expenses attributed to those services are set forth as a portion of the SVOD expenses reflected in Exhibit 4.13 (SVOD expenses) and as a portion of the SVOD revenue reflected in Exhibit 6.6 (VOD/PPV revenue).

Where Comcast is able to provide data for each DMA in which it operates in response to this Request, it has done so.

5(a):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 5.1, which provide the ending number of Streampix subscribers by zip code from December 2011 to the present.[10]

5(b):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 5.2, which provide the number of new Streampix subscribers by zip code from December 2011 to the present.

5(c):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 5.3, which provide the number of new Streampix subscribers that also added MVPD service at the same time by zip code from December 2011 to the present.

5(d):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 5.4, which provide the number of Streampix subscribers that cancelled the service by zip code from December 2011 to the present.

5(e):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 5.5, which provide the number of Streampix subscribers that canceled the service at the same time they cancelled their MVPD service by zip code from December 2011 to the present.

5(f):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 5.6, which provide the revenue attributed to Streampix for each of Comcast's sub-regions from January 2012 to the present. **[[ ]]**

5(g):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 5.7, which provide the programming expenses for the Streampix service by month from January 2012 to present.

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10 While Comcast launched the Streampix service in February 2012, it had a small number of trial accounts beginning in December 2011.

5(h):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibits 5.8(a) and 5.8(b), which provide the total number of video starts and the total number of hours viewed on the Streampix service by zip code and by DMA from September 2013 to the present, which is as far back as Comcast maintains data at the level requested.

5(i):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 5.9. Comcast offered three different promotions over the life of Streampix, but discontinued all such promotions in the fourth quarter of 2013: (1) a 3-month promotion ($0 for 3 months rolling to $4.99); (2) a 1-month promotion ($0 for 1 month rolling to $4.99) limited to online sales channels; and (3) a 24-month promotion ($0 for 24 months rolling to $4.99) offered with new subscriptions to certain double play service bundles (video and Internet). Currently, Comcast offers the Streampix service on an a la carte basis at $4.99/month. Subscribers to certain video and Internet tiers also receive the Streampix service as part of their package of services. Exhibit 5.9 provides the number of subscribers who receive the Streampix service on any of the above bases (promotional, a la carte, or as part of a service plan) for each of Comcast's regions.

6. Separately for (i) every zip code identified in 2(e), and (ii) every DMA for where the Company provides MVPD service, for every month from January, 2009, to the present, state:

a. separately for the Company's paid VOD service and PPV service, (1) the number of subscribers that used the service at least once; (2) the total revenues from subscribers; (3) the total cost of video programming distribution rights; and (4) the total number of hours viewed;

b. for free VOD service, (1) the number of subscribers that used the service at least once; (2) the total number of hours viewed; and (3) the total cost of video programming distribution rights; and

c. for the Company's over-the-top video services (e.g., "TV everywhere), (1) the percentage of the Company's MVPD subscribers that view video programming via the service, (2) the total number of hours viewed, and (3) the total cost of video programming distribution rights.

RESPONSE:

6(a):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 6.1 through Exhibit 6.6. Exhibit 6.1 provides the total number of PPV users, the number of PPV transactions, and PPV revenue by zip code from October 2012 to the present, which is as far back as Comcast maintains these data. Data is provided for those zip codes in which there was at least one PPV transaction recorded in that month. With respect to subpart (a)(3), Comcast incorporates by reference Exhibit 4.12, which provides PPV and transactional (i.e., paid) VOD expenses by sub-region, **[[ ]]**. In addition, Exhibit 6.2 provides the per user cost to Comcast for PPV and VOD programming categories. The information and data contained in Exhibit 6.2 are provided on a national basis **[[ ]]**. In addition, the information and data contained in Exhibit 6.2 are provided on the basis of a programming category. **[[ ]]**

With respect to transactional (i.e., paid) VOD, Exhibit 6.3 provides the number of paid users, paid views, and paid revenue by zip code from May 2013 to the present, which is as far back as Comcast maintain these data.[11] In addition, Exhibit 6.4 reflects data on VOD usage **[[ ]]**.

[11] TVOD data include programming provided on an electronic sell-through ("EST") basis. With an EST purchase, a customer owns a programming asset (i.e., the ability to view a program) and Comcast stores it for them.

Exhibit 6.5 provides (a) the TV Markets associated with each of Comcast's regions, and (b) the zip codes associated with each TV Market. Comcast cannot confirm that the mapping from zip code to TV Market is entirely precise but believes it is generally accurate. Finally, Exhibit 6.6 provides combined revenue data for VOD and PPV for each of Comcast's sub-regions. **[[ ]]**

6(b):

Information and data responsive to this subpart are provided in Exhibit 6.3 and Exhibit 6.4 discussed above in response to subpart (a). Exhibit 6.3 provides the total number of free VOD users and free VOD views by zip code from May 2013 to the present, which is as far back as Comcast maintains these data. Exhibit 6.3 also provides the total number of VOD hours, which reflects hours for all types of VOD, including free and transactional VOD. Exhibit 6.4, described herein, also provides free VOD usage from January 2010 to the present **[[ ]]**. As set forth in its response to subpart (m) of Request 4, **[[ ]]**; such programming is typically part of the license fee Comcast pays video programming networks for their linear and on demand programming and those expenses are reflected in the figures provided in Exhibit 4.12.

6(c):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 6.7, which provides the percentage of Comcast's video customers that used Comcast's over-the-top (i.e., TV Everywhere) video service – broken out separately for use through Xfinitytv.com or related Comcast websites and for use through Comcast's mobile device applications ("apps") – by zip code back to January 2013. Comcast is unable to provide the average number of hours viewed per subscriber, and it did not maintain data in a way that would allow it to provide usage statistics prior to 2013.

The percentage of the company's subscribers that view programming via the company's over-the-top video service variously known as XfinityTV.com, Xfinity TV Go, and TV Everywhere was calculated by dividing the number of video starts initiated by an account within the period by the number of video subscribers within each zip code, as a video subscription is generally required to use the company's over-the-top video service through the website or through the apps. A video start is triggered upon the successful initiation of linear streaming or VOD content playback within the web or app player without regard to the duration of the playback.

While these data provide a reasonable estimate of usage, there are a number of limitations to these data. Usage activity is collected throughout the month while the subscriber totals are captured at month end. For example, a subscriber who started a video during the month may have disconnected video services prior to the end of the month; their usage would be captured in the numerator, but they would not be reflected as a subscriber in the

denominator. Therefore, the numerator may contain activity from accounts that are not active subscriber accounts included in the denominator. **[[ ]]**

Comcast does not maintain data on the cost of video programming distribution rights for its over-the-top (i.e., TV Everywhere) video offerings. **[[ ]]** and those expenses are reflected in the figures provided in Exhibit 4.12.

7. For each month, from January, 2014, to the present, separately for subscribers to the Company's standalone services and bundled services, and by month of tenure on the subscriber's current plan, state and produce in CSV or Excel format:

a. the number of subscribers as of the first day of the month;

b. the average revenue per subscriber;

c. the total number of disconnects from the service plan initiated either by the subscriber or the Company in the month;

d. the number disconnects from the service plan initiated by the Company for non-payment or other reasons in the month;

e. the number of mover disconnects from the service plan initiated by the subscriber in the month; and

f. the number of other disconnects from the service plan initiated by the subscriber in the month.

RESPONSE:

Information and data responsive to this Request have been provided in machine-readable CSV format as Exhibit 7.1 and Exhibit 7.2, which provide the requested data separately for primary subscribers and bulk subscribers. The figures are provided as of Comcast's fiscal month-end, which is the 21st day of the month.[12] As in Request 4, Comcast provides monthly recurring charge ("MRC") in response to subpart (b) for average revenue per subscriber. All of the same qualifications regarding MRC detailed above apply equally here. As discussed with the FCC, **[[ ]]**. As such, Comcast has provided the data requested on beginning subscribers and disconnects by the tenure of the customer with Comcast (i.e., account history). Disconnects are broken out into four categories: (1) total disconnects, (2) non-payment disconnects, (3) voluntary disconnects, and (4) moving disconnects.

12 Comcast has provided data for service plans, which are defined as a product or set of products broken out by service tier, and is consistent with how it has responded to a request involving service plans in Request 89.

8. As of December 31, 2013, and June 30, 2014, and for each DMA, state and produce in CSV or Excel format:

a. the number of subscribers to the Company's MVPD service;

b. the number of the Company's subscribers who will become subscribers of Comcast's, SpinCo's, and Charter's MVPD service, stated as if the proposed TWC transaction and the proposed divestiture transactions had been consummated as of June 30, 2014;

c. the number of TV households, citing the source of this information and explaining how this number was calculated;

d. the number of Hispanic TV households, citing the source of this information and explaining how this number was calculated;

e. the number of Hispanic households that subscribe to MVPD service, citing the source of this information and explaining how this number was calculated;

f. the number of Hispanic households that subscribe to the Company's MVPD service; and

g. the number of the Company's Hispanic households who will become subscribers of Comcast's, Charter's and SpinCo's MVPD service, stated as if the proposed TWC transaction and the proposed divestiture transactions had been consummated as of June 30, 2014.

In the event that as a result of the proposed divestiture transactions, the assets, Hispanic households and the Hispanic subscribers in a single DMA will be divided between Comcast, Charter and SpinCo, for subparts (b) and (g), allocate the subscribers and Hispanic households to the receiving applicant, and provide an explanation of the methodology used to make the allocation.

RESPONSE:

8(a):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 8.1. The data are provided on a units cabled basis.

8(b):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 8.2. The data are provided on a units cabled basis

and are provided separately for the Comcast and SpinCo systems following consummation of the proposed transactions. As discussed with the FCC, the subscriber numbers provided for post-transaction Comcast are for Comcast's systems only, and do not include subscribers from Charter and Time Warner Cable systems that Comcast will acquire in connection with the proposed transactions.

8(c)-(g):

Information and data responsive to subparts (c) through (g) of this Request have been provided in machine-readable Excel spreadsheet format as Exhibit 8.3. Figures provided for the number of TV households, Hispanic TV households, and Hispanic MVPD subscribers are based on data provided by Nielsen. **[[ ]]** Comcast has also provided an estimate of its Hispanic MVPD subscribers as of December 2013 and June 2014. As discussed with the FCC, the subscriber numbers provided for post-transaction Comcast do not include subscribers from Charter and Time Warner Cable systems that Comcast will acquire in connection with the proposed transactions.

9. Produce all documents relating to the effects of geographic rationalization or clustering with respect to the operation of cable systems and the provision of programming or other services on such cable systems, including documents relating to geographic rationalization or clustering as a result of the proposed TWC transaction and the proposed divestiture transactions.

RESPONSE:

Documents responsive to this request will be produced to the FCC.

10. Produce all documents relating to competition in the provision of each relevant service in each relevant area, including, but not limited to, consumer surveys or studies, market studies, forecasts and surveys, and all other documents relating to:

a. sales, market share or competitive position of the Company or any of its competitors;

b. the relative strength or weakness of persons selling each relevant service, selling either standalone services or bundled services, and the extent to which providers of each relevant service compete with each other;

c. supply and demand conditions;

d. how consumers, MVPDs, and OVDs view or perceive video programming offered by the Company (including the impact of placing programming in a particular neighborhood or tier), the impact of not offering certain programming, the ability to substitute other programming, the impact of bundling more than one programming channel, or the impact of pricing on decisions to purchase video programming or MVPD service, including ratings and consumer surveys relating to video programming offered by the Company;

e. allegations that any person that provides any relevant service is not behaving in a competitive manner, including, but not limited to, customer and competitor complaints, threatened, pending, or completed lawsuits; and federal and state investigations, including any carriage or program access complaints filed against the Company with the Federal Communications Commission pursuant to 47 C.F.R. § 76.1301 et seq. or 47 C.F.R. § 76.1000 et seq., or to the Comcast-NBCU Order at App. A, § IV.G.1.a since January 1, 2009;

f. any actual or potential effect on the supply, demand, cost, or price of any relevant service as a result of competition from any other possible substitute service or provider, and the role of reputation and reliability in competition with other persons who supply any relevant service;

g. churn, subscriber acquisition costs, costs per gross addition, and subscriber retention costs, including consumer costs incurred in switching to another person's relevant service, and data and studies analyzing the source of the Company's new subscribers, why subscribers disconnect service with the Company and the reasons for disconnections, and factors affecting consumers' decisions to switch to or from a relevant service offered by the Company, including but not limited to pricing, quality of service and disputes between the Company and edge providers, CDNs or transit service providers;

h. **(1) consumer satisfaction with the Company's relevant services (including all documents relating to plans, policies and procedures for addressing concerns raised by rankings and surveys), and (2) consumer substitution between the Company's Internet access service and DSL service, service using fiber to the node technology, service using fiber to the premises technology, and mobile wireless broadband services;**

i. **the Company's experience or success in obtaining or retaining customers through marketing or promotions targeted at providers of relevant services, geographic areas, types of customers, and ethnic groups such as Hispanics or Asians, including the offers made and the amount spent on the marketing effort, the number of new subscribers gained, churn rates for such subscribers, and revenue realized by the Company;**

j. **the characteristics of consumers who want to purchase standalone services or bundled services, and the sales, market share or competitive position of the Company or any of its competitors in the sale of standalone services or bundled services;**

k. **the provision of video programming over the Internet, including, the sales, market share, or competitive position of the Company or its competitors, the relative strength or weakness of companies, including the Company and its competitors, that are currently providing or are planning to engage in online video distribution;**

l. **any advantage or disadvantage to any person arising from the size of its footprint or its subscribership on its ability: (1) to negotiate terms with persons selling or licensing video programming, including but not limited to terms that grant the Company exclusive rights to programming; (2) to negotiate terms of interconnection agreements with edge providers, persons who provide Internet backbone services, persons who provide Internet access service, and transit service providers; and (3) competition with other providers of MVPD service and persons that provide Internet access service;**

m. **the Company's decisions whether to block, stop, throttle, slow, favor, congest or otherwise hinder the transmission of any OVD service or other content, including the CDN, transit service provider or peer that supports the OVD service or to favor, prioritize or otherwise advantage the Company's relevant service over such competing service;**

n. **the role of innovations in competition or potential competition relating to improvements and innovations in features, functionality, platforms, performance, cost or other advantages to users of the service;**

o. **the impact of cord shavers, cord cutters and cord nevers on the Company's marketing, revenues and profits of each relevant service; and**

p. the Company's experience and success with video programming, broadcast television stations, broadcast programming networks, and non-broadcast programming networks targeted at specific ethnic groups, including but not limited to, competition with the video programming broadcast television stations, broadcast programming networks, and non-broadcast programming networks owned by, operated by managed by, attributed to or produced by Univision Communications Inc.

RESPONSE:

Documents responsive to this request will be produced to the FCC.

11. Produce all documents created or received by the Company that relate to the Company's or any other person's (i) pricing plans; (ii) pricing policies; (iii) pricing lists; (iv) rate cards; (v) pricing forecasts; (vi) pricing strategies; (vii) pricing analysis; (viii) introduction of new pricing plans or promotions; (ix) bundled pricing, including analysis of the profitability of bundles and their impact on customer retention; and (x) pricing decisions relating to each relevant service.

RESPONSE:

Documents responsive to this request will be produced to the FCC.

12. State the name and address of each person that has entered or attempted to enter into, or exited from, the provision of each relevant service, from January 1, 2009, to the present. For each such person, identify the services it provides or provided; the area in which it provided the services, including whether the person has sold or distributed the relevant service in the United States; and the date of its entry into or exit from the market. For each entrant, state whether the entrant built a new facility, converted assets previously used for another purpose (identifying that purpose), or began using facilities that were already being used for the same purpose.

RESPONSE:

Information and data responsive to this request have been provided in machine-readable Excel spreadsheet format as Exhibit 12.

Comcast's response to this request is based on information obtained through reasonable inquiry of knowledgeable employees of the company and from publicly available sources, but does not provide a comprehensive list of all entrants since 2009 in each relevant service. Although Comcast believes the sources on which its response is based to be generally reliable, it cannot fully verify the reliability of information obtained from third-party sources, many of which are self-reported.[13]

With respect to the geographic areas in which the entrants listed in Exhibit 12 provide service, MVPD services provided by DBS providers are available on a nationwide basis, and the availability of other providers varies depending on the geographic reach of the cable systems deployed by cable operators and telephone companies that provide MVPD services. Information with respect to this geographic reach has been provided in Comcast's response to Request 2 above. OVD services and other Internet Edge services are generally available on a nationwide basis to households that have access to the Internet. Video programming services are generally available on a nationwide basis; the availability of certain specific video programming services may be regional or local (e.g., regional sports or local news networks). Internet access service provided by mobile wireless or satellite providers are generally available on a nationwide basis, and the availability of other providers varies depending on the geographic reach of the cable and telephone company systems that provide these services. Internet backbone services are generally available on a nationwide basis.

Comcast generally does not maintain information concerning the facilities used by the entities listed in Exhibit 12.

[13] Exhibit 12 does not include information that is already provided regarding Comcast-owned programming networks to the extent such information is already provided in response to Request 18.

13. Provide a list of possible new entrants into the provision of, or a substitute for, each relevant service, stating why the Company believes each person is a possible entrant or could provide a substitute service, including but not limited to, mobile wireless broadband service, and what steps it has taken toward entry. Submit a list of all requirements for entry into the provision of, or a substitute for, a relevant service and an estimate of the time required to meet each requirement, and provide all documents relating to research and development, planning and design, production requirements, distribution systems, service requirements, patents, licenses, sales and marketing activities, and any necessary governmental and customer approvals for entry in to the provision of each relevant service.

RESPONSE:

Documents responsive to this request will be produced to the FCC. Comcast's response to this request is based on information obtained through reasonable inquiry of knowledgeable employees of the company and from publicly available sources, but does not provide a comprehensive list of all possible new entrants or possible substitute services, nor of all requirements and timing variations of meeting them, which vary greatly depending on scope of entry (as discussed in greater detail in response to Request 15). Although Comcast believes the sources on which its response is based to be generally reliable, it cannot fully verify the reliability of information obtained from third-party sources, many of which are self-reported.

A. Video Programming Distribution

1. MVPD

MVPD services are currently provided by cable companies (also known as multiple system operators or "MSOs"), telephone companies, Satellite Master Antenna TV companies, and direct broadcast satellite ("DBS") companies. Entry into the MVPD market generally requires significant fixed-cost investment to build out the physical infrastructure (e.g., fiber-optic cables, satellites) needed to deliver multiple channels of content. Nevertheless, companies continue to make these investments and to launch new MVPD options for consumers. For example, CenturyLink, Inc. recently began offering its own MVPD service ("Prism TV") in select markets and has indicated its intention to expand these offerings. Google, Inc. also has begun offering MVPD service in select markets through its Google Fiber service, and has announced its intention to expand to up to 34 communities in nine metropolitan areas. AT&T has also announced plans to accelerate expansion of its U-verse MVPD service across its footprint,[14] although the status of those plans is now uncertain given the pending DirecTV transaction. As discussed below with regard to Internet Access, municipal providers may also continue to enter the video programming distribution market.

[14] Remarks of Randall Stephenson, Chairman & CEO, AT&T Inc., Morgan Stanley Technology, Media & Telecom Conference (Mar. 6, 2014) *available at* http://seekingalpha.com/article/2072813-at-and-ts-ceo-presents-at-morgan-stanley-technology-media-and-telecom-conference-transcript.

Based on the success of AT&T U-verse, Verizon FiOS, and CenturyLink Prism, other telephone companies appear to be particularly well positioned to enter the MVPD market. Following Google's example, other technology companies may decide to enter the MVPD market as well, taking advantage of complementary products, brand recognition, customer relationships, and large cash positions.

2. OVD

The OVD industry continues to grow and evolve, and video content available on the Internet has proliferated from numerous sources.[15] As the FCC noted in a recent report, the OVD industry continues to innovate, and "no single business strategy has emerged as the dominant model."[16] OVDs use various business strategies for offering access to content, including free access supported by advertising, subscription services (both with and without advertising), or on-demand purchases or rentals, with some OVDs offering more than one option.[17] OVDs are also increasingly popular among consumers. One OVD, Netflix, reportedly now has over 39 million U.S. subscribers (over 50 million worldwide), representing half of all Internet customers in the United States and almost twice as many subscribers as the largest MVPD, Comcast. As a result, Netflix accounted for approximately 34 percent of all peak-period Internet download traffic in North America as of May 2014.[18] Hulu, according to the FCC, is "the major player among advertiser-supported OVDs" and makes available over 1,500 TV shows, 21,000 TV episodes, and 1,700 movies.[19] Additionally, Amazon, Google, and Apple each offer their own robust OVD services.

Several companies, inside and outside traditional media, are continuing to experiment with new business models and technology platforms, including business models that reportedly will be offered as a potential substitute for MVPD services. A partial list of possible future entrants in the provision of OVD services includes the following:

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15 *See Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming*, Fifteenth Report, 28 FCC Rcd 10496 ¶ 223 & n.787 (2013) ("*Fifteenth Video Competition Report*") (noting that Sandvine, an Internet network equipment and software company, measured over 28,000 unique websites streaming multiple videos online in the U.S. in a single month during Fall 2011).

16 *See id.* ¶ 269.

17 *See id.* ¶ 270.

18 Sandvine, *Global Internet Phenomena Report 1H 2014*, at 6 (2014), *available at* https://www.sandvine.com/downloads/general/global-internet-phenomena/2014/1h-2014-global-internet-phenomena-report.pdf; *see also* Drew Fitzgerald, *Netflix's Share of Internet Traffic Grows*, Wall St. J., May 14, 2014, http://online.wsj.com/news/articles/SB10001424052702304908304579561802483718502. Four other OVD services (YouTube, iTunes, Amazon Video, and Hulu) were listed among the top ten applications driving peak period download traffic in North America as of May 2014. *See* Fitzgerald, *supra*.

19 *See Fifteenth Video Competition Report* ¶ 271.

a. Start-up OVDs

The most popular OVD today, Netflix, launched as a DVD-by-mail company that evolved its business into an Internet start-up and is now the world's leading Internet television network offering more than a billion hours of TV shows and movies each month. Similarly, Machinima.com was founded in 2000 and now bills itself as "the dominant video entertainment network for young males around the world."[20] In addition to making its videos available through its own website, Machinima serves more than 2 billion monthly video views reaching over 175 million unique viewers each month, and features, among other things, scripted series, original content, and weekly and daily shows, all available through an app on a variety of Internet-connected devices. Other OVDs have had even more modest beginnings. Vimeo, for example, was founded by a group of filmmakers who wanted to share their creative work and personal moments of their lives; it enables consumers to produce their own content and share it with others on the Internet, including by developing "Channels" around common themes such as Documentary Films, Animation, Sports, etc. Given the low barriers of entry to distribution of video on the Internet, start-up OVDs are likely to continue to emerge on an ongoing basis.

b. Consumer Electronics Manufacturers

Consumer electronics manufacturers are potential entrants into the provision of OVD services. These manufacturers can use OVD services to stimulate sales of their consumer electronics or diversify their businesses. Manufacturers may also have strong brand recognition and existing marketing and advertising channels that could provide an advantage in starting a new OVD service. Indeed, multiple consumer electronics manufacturers have launched OVDs in recent years. Apple, Inc., for example, primarily sells computers and other devices but also sells video content through its iTunes service. That service, in turn, drives demand for Apple products, including the Apple TV set-top device. Sony Corp. has launched its own OVD service and is developing original exclusive video programming content for Sony PlayStation consoles.[21] Sony also has announced plans to launch a full MVPD replacement service over the Internet and is actively negotiating carriage contracts with programmers.[22] Similarly, Microsoft offers an OVD service, Xbox Video, available on Xbox devices, mobile devices, and web browsers. Microsoft Xbox also supports multiple third-party OVD applications, including HBO GO, Netflix, Amazon Instant Video, and several others. Given the advantages that consumer electronics manufacturers can capitalize on and the success of OVDs launched by similar companies, these consumer electronics manufacturers may decide to expand or evolve their OVD services, and other consumer electronics manufacturers may decide to launch their own OVD services.

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20 *About Machinima*, Machinima, Inc., https://www.machinima.com/overview/ (last visited Sept. 10, 2014).

21 *See* Chris O'Brien, *E3: Sony VP talks 'Powers,' its first TV series for PlayStation*, L.A. Times, June 13, 2014, http://www.latimes.com/business/technology/la-fi-tn-sony-vp-talks-powers-its-first-tv-series-for-playstation--20140613-story.html.

22 Andrew Wallenstein, *Sony in Talks for Virtual MSO Service*, Variety, Jan. 3, 2013, http://variety.com/2013/digital/news/sony-in-talks-for-virtual-mso-service-1118064150.

c. Video Programming Providers

A video content provider that decides it is in its business interest to do so can create an OVD service by allowing online access to its content, either through its own website or in partnership with an existing online video service. A substantial number of studios, broadcast networks, sports leagues, and programming networks offer content on the Internet or on mobile applications, including Sony, Warner Brothers, Paramount, ABC, CBS, FOX, NBC, ESPN, NBC Sports Network, Fox Sports, the NFL, NHL, NBA, and MLB, among others.[23] Video content providers that currently do not provide such access, and possess the rights to do so, may enter the provision of OVD services by providing such access.

d. Internet Search Engines, Portals, and Social Networking Sites

Potential entrants into the OVD market may include other Internet-based companies such as Internet search engines, portals, and social networking sites. Online video distribution is complementary to these sites' existing users: online video can be used to attract, retain, and more effectively monetize website users. Moreover, Internet-based companies may be able to use existing servers, network infrastructure, and commercial relationships to facilitate storage and distribution of bandwidth-intensive high-definition online video.

Some existing search engines and social networking sites already distribute video content online. Facebook, for example, entered the OVD market in 2011, offering online movie rentals for Warner Brothers, Miramax, and Universal Studios movies through applications on Facebook.[24] Google, which already owns the largest provider of online video in the world, YouTube,[25] launched an Internet-based entertainment store, Google Play, in March 2012, which includes thousands of episodes of television programs, including content from NBCUniversal, ABC Studios, and Sony Pictures.[26] Yahoo! likewise has an OVD service that includes original content and content from multiple video programming networks.[27] New search engines, Internet portals, and social networking sites are likely to emerge that will also launch OVDs to take advantage of the popularity of online video programming.

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23 *See Fifteenth Video Competition Report* ¶ 224.
24 *See id.* ¶ 230.
25 *See comScore Releases June 2014 U.S. Online Video Rankings*, comScore, Inc. (July 21, 2014), http://www.comscore.com/Insights/Market-Rankings/comScore-Releases-June-2014-US-Online-Video-Rankings.
26 *See Fifteenth Video Competition Report* ¶ 235; *Google play*, Google, https://play.google.com/store (last visited Sept. 10, 2014).
27 *See Fifteenth Video Competition Report* ¶ 229.

e. Retail Companies

Online and brick-and-mortar retailers also are current and potential entrants into the OVD market. Retail companies can use competitive advantages such as an established Internet presence, customer bases, and existing retail relationships with content providers and electronics manufacturers to successfully launch a new OVD service. Large retail companies may also have easy access to capital to finance such a venture.

Amazon, for example, is the leading online retail company, but also has a growing online video business. Amazon currently offers streaming and downloadable television programs and movies on a transactional basis through its Amazon Instant Video service and on a subscription basis through its Prime Instant Video Service. Amazon also has signed a series of agreements with HBO and other programmers for prior seasons of popular TV shows. Amazon recently launched the Amazon Fire TV set-top box, which includes multiple OVD applications in addition to Amazon Instant Video, and also sells a tablet device (the Kindle Fire) that allows for mobile viewing of HD video (either streamed in real time or downloaded to the device).

Similarly, Wal-Mart, primarily a brick-and-mortar consumer goods retailer, owns the OVD Vudu and makes Vudu available to electronics manufacturers to integrate into their products. Best Buy, with its nearly 2,000 retail locations, also has an OVD service, CinemaNow, which allows customers to rent or purchase TV or movie programming.

f. MVPDs

Cable operators and direct broadcast satellite companies can each offer their own over-the-top services.[28] MVPDs already maintain a presence on the Internet, and many already provide interactive online portals that allow their subscribers to view programming over-the-top or to schedule programs for recording on a digital video recorder ("DVR"), among other functions.

Indeed, several MVPDs, including Verizon and DirecTV, already have begun to offer, or announced plans to offer, such services. For example, in February 2012, Verizon formed a joint venture with the parent company of Redbox to provide over-the-top services.[29] And, earlier this year, Verizon purchased an online video streaming service from Intel that purportedly will enable it to provide a competitive MVPD substitute service over the Internet, including over wireless broadband networks.[30] Similarly, in 2012, DISH Network launched DISHWorld, which offers international movie content that customers

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28 *See id.* ¶ 239 (noting that "[s]everal MVPDs offer services to non-subscribers").

29 *Id.* ¶ 240.

30 Hayley Tsukayama, *Verizon buys Intel's cloud TV service*, Wash. Post, Jan. 21, 2014, http://www.washingtonpost.com/business/technology/verizon-buys-intels-cloud-tv-service/2014/01/21/67e94336-82a5-11e3-9dd4-e7278db80d86_story.html; Janko Roettgers, *Why Verizon is Buying Intel Media: It's All About Taking on Comcast*, Gigaom, Jan. 21, 2014, http://gigaom.com/2014/01/21/why-verizon-is-buying-intel-media-its-all-about-taking-on-comcast.

can stream on various devices,[31] and more recently, announced that it would offer a new service allowing subscribers to stream live and on-demand content from A&E and Walt Disney networks such as ABC and ESPN over the Internet.[32] DISH is also reported to be considering acquiring T-Mobile, which could give DISH "a national wireless network over which it could deliver mobile video" and "challenge conventional cable television."[33] These recent trends suggest that MVPDs that do not already offer an over-the-top service, but possess online programming distribution rights, are potential candidates for entry into the provision of OVD service. Indeed, IPTV services such as Sky Angel now offer over-the-top access to various cable networks, similar to MVPDs.

In this manner, OVDs and MVPDs can, in some regards, be viewed as providing either complementary or substitute services.

B. Video Programming

The number of video programming networks and the diversity of programming available have changed significantly over the last two decades. Looking only at cable television networks, the U.S. Court of Appeals for the D.C. Circuit observed in 2009 that "the number of cable networks has increased by almost 500 percent since 1992 and has grown at an ever faster rate since 2000."[34] Firms that have begun to provide video programming through new cable networks have included not only existing cable network providers and MVPDs, but also movie studios, television production companies, sports teams and associations, venture capital firms, and independent content producers. Moreover, new video programming distributed online or by video-on-demand ("VOD") services continues to emerge.

Based on recent trends and on the number of entities that have announced their interest in creating new video programming, and the increasing number of available outlets for video programming, it is reasonable to conclude that new video programmers will continue to emerge.

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31 *See Fifteenth Video Competition Report* ¶ 239.

32 Press Release, Dish Network Corp., *ESPN and Disney/ABC Television Group Launch WATCH Authenticated Products to DISH Customers* (Apr. 1, 2014), http://about.dish.com/press-release/programming/espn-and-disneyabc-television-group-launch-watch-authenticated-products-di; Daniel Frankel, *Dish trademarks new name and logo, possible for online video service: 'Nutv'*, FierceCable, Sept. 2, 2014, http://www.fiercecable.com/story/dish-trademarks-new-name-and-logo-possibly-online-video-service-nutv/2014-09-02.

33 Alex Sherman et al., *Dish Said to Discuss T-Mobile Deal with Deutsche Telekom*, Bloomberg, Sept. 5, 2014, http://www.bloomberg.com/news/2014-09-05/dish-said-to-discuss-t-mobile-deal-with-deutsche-telekom.html.

34 *Comcast Corp. v. FCC*, 579 F.3d 1, 8 (D.C. Cir. 2009).

1. Demand for New Video Programming Networks

New video programming likely will be launched to address the changing needs of diverse audiences, evolving interests of the viewing public, and new technologies:

a. Affinity Groups

As the demographic composition of the United States shifts, new video programming will likely emerge to meet the needs of diverse audiences. Over the past 10 years, for example, a number of Spanish-language cable television networks have emerged to satisfy the needs and interests of the United States' growing Hispanic population. As various ethnic populations of the United States continue to grow, video programming options, including new video programming networks, will likely continue to emerge to meet demands for language- and culture-specific content.

b. Evolving Interests

New video programming also will likely emerge in response to viewers' evolving interests. A number of new cable television networks – including Wine TV, Crime & Investigation Network, and Retirement Living TV – have emerged in the past ten years to serve the special interests of niche audiences.[35] Based on these trends, it is likely that new networks will be introduced to address consumers' changing interests.

c. New Technology

New and existing video programming providers also are likely to harness emerging technologies to provide cutting-edge content to consumers. For example, advanced TV set-top boxes with interactive features could allow programmers to develop customizable channels. Viacom recently announced plans to launch a children's programming network that allows viewers to indicate preferences and personalize the content aired on the channel.[36] Other companies also likely will enter the video programming market to take advantage of new opportunities made available by improved technology.

2. Possible Future Entrants

A partial list of possible future entrants to the provision of video programming includes the following:

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[35] OVDs such as YouTube have also begun developing video programming to cater to specific interest. *See* Lauren Indvik, *YouTube CEO: The Future of Content Is Niche Channels*, Mashable (Jan. 31, 2012), http://mashable.com/2012/01/31/youtube-niche-content-passive-viewing.

[36] *See* Amol Sharma, *Viacom to Launch Customized Kids' TV Channel*, Wall St. J., Jan. 14, 2014, http://online.wsj.com/news/articles/SB10001424052702303754404579312904182126302.

a. Existing Video Programming Providers

Existing owners of cable television networks are likely in the future to launch new video programming networks and develop new video programming for distribution in other formats. Existing cable network providers enjoy the benefits of (a) carriage relationships with MVPDs, (b) relationships with advertisers, and (c) experiential knowledge derived from launching other programming networks. News Corp., for example, launched two new networks in 2013 (Fox Sports and FXX).[37] Other large, established cable television networks are likely to continue developing and launching new channels to cater to changing preferences of cable television audiences. Existing owners of cable television networks are also likely to develop new video programming specifically for online distribution. By launching an Internet-based video programming network, an existing video programmer can use existing production assets to develop content to reach specific audiences and broaden their reach. For example, Discovery Communications Inc., which owns a number of cable television networks, recently launched TestTube, a free, online video network targeted at the young male demographic.[38] Other existing video programming providers are likely pursue a similar strategy.

In addition, video programming providers that currently offer only online content may migrate their programming to cable television networks or television VOD services. Some video programming networks that began as VOD-only networks, such as Anime, Fearnet, and Sprout, have used that programming to launch a linear television network. Similarly, funnyordie.com, which began as an online-only viewing service, now distributes content on HBO.

b. Media Figures, Owners of Established Entertainment Brands, and Individual Entrepreneurs

The uncertainties of launching a new cable television network are diminished when the new network is able to leverage a recognized entertainment brand. Media personalities that enjoy such brand recognition are therefore potential entrants into the provision of cable television networks. For example, political commentator Glenn Beck recently launched The Blaze; musician Sean "Diddy" Combs recently launched Revolt, a music-oriented network showing music videos, live performances, and news and interviews; and filmmaker Robert Rodriguez recently launched El Rey.[39] Other high-profile media figures may also decide to develop their own video programming networks.

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37 Cynthia Littleton, *Congloms Firing up New Cable Channels as Climate Improves*, Variety, Sept. 13, 2013, http://variety.com/2013/tv/news/congloms-firing-up-new-cable-channels-as-climate-improves-1200609613.

38 Keach Hagey, *Discovery to Launch 'TestTube' Online Video Network*, Wall St. J., May 23, 2013, http://online.wsj.com/news/articles/SB10001424127887323336104578499540671665824.

39 *See* Jeanine Poggi, *New TV Networks Scorecard: Eight Cable Channels to Watch in 2014*, Advertising Age, Dec. 26, 2013, http://adage.com/article/media/tv-networks-scorecard-channels-watch-2014/245770.

Existing media recognition also provides an advantage in developing new online or VOD content. Media figures with a presence on cable television may be particularly likely to develop new programming for distribution online to reach niche audiences. For example, Jeffrey Hayzlett of the Bloomberg TV show C-Suite is launching an over-the-top on-demand video service called C-Suite TV that provides new content that caters to existing C-Suite viewers.[40] Other media figures, including former Vice Presidential candidate and Alaska Governor Sarah Palin and comedian Louis CK, have also recently launched online-only video programming networks.[41] It is likely that other media figures, entrepreneurs, and owners of entertainment brands will pursue a similar strategy by launching video programming networks on the Internet to reach new audiences.

c. Sports Organizations

Much like established entertainment brands, sports teams and leagues may be able to leverage their current fan base to create new video programming networks. In recent years, several sports teams and leagues, including a number of collegiate sports conferences, have launched cable television networks. In the future, other sports organizations may likewise take advantage of their existing audiences to introduce new video programming networks.

d. Venture Capital Firms

Venture capital firms currently own interests in various video programming networks, including the Gospel Music Channel, Ovation TV, and Tennis Channel. Given their access to capital and existing carriage relationships, these and other venture capital firms could launch new video programming networks in the future.

To the extent that video programming is viewed primarily as a source of entertainment or information, any current or prospective provider of entertainment or information, including many of the potential new entrants in video programming, could potentially be viewed as offering a substitute service.

C. Internet Access Services

1. Subscribers

Internet access services are currently provided by a variety of companies, including cable system operators, telephone companies, satellite companies, and mobile wireless providers. The availability of high-speed Internet access from multiple providers across

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40 *See* Jim O'Neill, *C-Suite's Jeffrey Hayzlett launches an online, on-demand business TV network*, Ooyala, July 15, 2014, http://www.ooyala.com/es/videomind/blog/c-suite-s-jeffrey-hayzlett-launches-online-demand-business-tv-network.

41 *See* Andrew Kirell, *Sarah Palin Launches Subscription-Based Online Video Channel*, Mediaite, July 27, 2014, http://www.mediaite.com/tv/sarah-palin-launches-subscription-based-online-video-channel/; Louis CK, http://www.louisck.net (last visited Sept. 10, 2014).

the United States has increased significantly in recent years, and numerous companies are providing broadband Internet access services across a range of technological platforms.[42]

Telephone companies provide fiber-to-the-premises services to a growing number of American households and are upgrading their DSL-based services, in many cases by building fiber-to-the-node, to offer faster speeds across the country. Today, CenturyLink offers DSL speeds up to 40 Mbps, AT&T offers speeds up to 45Mbps, Verizon offers speeds up to 15 Mbps, and Frontier offers speeds up to 25 Mbps.[43]

CenturyLink has introduced 1 Gbps fiber-to-the-premises service to business and residential customers in 16 cities, including Denver, Seattle, and Minneapolis-St. Paul.[44] CenturyLink also continues to invest in DSL upgrades including VDSL2 and pair bonding to improve broadband speeds across its footprint.[45] Overall, telephone companies appear well-positioned to offer highly competitive broadband speeds well into the future.[46]

Cable overbuilders, new entrants like Google fiber, municipal providers, fixed wireless providers, and satellite broadband providers also are competing vigorously. And well-capitalized and aggressive nationwide mobile broadband providers now offer services that provide speeds comparable to many of the fixed broadband services that consumers purchase.[47]

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42 *See* Comcast Corp. and Time Warner Cable Inc., Applications and Public Interest Statement, MB Docket No. 14-57, at 42-56 (Apr. 8, 2014) ("Public Interest Statement").

43 *See* Letter from Lynn R. Charytan, SVP, Legal Regulatory Affairs and Senior Deputy General Counsel, Comcast Corp., to Marlene H. Dortch, Secretary, FCC, MB Docket No. 10-56, Ex. A, Pt. 3, at 10 (Feb. 21, 2014) (detailing competitive standalone broadband options in Comcast's top 30 markets).

44 Press Release, CenturyLink, Inc., CenturyLink expands its gigabit service to 16 cities, delivering broadband speeds up to 1 gigabit per second (Aug. 5, 2014), http://news.centurylink.com/news/centurylink-expands-its-gigabit-service-to-16-cities-delivering-broadband-speeds-up-to-1-gigabit-per-second.

45 *See, e.g.*, Glen F. Post, President and CEO, CenturyLink, Inc., Q4 2013 Earnings Call, Tr. at 5 (Feb. 12, 2014) ("We have utilized and continued to utilize a balanced capital investment approach, including gigabit fiber, VDSL2, and pair bonding deployments to efficiently enable higher speeds, enhanced services to consumers and businesses in our markets").

46 Robert W. Starr, Treasurer & SVP, Frontier Commc'ns Corp., Goldman Sachs TMT Leveraged Finance Conference, Tr. at 5 (Mar. 19, 2014) (noting Frontier is "compet[ing] against [cable] today on the residential and on the small business side and we're taking share away from them on the residential side . . . . [W]e think that our opportunit[y] against the cable companies continue to be a very good one").

47 *See Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act*, Eighth Broadband Progress Report, 27 FCC Rcd 10342 ¶ 6 (2012) (noting that mobile providers are "deploying new, faster, and more spectrally efficient mobile network technologies, most notably Long Term Evolution (LTE), which offers advertised download speeds as high as 5-12 Mbps").

Broadband providers are racing to give consumers access to the Internet content and applications that they demand. For example, in 2010, AT&T offered only traditional ADSL service to the significant majority of the 76 million households in its wireline footprint[48] and had announced no plans to upgrade its network in these areas. Today, AT&T is well into the process of deploying a mix of fiber-to-the-premises, fiber-to-the-node, IP-DSLAM, and fixed wireless broadband technologies to as many as 70 million customer locations.[49] Google, CenturyLink, Cox, and others have also announced ambitious plans to roll out fiber-to-the-premises networks and have begun to set these plans into motion.[50]

Notably, in 2010, none of the four nationwide mobile broadband providers had even begun to deploy LTE networks until Verizon began its deployment in December of that year.[51] Now, all four major wireless providers operate LTE networks that collectively blanket the nation.[52] And, the fastest mobile LTE network in the United States can achieve average download speeds close to 20 Mbps and peak speeds over 70 Mbps.[53]

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48 Press Release, AT&T Inc., AT&T Reports Record 2.8 Million Wireless Net Adds, Strong U-verse Sales, Continued Revenue Gains in the Fourth Quarter (Jan. 27, 2011), http://www.att.com/gen/press-room?pid=18952&cdvn=news&newsarticleid=31519&mapcode=financial (indicating that U-Verse passed 27 million of the living units in AT&T's footprint in Q4 2010).

49 *See* Press Release, AT&T Inc., AT&T to Acquire DIRECTV (May 18, 2014), http://about.att.com/story/att_to_acquire_directv.html ("*AT&T/DirecTV Press Release*").

50 *See* Milo Medin, VP, Google Access Services, *Exploring New Cities for Google Fiber*, Google Fiber Blog (Feb. 19, 2014), http://googlefiberblog.blogspot.com/2014/02/exploring-new-cities-for-google-fiber.html; Press Release, CenturyLink, Inc., CenturyLink Brings 1 Gigabit Fiber Service to Las Vegas (Oct. 9, 2013), http://news.centurylink.com/news/centurylink-brings-1-gigabit-fiber-service-to-las-vegas-2598362; Press Release, Cox Commc'ns, Cox Communications Kicks Off Plan to Offer Residential Gigabit Speeds (May 22, 2014), http://cox.mediaroom.com/index.php?s=43&item=753.

51 *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions with Respect to Mobile Wireless, Including Commercial Mobile Services*, Fifteenth Report, 26 FCC Rcd 9664 ¶¶ 108-14 (2011) (describing the four nationwide mobile broadband providers' initial efforts to test and deploy LTE services); *see also* Press Release, Verizon Wireless, Blazingly Fast: Verizon Wireless Launches the World's Largest 4G LTE Wireless Network on Sunday, Dec. 5 (Dec. 3, 2010), http://www.verizonwireless.com/news/2010/12/pr2010-12-03.html (touting Verizon's LTE network, which launched in 38 cities in December 2010, as "the world's largest").

52 *See* The Verizon Wireless 4G LTE Network, Verizon Wireless, http://www.verizonwireless.com/news/LTE/Overview.html (last visited Sept. 10, 2014); *About Our Network*, AT&T, http://about.att.com/news/wireless-network.html (last visited Sept. 10, 2014); Press Release, Sprint Corp., 4G LTE Launched Markets (Sept. 9, 2014), http://newsroom.sprint.com/news-releases/4glte-launchedmarkets.htm; *T-Mobile 4G LTE*, T-Mobile, http://t-mobile-coverage.t-mobile.com/4gcitylist.aspx (last visited Sept. 10, 2014). According to NTIA data, 97.3 percent of households in the United States have access to a mobile wireless provider offering downstream speed of at least 10 Mbps. *See* Mark A. Israel, Implications of the Comcast/Time Warner Cable Transaction for Broadband Competition ¶ 62 (Apr. 8, 2014), Exhibit 6, Applications and Public Interest Statement, MB Docket No. 14-57 ("Israel Decl."). The FCC recently noted in its Open Internet NPRM that LTE subscriptions grew by a factor of nearly 500 during this period, *see Protecting and Promoting the Open Internet*, Notice of Proposed Rulemaking, 29 FCC Rcd 5561, ¶ 48 n.110 (May 15, 2014), and SNL Kagan predicts that there will be 224 million unique 4G subscriptions in the United States by 2018, *see* SNL Kagan, *Covered Pops & Subscribers by Technology in U.S. Wireless* (July 2013). Mobile broadband's share of the Internet ecosystem is rapidly growing; mobile data traffic is projected to grow three times faster than fixed IP data traffic between 2013 and 2018. *See Visual Networking Index: Forecast and Methodology, 2013-2018*, Cisco (June 10, 2014), http://www.cisco.com/c/en/us/solutions/collateral/service-provider/ip-ngn-ip-next-generation-network/white_paper_c11-481360.html.

53 *See* Israel Decl. ¶ 61.

These competitive developments are reflected in the FCC's Form 477 data. The tables below illustrate broadband competition at the 10 Mbps threshold. The most recently released round of this data is from June 2013 and thus does not account for significant additional progress that has been made in the past year, but even the June 2013 data reveal a significant increase in competition since the FCC's previous review:

Number of Fixed Broadband Providers[54]	% of Households as of December 31, 2009	% of Households in June 2013
At Least 3	2%	54%
At Least 2	22%	92%
At Least 1	80%	99%

Furthermore, when accounting for mobile broadband providers the data show that competition is even more vibrant:

Number of Fixed or Mobile Broadband Providers[55]	% of Households in December 2009	% of Households in June 2013
At Least 3	2%	91%
At Least 2	22%	98%
At Least 1	80%	99%

Chairman Wheeler recently stressed the importance of targeting ever-higher broadband

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54 This chart displays the number of households located in census tracts where fixed broadband providers reported offering broadband Internet access service speeds of at least 10 Mbps downstream and 1.5 Mbps upstream. *See* FCC, *Internet Access Services: Status as of December 31, 2009* (WCB Dec. 2010), 7 & fig. 3(a), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-303405A1.pdf; Internet Access Services: Status as of June 30, 2013, Ind. Analysis & Tech. Division, Wireline Competition Bureau, FCC, (June 2014), at 9 & fig. 5(a), *available at* http://transition.fcc.gov/Daily_Releases/Daily_Business/2014/db0625/DOC-327829A1.pdf ("*June 2013 IAS Report*").

55 This chart displays the number of households located in census tracts where fixed broadband providers reported offering broadband Internet access service speeds of at least 10 Mbps downstream and 1.5 Mbps upstream *or* mobile broadband providers reported operating a network capable of such speeds. *See* Internet Access Services: Status as of December 31, 2009, Ind. Analysis & Tech. Division, Wireline Competition Bureau, FCC, (Dec. 2010), at 8 & fig. 3(b), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-303405A1.pdf; *June 2013 IAS Report* at 10 & fig. 5(b).

speeds in order to meet increasing consumer demand.[56] Although many online activities do not require higher speeds, the demand from consumers noted by Chairman Wheeler illustrates the strong incentives that broadband providers have to upgrade and deploy increasingly better technology, and improve and expand their offerings. Thus it is not surprising that various mobile and fixed broadband providers have undertaken significant investments in recent years and are likely to continue to do so.

Moreover, municipal governments also have begun offering Internet access service to local residents.[57] For example, Santa Cruz County recently announced a plan to build out Internet infrastructure to extend broadband service.[58] Indeed, as of May 2013, there were approximately 135 municipal fiber-optic networks in the United States.[59]

Potential new entrants into the provision of Internet access services may include telephone companies, technology companies, cable overbuilders, wireless companies, or more government municipalities. DISH Network also has begun trials partnering with wireless providers such as Sprint to provide fixed wireless services.[60] In recent trials, DISH and Sprint achieved download speeds of 200 Mbps.[61] And, as innovations in wireless technology lead to faster speeds and greater capacity,[62] other wireless options are likely to emerge and begin offering high speed fixed and mobile broadband products. Indeed, the price per gigabyte of transmitting data over mobile wireless networks is likely to continue decreasing as available spectrum and spectral efficiency both increase.[63] These reductions in cost will likely cause reductions in prices for consumers and greater usage of mobile wireless broadband.[64]

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56 Remarks of Chairman Tom Wheeler, FCC, "The Facts and Future of Broadband Competition," 1776 Headquarters, Washington, D.C. (Sept. 4, 2014), http://www.fcc.gov/document/chairman-remarks-facts-and-future-broadband-competition.

57 *See* Edward Wyatt, *Fast Internet is Chattanooga's New Locomotive*, N.Y. Times, Feb. 3, 2014, http://www.nytimes.com/2014/02/04/technology/fast-internet-service-speeds-business-development-in-chattanooga.html?_r=0 (describing Chattanooga, Tennessee's taxpayer-owned fiber optic network).

58 Jason Hoppin, *Santa Cruz County to get new Internet backbone*, Santa Cruz Sentinel, Apr. 11, 2014, http://www.santacruzsentinel.com/news/ci_25549462/santa-cruz-county-get-new-internet-backbone.

59 Masha Zager, *Number of Municipal FTTP Networks Climbs to 135*, Broadband Communities, May/June 2013, http://www.bbpmag.com/Features/0513feature-MuniCensus.php.

60 Press Release, Sprint Corp., Sprint and DISH to Trial Fixed Wireless Broadband Service (Dec. 17, 2013), http://newsroom.sprint.com/news-releases/sprint-and-dish-to-trial-fixed-wireless-broadband-service.htm.

61 Sarah Reedy, *Son: Dish Could be Sprint's Great Ally*, LightReading, Mar. 27, 2014, http://www.lightreading.com/mobile/4g-lte/son-dish-could-be-sprints-greatally/d/d-id/708408.

62 *See* Sacha Segan, *Fastest Mobile Networks 2014*, PC Magazine, June 11, 2014, http://www.pcmag.com/article2/0,2817,2459185,00.asp.

63 *See* Israel Decl. ¶ 67.

64 *Id.*

2. Edge Providers[65]

Entities that provide content, applications, or services over the Internet frequently can be providers of similar services in offline settings. For example, Sony has a series of PlayStation video game platforms that can work with the internet or offline. Depending on the service, providers of offline versions of the service are likely to be well-positioned as new entrants as an edge provider service. To the extent that substitute products are available, these are likely to be provided by existing providers of offline versions of the services, depending on the type of service described.

Voice over Internet Protocol ("VoIP") services are currently offered by many companies, and several new service providers have launched in the past few years. Existing VoIP providers includes companies like Cisco that offer an array of communication and networking services for businesses. Other companies offering communication services and equipment to business are likely to develop and launch new VoIP offerings.

Existing VoIP providers also include mobile app-based services such as Viber. Given the ongoing improvements in mobile wireless networks and ubiquitous use of mobile devices like tablets, new app developers are particularly likely to enter the provision of VoIP service. For example, the popular instant messaging service WhatsApp? is reported to be developing a VoIP product.[66]

D. Internet Backbone Services

The Internet backbone service industries are dynamic and continue to evolve in response to changes in technology and consumer preferences. In the order approving the Level 3/Global Crossing merger, the FCC noted that "the number of Tier 1 ISPs appears to have grown since 2005" and that "[t]he emergence of several new Tier 1 peers . . . undercuts the argument that there are overwhelming barriers to entry into the Tier 1 market."[67] Several other companies in addition to traditional Tier 1 ISPs offer combinations of direct peering, transit, and Content Delivery Network ("CDN") services, and that number is likely to continue to grow. Indeed, evidence suggests that the traditional view of a "hierarchy" of Internet backbone services, in which Tier 1 ISPs typically peer with one another on a settlement-free basis and other ISPs purchase transit from the Tier 1 providers, no longer describes the range of relationships in Internet backbone services.[68] Instead, Internet companies in need of Internet backbone services have multiple alternatives, including CDNs, as well as direct peering or partial transit.[69]

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65 OVDs are discussed above under Video Programming Services.
66 Lance Whitney, *WhatsApp could add voice calling very soon*, CNET.com, Apr. 9, 2014, http://www.cnet.com/news/whatsapp-could-add-voice-calling-very-soon/.
67 *Fifteenth Video Competition Report* ¶ 28.
68 *See* Israel Decl. ¶ 74.
69 *Id.*

Internet-based companies including Google, Facebook, and Amazon have also begun investing in their own Internet backbone infrastructure.[70] By investing in fiber networks, Internet-based companies may be able to reduce their own content delivery costs and improve performance. As overall Internet traffic increases with the proliferation of high-definition streaming video and other bandwidth-intensive applications, more Internet-based companies are likely to invest in infrastructure and enter the Internet backbone service market, making them possible entrants into the CDN market as well.

E. Content Delivery Networks

CDNs are, like Internet Backbone services, part of the process of delivering content over the Internet to ultimate end users. As discussed with regard to Internet Backbone services, the industry for the process of delivering content over the Internet is in flux and dynamic. CDNs are part of a broader trend towards increasing the number of traffic delivery options beyond relying on transit services provided by traditional global backbone networks. In response to overall increases in Internet traffic and demand for higher quality, various companies have been developing innovative traffic exchange solutions. Indeed, the lines distinguishing among backbone networks, Internet access providers, and content providers are increasingly blurry.[71]

The companies discussed above as potential new entrants for providing Internet Backbone services are likely potential providers of CDNs as well. For example, Level 3 Communications began providing CDNs after having established an Internet Backbone service. Other Internet Backbone services providers, as well as other content providers, may begin investing in CDNs. Content providers that invest in a CDN for their own content (such as Google and Apple) may later be able to use that CDN in order to provide capacity to third parties.

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70 *See* Drew Fitzgerald & Spencer E. Ante, *Tech Firms Push to Control Web's Pipes*, Wall St. J., Dec. 16, 2013, http://online.wsj.com/news/article_email/SB10001424052702304173704579262361885883936-lMyQjAxMTAzMDEwNjExNDYyWj.

71 Dennis Weller, *The Internet Market For Quality*, 84 Comm. & Strategies 35, 38 (2011).

14. Produce all documents relating to the Company's or any other person's pre-transaction and post-transaction plans relating to any relevant service, including, but not limited to, business plans; short-term and long-range strategies and objectives; budgets and financial projections; presentations to management committees, executive committees, and boards of directors; expansion plans; research and development efforts; and plans to deploy DOCSIS 3.1, converged cable access platform, converged regional area network, IP Cable and Wi-Fi access points and mobile wireless broadband services; plans relating to the company's time-shifted and place-shifted video programming, dynamic ad insertion service, addressable advertising; plans to offer an OVD service outside the Company's current service area or to provide the Company's video programming to unaffiliated OVDs, wireless backhaul services, and business services; and plans to reduce costs, to improve services or service quality, and to manage communications security and reliability risks. For regularly prepared budgets and financial projections, the Company need only produce one copy of final year-end documents for 2011 through 2013 and cumulative year-to-date documents for 2014.

RESPONSE:

Documents responsive to this request will be produced to the FCC.

15. Separately for each relevant service (i) describe the minimum viable scale necessary for entry, including but not limited to, hurdle rates, the capital required for entry, construction of new facilities, spectrum and/or licensing requirements, whether carriage on any particular MVPD or OVD is necessary and if so, the identity of each such provider, and the number of subscribers and advertisers needed to break-even, and to the extent not already produced, (ii) produce all documents relating to the Company's entry into each of the above services since January 1, 2009. Indicate in your response whether your response would vary based upon the type of video programming (e.g., movies, sports, Spanish-language).

RESPONSE:

A. Video Programming Distribution

1. MVPD

a. Minimum Viable Scale Necessary for Entry

Due to the number and complexity of the variables affecting the costs of providing an MVPD service, as described below, Comcast is unable to offer any specific estimate of the minimum viable scale necessary for entry into the market for MVPD service.[72] The minimum viable scale necessary for entry in the MVPD market is a function of a number of factors, including costs (equipment, infrastructure, programming, marketing, etc.), regulatory mandates and obligations, and the objectives of the entrant (which may or may not require that the service be profitable on a standalone basis). MVPDs must establish, maintain, and operate distribution systems, acquire or create programming networks, and organize networks onto channels lineups. There are also significant regulatory requirements for entry into the market. Accordingly, minimum viable scale necessary for entry cannot be predicted in the abstract. There are, however, many MVPDs with only one thousand subscribers or fewer.[73]

A new MVPD may need to make significant fixed-cost investments to begin providing services. For example, an MVPD may have to build out infrastructure and acquire equipment for distributing video programming content to subscribers' premises. Video programming can be distributed by coaxial cable, fiber-optic cable, a combination of fiber-optic cables and telephone cables, or DBS, and wireless licenses. An MVPD seeking to enter the market could either build new systems or acquire existing systems,

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72 The Second Request defined MVPDs and OVDs as separate Relevant Products and Comcast is responding accordingly. As noted in the introductory comments, however, the issue of antitrust product market definition is not addressed here. The Complaint filed in connection with the NBCUniversal transaction could be read to define a single antitrust product market that includes both MVPDs and OVDs. *See* Complaint, *United States v. Comcast Corp.*, No. 1:11-cv-00106 ¶¶ 34-35 (D.D.C. Jan. 18, 2011). In the same transaction review, the FCC concluded that it did not need to determine whether MVPDs and OVDs operated in the same market. *See Applications of Comcast Corp., Gen. Elec. Co., and NBC Universal, Inc. for Consent to Assign Licenses and Transfer Control of Licenses*, Memorandum Opinion and Order, 26 FCC Rcd 4238 ¶ 41 (2011) ("*NBCUniversal Order*").

73 *See* Press Release, Am. Cable Ass'n, Smaller Cable Companies, Larger Programmers Have Long Benefited From Buying Groups Like NCTC, (Mar. 24, 2014), http://www.americancable.org/node/4718.

such as Google reportedly did when it purchased existing infrastructure and equipment in Provo, Utah for one dollar ($1).[74] The cost of building or acquiring distribution systems would vary based on the type of system involved (e.g., DBS or cable). Costs would also depend on the size of the geographic area and number of subscribers a new entrant intends to serve and other factors such as population density.

A new MVPD would also need to acquire the rights to distribute video programming. These acquisition costs would depend on whether the MVPD planned to develop new programming or use programming from existing content providers. Programming costs would also depend on the amount of programming (i.e., number of channels) an MVPD intends to carry. Some programming networks may cost significantly more than others depending on their perceived quality or popularity with subscribers; others cost very little or are free and survive primarily on advertising revenue. A new MVPD could choose to negotiate these contracts directly or could save costs by negotiating through a Bargaining Agent, such as the NCTC. Accordingly, overall programming costs would depend on the mix of networks an MVPD decides to carry.

Other costs associated with providing MVPD services include costs of maintaining and operating systems, marketing, and regulatory costs. Marketing costs will be affected by the types of marketing efforts used, such as call centers, direct mail, online display advertising, television advertising, or door-to-door marketing.

MVPDs also must comply with various regulatory requirements. For example, cable MVPDs must obtain a franchise agreement from the local or state government. DBS providers must obtain satellite licenses from the FCC. The costs associated with obtaining and maintaining cable franchises may vary by locality, as may the cost associated with obtaining and maintaining a DBS license.

b. Number of Subscribers and Advertisers Needed to Break Even

The number of subscribers and advertisers needed to break even also depends on the overall fixed and variable costs associated with operating an MVPD system. Throughout the nation, there are numerous viable MVPDs that compete in the marketplace today with relatively few subscribers (some fewer than one thousand). The time required to break even also will depend on costs, as well as a number of other factors such as an MVPD's pricing strategy, marketing efforts, other competitors in the market, etc. To the extent an MVPD offers other non-video services over the same network as its video services – e.g., broadband Internet, voice, technology solutions and equipment – as many currently do, revenue from those other services will help defray costs and accelerate the time it takes the MVPD to break even.

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74 Angela Moscaritolo, *Report: Google Buying Provo Fiber Service for $1*, PC Magazine, Apr. 19, 2013, http://www.pcmag.com/article2/0,2817,2417966,00.asp.

2. OVD

a. Minimum Viable Scale Necessary for Entry

The minimum viable scale necessary for entry in the OVD market is a function primarily of programming cost, content delivery cost, marketing, and revenue strategy, none of which can be predicted in the abstract.

An OVD must provide or create program content, aggregate the content, transport the content to the viewer, provide navigation tools to the viewer, and market the service. Whatever the long-run minimum viable scale, the requirements for distributing video online can be minimal.[75]

Basic online programming entry requirements do not include costly tangible assets, such as the construction of new facilities. An OVD's major assets are programming rights to distribute content over the Internet and potentially networking and hosting equipment, all of which can readily be obtained from numerous third parties. Specifically, the provision of OVD services requires developing a programming concept, obtaining the rights to distribute or creating programming, obtaining the needed technology to aggregate and then distribute the programming on the Internet (e.g., servers), creating an operational infrastructure, promoting and marketing the OVD service, and arranging for advertising sales (if the service is to be supported in whole or in part by advertising). Each of these steps can be accomplished in a number of ways, and the costs and time required to accomplish each step necessarily depend on the specific characteristics of the proposed service. In all cases, it is possible to obtain from third parties that specialize in the distribution of content on the Internet (e.g., Amazon Wholesale Services, Akamai, Limelight) the resources necessary to distribute video online, and in some cases, OVDs have launched simply by starting to post videos on servers accessible through the Internet. There are no significant regulatory barriers affecting entry into OVD services.

The capital required to create OVD services for professional content depends on the costs of obtaining video programming, which will in turn depend on factors such as whether the service intends to use existing programming to meet a significant portion of its needs or to develop entirely new programming. The costs of obtaining video programming also will largely depend on whether the OVD seeks exclusive rights to programming and the age of the content. An OVD service's cost structure will be affected by the scale of its entry, including the number of hours of video it intends to distribute, the quality and length of the videos distributed, and the frequency with which it plans to update its content. The cost structure may also vary based on whether the entrant is already participating in a related line of business and thus is able to share some of the costs of creating and operating the OVD service. Because of the array and complexity of these

[75] FCC Commissioner Mignon L. Clyburn noted that Rowdy Orbit IPTV, an online platform featuring professionally produced original programming for minority audiences, was launched with an initial investment of only $526. *See* Remarks of Commissioner Mignon L. Clyburn, FCC, at the MMTC Broadband and Social Justice Summit (Jan. 22, 2010), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-295888A1.pdf.

variables, Comcast is unable to offer any specific estimate of the total capital required for entry into the OVD market.

b. Number of Subscribers and Advertisers Required to Break Even

OVDs currently offer advertising-supported, transaction-based, or subscription-based services – or some combination of those models. The time required to break even will depend on the service's costs and revenues.

With respect to costs, costs of acquiring programming vary widely based on the number, breadth, and quality of programs acquired. Similarly, the cost of distributing programming fluctuates based on the number of simultaneous customers a distributor hopes to serve and the bandwidth and hardware necessary to do so.

For advertiser-supported OVDs, it is not possible to predict the number of advertisers required for a particular OVD to break even, given that this number would necessarily be highly variable, as it is a function of the highly variable costs and revenues. Some OVD providers have few advertisers that pay more to sponsor longer content, others have many advertisers that pay less for frequently changing banner advertisements, while still others utilize a combination of both.

It would be similarly difficult to predict the number of subscribers (and advertisers, if applicable) necessary to break even for a subscription-based OVD service, due to the significant variables on both sides of the break-even equation. In addition to the factors mentioned above regarding how advertising revenue and programming costs are variable, so too are subscription revenues, which would differ depending on the business model of the particular OVD. Subscription revenues could depend on the type of product offered, including the number and breadth of programming options, whether advertisements would still be shown, and the typical subscriber consumption profile (i.e., whether a subscriber watches 10 hours per month or 10 hours per week). And some subscription-based OVD services (e.g., Netflix) do not feature advertising at all.

B. Video Programming Production

1. Minimum Viable Scale Necessary for Entry

Minimum viable scale is a function primarily of programming cost and marketing cost, each of which, in turn, depends upon the particular programming concept and delivery method chosen (e.g., linear networks, video on demand, online a la carte) and as a result cannot be predicted in the abstract. Because of the array and complexity of these variables, as described below, Comcast is unable to offer any specific estimate of the total capital required for entry into video programming services.

Launching a new linear network for MVPD distribution has three primary components: program content, infrastructure, and distribution. Specifically, in order to launch a new linear programming service, a programmer must develop a programming concept, create

and/or obtain programming, obtain a method to distribute the programming to affiliates (such as uplink capacity and transponder space for satellite delivery of the programming), negotiate distribution agreements with affiliates, promote and market the programming service, arrange for advertising sales (if the service is to be supported in whole or part by advertising), and create an operational infrastructure. Each of these steps can be accomplished in a number of ways, and the costs and time required to accomplish each step depend very much on the specific characteristics of the proposed programming service. In all cases, however, it is possible to obtain from third-party sources the assistance necessary to satisfy each such requirement, and there are few if any regulatory barriers affecting entry into programming services.

Many of these same steps are required for providing video programming services via online distribution, as the provider still needs to take the steps necessary to create a video product, but no longer has the additional requirement of negotiating distribution agreements with MVPDs. Depending on the exact nature of the online product, it would likely be necessary to negotiate advertising sales and/or develop a subscription-based web service in order to recoup revenue. As discussed in the response to Request 44, some new video programmers may choose to create their own website for distributing video content online. Other video programmers may decide to license content to existing OVDs or to upload content to a service such as YouTube (or to even create their own YouTube channel). Producers of video programming increasingly have a choice as to whether to attempt to gain distribution on a linear network (and ultimately an MVPD), as a standalone program available on demand through MVPDs or via an OVD programmer (as in the case of original programming appearing on Netflix such as *House of Cards* or *Orange Is the New Black*), or some combination of the two.

In general, the minimum viable scale of on-demand programming, whether delivered online or via an MVPD, is likely to be lower than that of a new linear network because there is not a need to provide the same number of hours of programming and because the programming does not necessarily need to appeal to a wide audience. Due to changes in consumer habits, the desire for "on-demand" programming, whether delivered online or through an MVPD, has risen dramatically in recent years, as reflected in the popularity of on-demand streaming services such as Netflix, devices such as DVRs, and VOD offerings of MVPDs. Meanwhile, the costs to produce and distribute at least some types of on-demand programming have decreased substantially, especially for on-demand programming online. Uploading video programming to a website like YouTube can be a relatively low-cost endeavor, depending on the nature of the programming. For example, with a relatively low initial investment and small scale, a standup comedy routine created and uploaded to YouTube may generate significant viewership.

The scale of a programming services entry affects its cost structure as well. For example, as discussed above, a 24-hour-per-day linear cable channel will typically have a different cost structure than an on-demand online video product. The capital required for entry into the provision of video programming services depends very much on the specific type of video programming service to be provided. Creating and distributing online video

products through services such as YouTube or Facebook has a relatively low cost to entry (depending on the production quality) compared to launching a new linear cable network. Whether the entrant is already participating in a related line of business (and thus is able to share some of the costs of creating and operating the programming service), is also relevant to its cost structure. For example, as discussed in the response to Request 44, varied businesses such as sports leagues, consumer electronics manufacturers, and retailers are beginning to create video products.

Basic programming entry does not require costly tangible assets, such as the construction of new facilities. A linear cable network has assets such as program license or transponder and fiber rental agreements; such agreements can be structured so that the unused portions of licenses or rentals can be resold upon exit. Cost of entry includes the cost of initial operating losses, which are often incurred while setting up distribution and acquiring content. If a video programming business exits before it reaches the break-even point, it may still be able to recoup its initial operating losses by selling its business either to another entrant or to an existing service. The buyer may either maintain and attempt to improve the performance of the existing format, or it may decide to change it.

2. Necessity of Carriage on a Particular Distributor

Given the numerous outlets and means for the distribution of video programming, programmers have more ways than ever before to distribute their programming and recoup their costs. Thus, programmers are not reliant on distribution of a new video programming service by a particular MVPD or OVD.[76] This fact is underscored by the fact that programmers willingly enter into exclusive distribution arrangements with various MVPDs and OVDs. For example, DBS companies have a number of exclusive arrangements with certain programmers that have desirable programming.[77] Similarly, some OVDs have exclusive agreements to carry popular content in certain windows.[78]

Numerous programmers seek to launch linear networks on MVPDs each month, and distributors are always seeking content that may be of interest to their subscribers. Moreover, OVDs are continuing "to expand the amount of content available to

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[76] *See Comcast Corp. v. FCC*, 579 F.3d 1, 8 (D.C. Cir. 2009) (observing that the video marketplace has changed significantly in the past 20 years and that cable operators "no longer have the bottleneck power over programming" given entry by other MVPDs and the ability to distribute content over the Internet).

[77] *See id.* at 6, 8. Furthermore, many programmers have thrived with relatively low numbers of subscribers. *See* Letter from Helgi C. Walker, Wiley Rein LLP, Arthur J. Burke, Davis Polk & Wardwell, and Michael H. Hammer, Willkie Farr & Gallagher LLP, Counsel for Comcast Corp. to Marlene H. Dortch, Secretary, FCC, MM Docket No. 92-264 (Apr. 4, 2007), *available at* http://apps.fcc.gov/ecfs/document/view?id=6519107965.

[78] *See, e.g.*, Todd Spangler, *HBO Cuts Exclusive Licensing Deal with Amazon*, Variety, Apr. 23, 2014, http://variety.com/2014/digital/news/hbo-cuts-exclusive-licensing-deal-with-amazon-1201161895/; Ryan Lawler, *Netflix Strikes Streaming Deal With Disney, Gains Exclusive Access To New Titles Beginning in 2016*, TechCrunch, Dec. 4, 2012, http://techcrunch.com/2012/12/04/netflix-disney/; David Goetzl, *Netflix, AMC Cut Deal For Exclusive Streaming Rights*, MediaPost, Oct. 7, 2011, http://www.mediapost.com/publications/article/160111/netflix-amc-cut-deal-for-exclusive-streaming-righ.html.

consumers" both with original programming and agreements with traditional video programmers.[79] Mutually beneficial relationships between programmers and programming distributors may be established in various ways. Video programmers, for example, may promote carriage of new cable television networks by offering MVPDs financial incentives such as launch fees or launch support, foregoing affiliate fees for a certain period, providing a share of national advertising revenues to the operator, or, in the case of programming that includes home shopping components, by offering a share of merchandising revenues. Video programmers may also promote carriage of new video cable television networks by offering incentives to MVPDs in the form of the ability to insert local advertisements (known as local ad avails), marketing and promotional support, and revenue sharing. Some services are also able to obtain carriage of new programming because their "brand" identity provides assurances to distributors of the quality of their offerings. Additionally, programmers may seek to promote carriage of new cable television networks by offering lower affiliate fees on more established networks to MVPDs that agree to carry the new networks.

Obtaining carriage is only one element of the successful launch of a new linear programming service. Success also depends on gaining consumer awareness and viewership, which leads to advertising revenues. Video programmers may seek to generate consumer awareness and viewership in a number of ways, including advertising, cross-promotion, and distribution on both MVPDs and OVDs. Additionally, the likelihood of successful entry is not necessarily dependent on a service's entry costs. Although a higher-cost service may be able to command higher affiliate fees and achieve higher ratings and associated advertising revenues, low-cost, niche content may be an attractive addition to an MVPD or OVD programming package.

Notably, distribution of video programming services online does not require carriage on any distributor; the video programmer is able to distribute its programming on its own using the Internet. As noted in the response to Request 44 above, a number of programmers have launched their services on their own online, including movie studios, sports leagues, and even individuals like Glenn Beck, Louis CK, Sarah Palin, and Jeffrey Hayzlett.

3. Number of Subscribers and Advertisers Required to Break Even

The time it takes for a new service to break even depends in large part on the appeal of its programming concept to consumers, its costs, and the objectives of the entrant. For some basic services, high penetration is particularly desirable.[80] However, other basic services (similar to special-interest magazines) aim at a niche audience, one which its target advertisers want to reach, and may be able to break even with a smaller subscriber base.

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79 *Fifteenth Video Competition Report* ¶ 9.

80 Entrants who provide such services may be able to achieve high penetration by initially building an audience through television VOD or online distribution. *See infra* response to Request 44.

The same is true for services that provide, for example, sports-only programming, multicultural content, or programming based on emerging technology.

It is not possible to predict the number of advertisers required to break even, given that this number would be a function both of costs of establishing advertising relationships, which are highly variable, and the amount each advertiser pays, which also could be highly variable depending on the demographics reached by the service.

Comcast's response to subpart (a) with respect to video programming would vary based upon the type of video programming involved. For example, there are higher costs associated with licensing certain content, such as live, premium sporting events, than with licensing other content.

C. Internet Access Services

1. Minimum Viable Scale Necessary for Entry

The minimum viable scale necessary for entry in the Internet access services market is a function of several factors, including network infrastructure costs, interconnection costs, marketing costs, and regulatory costs. Accordingly, minimum viable scale necessary for entry cannot be predicted in the abstract.

A new Internet access service provider will need to make fixed-cost investments to begin providing services. For example, an Internet access service provider must acquire equipment for connecting subscribers' premises to the Internet. Access can be provided by coaxial cable, fiber-optic cable, digital subscriber line ("DSL") over traditional telephone wires, a combination of fiber-optic cables and DSL, satellite, and fixed or mobile wireless. An Internet access service provider seeking to enter the market could either build new systems or acquire existing systems.

The cost of building or acquiring distribution systems would vary based on the type of system involved. For example, a new provider offering service via fiber-optic cables would have to acquire cables and incur costs deploying the cables in a potential new service area. A new provider offering service via satellite might have to acquire and launch a new satellite. A new provider offering service via fixed or mobile wireless would have to acquire the rights to use a band of wireless spectrum and provide equipment to subscribers to receive the wireless signal. Costs would also depend on the size of the geographic area and the number of subscribers a new entrant intends to serve, and other factors such as population density.

Internet access service providers must also acquire Internet backbone services to connect their subscribers to the rest of the Internet. An Internet access service provider may purchase transit service from a third-party provider or may seek to interconnect directly with other Internet access service providers or Internet content providers. The cost of transit or other Internet backbone services is a function of a variety of market forces. (In

general, the cost of transit service has decreased dramatically over time.[81]) The cost of other Internet backbone services, such as peering, also depends on the prevailing cost of transit service.

A new Internet access service provider could also face regulatory costs. As discussed above, a provider offering service via fixed or mobile wireless would have to obtain the rights to use wireless spectrum via licenses or other regulatory authorizations. Providers offering a wireline service may have to obtain permission to use the public rights-of-way from the local government.

Because of the number and complexity of the variables affecting the costs of providing an Internet access service, Comcast is unable to offer any specific estimate of the total capital required or the minimum viable scale necessary for entry into the market for Internet access services.

2. Number of Subscribers Needed to Break Even

The number of subscribers needed to break even also depends on the overall fixed and variable costs associated with operating an Internet access services system. It is expected that a new service will take a number of years to break even; the number of years required will in turn depend on the service's costs. These costs in turn depend on a variety of factors (discussed above). To the extent an Internet access service provider offers other services over the same network as its Internet services – e.g., multichannel video programming, voice, technology solutions and equipment – as many of them currently do, revenue from those other services will help defray costs and accelerate the time it takes the provider to break even.

D. Internet Edge Providers[82]

1. Minimum Viable Scale Necessary for Entry

The minimum viable scale necessary for entry in the Internet access services market is a function of several factors, including what services they were intending to provide, marketing costs, and regulatory costs. Accordingly, minimum viable scale necessary for entry cannot be predicted in the abstract.

2. Number of Subscribers Needed to Break Even

The number of subscribers required for an Internet edge provider to break even depends on many of the variables discussed above. Furthermore, many services and content provided over the Internet are not offered on a subscription basis at all. For example, as

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[81] *See* Vytautas Valancius, et al., *How Many Tiers? Pricing in the Internet Transit Market*, 2011 ACM SIGCOMM 194 (2011) (stating that "on average, transit prices are falling by about 30% per year").

[82] OVD service is discussed above in under Video Programming Distribution.

discussed with regard to OVDs above, an Internet edge provider may earn revenue through advertisements while Internet gaming online may be a complement to sales of video game hardware rather than a source of subscription revenue. Therefore, it is not possible to predict the number of subscribers required to break even in the abstract.

E. Internet Backbone Services

1. Minimum Viable Scale Necessary for Entry

The minimum viable scale necessary for entry in the Internet backbone service market is a function of several factors, including infrastructure costs, maintenance and upgrades, and interconnection costs. Accordingly, minimum viable scale necessary for entry cannot be predicted in the abstract.

A new Internet backbone service provider may need to make significant fixed-cost investments to begin providing services. For example, an Internet backbone service provider would need to acquire fiber-optic Internet backbone networks or utilize current dark fiber capacity for connecting customers' networks to the rest of the global Internet. The providers would also need to acquire backbone ports for providing interconnection links, and could either purchase new ports and equipment or acquire an existing providers' equipment. Internet backbone ports are typically housed in large, carrier-neutral facilities owned and operated by companies such as Equinix. There are several such facilities in cities across the United States. An Internet backbone service provider would need to purchase space in a facility and pay for power to run its ports, as well as purchase cable for cross-connecting ports to interconnection counterparties.

The variable costs associated with providing Internet backbone services are a function of several factors. Internet backbone service providers must acquire new backbone ports to meet increasing traffic demands. Internet backbone service providers must also continually monitor capacity and traffic, provide technical support staff to resolve outages, and potentially pay for transit or peering services with other networks. Internet backbone service providers generally benefit from interconnecting with other Internet backbone networks because doing so allows them to send traffic over more routes and provide more efficient service. For example, it might be more efficient for an Internet backbone service provider to send traffic through another Internet backbone service provider that has more capacity in an area that is physically close to the destination of the traffic rather than carrying the traffic over its own network.

In some cases, an Internet backbone service provider may seek to peer with other networks on a settlement-free basis in which exchange of traffic serves as consideration for access to each network. In other cases, Internet backbone service providers may purchase transit or pay other Internet backbone providers for direct interconnection. Settlement-free interconnection would impose costs such as those associated with maintaining and upgrading the network to adequately handle the traffic exchange. The cost of other interconnection services may vary based on supply and demand forces,

improving technology, and changes in Internet traffic patterns to and from the networks to which the Internet backbone service provider provides services.

Because of the number and complexity of the variables affecting the costs of providing an Internet backbone service, Comcast is unable to offer any specific estimate of the total capital required or the minimum viable scale necessary for entry into the market for Internet backbone services.

F. Content Delivery Networks

1. Minimum Viable Scale Necessary for Entry

The minimum viable scale necessary for entry into the provision of CDN service is a function of several factors, including infrastructure costs, maintenance and upgrades, and interconnection costs. In general, many of the same the factors, including many of the same facilities, affecting the minimum viable scale necessary for an Internet backbone service provider described above also apply to a CDN. Generally, CDNs pay for transit or peering given the one-way direction of their traffic. On occasion, especially with smaller providers, CDNs may arrange for settlement free peering because the smaller provider may otherwise have to pay for transit.

Because of the number and complexity of the variables affecting the costs of providing a CDN service, Comcast is unable to offer any specific estimate of the total capital required or the minimum viable scale necessary for entry into the market for provision of CDN service.

15(ii):

Documents responsive to this subpart will be produced to the FCC.

16. Produce all documents (except engineering and architectural plans and blueprints) discussing any plans of the Company or any other person for the construction of new facilities or equipment, the closing of existing facilities, or the expansion, conversion, or modification (if such modification has a planned or actual cost of more than $1 million) of current facilities for providing each relevant service in each relevant area.

RESPONSE:

Documents responsive to this request will be produced to the FCC.

17. For each relevant service, standalone services and bundled services, produce (i) one copy of all current selling aids and promotional materials and (ii) all documents relating to advertising plans and strategies.

RESPONSE:

Documents responsive to this request will be produced to the FCC.

18. Identify each non-broadcast programming network owned by, operated by, managed by, or attributed to the Company, by stating the information requested by the subparts to this Request, and provide the date and details of any changes to that information:

a. the nature and percentage of the Company's ownership interest;

b. the identity of and percentage owned by each other person who holds an attributable interest;

c. the date the network was launched, and if acquired from another entity, the date the network was acquired and from whom the Company acquired its ownership interest; and

d. the nature and extent of the Company's role in management, including whether the Company has any board representation, management rights, voting rights, and/or veto power supermajority or other investor protections.

RESPONSE:

18(a)-(d):

Information and data responsive to these subparts have been provided as Exhibits 18.1(a)-(b). Exhibit 18.1(a) is a table incorporating the requested information for the non-broadcast cable networks, as well as broadcast networks, NBC and Telemundo (which are listed separately). The months in which ownership and other changes occurred are noted; otherwise they remained constant. Exhibit 18.1(b) is a spreadsheet that provides ownership interests of both Comcast and third-party owners (if any) of these networks on an annual basis.

Comcast also owns 100 percent of and manages the following non-sports, regional networks (year of launch in parentheses): CTV (Michigan) (2008); Hoosier TV (2008); Comcast Hometown Network (CHN) (2009); C2 (2002); CN100 (2008[83]); Comcast Entertainment Television (CET) (2004); Utah 6 (2007); and WNFM-TV (Naples, FL) (1995).

83 Reflects its launch as CN100.

19. For each non-broadcast programming network identified in response to Request 18, state separately, and produce in CSV or Excel format, for each month from January, 2009, to the present:

a. the identity of any MVPD that carries the network, and for each MVPD state (1) the total and per subscriber license fee paid by the MVPD to the Company, (2) the total number of the MVPD's subscribers that receive the network, (3) the number of minutes per hour granted to the MVPD for local advertising sales and (4) the tier on which the network is carried;

b. for all MPVDs carrying the network, state (1) the total per subscriber license fees and average per subscriber license fees paid by all MVPDs to the Company, (2) the total number of MVPD subscribers that receive the network, and (3) the average number of minutes per hour granted to MVPDs for local advertising sales;

c. the average gross advertising revenue per subscriber and the average net advertising revenue per subscriber and an explanation of how these values were calculated; and

d. the identity of each OVD, including but not limited to Apple, Amazon.com, Google, Netflix, Hulu, and the Company that publishes, sells or distributes, in whole or part, content produced or distributed by the non-broadcast programming network, and the total fees paid each year by the OVD to the Company for the right to distribute such programming.

RESPONSE:

19(a-b):

Information and data responsive to these subparts have been provided in machine-readable Excel spreadsheet format as Exhibits 19.1-19.3 (and subparts).

Exhibits 19.1(a)-(b) provide the total number of subscribers (as well as specifically delineated for each of the top 25 MVPDs) who receive each network on an annual basis. Exhibit 19.1(a) provides this primarily for certain national networks with a monthly average number of subscribers for the year in question; 19.1(b) provides this for other networks (primarily Regional Sports Networks) by providing the year-end number of subscribers for the year in question. Exhibit 19.1(c) provides the number of subscribers for the networks referenced in Exhibit 19.1(a) in months around changes in Comcast's ownership interest in the networks. (Exhibit 19.1(b) provides the same monthly information.)

Exhibits 19.1(b) and 19.2(a)-(b) provide subscriber revenues received from MVPDs that carry each programming network. Exhibit 19.2(a) provides the revenue received from MVPDs (specifically delineated for the top 25 MVPDs) on an annual basis for the networks addressed in Exhibit 19.1(a). Exhibit 19.2(b) provides the subscriber revenue for the networks addressed in Exhibit 19.2(a) for certain months around changes in Comcast's ownership interest. In addition to providing subscriber information, Exhibit 19.1(b) provides subscriber revenue information, including information specifically delineated for the top 25 MVPDs, primarily for Regional Sports Networks.

Exhibits 19.3(a)-(b) provides subscriber revenue in terms of revenue per subscriber for the national networks addressed in Exhibits 19.2(a)-(b). Exhibit 19.3(c) provides this same information primarily for Regional Sports Networks for both in-market subscribers and, where different, total (including out-of-market) subscribers. (**{{ }}**)

As is relevant to Exhibits 19.1-19.3 (and subparts), Comcast provides the following additional explanation.

- The information as presented here reflects how this information is maintained and recorded in the ordinary course of business and Comcast believes these Exhibits reflect the most accurate information it is able to provide. As fees for most networks are based on the number of subscribers to whom programming is delivered and subscriber figures are typically in flux, such fees accrued in any given month will on occasion reflect adjustments based on over- or under-payments in past months, or other adjustments based on prior billings. As is noted in Exhibit 19.3(a), for a limited number of networks (in certain years), the annual information is based on partial billing years, usually due to the network only airing for a partial year. (In such instances, the monthly per subscriber rates displayed in Exhibit 19.3(a) reflect the months for which billing occurred.)

- Prior to the third quarter of 2012, network subscriber and revenue information with regards to Bright House Networks was not tracked separately from the information tracked for TWC. Beginning in the third quarter of 2012, information for Bright House Networks was tracked separately.

- Typically, the high-definition feed of a network is delivered as part of a contractual package with the standard definition feed; when that occurs, subscribers and revenue are not recorded separately for the high-definition and standard-definition feeds. High-definition subscribers are separately recorded in these Exhibits (and in the ordinary course of business) only to the extent that they reflect separate revenue specific to the high-definition feed.

- The entry for "Olympics" does not refer to a specific network. Rather, this refers to a surcharge that MVPDs pay in order to receive Olympic coverage on the Comcast/NBCUniversal cable networks that carry the Olympics.

- Comcast owns broadcast networks, including NBC and Telemundo. To the extent that there are no retransmission fees associated with the network as to a particular MVPD, subscribers are generally not tracked for these broadcast networks on that particular MVPD. Subscribers and affiliate revenues are tracked separately to the extent that such broadcasters have retransmission fees associated with the network. Information regarding these broadcast networks are included with the non-broadcast networks here; such information is also responsive to Request 37.

- Certain entries on these Exhibits, such as "WNBC," refer to a specific broadcaster of a programming network owned by Comcast, such as NBC. Such information may also be responsive to Request 36.

- Telemundo and Telemundo Retrans are listed separately; the former is a national cable network, while the latter is a local broadcast network with some (though not all) duplicative content.

Comcast provides the following information in response to subpart (a)(3) and (b)(3). Networks generally provide all MVPDs with the same advertising availabilities, which do not generally change year-to-year. The advertising availabilities provided by Comcast networks to MVPDs are as follows: **{{ }}**

For certain Regional Sports Networks (CSN California, CSN Northwest, and SportsNet New York), due to rights restrictions, there are currently different advertising availabilities provided in-game than during the remaining programming. (The advertising availabilities provided above are the standard, non-game advertising availabilities for these three networks.) **{{ }}**

In response to subpart (a)(4), Comcast does not track the programming tier on which its networks are carried in the ordinary course of business. (Comcast instead tracks the subscriber totals, which are provided in Exhibits 19.1 and subparts.)

Comcast does not have custody or control of information sufficient to respond to part or all Request 19 with respect to Midco Sports, Pittsburgh Cable News, TV One, Saigon Broadcasting Television Network, and The Weather Channel, which are video programming networks in which Comcast holds non-controlling interests, does not manage, or otherwise lacks the relevant information to answer.

19(c):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibits 19.4(a) (reflecting net advertising revenue per subscriber per network) and 19.4(b) (reflecting gross advertising revenue per subscriber per network).

Comcast notes that these metrics are not kept or used in the ordinary course of business by Comcast, or, as far as Comcast is aware, by the industry generally. Comcast has

calculated these figures for Exhibit 19.4(a) (reflecting net) by dividing the annual net advertising revenue for each network by 12 (in order to convert to a monthly figure) and then dividing that figure by the monthly subscribers for the corresponding year. Annual gross advertising revenue per subscriber is provided in 19.4(b) and is calculated in a parallel manner. **[[ ]]**

19(d):

In response to subpart (d) of this Request, information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibits 19.5(a)-(d). Exhibit 19.5(a) provides a list of OVDs to whom Comcast/NBCUniversal has licensed video programming (along with associated revenue on an annual basis and in certain quarters surrounding ownership changes). Programming is not licensed to OVDs on a network-by-network basis, but rather on a studio basis. Therefore the titles that are licensed to OVDs generally do not correspond to the full programming slates of particular networks (whether a broadcast network or a cable network), but rather consist of specific programs of particular networks, as well as movie titles that may not necessarily have appeared on television. (Revenue from licensing is obtained through both television and movies.) Exhibit 19.5(b) (certain streaming OVDs) and 19.5(c) (certain electronic sell through OVDs) provide the programming titles (television and film) available to certain of these OVDs on an annual basis to the extent such data are kept.

Comcast/NBCUniversal has also licensed programming to wireless providers. A list of the wireless providers (which may be considered for these purposes to function as OVDs) to whom Comcast/NBCUniversal have licensed video programming is provided at Exhibit 19.5(d). This Exhibit also provides, for the wireless providers for which it is available, the average number of monthly subscribers during a year. The video programming licensed to wireless providers is generally a package of linear networks, usually including the NBC broadcast network, and on-demand programming for which Comcast/NBCUniversal has charged a fixed rate or a per subscriber rate.

Comcast generally notes that short clips or highlights of programming appearing on Comcast-owned networks may be shown online, generally serving as promotional material, by additional online outlets. Comcast further notes that some of the MVPDs listed in Exhibit 19.1 (and subparts) to whom its networks have licensed programming have the right to display some or all of that programming online, depending on the precise contractual arrangement. Comcast's response to subpart (d) focuses on long-form programming that is licensed to OVDs for viewership.

20. Produce all agreements between the Company and any other person relating to the carriage, licensing, or distribution of any video programming owned by or controlled by the Company, and all documents relating to each negotiation since January 1, 2009, between the Company and any (i) MVPD, and (ii) OVD for video programming, regardless of whether or not the negotiations resulted in a contract (formal or informal). Exclude any documents related to the *Project Concord, Inc. v. NBCUniversal Media, LLC* proceeding.

RESPONSE:

Documents responsive to this request will be produced to the FCC.

21. Identify each instance where an MVPD has discussed raising, threatened to raise, or has raised, a program access complaint as a means to obtain the right to distribute the Company's non-broadcast programming, including via VOD and PPV, and separately for each type of non-broadcast programming network (i.e., standard or high definition), describe:

a. the nature of the dispute or issue;

b. the persons involved in the dispute; and

c. how and whether the dispute or issue was resolved. To the extent the dispute was settled, explain whether the settlement required the Company to provide program access to the complaining party, and produce all documents relating to each instance identified, and any settlement thereof.

RESPONSE:

Comcast has been involved in numerous program access negotiations during the relevant time period. Although it is possible that a party may have generally referenced or discussed the program access rules in negotiations, Comcast has reviewed its records to identify any program access complaint and any pre-filing notices of a potential program access complaint over this time period. Comcast has identified only the single instance described below.

In December 2009, WaveDivision Holdings, LLC, Horizon Cable TV, Inc., Stanford University, and the City of San Bruno, California, jointly filed a program access complaint seeking to reverse certain changes to the professional sports programming on Comcast SportsNet Bay Area and Comcast SportsNet California, in addition to other relief. Complainants alleged that the realignment of programming on those networks was an unfair practice, that the networks discriminated against Complainants in the price and certain other terms of carriage, and that Comcast Corporation unduly influenced the programming changes. The Comcast entities named in the complaint denied these allegations and asked for dismissal of the action. After an initial conference with the FCC, the proceeding was settled in late 2010 and the complaint was dismissed with prejudice by the FCC in January 2011. Because Complainants already carried the programming at issue, the settlement did not require the Comcast entities to provide program access.

Responsive materials have been provided as Exhibits 21.1-21.4. Additional documents responsive to this request will be produced to the FCC.

22. Identify each agreement the Company has entered with another person through which the Company licenses another person to distribute the Company's broadcast or non-broadcast video programming , that contains any of the following provisions: (i) any economic or non-economic Most-Favored-Nation clause; (ii) any exclusive rights to distribute the programming; (iii) any limits on the further distribution of the programming that is the subject of the agreement either temporally, such as through the use of "windows," or by another person or class of similar persons; (iv) any limits on the further distribution of the programming on another platform; and (v) any rights to obtain, or limits on distribution of, additional programming whether or not such programming was in existence at the time the agreement was entered; and (vi) any other provision that impacts the way that the programming is distributed or made available to other distributors, and for each such agreement state:

a. the parties to the agreement;

b. the date of the agreement;

c. the term of the agreement;

d. a description of the provision;

e. the date that any party to the agreement exercised any rights or received any benefits from any of the provisions set forth in parts (i) through (vi) of this Request; and

f. a description of any actions taken or benefits received as a result of any of the provisions set forth in parts (i) through (vi) of this Request.

RESPONSE:

NBCUniversal seeks broad distribution of its programming. To that end, **{{ }}** Nonetheless, on some occasions, **{{ }}**

Stated broadly, MFN provisions generally require NBCUniversal to provide the MVPD with the benefit of rights NBCUniversal may grant to other distributors.

ADM language generally **{{ }}**

Further, an NBCUniversal service **{{ }}**

An MVPD may also **{{ }}**

Although these provisions **{{ }}**, NBCUniversal has only agreed to restrictions and conditions that it believes are consistent with common and reasonable industry practice.

For further information on particular agreements, Comcast refers the FCC to the text of the agreements themselves, which will be produced to the FCC.

23. 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:

In response to this request, Comcast refers to Exhibit 23.1, which was prepared by Cornerstone Research together with Dr. Greg Rosston. Backup data associated with this request will be produced to the FCC.

24. 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:

In response to this request, Comcast refers to Exhibit 24.1, which was prepared by Cornerstone Research together with Dr. Greg Rosston. Backup data associated with this request will be produced to the FCC.

25. 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:

In response to this request, Comcast refers to Exhibit 25.1, which was prepared by Cornerstone Research together with Dr. Greg Rosston. Backup data associated with this request will be produced to the FCC.

26. Identify all sports teams, leagues, and other organizations with which the Company (or a network in which the Company has an attributable interest) has a contract granting distribution rights in the United States, and for each contract state:

a. the official name of the team, league, or organization, the sport played, and its home venue;

b. the term of the contract that grants the right to distribute the sports programming in the United States and whether the Company has a right of first refusal;

c. the geographic area in which the Company has rights to distribute the sports programming;

d. the percentage of total game events entitled to be distributed live under the contract, and the percentage of total game events which the live distribution rights are exclusive to non-broadcast programming networks or cable systems in which the Company has an interest;

e. any plans to begin distributing game events in the United States; and

f. whether the Company is currently distributing this sports programming on an attributable or non-attributable sports programming network.

RESPONSE:

Documents responsive to this request will be produced to the FCC. Comcast also incorporates its response to Request 27, below, which provides information on Comcast's sports rights counterparties. Additional information responsive to this request will be provided to the FCC.

27. Provide a list of and produce a copy of all contracts or informal understandings, entered into since January 1, 2009, between the Company (or a network in which the Company has an attributable interest) and any marquee sports league which convey the right to distribute the league's games or other content in the United States. Include any contract that allows for distribution as a part of any non-broadcast programming network in which the Company has an ownership, controlling or attributable interest, or as video programming on the Internet, whether distributed via MVPD or by an OVD, and all documents relating to negotiations of the contracts produced in response to this Request.

RESPONSE:

Documents responsive to this request will be produced to the FCC, **[[ ]]**. Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 27, which provides a list of agreements since 2009.

28. As of June 30, 2014, identify each RSN in which the Company has an ownership interest (or an attributable interest), and for each RSN identified, state:

a. the primary DMA in which the RSN is distributed;

b. the average license fee revenue per subscriber (excluding out of market subscribers);

c. the average gross and the average net advertising revenue per subscriber (excluding out of market subscribers) and an explanation of how these values were calculated;

d. the number of subscribers (excluding out of market subscribers) to the RSN, separately for each MVPD that distributes the RSN;

e. the number of Comcast, Charter, and SpinCo subscribers (excluding out of market subscribers) to the RSN, stated as if the proposed TWC transaction and the proposed divestitures transactions had been consummated on June 30, 2014; and

f. each MVPD that serves the DMA that does not distribute the RSN and the reason that the MVPD does not distribute the RSN.

RESPONSE:

28(a):

Comcast provides the following information in response to this subpart:

RSN	**DMA(s)**
CSN Bay Area	San Francisco-Oakland-San Jose
CSN California	San Francisco-Oakland-San Jose; Sacramento-Stockton-Modesto
CSN Chicago	Chicago
CSN Houston	Houston
CSN Mid-Atlantic	Washington, D.C.
CSN New England	Boston

CSN Northwest	Portland
CSN Philadelphia	Philadelphia
SportsNet New York	New York City

28(b):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 28.1, which provides subscriber revenue on a per subscriber basis for in-market subscribers for June 2014.

28(c):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 28.2. As described in response to Request 19 subpart (c), Comcast notes that this is not a metric that is generally kept or used in the ordinary course of business by Comcast, or, as far as Comcast is aware, by the industry generally. Comcast calculated this total by (separately) taking the gross and net revenue for each of the networks over the 12 months prior to June 30, 2014, dividing that total by 12 in order to convert it to a monthly figure, and then dividing that figure by the number of in-market subscribers for the network as of June 30, 2014.

28(d):

In response to this subpart, Comcast refers to Exhibit 19.1(b), which provides June 30, 2014, subscriber figures (separately for in-market and out-of-market) for certain networks, including each RSN.

28(e):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 28.3. For each of the RSNs which will have subscribers affected by the transaction, Exhibit 28.3 provides the number of in-market subscribers that would be served by Comcast, Charter, and SpinCo. (For other RSNs, the figures provided in Exhibit 19.1(b) apply.) Comcast notes that these figures are being calculated based on Comcast's best understanding of the current parameters of the transactions. Comcast further notes that it does not have knowledge of whether or how either Charter or SpinCo intend to carry these RSNs (or any other network) following the transactions.

28(f):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 28.4, which provides the MVPDs that operate in each market referred to in response to 28(a) (to the extent that Comcast is aware of them) that do not carry the RSNs.

All MVPDs have the opportunity to carry the referred-to RSNs. To the extent that such MVPDs do not currently carry the RSNs, it is generally because the MVPD and RSN have been unable to reach mutually agreeable commercial terms of carriage. Comcast RSNs generally seek distribution from each MVPD in these DMAs. For certain larger MVPDs, Exhibit 28.4 also provides comments regarding relevant MVPD/RSN interactions.

29. For each channel of video programming that the Company obtained from another person, separately for each month from January 1, 2009 to the present, state:

a. the name and genre of each channel of video programming the Company obtained;

b. the number of the Company's subscribers whose MVPD programming packages include each such channel;

c. the total and per subscriber fee paid by the Company for each such channel; and

d. the name and genre of each channel of video programming produced by each such person that the Company chose not to obtain and the reason(s) why the Company chose not to carry the channel.

RESPONSE:

Comcast provides the information below in response to this request. Comcast is interpreting "obtain[ing]" video programming as obtaining the right to distribute video programming on its cable systems rather than obtaining ownership interests in video programming channels.

29(a):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Comcast Exhibit 29.1. While "genre" categorizations are provided here in order to respond to this request, Comcast does not keep "genre" categorizations for each network in the ordinary course of business. Many networks' programming slates are difficult to categorize and/or could easily be viewed as fitting into two or more different genre categories (e.g., HBO Español could be viewed as a foreign language channel or a movie channel).

29(b):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Comcast Exhibit 29.2.

As is relevant to Exhibits 29.2-29.4, the information contained here is provided in the manner that it is kept by the Comcast content acquisition department in the ordinary course of business. These exhibits do not reflect the actual names of network counterparties, but rather anonymized placeholders for confidentiality purposes. Comcast records costs accrued in a given month. As fees for most networks are based on the number of subscribers to whom programming is delivered and subscriber figures are typically in flux, such fees accrued in any given month often reflect adjustments based on

over- or under-payments in past months, or other adjustments based on prior billings. **[[ ]]** Also included in Exhibits 29.2-29.4 are additional, **[[ ]]**.

29(c):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Comcast Exhibits 29.3 and 29.4. Exhibit 29.3 provides total costs per network and Exhibit 29.4 provides costs per network per subscriber. The net effective rate per subscriber is provided in Exhibit 29.4 on the basis of calculating the total cost accrued in a month (provided in Exhibit 29.3) by the number of subscribers across whom that cost is accrued (provided in Exhibit 29.2).

29(d):

Documents responsive to this request will be produced to the FCC. Comcast also incorporates its response to Request 34, below, which provides information on negotiations between Comcast and video programmers. As indicated in that response, Comcast is not aware of any network with which it has engaged in substantive negotiations but then concluded definitely that it would not carry the network. Some negotiations are still ongoing.

30. Describe how the Company determines whether to carry a particular non-broadcast programming network on its own systems and in what geographic areas that network will be carried, including the extent to which carriage decisions are made at the corporate level or by an individual system manager (include the identity of specific decision makers), and factors considered by the Company in making its carriage decisions. Explain and provide examples of how the Company evaluates potential replacements for any non-broadcast programming network, including, but not limited to: (i) the geographic areas in which it will offer the replacement non-broadcast programming network; (ii) the metrics used; (iii) how the Company evaluates potential subscriber losses for not carrying a specific non-broadcast network in a market; and (iv) the factors considered when negotiating the terms and conditions of carriage.

RESPONSE:

Comcast strives to offer a wide variety of compelling content for its customers in various packages and at various price points, while also balancing financial costs, opportunity costs, consumer demand, and available bandwidth, among other considerations. Comcast has launched or expanded the carriage of *dozens* of unaffiliated networks in recent years by more than 50 million subscribers. Comcast carries over 160 independent networks, including many small, diverse, and international networks, and more than six out of seven channels that Comcast carries are unaffiliated.

While each carriage decision involves unique circumstances, Comcast typically considers a number of factors when making the business and editorial judgments that enter into carriage decisions. Comcast typically considers: (1) programming appeal (e.g., demonstrated viewer interest, and will the network help Comcast attract or retain subscribers); (2) cost (i.e., the network's price and other economic terms); (3) network maturity (i.e., the network's track record and management); (4) bandwidth constraints; and (5) how the programming fits within Comcast's channel assortment (when comparing it to networks already carried in that particular market).

While affiliation agreements are negotiated primarily by corporate executives, carriage decisions about new cable networks are typically made in collaboration by executives in the field together with corporate executives within the Content Acquisition, Video Business Unit, and Marketing departments at Comcast Cable who can bring to bear their detailed experience and knowledge of the company and of the industry in applying the criteria set forth above. Content Acquisition executives frequently confer with divisional and regional executives regarding the subscriber demand for particular networks as well as cost and bandwidth constraints within the systems the divisional and regional executives manage. Corporate personnel at Comcast are involved in most decisions related to the carriage of new networks, including whether a particular network will be carried or not, the timing and extent of the launch of a network on Comcast systems, and the service tier on which a network is carried. Executives in the Content Acquisition

department and in the field frequently meet with programmers to receive carriage proposals and updates on demand for their services.

In many cases, the Content Acquisition department negotiates what is called a "hunting license" with a particular network. In those situations, a master agreement is negotiated to set the general terms of carriage, but decisions about whether to carry that network are made at the local level. In other situations, the Content Acquisition department negotiates a carriage agreement that guarantees some initial linear carriage and allows for some flexibility about tier placement or expansion to additional subscribers. Typically, a Comcast region that wishes to add a network to one or more of its systems' lineups, or to change a network's distribution level, **[[ ]]**.

Key executives involved in the carriage decision-making process include **[[ ]]**.

Key Program Carriage Factors

Programming Appeal

Comcast considers network programming content and appeal to subscribers to be of critical importance when making carriage decisions. In assessing the desirability of adding (or expanding or reducing the carriage of) a particular network, Comcast takes into account the composition of its overall programming lineup and the impact of the network on Comcast's overall ability to attract or retain subscribers.

As noted above, carriage decisions about new cable networks are typically made in collaboration by executives in the field together with corporate executives within the Content Acquisition, Video Business Unit, and Marketing departments at Comcast Cable. In this regard, Comcast does not generally use customer surveys or detailed analyses of potential substitute networks when making carriage decisions but instead relies on its division and system managers in the field – who are focused on knowing the needs of the subscribers they serve – to keep Comcast's Content Acquisition group informed about customer interest in particular networks. But Comcast does use meaningful customer inquiries, churn and retention observations, and demonstrated viewer interest. Regarding the impact on Comcast's ability to attract or retain subscribers, this process is not a precise science, but requires Comcast to make a business judgment weighing perceived subscriber interest and sentiment against cost, bandwidth constraints, and the availability of the content to Comcast's customers via other platforms (which may make using Comcast's bandwidth to offer such content a less compelling proposition). Moreover, Comcast is often required to decide between carrying competing networks that might both have loyal subscriber bases. Consequently, and as noted above, Content Acquisition executives frequently confer with divisional and regional executives regarding the subscriber demand for particular networks, as well as cost and bandwidth constraints within the systems the divisional and regional executives manage. In most discretionary carriage negotiations, Comcast also typically stays apprised of the extent to which other distributors carry the network – both those distributors that compete directly with

Comcast as well as other large cable operators who face similar competitive pressures as Comcast.

Cost

Another key factor is cost – the typical cable channel business model generally involves the distributor (Comcast) paying the owners of the cable channels that the distributor carries. Consequently, Comcast must always assess the value of adding a given network to their channel lineups in light of the network's price and other economic terms (e.g., tier position, launch commitments, long-term price inflators and protection). Perhaps the most critical economic element is wholesale programming cost – that is, how much it will cost Comcast to carry the network.

As a general rule, when negotiating with programmers, Comcast Cable seeks to obtain the lowest possible wholesale cost and greatest packaging flexibility so that it can provide attractive packages of programming at competitive prices. At its most basic level, the monetary cost of a carriage agreement for a given network is frequently the product of the license fee multiplied by the total number of subscribers who receive the network. A network's total number of subscribers across Comcast's systems is determined by some combination of (1) the number and breadth of systems distributing the network and (2) the level or package of service in which such systems offer the network. Thus, a network such as ESPN is generally offered on a highly penetrated tier to almost all of Comcast's systems, whereas a less-widely distributed network might be carried on a less penetrated tier in certain systems and not at all in other systems. If a network has demonstrated its value in the marketplace, its distribution will tend to increase over time, as it is launched in additional systems and/or made available on more broadly penetrated tiers.

Network Management Team Maturity

Comcast also typically considers the track record of a network's ownership or management team. A network launched by a company or management team that has previously successfully operated cable programming networks will often have a greater likelihood of long-term success. The experience and capabilities of a network's management team affect how a network raises and manages capital, what programming the network creates or acquires, the level of talent it can attract, the soundness of its business plan, its ability to create an advertising business, and how the entire operation executes that plan.

Bandwidth

Bandwidth and engineering constraints are a significant factor affecting Comcast's decisions regarding which networks it can carry and in which markets, and/or what format each channel is carried in (standard definition and/or high definition). Bandwidth constraints vary by system across Comcast's footprint. Although Comcast has major initiatives underway to increase bandwidth, these efforts do not necessarily translate into extra bandwidth available for new channels in any given system. For example, in many

Comcast systems, existing programming rights (including for example the right to launch an existing channel in HD) cannot be exercised due to bandwidth constraints. Where capacity is freed up, Comcast may opt to exercise these programming rights rather than launch new channels. Comcast also must weigh how much bandwidth to make available for video given the rapidly increasing levels of High Speed Internet ("HSI") usage. Rather than launch new programming in a particular market, Comcast may opt to make bandwidth available to satisfy HSI demands.

If a system faces bandwidth constraints (which most of the Comcast systems do), it may be hesitant to add programming within genres that are already heavily represented in its programming lineup, absent a passionate fan base for the programming, or it may have to substitute out an existing network, again based on field managers' assessment of the relevant subscriber interests, in order to launch a new or more desirable channel. And, even where a network is not asking for distribution on a highly-penetrated level of service, the same analysis has to be done because, for instance, it takes up the same amount of bandwidth on Comcast's systems to add a network to the Sports and Entertainment package as adding a network that is distributed to all Comcast customers.

Programming Fit

In assessing the desirability of adding (or expanding the carriage of) a particular network, Comcast takes into account the composition of its overall programming lineup. In determining programming fit, Comcast typically considers the breadth of the network's popularity, the passion or intensity of its fan base, and whether similar programming is available elsewhere within Comcast's channel lineup. There are many genres that are already heavily represented in Comcast's programming lineup, and that is certainly a relevant factor when Comcast is assessing the value proposition of another network offering programming in such well-represented genres. But the network's overall popularity and the intensity of its fan base also play significant roles. Thus, a network in a genre that is not represented in Comcast's lineup may not have much of a potential fan base or subscriber interest, whereas a network with programming in a genre that is already well-represented may be attractive *if* the network has compelling programming that sets it apart and is highly appealing (and assuming the economic terms make sense for both parties).

For example, although Comcast already carries numerous sports programming channels, it generally is willing to consider new programming that has a particularly passionate fan base. In these instances, Comcast must carefully consider the overall economics of the deal that the network is offering and work with the programmer to determine the most appropriate tier position and/or geographic carriage. College sports programming traditionally falls in this category.

Two examples of new college sports programming added by Comcast include the Big Ten Network and the SEC Network. The Big Ten and SEC conferences are known for their passionate fan bases. Thus, in Comcast systems within the Big Ten Conference

territory, Comcast carries the network on highly penetrated tiers, since there is naturally a higher percentage of Big Ten sports fans among subscribers in those regions. In systems outside of the Big Ten territory, by contrast, Comcast makes the network available on its Sports and Entertainment package, where the proportionally smaller number of passionate Big Ten sports fans can subscribe to the sports tier to receive the network. The recent expansion of the Big Ten Conference **[[ ]]**. Rutgers University and the University of Maryland became official members of the Big Ten Conference on July 1, 2014. **[[ ]]** A similar geographically-focused approach was taken with regard to the recent launch of the SEC Network.

Determining Scope of Carriage

The geographic scope of carriage varies greatly depending upon application of the aforementioned factors. Typically, a Comcast region that wishes to add a network to one or more of its systems' lineups, or to change a network's distribution level, **[[ ]]**.

Evaluation of Potential Replacements

Comcast uses all of the factors described above to evaluate potential replacements, in the event that a network is withdrawn or dropped.

31. List and describe all requests for program carriage since January 1, 2011, specifying which program carriage requests were approved and which were denied, and for each request state:

a. the date of the request and the reasons why each non-broadcast programming network request was approved or denied;

b. the genre of each non-broadcast programming network (i.e., children's, news, Spanish language, etc.);

c. the tier and channel placement for networks granted carriage;

d. whether the inclusion of the non-broadcast programming network resulted in any adjustment or modification to the price for the tier on which such programming is carried based on said carriage; and

e. whether any carriage agreement into which the Company has entered during the last three years has resulted in a change in tier placement for the subject network in any geographic area covered by the agreement.

RESPONSE:

Comcast receives numerous inquiries concerning carriage. Prior to 2011, Comcast did not track each carriage request and it still does not track the specific information sought in this request regarding each request for carriage. In 2011, pursuant to Section IV.N.2 of the Final Judgment, *United States, et al. v. Comcast Corp., et al.*, Civil Action No. 11-cv-00106 (D.D.C. Sept. 1, 2011), Comcast began producing semiannual reports that identify persons who, in writing, have requested or submitted offers for carriage or retransmission of video programming on Comcast systems, including the date of the person's most recent written request or contractual offer, and the date of Comcast's response or offer to such person. Comcast is providing copies of the reports covering January 2011 through April 2014 as Exhibit 31.

Further, and as discussed in response to Request 34, many of the requests for carriage Comcast receives (and that are identified in Exhibit 31) are merely inquiries that relate only to proposed programming concepts that are never launched as networks and do not lead to negotiations for a carriage agreement. In fact, it is relatively unusual for Comcast to enter into serious give-and-take negotiations with a video programmer about terms of carriage, licensing, or distribution for an active, launched network and then decline to carry it. Because Comcast wants to avoid inefficient use of its resources, prior to entering into such negotiations, Comcast generally will have made an initial assessment about whether the programmer is offering content that may present an appealing value proposition. In addition, Comcast must consider a programmer's ability to actually deliver the content. When Comcast enters into negotiations with a programmer, it works hard to reach a result that is mutually agreeable to both parties, even if it takes months or years to finalize an affiliation agreement. See the response to Request 30 for a further discussion of the process by which Comcast makes carriage decisions and the response to Request 34 for a further

discussion of Comcast's negotiations for carriage.

As described in response to Request 34, Comcast is not aware of any instances during the relevant time period in which carriage negotiations have concluded without resulting in an agreement. In the chart below, Comcast identifies each network that has launched on Comcast systems during the relevant timeframe, as well as its initial launch date, genre, tier, and a brief statement of the reason for carriage. As discussed in response to Request 30, the decision to launch a network is a product of many factors, which are summarized below as either an Appealing Value Proposition, Competitive Alignment (a response to competitors), or compliance with a voluntary commitment made during the Comcast-NBCUniversal transaction.

Network	Initial Launch Date	Genre	Tier	Reason
Antenna 3	2011	Spanish Language	Hispanic Tier	{{
Al Jazeera America (fka: Current)	2013	News	D1	}}
Aspire	2012	Entertainment	D1	FCC/MOU Commitment/{{ }}
AXS (fka: HDNet)	2012	Entertainment	D1	{{ }}
Baby First Americas	2012	Kids & Family	D1	FCC/MOU Commitment/{{ }}
BBC World News	2011	News	D1	FCC/MOU Commitment/{{ }}
BBCA HD	2011	Entertainment	DS	{{
beIN Sports - English	2012	Sports	SEP	
beIN Sports - Spanish	2012	Sports	SEP/H1	
Blue Highways TV	2011	Entertainment	D1	
BYU TV HD	2011	Kids & Family	B1	
CentroAmerica TV	2011	Spanish Language	Hispanic Tier	
Cine Sony	2013	Spanish Language	Hispanic Tier	
Cooking Channel HD	2011	Entertainment	D1	
Crossings TV	2012	Multi-Lingual	DS	
CSN Houston	2012	Sports	DS	
CSN Houston HD	2012	Sports	DS	
C-SPAN 2 HD	2011	News	DS	
C-SPAN HD	2011	News	B1/DS	
Discovery Familia	2011	Spanish Language	Hispanic Tier	
Disney Jr. (fka: SoapNet)	2012	Kids & Family	D1	
Disney Junior HD	2013	Kids & Family	D1	
DIY HD	2011	Entertainment	D1	}}
El Rey	2013	Entertainment	D1	FCC/MOU Commitment/{{ }}
Encore en Espanol	2014	Spanish Language	Hispanic Tier	{{
ESPN Goal Line / BuzzerBeater	2012	Sports	SEP	
Esquire (fka: Style)	2013	Entertainment	DS	
FEARnet (linear feed)	2011	Entertainment	D1	
FS Plus Arkansas	2014	Sports	DS	
FS Plus Louisiana	2014	Sports	DS	
FSN Hybrid	2011	Sports	DS	
FSN Hybrid HD	2011	Sports	DS	
FSN North Plus HD	2013	Sports	DS	
FSN Southwest (Arkansas) HD	2011	Sports	DS	
GSN HD	2011	Entertainment	DS/D1	
HSN2	2014	Shopping	DS	
Impact Network	2011	Kids & Family	B1	
LAS	2012	Spanish Language	Hispanic Tier	
LATV	2011	Spanish Language	D1	
MavTV HD	2011	Sports	SEP	
Mediaset - Italia	2011	Multi-Lingual	ALC	
Metro Sports HD	2013	Sports	DS	
Milenio TV (Spanish lang.)	2011	Spanish Language	Hispanic Tier	
Nat Geo Wild HD	2011	Entertainment	D1	
nuvoTV HD	2011	Entertainment	D1	
Outside TV	2012	Sports	SEP	
OWN	2011	Entertainment	DS/D1	}}

Network	Initial Launch Date	Genre	Tier	Reason
Oxygen HD	2011	Entertainment	DS	{{
Pac-12	2012	Sports	DS/SEP	
Pac-12 Overflow (7 regional feeds)	2012	Sports	DS/SEP	
Pac-12 HD	2012	Sports	DS/SEP	
Pasiones	2011	Spanish Language	Hispanic Tier	
Pivot (fka: Halogen)	2013	Entertainment	D1	}}
Revolt	2013	Entertainment	D1	FCC/MOU Commitment/{{ }}
SEC	2014	Sports	DS/D1	{{
SEC Overflow	2014	Sports	DS/D1	
SEC HD	2014	Sports	DS/D1	
Smithsonian	2011	Entertainment	D1	
Smithsonian HD	2011	Entertainment	D1	
Sprout HD	2011	Kids & Family	DS	
TV Guide Entertainment HD	2011	Entertainment	DS	
TYC Sports	2013	Spanish Language	Hispanic Tier	
UDN	2014	Spanish Language	D1/Hispanic Tier	
Univision (Satellite Feed) HD	2011	Entertainment	DS	
V-Me Kids	2011	Spanish Language	Hispanic Tier	}}

With respect to subsection (d) of this request, the retail price of cable service is the product of many factors, but the most critical element is wholesale programming cost – that is, how much it will cost Comcast to carry the network. Indeed, increases in overall programming costs are a principal cost input for Comcast and translate into increases in cable pricing. **{{ }}**

With respect to subsection (e) of this request, as discussed in the response to Request 30, in many cases, the Content Acquisition department negotiates what is called a "hunting license" with a particular network. In those situations, a master agreement is negotiated to set the general terms of carriage, but decisions about whether to carry that network are made at the local level. In other situations, the Content Acquisition department negotiates a carriage agreement that guarantees some initial linear carriage and allows for some flexibility about tier placement or expansion to additional subscribers. On occasion, the Content Acquisition department has negotiated carriage agreements that may result in a change in the tier placement of the subject network and has done so since January 1, 2011.

32. Provide a list of and produce a copy of all agreements between the Company and any other person for distribution of any video programming carried by the Company's (i) MVPD service and (ii) OVD service, and in each case produce all documents relating to each negotiation since January 1, 2009, between the Company and any other person regardless of whether the negotiations resulted in an agreement or informal arrangement.

RESPONSE:

Documents responsive to this request, including the requested list of agreements, will be produced to the FCC.

33. Identify each agreement the Company has entered with another person through which the Company acquires video programming from another person that contains any of the following provisions: (i) any economic or non-economic Most-Favored-Nation clause; (ii) any exclusive rights to distribute the programming; (iii) any limits on the further distribution of the programming that is the subject of the agreement either temporally, such as through the use of "windows," or by another person or class of similar persons; (iv) any limits on the further distribution of the programming on another platform; and (v) any rights to obtain, or limits on distribution of, additional programming whether or not such programming was in existence at the time the agreement was entered; (vi) any provision relating to the authentication of users, including any limits on video programming distributors that impact their ability to authenticate the identity of a user for the purpose of delivering additional data to advertisers, and any provision that concerns the extent to which access to the set-top box impacts the ability of any person to authenticate users, for example through the operations of apps; and (vii) any other provision that impacts the way that the programming is distributed or made available to other distributors or providers differential treatment of a service provided by the Company or any affiliate, and for each such agreement state:

a. the parties to the agreement;

b. the date of the agreement;

c. the term of the agreement;

d. a description of the provision;

e. the date that any party to the agreement exercised any rights or received any benefits from any of the provisions set forth in parts (i) through (vi) of this Request; and

f. a description of any actions taken or benefits received as a result of any of the provisions set forth in parts (i) through (vii) of this Request.

RESPONSE:

Comcast understands this request to relate to agreements for carriage on Comcast's MVPD service.

As discussed in response to Request 30, Comcast strives to offer a wide variety of compelling content to its customers in various packages and at various price points, while also balancing financial costs, opportunity costs, consumer demand, and available bandwidth, among other considerations. Its programming affiliation agreements will

sometimes include some of the types of provisions identified in this request. For instance, Comcast has a **{{ }}**

Regarding exclusive rights, Comcast does not have exclusive distribution rights with respect to any linear channel or Video on Demand ("VOD") that were entered into or renewed following the NBCUniversal transaction, other than short-term arrangements consistent with Condition IV.B. of the Comcast-NBCUniversal Order (i.e., 14 or 30 days). While it may be that a small number of older agreements provide for exclusivity (more likely for VOD), Comcast does not enforce such provisions.

Comcast carefully reviews proposals to limit online display of video programming to ensure compliance with Condition IV.B. To this end, Comcast's typical contract language in its carriage agreements **{{ }}**

The remaining aspects of this request are so broadly written as to potentially cover many other typical aspects of Comcast's agreements. **{{ }}**

Also, Comcast's agreements **{{ }}**

In addition, **{{ }}**

For further information on particular agreements, Comcast refers the FCC to the text of the agreements themselves, which will be produced to the FCC.

34. For each instance that the Company, in negotiations with another person that did not result in an agreement for the Company to either acquire broadcast or non-broadcast video programming from another person, or license another person to distribute the Company's broadcast or non-broadcast video programming, such negotiations proposed any of the following provisions: (i) any economic or non-economic Most-Favored-Nation clause; (ii) any exclusive rights to distribute the programming; (iii) any limits on the further distribution of the programming that is the subject of the agreement either temporally, such as through "windows," or by another person or class of similar persons; (iv) any limits on the further distribution of the programming on another platform; and (v) any rights to obtain, or limits on distribution of, additional programming whether or not such programming was in existence at the time the agreement was entered; (vi) any provision relating to the authentication of users, including any limits on video programming distributors that impact their ability to authenticate the identity of a user for the purpose of delivering additional data to advertisers, and any provision that concerns the extent to which access to the set-top box impacts the ability of any person to authenticate users, for example through the operations of apps; and (vii) any other provision that impacts the way that the programming is distributed or made available to other distributors or providers differential treatment of a service provided by the Company or any affiliate, and for each such agreement state:

a. the person to whom the term was proposed;

b. the broadcast or non-broadcast video programming that would have been the subject of the provision;

c. the date the proposal was made; and

d. the reasons why an agreement was not reached.

RESPONSE:

For purposes of this request, Comcast understands "negotiations" to mean interactions between Comcast Cable and a video programmer in which there was a serious give-and-take about terms of carriage, licensing, or distribution with active, launched networks. Similarly, for purposes of this request, Comcast understands "did not result in an agreement" to mean that negotiations have ceased without finalizing an affiliation agreement.

It is rare for Comcast to enter into negotiations with a video programmer and then decline to carry that programmer. Because Comcast strives to avoid inefficient use of its resources, prior to entering into such negotiations, Comcast generally will have made an initial assessment about whether the programmer is offering content that may present an appealing value proposition. In addition, Comcast must consider a programmer's ability

to actually deliver the content (Comcast is frequently approached by parties that have an idea for a network, but lack the funding or expertise needed to launch the network). There have been occasions in the past where Comcast expended the resources to enter into carriage agreements with programmers that have not launched their networks. When Comcast enters into negotiations with a programmer, it works hard to reach a result that is mutually agreeable, even if it takes months or years to finalize an affiliation agreement. See the response to Request 30 for a further discussion of the process by which Comcast makes carriage decisions.

As noted, most of Comcast's negotiations result in agreements and, during the relevant time period, Comcast is unaware of any negotiations involving the specific provisions identified in this request that concluded without resulting in an agreement. See the response to Request 33 for a further discussion of the types of provisions identified in this request as they may affect Comcast's programming affiliation agreements.

35. Describe each instance since January 1, 2009 when the Company obtained a lower per-subscriber fee than the rate the Company was previously paying for any video programming (including through the acquisition or sale of or affiliation with any MVPD or video programming channel), and for each such instance: (i) state the date, circumstances and the reduction received; (ii) whether the Company passed through the programming cost saving to its residential subscribers in the form of lower monthly subscription fees, moving the relevant channel to a less costly service tier, or in any other way; and (vi) produce all documents discussing any savings, including how the savings were allocated or passed through to subscribers. Produce all documents that would allow a comparison between the per subscriber fee the Company pays for video programming and the per subscriber fee paid by other persons for the same video programming.

RESPONSE:

Information and data responsive to subpart (i) of this request have been provided in machine-readable Excel spreadsheet format as Exhibit 35. Exhibit 35 provides the instances in which Comcast received a reduced per-subscriber fee and the circumstances surrounding that reduction. This exhibit does not reflect the actual names of network counterparties, but rather anonymized placeholders for confidentiality purposes.

In response to subpart (ii) of this request, Comcast generally pays for video programming on a "per-subscriber" basis – meaning that it must pay a fee for each subscriber to whom it distributes a given channel (regardless of whether a particular customer watches the programming). From Comcast's perspective, this is a variable or marginal cost. Video programming expenses are, by far, the largest variable cost that Comcast incurs, accounting for over **{{ }}** in 2013. These expenses have been rising rapidly, at a pace well above the general rate of inflation. In response, Comcast has had to pass on a portion of these increased expenses to its customers – although Comcast has generally increased retail cable rates more slowly than wholesale programming expenses have increased. Conversely, the reductions in programming costs that Comcast has been able to achieve in the instances described in Exhibit 35 served to counteract the general trend in increased video programming prices and therefore mitigated to some degree the financial pressure to raise retail cable rates. In short, costs have increased less than they otherwise would have.

Documents responsive to this request will be produced to the FCC, **[[ ]]**.

36. Provide a list of all broadcast television stations (i) which the Company owns or has an attributable interest, and (ii) the Company manages or operates pursuant to an agreement, including but not limited to a joint sales agreement or local marketing agreement, (and produce a complete copy of each associated contract), and for each station listed:

a. identify the licensee, the network affiliation (if any), the call sign, the community of license and DMA in which the broadcast television station operates, and the number of television households it reaches;

b. identify each MVPD system that currently retransmits the broadcast television station, and for each: (1) state whether the station is carried under a retransmission consent agreement or a must-carry election; (2) if the station is carried under a retransmission consent agreement, state the term and expiration date of such agreement; (3) if the station is carried under a retransmission consent agreement, indicate whether the agreement was combined, bundled, or negotiated concurrently with a contract for rights to other video programming in which the Company has a financial interest (if so, identify the specific video programming with which the retransmission rights were combined, bundled, or negotiated concurrently); and (4) identify the periods of time, if any, during which the broadcast television station was not retransmitted by the MVPD; and

c. state, for each MVPD that retransmits the broadcast television station, the number of subscribers that receive the retransmitted broadcast television station, and the retransmission consent fee;

d. state, the monthly revenues received since January, 2009, by each such broadcast station including, but not limited to, revenue received from (1) MVPDs; (2) local advertising; (3) NBCU; and (4) other sources.

RESPONSE:

Comcast is providing data for broadcast television stations which the Company owns or in which it has an attributable interest. The company does not manage or operate any stations in addition to those stations which it owns or in which it has an attributable interest.

A list of all broadcast television which the Company owns or in which it has an attributable interest has been provided in machine-readable Excel spreadsheet format as Exhibit 36.1. Exhibit 36.1 provides a list of broadcast television stations responsive to this request, as well as a number of details regarding each station as described below.

36(a):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 36.1. Exhibit 36.1 provides the call sign, licensee, community of license, Nielsen DMA, Nielsen television households, and network affiliation for all television stations owned by or attributed to NBCUniversal. The number of households reached by each television station is represented in this exhibit by the number of Nielsen television households in each DMA, according to Nielsen.

36(b):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibits 36.2(a)-(c). Exhibit 36.2(a) contains a list of MVPDs retransmitting NBC stations (excluding retransmission of NBC stations in Puerto Rico). **{{ }}** In addition, the exhibit provides the number of subscribers, the average billed rate per subscriber and the annualized subscriber fee revenue for each MVPD for each station.

Exhibit 36.2(b) contains the same categories of information for Telemundo stations (excluding retransmission of Telemundo stations in Puerto Rico). Exhibit 36.2(c) contains the same categories of information for both NBC and Telemundo to the extent it involves retransmission of broadcast stations in Puerto Rico.

36(c):

In response to this subpart, Comcast refers to Exhibits 36.2(a)-(e).

Exhibit 36.2(a) contains the information responsive to this subpart for NBC stations (excluding retransmission of NBC stations in Puerto Rico). For each MVPD retransmitting a station, it provides the number of subscribers and the average billed rate per subscriber.

Exhibit 36.2(b) contains the same categories of information for Telemundo stations (excluding retransmission of Telemundo stations in Puerto Rico). Exhibit 36.2(c) contains the same categories of information for both NBC and Telemundo to the extent it involves retransmission of broadcast stations in Puerto Rico. Exhibit 36.2(d) and Exhibit 36.2(e) provide a breakdown of subscriber data for NBC and Telemundo stations, respectively, being retransmitted by NCTC members under an NCTC license.

36(d):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 36.3.

Comcast is providing data for subpart (d)(1) on a quarterly basis for all quarters since January 1, 2013 and on an annual basis for 2012. For years prior to 2012, Comcast did not receive retransmission revenues from MVPDs. Comcast does not maintain the requested information in a form that would allow for reporting on a monthly basis.

As described in more detail above, Exhibit 36.3(a) summarizes revenues received from MVPDs beginning in 2012. Exhibit 36.3(b) and (c) contain the monthly revenues received from national advertising, local advertising, and other sources.

37. Identify each broadcast programming network owned by, operated by, managed by, or attributed to the Company, and for each such network, state the nature and extent of the Company's role in management, including whether the Company has any board representation, management rights, voting rights, veto power or supermajority or investor protection rights, and for the period beginning January, 2009, to the present, state separately for each quarter:

a. each OVD that distributes, and the total number of subscribers and unique users of each OVD who view, content produced or distributed by each broadcast programming network;

b. the total revenues, separately categorized by (1) subscription fees, (2) advertising revenues, and (3) other (briefly describe) received from each (a) MVPD; (b) non-affiliated OVD; (c) affiliated OVD; and (d) broadcast affiliate;

c. the margin the Company earns on each broadcast programming network separately for each (1) MVPD; (2) non-affiliated OVD; and (3) affiliated OVD; and

d. the value to the Company of selling each broadcast programming network to each additional subscriber (categorized by (1) subscription fees, (2) advertising revenue, and (3) other (briefly describe)), separately for each (a) MVPD; (b) non-affiliated OVD; and (c) affiliated OVD.

RESPONSE:

In response to this request, Comcast refers to Exhibit 18.1, which provides information regarding broadcast networks NBC and Telemundo. The relevant information is reproduced in the table below:

Channel	Any Changes in Ownership Since 2009	How and When Channel Formed and From Whom Interest Was Acquired	Management & Voting Rights
NBC	Prior to January 2011, the network was owned by NBCUniversal. In January 2011, ownership of the network was transferred to the NBCUniversal joint venture, which was 51 percent owned by Comcast and 49 percent owned by GE. In March 2013, Comcast acquired GE's ownership interest, increasing Comcast's interest to 100 percent.	NBC was formed in 1926 by the Radio Corporation of America.	Since Comcast has a 100 percent interest, it has full management control and governance rights.
Telemundo	Prior to January 2011, the network was owned by NBCUniversal, which was owned by GE. In January 2011, ownership of the network was transferred to the NBCUniversal joint venture, which was 51 percent owned by Comcast and 49 percent owned by GE. In March 2013, Comcast acquired GE's ownership interest, increasing Comcast's interest to 100 percent.	Telemundo was founded by Angel Ramos in San Juan, Puerto Rico, with the launch of WKAQ on March 28, 1954. Telemundo was launched in the United States in 1987. Telemundo was acquired by NBCUniversal on April 12, 2002.	Since Comcast has a 100 percent interest, it has full management control and governance rights.

37(a):

In response to this subpart, Comcast refers to Exhibits 19.5(a)-19.5(d), which, as described in response to Request 19 (subpart (d)), provide information regarding OVDs to whom Comcast licenses OVDs. As described, the titles that are licensed to OVDs generally do not correspond to the full programming slates of particular networks (whether a broadcast network or a cable network), but rather consist of specific programs

of particular networks, as well as movie titles that may not necessarily have appeared on television.

37(b):

With regard to revenues from OVDs, Comcast refers to and incorporates its answer in response to subpart (a).

With regard to revenue from MVPDs, Comcast refers to Exhibits 19.2(a)-(b), as described in response to Request 19 (subparts (a)-(b)). All of NBC and Telemundo's revenues from MVPDs can be categorized as subscriber revenue. These broadcast networks, like cable networks, do not receive advertising revenues from MVPDs.

37(c):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 37.1, which provides total OCF for each broadcast network. Comcast does not maintain data permitting it to calculate network-specific margins on an MVPD or OVD basis, and is therefore providing total OCF for each broadcast network in Exhibit 37.1. After the fixed costs of producing a particular channel or program have been incurred, there are minimal costs associated with providing programming to a particular MVPD or OVD. Comcast also refers to Exhibits 19.3(a)-(b) which provides information regarding NBC retransmission fees per subscriber.

37(d):

Comcast does not maintain additional data permitting it to calculate "value" as distinct from "margin," and therefore in response to this subpart, Comcast refers to and incorporates its responses to subparts 37(b) and 37(c). In response to subpart (d)(2) regarding advertising revenue, information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 37.2, which provides total advertising revenue for each broadcast network.

38. As of June 30, 2014,

a. identify each broadcast television station owned by or in which the Company has an attributable interest in, and state the call sign of the station and the DMA it serves;

b. state separately, for each station identified in response to subpart (a), the average retransmission consent fee per subscriber;

c. state NBCU's and Telemundo's average gross and average net advertising revenue per viewer for national broadcast advertising sales, and explain how these values were calculated; and

d. state separately for each station identified in response to subpart (a), the average gross and the average net advertising revenue per viewer for local spot advertising sales sold by the station, and explain how these values were calculated.

RESPONSE:

38(a):

In response to this subpart, Comcast refers to Exhibit 36.1. Exhibit 36.1 provides the call sign and the Nielsen DMA for all television stations owned by or attributed to NBCUniversal.

38(b):

In response to this subpart, Comcast refers to Exhibits 36.2(a)-(e).

Exhibit 36.2(a) contains the information responsive to this subpart for NBC stations (excluding retransmission of NBC stations in Puerto Rico). For each MVPD retransmitting a station, it provides the average billed rate per subscriber.

Exhibit 36.2(b) contains the same categories of information for Telemundo stations (excluding retransmission of Telemundo stations in Puerto Rico. Exhibit 36.2(c) contains the same categories of information for both NBC and Telemundo to the extent it involves retransmission of broadcast stations in Puerto Rico. Exhibit 36.2(d) and Exhibit 36.2(e) provide the names of MVPDs that retransmit NBC and Telemundo stations, respectively, under an NCTC license.

38(c):

In response to this subpart, Comcast refers to Exhibits 36.3(b) and (c). Exhibit 36.3(b) and (c) contain the average gross and average net advertising revenues per viewer for national broadcast advertising.

The average net advertising revenues per viewer for an individual station were calculated by dividing the revenues from national advertising for the station by the number of viewers 18 years of age or older as of January 1, 2014 (as reported by Nielsen). **{{ }}**

38(d):

In response to this subpart, Comcast refers to Exhibits 36.3(b) and (c). Exhibit 36.3(b) and (c) contain the average gross and average net advertising revenues per viewer for local spot advertising.

The average net advertising revenues per viewer for an individual station were calculated by dividing the revenues from local advertising for the station by the number of viewers 18 years of age or older as of January 1, 2014 (as reported by Nielsen). **{{ }}**

39. Produce all documents relating to:

a. the Company's current and continued support for currently deployed operator-supplied CableCARD devices, currently deployed retail CableCARD devices, and future CableCARD devices;

b. the Company's plans to deploy system technology or otherwise offer any relevant service that will be incompatible with the current CableCARD standard, including documents discussing the nature of the new technologies and the timeframes for their deployment;

c. technologies currently deployed by TWC but not by Comcast, such as StartOver and LookBack, including underlying system technologies not generally visible to consumers;

d. the development and deployment of streaming solutions that provide the Company's broadcast or non-broadcast video programming to consumer devices with or without using in-home hardware to transcode the video programming;

e. the extent to which new system technologies used in providing any of the Company's relevant services would enhance or limit a subscriber's ability to use a consumer-owned navigation device to record video programming; and

f. consumer-owned navigation devices, including, but not limited to, compliance with Section 629 of the Communications Act through technologies other than CableCARD, including downloadable security, and agreements to develop and support these technologies, and the retail and wholesale pricing of CableCARDs, including licensing fees. (47 U.S.C. § 549).

RESPONSE:

Documents responsive to this request will be produced to the FCC.

40. Describe the Company's current participation in, support for, and future plans relating to:

a. CableLabs, and its role in the development of products and technologies deployed by or planned to be deployed by the Company in providing any relevant service, particularly relating to the Comcast X1/X2 platform and other cloud services; and

b. The Society of Cable Telecommunications Engineers, and its role in the development of products and technologies deployed by or planned to be deployed by the Company in providing any relevant service, particularly relating to the Comcast X1/X2 platform and other cloud services.

RESPONSE:

40(a):

CableLabs is a research and development consortium supported by the cable industry, and has helped develop numerous technologies that are widely deployed by all cable operators today, including DOCSIS (which is the standard that allowed cable operators to begin offering Internet and IP video services) and Packet Cable (for wireless, gaming, and IP voice services). CableLabs also is helping to drive the development of next generation cable technologies, such as DOCSIS 3.1, the Converged Cable Access Platform ("CCAP"),[84] and more energy efficient set-top boxes. Comcast has been an active participant in, and supporter of, these activities, and, as detailed in the Public Interest Statement, has started deploying, or will soon deploy, these technologies in its cable systems.[85] Comcast will continue to participate in CableLabs' activities in the

[84] CCAP is a new technology that will enable Comcast to bond 16 or more downstream QAM channels and 8 upstream QAM channels to deliver downstream speeds in excess of 250 Mbps and upstream speeds in excess of 50 Mbps over Comcast's existing HFC network plant. Comcast has begun deployment of CCAP technology and will have it deployed to about **[[ ]]** percent of its footprint by the end of this year, **[[ ]]** percent by the end of 2015, and 100 percent in 2016. *See* Public Interest Statement at 34-35.

[85] *See* Public Interest Statement at 34-35. In December 2013, Comcast joined with other leading multichannel video programming distributors, equipment manufacturers, and energy advocacy groups in launching a historic set-top energy conservation agreement. When fully implemented across the industry, the agreement will result in an estimated $1.5 billion in annual residential electricity savings and reduce carbon emissions by the equivalent of four power plants each year. Comcast already meets most of the energy savings goals set out in the agreement. In 2013, over 93 percent of the new set-top boxes Comcast purchased and brought into its inventory satisfied the Environment Protection Agency's ENERGY STAR 3.0 efficiency levels, exceeding the 90 percent benchmark established in the agreement. Comcast expects those percentages to increase in 2014. At the same time, Comcast is also working with its vendors on the next-generation of energy-efficient set-top boxes. For example, Comcast is partnering with silicon chip manufacturers to integrate auto-power-down "deep sleep" modes and other energy features into their "system-on-a-chip" technology used in set-top boxes. *See A Commitment to Creating the Sustainable Devices of Tomorrow*, Comcast Corp., http://corporate.comcast.com/news-information/news-feed/a-commitment-to-creating-the-sustainable-devices-of-tomorrow (last visited Sept. 10, 2014). A new report released last month shows that the voluntary agreement has saved American consumers approximately $168 million in energy bills. According to the Voluntary Agreement for Ongoing Improvement to the Energy Efficiency of Set-Top Boxes 2013 Annual Report, the improved energy efficiency of set-top boxes also represents a savings of nearly 842,000 metric tons of carbon dioxide (CO_2) per year. *Voluntary Agreement for Ongoing Improvement to the Energy Efficiency of Set-Top Boxes 2013 Annual Report* 15 (Aug. 15, 2014). This is equivalent to the output of one-half of a large (500MW) power plant. See Press Release, NCTA, Energy Efficient Set-Top Boxes Saving Consumers Hundreds of Millions of Dollars (Aug. 28, 2014), https://www.ncta.com/news-and-events/media-room/content/energy-efficient-set-top-boxes-saving-consumers-hundreds-millions-dollars.

future. With respect to the X1 platform,[86] while some of the features of the platform make use of technologies developed by CableLabs, such as DOCSIS and CableCARD, CableLabs has not played a role in the development of the X1 platform itself, and Comcast does not envision that changing in the future.

40(b):

Comcast also has been actively involved in the standards-setting work of the Society of Cable Telecommunications Engineers ("SCTE"), and will continue to participate in SCTE activities in the future. Among other things, SCTE has been responsible for setting cable industry standards relating to digital video delivery over cable networks; DOCSIS; emergency alert systems; network monitoring systems; cables, connectors and amplifiers; and construction and maintenance practices. These standards have been broadly adopted in cable networks today, and the X1 platform conforms to the relevant standards. So, for example, the XG1 set-top box, which is used to access the X1 platform, accesses digital video pursuant to SCTE standards and also conforms to SCTE standards for use of CableCARDs and digital connectors in cable equipment. However, SCTE was not involved in the development of the X1 platform itself, and Comcast does not envision that changing in the future.

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[86] Although Comcast has significantly enhanced the X1 platform since its initial launch, including by launching what has been referred to as the X2 guide, the term X1 platform generally encompasses the original launch of the platform and all subsequent updates, and accordingly, Comcast herein refers to the X1 platform.

41. Describe, and produce all documents relating to, each instance the Company has attempted to partner with another MVPD to achieve joint objectives, including but not limited to attempts to launch a coordinated TV Everywhere service. In the description, state the results of each instance and the reasons for its success or failure.

RESPONSE:

As detailed in the response to Request 40, Comcast will work on an industry-wide basis with other cable operators to develop core technologies that are supported in most cable networks and equipment today. These efforts have produced many successes, such as the DOCSIS and digital video distribution standards. More recently, Comcast established a joint venture with Time Warner Cable and Liberty Global to develop the Reference Design Kit ("RDK"), a pre-integrated software bundle that provides a common framework for powering IP set-top boxes and other customer-premises equipment. The RDK was created to accelerate the deployment of next-generation video products and services. However, while these and other joint efforts have been successful in developing core technology capabilities that have broad application across the cable industry, Comcast's experience has been that joint efforts to develop actual products and services have been more challenging. In many cases, joint efforts do not achieve all of the potential benefits because of well-known difficulties that arise in contracting, including transactional frictions and costs, differences in beliefs and strategy, double marginalization, and the requirement for large investments specific to collaboration with another company in which returns hinge on the future behavior of the other company.

Comcast documented in its Public Interest Statement and/or the accompanying Rosston/Topper and Angelakis declarations specific instances where Comcast and TWC, or Comcast and other cable operators, have sought to achieve efficiencies via contracting or consortium approaches in several contexts with mixed results.[87] Comcast provides an abbreviated summary of those efforts here.[88] Comcast does not track systematically every possible MVPD collaboration entertained by the company, so what follows is an overview of collaborations that Comcast is aware of that are responsive the Information Request.

First, **{{ }}**

[87] *See* Public Interest Statement at 81; *see also* Applications and Public Interest Statement, Declaration of Dr. Gregory L. Rosston & Dr. Michael D. Topper ¶¶ 72-79, 111-115, 141, 158-160, MB Docket No. 14-57 (Apr. 8, 2014) ("Rosston/Topper Decl."); Applications and Public Interest Statement, Declaration of Michael J. Angelakis ¶ 17, MB Docket No. 14-57 (Apr. 8, 2014).

[88] Documents responsive to this request will be produced to the FCC. In addition, material responsive to this request is provided as Exhibit 41.

Second, Comcast's and other cable operators' efforts to develop a common "front door" by which cable customers nationwide could access TV Everywhere content from their local cable operator met with frustration. This front door was conceived of as a single application and user interface for customers to access their respective cable providers' TV Everywhere content on third-party consumer-owned devices, such as tablets, smartphones, computers, and gaming consoles. **{{ }}** These efforts were unsuccessful because, among other things, conforming to a common approach given the realities of differing legacy and planned technologies, priorities, and business models became overly complex for the parties. As a result, Comcast and its would-be partners were unwilling to make the necessary investments.

Third, Comcast and TWC were not able to collaborate to offer a "Download To Go" feature across their combined footprint. Comcast offers its customers the ability to download content to mobile devices and tablets via the Xfinity TV Go app, which allows customers to watch content on those devices when not connected to the Internet. Comcast and TWC put time and effort into a technical collaboration to make this technology available to TWC customers. However, they ultimately found that the difficulties and costs associated with supporting two different technology roadmaps were prohibitive and they were not able to proceed with the partnership.

Fourth, for several years Comcast and other cable operators have discussed partnering to serve super-regional businesses that span their footprints. In this regard, Comcast and TWC very recently signed their first (and only) joint contract. Further, TWC recently evaluated the feasibility of a more extensive consortium between cable operators to pursue large, super-regional business customers, and identified a number of potential obstacles to success. For example, TWC concluded that **[[ ]]**.

Fifth, joint industry efforts to develop advanced advertising services also met with failure. Canoe Ventures was a joint venture launched by the six largest cable operators in 2008 to provide advanced services (primarily interactive advertising, but also addressability, and VOD insertion). Canoe encountered numerous challenges due in part to varying degrees of digital capabilities and other technology differences across cable companies. It managed to launch an Interactive TV product in 2010 that let viewers request more information, coupons, or product samples. However, acceptance was limited and Canoe "pulled the plug" on its interactive operations in 2012 and redirected its efforts. The consortium approach added a lot of complexity and difficulty, including disagreements about desired deployment times, management issues (size of staff and tension over who was owner and seller of the platform), and conflicting incentives between owners of the venture. Technical coordination problems between partners and platforms also played a role.

Sixth, **{{ }}**

42. Describe the extent to which the technology, cloud services, software, and hardware developed in support of the X1 and X2 platforms are available for license or purchase by unaffiliated MVPDs from (i) third party hardware, software, and service providers, and (ii) available for license or purchase from Comcast.

RESPONSE:

The X1 platform currently comprises over 400 separate but to some extent interdependent components, and includes technology developed and owned by Comcast as well as technology purchased or licensed on a non-exclusive basis from a variety of third parties, and technology available as open source. The platform includes six basic service systems, and is supported on Comcast-supplied, but third-party-manufactured, set-top boxes (e.g., the XG1) and on customer-owned devices via Xfinity mobile apps. What follows is a general description of each of the six service systems:

- *RDK*: RDK is a pre-integrated software platform based on IP and other technologies that can be used in a wide range of set-top boxes and other devices and provides a common platform for the X1 user interface and other services. RDK allows flexibility for optional components selected by the operator, so the components that Comcast selects can and do differ from those selected by other operators. RDK is licensed out on a royalty-free basis by a joint venture that includes Comcast, Time Warner Cable, and Liberty Global, and has now been licensed to over 150 entities.

- **[[ ]]**

- *Xcal Data Services*: These are the interactive features that customers can access via the user interface and that have been incorporated into the programming guide, such as traffic and weather information. Comcast licenses these services from third-parties.

- *Viper*: The Viper system is the component of the X1 platform that is used for content ingest, storage, processing, and delivery of video content in IP (as opposed to over traditional cable QAM). **[[ ]]**

- *Compass*: Compass is the system that, among other things, Comcast uses to aggregate metadata from Rovi, Common Sense Media, Rotten Tomatoes, and other sources, and to process search, browse, and recommendation queries from X1 customers to help customize the user experience. **[[ ]]**

- *XBO:* Xcal Back Office ("XBO") is the system that provides back office support for the X1 platform. It consists of hosting, monitoring, and other server-based technology and services that Comcast purchases from third parties.

As noted, Comcast licenses components from third-parties on a non-exclusive basis, so a company that wanted to build its own platform using these same components would be able to pursue that option. Of course, such a company would also need to do its own integration work to combine these components with technologies that the company owns or obtains from open source in order to develop its own finished service. Other investments are required to maintain and support the platform. To give a sense of the level of effort, Comcast has over **[[ ]]** engineers working on X1.

(It also bears noting that there are already competing services in the marketplace today, such as Cisco's Videoscape service and Ericsson's Mediaroom, so a company could also pursue these alternatives.)

As Comcast explained in the Public Interest Statement, Comcast has explored arrangements to enable unaffiliated companies to license the X1 platform in its entirety. **{{ }}**

43. With respect to the deployment of TV Everywhere provide:

a. a complete list of devices for which the Company provides TV Everywhere authentication and a complete list of applications for which the Company provides TV Everywhere authentication, that also includes identification of each device through which access for each application has been approved;

b. a list of and description of each application and device for which the Company is currently negotiating TV Everywhere authentication services;

c. a list of and description of each application and device for which the Company has declined to provide TV Everywhere authentication services;

d. a description of all the criteria used by the Company to determine whether to enter into an agreement to provide TV Everywhere authentication service to an application, content provider, or device manufacturer;

e. all documents relating to the planned or possible deployment of TV Everywhere technologies currently offered by Comcast to its current subscribers but not offered by TWC to its current subscribers; and

f. a description of Comcast's authentication of HBO Go on consumer-owned devices.

RESPONSE:

43(a):

TV Everywhere ("TVE") authentication services generally refer to the services a multichannel video programming distributor ("MVPD") provides to authenticate that a consumer trying to access TVE video programming over the Internet is a customer of the MVPD and that the video programming the customer is attempting to access is part of that customer's MVPD service. Comcast provides TVE authentication services for programmer websites and programmer applications running on customer-owned devices, and also provides its own TVE services via the XfinityTV.com website and the Xfinity TV Go application running on customer-owned devices. With respect to programmer websites and applications, Comcast currently provides TVE authentication services for the websites and applications of **[[ ]]** different program networks on up to **[[ ]]** different device platforms. These numbers have been growing – this year alone, Comcast has already integrated its TVE authentication services with **[[ ]]** additional networks on **[[ ]]** different devices – and that trend will continue as more programmers pursue TVE authentication. A chart detailing the programmers that are using Comcast's TVE authentication services, and the devices on which those apps are authenticated, is attached hereto as Exhibit 43.

With respect to Comcast's own TVE services, XfinityTV.com and Xfinity TV Go include on-demand content from the following programmers: **[[ ]]**

The Comcast website and app also include the following live TV channels:[89]

89 *See Streaming Now Online*, Comcast, http://xfinitytv.comcast.net/watch-live-tv (last visited Sept. 9, 2014).

A&E
History Channel
BBC World News
beIN Sports
beIN Sports en Espanol
Big Ten Network
Disney Channel
Disney Jr
Disney XD
ESPN
ESPN 2
ESPN 3
ESPN Deportes
ESPNews
ESPNU
SEC Network
SEC+
Bravo
CNBC
E!
Golf Channel
MSNBC
mun2
NBC Sports Network
Oxygen
Sprout
Syfy
USA Network
FOX News Channel
FOX Business Channel
FOX Sports 1
FX
FXX
National Geographic Channel
Nat Geo Wild
Nat Geo Wild Portuguese
Pac-12 Network
Pac-12 Arizona
Pac-12 Bay Area
Pac-12 Los Angeles
Pac-12 Mountain
Pac-12 Oregon
Pac-12 Washington
Cooking Channel
DIY
Food Network
HGTV
Travel Channel
Starz
CNN
HLN
TBS
TruTV
TNT
Willow TV

The XfinityTV.com website can be accessed on personal computers and other device platforms using Internet Explorer, Firefox, Chrome, or Safari browsers. The Xfinity TV

Go app is available on iPhone, the later generations of iPod touch, iPad, Kindle Fire, and some Android phones and tablets.[90]

43(b):

Programmers hold the rights to enable Comcast customers to access the programmer's authenticated content via Comcast's and/or the programmer's website and app. Comcast typically requests such rights from programmers, and subsequently negotiates TVE rights as part of a broader affiliation agreement with a particular programmer or program group that will also address carriage of cable-delivered programming, content security, marketing, license fees, ad shares, and other aspects of the affiliation relationship. These negotiations usually occur when a program network is first launched or at renewal. However, Comcast continues to be interested in acquiring TVE-related rights from programmers between launch and renewal to more quickly gain the ability to offer consumers more video content via online platforms. Comcast has currently requested rights and/or is actively negotiating TVE rights with the following programmers for authentication via Comcast's website and apps and the programmer's website and apps:

Cable Group/Networks
{{ }}
Multicultural Networks
{{ }}
Broadcast Groups/Stations
{{ }}
Other
{{ }}

There are also instances where a particular programmer or program group may not be interested in having Comcast authenticate its website or app (potentially because the programmer has not yet developed its website or app to provide authenticated content). In those cases, Comcast will negotiate with the programmer only for authentication via Comcast's website and apps. The following programmers fall into this category:

[90] The XfinityTV website and Xfinity TV Go app provide a path for online authentication for smaller programming networks that may not have the resources to create a website and/or application that can support video streaming and pay for back-office support for authentication and other services. This includes several small independent programmers that might otherwise not offer online TVE options.

Multicultural Networks
{{ }}
Broadcast Groups/Stations
{{ }}

In addition, Comcast has had discussions with programmers for which it already provides authentication services about expanding those services to new platforms. This category includes: **{{ }}**

Finally, Comcast is engaged in negotiations with **{{ }}** to support authenticated services on those platforms, whether for the Xfinity TV Go app or individual programmer apps.

43(c):

With respect to Comcast's Xfinity website and app, Comcast customers have access to over 50 live TV channels,[91] as well as on-demand content from a wide range of programmers, and Comcast is seeking to obtain the rights to include *more* programmers in these services in its affiliation negotiations.

As for programmer applications, as explained above, Comcast has been steadily expanding the number of programmer apps that it authenticates. Comcast has not "declined" to authenticate any particular programmer (or device) in the sense of having made any official or final decision in any case that it would and would not do so. However, there are instances where Comcast and a particular programmer have not reached agreement – either on launching authentication services with the programmer, or expanding authentication services to new device platforms. There are a variety of reasons why this may occur. For example, a programmer may not offer Comcast the rights for Comcast subscribers to be authenticated on the programmer's app or website; or Comcast and a particular programmer may reach an impasse over the value of such rights, or such programmer may not be willing to protect the data that Comcast is providing as part of the authentication services or support Comcast's fraud mitigation policies. In most cases, Comcast and the programmer work through the issue, but discussions over TVE-related rights and authentication services can sometimes take a long time to complete.

43(d):

Comcast considers a variety of factors when determining whether to enter into a TVE agreement, but, the first step requires the programmer to be willing to grant Comcast the right to give access to authenticated content to Comcast subscribers. As noted, with

91 *See Streaming Now Online*, Comcast, http://xfinitytv.comcast.net/watch-live-tv (last visited Sept. 9, 2014).

respect to programmers, Comcast will typically consider TVE rights in the context of a broader negotiation over an affiliation agreement that will often include a wide range of issues covering multiple platforms and services. Consequently, the gives-and-takes of each negotiation will be different, so the precise scope of TVE rights that are negotiated will vary from deal to deal. Authentication services involve handing off sensitive consumer data (about entitlements, subscriber status, services purchased, etc.) to programmers to assist in the programmers' effort to provide access to such entitled content via the programmer's website or its applications running on customer-owned devices. In general, Comcast will want to ensure that any TVE agreement satisfies certain guidelines relating to the protection of customer data, fraud prevention (so that customers or other individuals cannot access content they have not paid for), procedures to ensure the security and integrity of the authentication process, and other measures associated with the authentication services. To the extent that a programmer refuses to adhere to adequate fraud prevention, consumer protection, or other important guidelines (which has occurred in some circumstances), this can complicate, delay, or even prevent the authentication of a website or application.[92]

With respect to devices, Comcast typically enters into an agreement with a device platform provider only where Comcast is seeking the right to include an Xfinity app on the device; otherwise, authentication of a programmer app on a particular device tends to be driven by the agreement between Comcast and the relevant programmer. In determining whether to enter into a direct agreement with a device platform provider, Comcast will take a number of considerations into account:

- *Customer Benefits*: Comcast will review the platform's usage and performance to assess how a particular platform is likely to add value for its subscribers. Comcast will consider, among other things, whether the platform has a material audience, allows for a unique or enhanced user experience, and enables the trialing of new features.

- *Service Look-and-Feel*: Comcast has a strong interest in preserving the look-and-feel of its services across device platforms. This ensures that customers have a consistent experience whether accessing services on a Comcast-supplied device or a customer-owned device. Comcast will explore whether the device is able, and the device platform provider is willing to, respect the integrity of Comcast's look-and-feel.

- *Customer Service*: Comcast also needs to ensure high quality customer service on a new platform, which needs to scale as more devices are added. When there is an issue with the authentication of the Xfinity TV Go app on a particular device

[92] Comcast is not responsible for video distribution of the programmer's content to the programmer's website and apps as part of these authentication services. Rather, the programmer is responsible for distribution, and will typically negotiate separate agreements with device platform providers to support use of the programmer's app on different platforms.

platform, Comcast typically gets the call from the customer, not the device manufacturer.

- *Regulatory Requirements*: The device platform must be able to deliver Comcast services consistent with applicable regulatory requirements, such as closed captioning and other accessibility mandates.

Comcast's goal is always to create the best experience for its subscribers, and it will continue to look for ways to maximize device choices. The large and growing number of device platforms on which Comcast supports its TVE services – and its willingness to engage in discussions with potential new device platforms like **{{ }}** – demonstrates that it is successfully advancing this goal.

43(e):

Documents responsive to this request have been provided to the FCC.

43(f):

HBO has granted Comcast rights to give access to authenticated content to Comcast subscribers, and Comcast authenticates (via Comcast's TVE authentication services) the HBO Go app on the following devices: desktop/laptop computers, iPad, iPhone, Android smartphones, Kindle Fire, Android 7 and 10 inch tablets, Samsung Smart TVs, Xbox 360, and Apple TV. As noted, **{{ }}**.

44. With regard to the capability of the Company's content and consumer premises equipment ("CPE") to interact or operate with unaffiliated content, such as through the use of applications on the Company's CPE and devices, as described on page 79-80 of the Public Interest Statement, provide:

a. a list of unaffiliated content supported by the Company that includes a description of the applications, devices or technologies that the Company uses for interoperability with such unaffiliated content;

b. the licensing and other agreements entered into by the unaffiliated content providers to accomplish the interoperability with the Company's CPE;

c. the criteria used to determine whether to grant or deny an unaffiliated person's request for access to the Company's CPE, devices or content;

d. a list of all unaffiliated content providers who have not received approval and the reasons supporting each denial for (1) unaffiliated content sources, such as those from Netflix, Hulu, and Amazon on the Company's CPE, (2) delivery of unaffiliated content to retail devices in the home, such as to Microsoft's Xbox, Sony's Playstation, TiVo devices, Roku devices, and Apple's AppleTV by in-home streaming, CableCARD, and other technologies; and (3) delivery of unaffiliated content to retail devices outside the home; and

e. all documents related to CPE research, development and innovation plans.

RESPONSE:

44(a):

Comcast currently includes two Internet-delivered apps from unaffiliated content providers on the X1 platform – Pandora and Facebook.[93] Comcast also recently launched a Comcast-developed Internet app that currently lets customers view photos they have put on third party photo-sharing sites; a similar over-the-top Comcast app allowed customers to view headlines from various third-party online news sites, but the app has been decommissioned for lack of use. In addition, Comcast used the platform for a brief period of time to provide an over-the-top app with additional NBCUniversal Olympics

[93] For purposes of responding to this request, Comcast assumes that the Commission is focused on launch of unaffiliated Internet-delivered apps on the X1 platform. To the extent the Commission is addressing the broader question of support for unaffiliated content on Comcast's cable service, Comcast detailed in the Public Interest Statement how most of the programming carried on Xfinity TV is unaffiliated, and how Comcast has been adding diverse, independent programming consistent with its obligations under the NBCUniversal Order. *See* Public Interest Statement at 114-17; *id.* at 169-70.

content to supplement the cable television offerings on various NBCUniversal channels.[94] As discussed below, Comcast has had discussions with other third party Internet content providers, including **{{ }}**, among others, but Comcast's plans for the platform are still evolving, and Comcast is assessing whether providing a large suite of apps is consistent with the cable-focused nature of Comcast's service and set-top box offerings.

Notably, the X1 platform also includes a Send-to-TV feature that allows customers to access Internet webpages over the set-top box, in conjunction with a second screen device, such as a tablet or smartphone.[95] This is an early-stage feature, which will help Comcast assess the degree to which customers have an interest in accessing Internet content over their set-top box, and whether content providers are interested in developing TV-optimized websites or applications; to date, usage has been low, though Comcast is presently working on improvements to the Send-to-TV feature.

44(b):

Documents responsive to this request will be produced to the FCC. In addition, material responsive to this request is provided as Exhibits 44.1-44.4.

44(c):

Comcast has not established criteria to determine what Internet-delivered apps from unaffiliated content providers will be launched on the X1 platform. As noted, the platform is still nascent, and the distribution of the X1 today is still relatively small: X1 is only used today by **{{ }}** subscribers, accounting for approximately **{{ }}** percent of Comcast's deployed set-top boxes, and approximately **{{ }}** percent of X1-capable set-top boxes lack the technical capability (e.g., memory and processor speed) to support Internet-delivered apps. The remainder of Comcast's subscribers receive their cable service using legacy digital set-top boxes, which have no ability to access Internet-delivered applications. While Comcast anticipates that, over the next five years, X1 penetration may increase to approximately **{{ }}** percent of Comcast subscribers, almost **{{ }}** Comcast subscribers will still be using legacy equipment.[96]

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94 *See* Press Release, Comcast Corp., Sochi 2014: A TV Everywhere Success Story (Mar. 7, 2014), http://corporate.comcast.com/news-information/news-feed/sochi-2014-a-tv-everywhere-success-story ("During the 2014 Olympic Winter Games from Sochi, Russia (Feb 6-23), NBCOlympics.com and the NBC Sports Live Extra app featured, for the first time, live streaming coverage of all Winter Games competition plus the closing ceremony, event rewinds and extensive video highlights"). **[[ ]]**

95 *See Download and Use Send to TV*, Comcast, http://customer.comcast.com/help-and-support/cable-tv/download-and-use-send-to-tv/ (last visited Sept. 5, 2014). An over-the-top provider could create a Send-to-TV-ready version of its site and ensure that an X1 customer could reach its service directly, while still within the X1 interface, rather than toggling to a different TV-connected device.

96 These penetration levels only include existing Comcast systems. If the systems that Comcast seeks to acquire from Time Warner Cable and Charter are included, those penetration levels would be even smaller since neither Time Warner Cable nor Charter support X1.

For these reasons, it is premature for Comcast to have reached definitive views about the best direction for the platform. At this stage of development, interactive features on the X1 platform largely have been used for cable-delivered apps that are tightly integrated with the core Xfinity TV cable service.[97] The Internet apps that Comcast has launched or pursued are, like the NBC Olympics app, designed specifically to enhance the cable entertainment experience with related or enhanced content. Likewise, Facebook and Pandora were selected as the initial apps for X1 because they seemed increasingly to be a part of what customers were expecting as part of their cable ecosystem – many other providers were offering these same features[98] – and because they complement the cable television experience.[99] Comcast continues to consider what the best use of the platform would be, especially given that online content and services are already readily available to consumers via the more than 24 million connected TV or streaming media devices.[100] Indeed, lack of consumer interest to date in Internet apps on the X1 has resulted in Comcast recently decommissioning its over-the-top "headline" app on the X1 for lack of use; even Pandora, which is **[[ ]]**.

44(d)(1):

Comcast has engaged in discussions with various unaffiliated content providers about launching their apps on the X1 platform, but has certainly not "denied" access to its platform to these providers. Indeed, in some cases (e.g., **{{ }}**), *Comcast* is the party that initiated the discussions at issue. But even leaving this aside, edge providers may develop a Send-to-TV compatible site to enable X1 users to access the application over the platform. No permission is required from Comcast to enable "access" from the platform in this way since this feature is fully open. In this regard, Comcast has launched

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97 X1 also includes traffic, weather, and a few other cable-delivered apps. *See X1 Applications*, Comcast Corp., http://customer.comcast.com/help-and-support/cable-tv/dashboard-for-xfinity-tv-on-the-x1-platform/ (last visited Sept. 8, 2014).

98 *See, e.g.*, *FiOS TV is the First To Make Pandora Widely Available to Subscribers*, Verizon Blog (July 20, 2011), http://forums.verizon.com/t5/Verizon-at-Home/FiOS-TV-Is-the-First-to-Make-Pandora-Widely-Available-to/ba-p/327419; Press Release, AT&T Inc., AT&T Brings Facebook to Your TV Screen with New U-verse TV App, (Aug. 29, 2012), http://www.att.com/gen/press-room?pid=23248&cdvn=news&newsarticleid=35260&mapcode=consumer|news_u-verse.

99 Facebook enables customers to pull up posts and photos that are relevant to the shows they watch, while Pandora enhances the music options available on Music Choice and other offerings on the cable service by providing a more customized listening experience.

100 *See* Quentin Fottrell, *Cable Companies Should Be Afraid of This Trend*, MarketWatch, Sept. 3, 2014, http://www.marketwatch.com/story/cable-companies-should-be-afraid-of-this-trend-2014-09-03; *see also TDG: Net-connected TV Penetration Tops 60% of Internet Households, Up 19% YOY*, PRWeb, Feb. 13, 2014, http://www.prweb.com/releases/2014/02/prweb11582038.htm (over 60% of U.S. homes have at least one connected TV device); Aaron Baar, *Good News, Roku, Streaming Media is Catching On*, MediaPost, July 9, 2014, http://www.mediapost.com/publications/article/229652/good-news-roku-streaming-media-is-catching-on.html. An X1 set-top box – like any other cable set-top box – can be plugged into any of these devices (*e.g.*, an Apple TV, a Roku, a Samsung smart TV), and an Xfinity user who wants to access an over-the-top app would simply change the input on the TV to the relevant device and navigate to the app on the device's main menu, or, in some cases, just press a dedicated button on the device's remote control for that particular app.

a portal for X1 developers, which includes documentation and guidelines for building a TV-optimized website for display on the X1 platform.

In contrast, an X1 app – just like apps in the mobile space – would likely be more integrated with the device's capabilities and services because it is offered based on a direct arrangement between Comcast and the app provider. This is not necessarily a matter of Comcast "approving" the launch of the app, but involves discussions between Comcast and edge providers contemplating an X1 app regarding requests by the app provider for its app to be integrated into the X1 menu, into the content search capabilities, and the like, which would require significant design work by Comcast; Comcast has to determine whether to commit those types of resources, which may be premature for the reasons set forth above. Many of these issues would not be "show-stoppers" for a new app launch, but they give a sense of the complexities that can be involved in a launch decision. Application providers have also asked for access to customer data, which would be incompatible with Comcast's privacy guarantees as a cable provider; have demanded that Comcast allow the app provider to keep a visiting customer in the application (rather than returning to the X1 user interface); and have sought exemption from Comcast's terms and conditions for the customer's use of over-the-top applications (i.e., the applicability of any data usage plan, which Comcast *does* apply for use of any Internet apps over the X1, whether its own or third parties').

44(d)(2):

To the extent this request relates to TVE services, Comcast addressed that issue in its responses to Question 43 and incorporates those responses by reference here. If, however, the Commission is asking about delivery of unaffiliated apps on retail devices in the home – such as support for the Facebook app on a TiVo or Roku device – Comcast is not involved in those decisions. Rather, the device manufacturer and app provider make such launch decisions. As noted above, an X1 set-top box can be used in conjunction with third party streaming video or connected TV devices, but this would have no impact on what and whether third-party applications were supported on or accessible over such devices. (Likewise, the use of the Xfinity TV application on a third-party device like an iPad has no impact on the support for or access to other applications on that device.)

44(d)(3):

To the extent this request relates to TVE services, Comcast addressed that issue in its responses to Question 43 and incorporates those responses by reference here. If, however, the Commission is asking about delivery of unaffiliated apps on retail devices outside the home – such as support for the Facebook app on an iPad – Comcast is not involved in those decisions. Rather, the device manufacturer and app provider make such launch decisions.

44(e):

Documents responsive to this request will be produced to the FCC.

45. Describe the extent to which retail customers who adopt Comcast's new services, such as the "robust and innovative" services referred to on page 83 of the Public Interest Statement, are, or will be encouraged, or will otherwise find it necessary to substitute a leased CPE for a retail CPE and the extent to which future relevant services will require proprietary hardware.

RESPONSE:

As noted in the response to Question 43 above, Comcast is strongly committed to giving customers the ability to access their Xfinity services on the device of their choice. This is true for the "robust and innovative" voice services referred to on page 83 of the Public Interest Statement, which are *only* accessible on retail CPE (given that Comcast does not offer leased phones or other equipment for those services, although for access to voice services at home, customers will need to either purchase or lease an eMTA). It is also true for Xfinity broadband service, which permits customers to use any one of 44 certified third party modems.[101] And it is true for TVE services and Xfinity TV cable services, which Comcast understands to be the focus of the question.

Comcast has a strong track record of supporting retail CableCARD-enabled devices in its cable systems, and is committed to continuing that support post-transaction. Comcast also has gone above and beyond the Commission's CableCARD requirements by working directly with TiVo to give TiVo customers the ability to access Comcast's VOD services on TiVo devices (which otherwise are not accessible via CableCARD). Comcast has rolled out this "Cardio" solution throughout its footprint. Furthermore, under the terms of an agreement Comcast recently reached with TiVo, Comcast has committed to continue to provide and support CableCARDs in retail devices notwithstanding the D.C. Circuit's *EchoStar* decision last year vacating certain CableCARD rules.[102] Comcast will ensure that all CableCARD-enabled devices will continue to have access to all linear channels in all current and future Comcast markets.[103]

Furthermore, Comcast's transition to IP cable services is resulting in *increased* access to Comcast services over third party retail devices. X1 customers today can use the Xfinity TV app to watch essentially their entire linear cable lineup (including PEG

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101 *See DOCSIS Device Information Center*, Comcast Corp., http://mydeviceinfo.comcast.net/ (last visited Sept. 8, 2014) (listing certified modems by vendor, including, among others, Zoom Telephonics, ZyXEL, Ubee, and D-Link).

102 As TiVo noted in its comments supporting the transactions, "Comcast has been the most supportive of enabling innovation in retail set-top boxes, thereby enabling consumers to have a robust alternative to an operator-leased set-top box." TiVo Comments, MB Docket No. 14-57, at 1 (Aug. 25, 2014).

103 Comcast also is an industry leader in supporting Digital Living Network Alliance ("DLNA") standards that enable the networking of cable services from Comcast-supplied set-top boxes to third-party devices in the home. Comcast was the first cable operator to deploy set-top boxes that utilized DLNA, and will be deploying DLNA CVP-2 in its XG set-top boxes. This capability will enable Comcast customers with compatible DLNA-certified CE devices to access its cable services via the home network.

and broadcast) on IP-enabled iOS devices running 7.0 or higher, and Android devices running 4.4 or higher, as well as PCs and Macs.[104] This can replace the need for customers to lease multiple set-top boxes from Comcast. Comcast also makes its IP VOD services available through an application on Xbox 360s and Samsung TVs, which likewise can obviate the need for additional set-top boxes. And Comcast is exploring delivery of its IP cable service without the need for *any* Comcast set-top box at all – so that a customer could receive their in-home cable service entirely on their own IP-enabled devices.[105]

Moreover, pursuant to the agreement with TiVo, Comcast will make available to TiVo a non-CableCARD solution for accessing Comcast's IP cable services (linear and VOD) on retail devices. This "Cardless Solution" would be supported in both TiVo and Comcast-supplied set-top boxes. In addition, Comcast has committed to make this "Cardless Solution" available to other CE companies and cable operators.

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104 *See X1 DVR with Cloud Technologies: General FAQs*, Comcast Corp., http://customer.comcast.com/help-and-support/cable-tv/x1-dvr-cloud-technology-general-faqs/ (last visited Sept. 8, 2014).

105 Comcast is doing precisely this at universities today, allowing students to watch live TV and VOD content on their IP-enabled devices, including laptops, tablets, and smartphones, while on campus. *See* Press Release, Comcast Corp., Comcast Brings TV To Every Screen for Colleges and Universities (Aug. 21, 2014), http://corporate.comcast.com/news-information/news-feed/comcast-brings-tv-to-every-screen-for-colleges-and-universities.

46. Provide the following information separately for Strata Marketing, Inc. ("Strata") and National Cable Communications LLC ("NCC Media"):

a. all ownership, voting, or management interests in Strata and NCC Media and the parties that hold these interests;

b. a description of the roles and functions of Strata and NCC Media with respect to, and separately for, national, regional, and local cable spot advertising, including, but not limited to:

i. the persons that do business with Strata and NCC Media;

ii. the access, services, and products provided by Strata and NCC Media;

iii. the criteria used by Strata and NCC Media to determine whether to provide access, services, or products to a person and the prices charged, including any affiliation with Strata, NCC Media, or a person with an interest in Strata or NCC Media; and

iv. any alternatives to Strata and NCC Media that are available to persons that wish to place cable spot advertising; and

c. separately for national, regional, and local cable spot advertising, the quarterly revenues received by the Company from Strata and NCC Media since January 1, 2009.

RESPONSE:

46(a):

Comcast owns **{{ }}** percent of NCC Media. The remaining ownership stakes are held by **{{ }}**

Comcast owns **{{ }}** percent of Strata and **{{ }}**

46(b):

NCC Media serves as a representative for MVPDs (including each major cable, Direct Broadcast Satellite, and telco video provider) in the sale of their local advertising availabilities (i.e., spot cable advertising) to national advertisers. While NCC Media negotiates on their behalf, the represented MVPDs (which sometimes serve as managers of interconnects) **[[ ]]**. In exchange for serving as a sales representative, NCC Media receives a commission of approximately **{{ }}** (depending on the counterparty) of the amount of the advertising purchase. NCC Media does business with counterparties with

whom it is able to reach mutually commercially agreeable terms. Net of NCC Media's fees, revenue from the sale of advertisements is **{{ }}** among the MVPDs and/or interconnects that contributed advertising inventory to the sale on the basis of **{{ }}**.

By representing multiple MVPDs' and/or interconnects' local advertising availability inventories across multiple markets, NCC Media enables a national advertiser to reach a large audience and/or to tailor its advertising message to particular regions or particular groups of markets in an efficient manner – by making one buy instead of dozens or more. In this manner, NCC Media reduces transaction costs for national advertisers, since they can negotiate with NCC Media for advertising purchases rather than attempting independently to aggregate availabilities from numerous MVPDs and interconnects to assemble a national or regional purchase. Affiliate MVPDs also benefit from NCC Media as they are able to receive revenue for advertising availabilities without having to invest in selling such availabilities. MVPDs could, as an alternative to using NCC Media as a representative, use a different third-party representative (such as TeleRep, HRP, MMT, Katz Media and Petry Media) or contract directly with national advertisers.

Strata is a software company that provides tools that support both advertising agencies (who buy advertising time) and MVPDs (who sell advertising time). Strata software supports these buyers and sellers in such functions as billing and campaign planning, as well as providing qualitative and quantitative research and analytic software tools. Strata does business with a number of buyers and sellers of advertising, such as advertising agencies and MVPDs. While Strata provides helpful support tools as described above, advertisers do not buy or sell advertisements through Strata as a representative. Therefore, there are no "alternatives" needed to Strata to purchase or sell cable spot advertising. There are several other firms that specialize in providing software to support the advertising industry, including, for example Mediaocean, MSA, Broadway Systems, and Telmar.

46(c):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibits 46.1 and 46.2, which provide revenue Comcast received from Strata (Exhibit 46.1) and NCC Media (Exhibit 46.2) on a quarterly basis.

Comcast **{{ }}** but rather receives revenue from NCC Media **{{ }}**. Comcast does not further categorize this revenue. Given the services that NCC Media provides as described in response to Request 46(b), this revenue can be generally categorized as being from national advertisers as NCC Media specializes in providing representation for advertising sales to national advertisers across multiple markets.

As described in response to Request 46(b), Strata provides software that supports both advertising buyers and sellers. Its revenue is not susceptible to separate categorization into local, regional, and national.

47. Provide the following information concerning the cable interconnects that are owned by, controlled by, or managed by the Company in the relevant area:

a. a description of the roles and functions of the cable interconnects with respect to, and separately for national, regional, and local cable spot advertising, including, but not limited to:

i. the parties that do business with the cable interconnects;

ii. the access, services, and products provided by the cable interconnects;

iii. how the Company determines whether to give a person access to a cable interconnect, or provide related services or products to the person, and the prices charged, including the extent to which these determinations depend on whether the party is owned by, controlled by, managed by, or affiliated with the Company; and

iv. any alternatives to the cable interconnects that are available to persons that wish to place cable spot advertising; and

b. a listing of all DMAs in which the Company owns, controls, or manages one or more cable interconnects, indicating the following for each such DMA:

i. whether the DMA also is served by one or more cable interconnects that are not owned, controlled, or managed by the Company;

ii. the extent to which any such cable interconnects overlap or compete with cable interconnects that are owned, controlled, or managed by the Company; and

c. separately for national, regional, and local cable spot advertising, the quarterly revenues received by the Company from the cable interconnects since January 1, 2009, in CSV or Excel format.

RESPONSE:

47(a):

Interconnects have typically been established and subsequently managed by the largest MVPD in a particular market in order to compete more effectively in the local advertising market. In particular, participating in an interconnect (as manager or affiliate) permits MVPDs to compete more effectively for local advertising spending with other outlets, such as broadcast television, radio, Internet, print media, and direct mail, all of which sell advertising inventory on a DMA-level with far greater coverage than any individual

MVPD. It should be noted that MVPDs generally receive only two minutes per hour of advertising availabilities on national cable networks (and none on broadcast networks) versus the 12-14 minutes per hour sold by national cable and broadcast networks. Therefore, the advertising inventory available for MVPDs to sell is considerably smaller than that of cable and broadcast networks, which sell approximately 90 percent of television commercial slots. MVPDs only account for approximately 7 percent of all local advertising sales.

The formation of an interconnect requires significant investments in personnel, research, networking, technology (to handle the processes of inserting an advertisement across multiple MVPDs and systems), and sales/marketing efforts by the MVPD that manages the interconnect. The managing MVPD of an interconnect contracts with other MVPDs in the DMA who want to participate in the local interconnects and contribute their advertising availability inventory to the interconnect for sale. The managing MVPD generally compensates participating MVPDs by distributing the revenue it generates through its sales efforts back to MVPDs **[[ ]]**.

Comcast, when it serves as a managing MVPD of an interconnect, sells the pooled advertising inventory to advertisers, primarily those who wish to advertise across a DMA. Comcast is generally willing to represent any and all MVPDs in an interconnect. Indeed, in recent years, Comcast has actually worked to *expand* the involvement of otherwise competitive MVPDs (such as satellite and telcos) in the interconnects it manages. Comcast prefers to represent other MVPDs directly rather than dealing further with a middle-man or broker (such as Viamedia); these third party brokers are not necessary to facilitate any MVPD's participation in the interconnect, and thus bring no value to the interconnect's operation, while at the same time seeking to "free ride" on the interconnect for separate inventory sales. Despite this, Comcast **{{ }}** – and Comcast expects that this arrangement will move forward. Comcast does not always serve as the manager of interconnects in which it participates; in certain markets, Comcast provides its advertising inventory to the creator and manager of a local interconnect for sale (including to Viamedia in Evansville).

As an alternative to being represented through a local interconnect, an MVPD may choose to sell its advertising inventory directly to advertisers or through another representative service (such as Viamedia). MVPDs may also do combinations of these, selling some of their advertising inventory through the interconnect and others directly to advertisers or through a different representative service.

47(b):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 47.1, which lists all DMAs in which Comcast manages an interconnect. In each of the markets where Comcast manages an interconnect, this is the only interconnect of which Comcast is aware in the DMA. As interconnects, by their nature, are generally DMA specific, Comcast is not aware of any

"overlap" with other interconnects. As discussed in response to subpart (a) above, the interconnect for a market is generally managed by the largest MVPD in a market. A major efficiency provided by interconnects is that an advertiser can purchase DMA-wide advertisements from one source (rather than having to go MVPD-by-MVPD) and so this general industry structure of one interconnect per DMA makes sense given the nature of the business.

47(c):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 47.2.

Interconnects, by their nature, sell advertisements at the DMA level to both "regional" and "national" advertisers. Interconnects do not generally focus on sales of local-zoned (or sub-DMA level) advertisements, and therefore "local" sales through interconnects are generally de minimis. Therefore, generally all of the revenue for an interconnect can be considered as having come from regional or national advertisers who purchased advertisements that covered an entire DMA. (In its historical interconnect billing data, the "regional" and "national" lines of interconnect-specific business are not separately distinguished.) For the interconnects it manages, Comcast receives revenue both as a contributor of subscribers to the interconnect and for management services provided by Comcast. These revenue streams are broken out separately in Exhibit 47.2. The "Comcast IC Share" figures in Exhibit 47.2 provide the total revenue that Comcast receives from the interconnects it manages on a quarterly basis.

As reflected in the notes in Exhibit 47.2, Comcast has certain limitations in its records regarding what portion of its advertising revenue can be attributed to interconnects for the period from 2009-2011. Therefore, for the years prior to 2012, Comcast has estimated revenue allocations for the purposes of responding to this request. For the years 2009-2011, Comcast allocated its total interconnect revenue between Comcast as a contributor of subscribers to the interconnect and the revenue it earned in fees for Comcast's services managing the interconnect. Such revenue allocations were estimated based on known revenue splits in the years 2012-2014 (including revenue trends over that period). For 2009, Comcast allocated revenue to derive a total interconnect revenue for Comcast-managed interconnects (for this year, such revenue was aggregated with Comcast's sales of its local advertising inventory in the historical data) based on the comparison of the revenue from 2010 and revenue trends. (For 2010-2014, the total interconnect revenue provided is based on exact figures.)

48. Provide the following information concerning the Company's provision of cable advertising representation services in the relevant area:

a. a listing of all DMAs in which the Company provides these services;

b. an explanation of how the Company determines whether to run advertising on a cable system that is owned or managed by the Company and the prices charged, including the extent to which these determinations depend on whether the Company provides cable advertising representation services for that advertiser; and

c. separately for national, regional, and local cable spot advertising, the quarterly revenues received by the Company from cable advertising representation services since January 1, 2009, produced in CSV or Excel format.

RESPONSE:

48(a):

In response to this subpart, Comcast refers in part to Exhibit 47.1, which lists all DMAs in which Comcast manages interconnects. Additionally, Comcast provides representation services with regard to local-zoned advertising (i.e., a sub-DMA level advertising) **[[ ]]**.

48(b):

Comcast runs advertisements in its cable systems placed by parties with whom it is able to reach mutually agreeable commercial terms, including with regard to price. Comcast does not provide advertising representation services for advertisers. Rather, Comcast negotiates with advertisers either on its own behalf or on behalf of MVPDs it represents as a seller of advertising time. (Therefore, no determination is based upon whether Comcast provides representation services for an advertiser.)

48(c):

Information and data responsive to this subpart have been provided in machine-readable Excel spreadsheet format as Exhibit 48, which provides total representation revenue information, regional/national representation revenue information, and local representation revenue information.

As described in response to Request 47(c), Comcast represents MVPDs in sales to regional and national advertisers through interconnects. Therefore, the "Comcast Interconnect Management Revenue" figure provided in Exhibit 47.2 (and reproduced in Exhibit 48) provides the representation revenue Comcast derived from representation of

MVPDs in the sale of advertisements to regional and national advertisers (with the same limitations regarding this data as described in response to Request 47(c)). This figure represents the difference between Comcast's revenue from interconnects as a contributor of subscribers to the interconnect and its total revenue from the interconnect, including management revenue. These management fees reflect the numerous investments necessary to establish and run an interconnect that Comcast referred to in Request 47(a), including in representation/sales services. The Comcast Interconnect Management Revenue figure is based on certain approximations for the years 2009-2011, as described in response to Request 47(c).

Exhibit 48 also provides Comcast's representation revenue in the sales of local-zoned advertisements. **[[ ]]**

49. Describe the impact the Company's policies and practices relating to dynamic ad insertion and addressable advertising have on the ability of advertisers who place ads on unaffiliated video programming or unaffiliated content to take advantage of these services, including but not limited to whether the programming is delivered to the Company's subscribers either though a set-top box or Internet access service, and the extent to which any restrictions imposed on unaffiliated video programming and content apply to advertisers placing ads on the Company's video programming or other content.

RESPONSE:

The Company's policies and practices in this area do not differ for advertisers placing dynamic or addressable ads in affiliated versus unaffiliated video programming, either through a set-top box or Internet access service. The technologies and capabilities that the Company offers for dynamic ad insertion ("DAI") for video on demand ("VOD") via a set-top box ("STB") and online, as well as for addressable advertising, are available to any advertisers who meet the advertising standards and guidelines agreed to between the Company and the relevant programmer, whether affiliated or unaffiliated.[106] Those technologies and capabilities are offered on the Company's "ad avail" time slots on the relevant programming, which, per industry standard, is typically two minutes per hour of programming (whether linear, VOD, or online).[107] Comcast Cable will seek to sell, through Comcast Spotlight, this entire – albeit relatively limited – inventory of ad avails based on the specific needs and goals of advertisers, without regard to whether the ad avails have been obtained from affiliated or unaffiliated programming.

As to the remaining ad avails – the vast majority of which are controlled by the programmers themselves – the sale and placement of ads for that inventory is handled directly by the programmers without the Company's involvement. Programmers, whether affiliated or unaffiliated, can arrange for access to the same DAI capabilities that the Company uses, and make it available to their advertisers.[108]

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106 These include, for example, no tobacco advertising, no alcohol commercials during children's programming, etc.

107 Comcast's allocation of advertising inventory in VOD programming content is negotiated as part of the licensing arrangement. Comcast seeks this allocation wherever it makes economic sense (*e.g.*, where there is enough content/ad avail time to merit the expense of actually employing DAI) without regard to whether the programmer is affiliated or unaffiliated.

108 Comcast Spotlight (which sells the Company's ad avails to advertisers) is also pursuing opportunities to buy excess VOD ad inventory from programmers, whether affiliated or unaffiliated, for resale to advertisers either by Comcast Spotlight or through joint marking efforts, including with addressable capabilities if desired by the advertiser. Though Comcast Spotlight entered into the first arrangement for this offering with NBCUniversal for its national cable networks, the arrangement is not exclusive to NBCUniversal and is open to unaffiliated programmers.

50. State the number of households:

a. eligible, as of the date of this Request, for the Company's Internet Essentials program, describe the method for calculating the number of eligible households, and produce all documents relied upon in formulating your response.

b. that will be eligible to receive Internet Essentials under Comcast's expanded eligibility requirements, as described on pages 63-64 of the Public Interest Statement after consummation of the proposed TWC transaction, and after consummation of the proposed divestiture transactions; describe the method for calculating the number of eligible households, and produce all documents relied upon in formulating this response.

RESPONSE:

50(a):

As of June 28, 2014, Comcast estimated that there were **[[ ]]** households within its service area that are eligible for the *Internet Essentials* program. The task of estimating the number of *Internet Essentials*-eligible households is complicated and necessarily involves a number of separate assumptions and estimates. For instance, **[[ ]]**. This data has been confirmed by survey research of *Internet Essentials* customers.

Comcast changed the assumptions when it expanded the eligibility criteria to include any otherwise qualifying families with a delinquent balance of more than one year old effective August 4, 2014. Comcast has not yet adjusted its method for estimating the number of eligible households within its service areas to account for the new eligibility criteria.

50(b):

Comcast recently began the process of determining the number of eligible households that would be living in Comcast's service territory after consummation of the proposed TWC transaction and the proposed divestiture transactions. The company has decided to seize upon the expansion of *Internet Essentials'* coverage area to refine its eligibility estimates. **[[ ]]** Comcast believes that this optimized process for estimating qualifying populations will yield a higher and more accurate number of eligible households in its existing and post-transaction markets.

Documents responsive to this request will be produced to the FCC.

51. On page 106 of the Public Interest Statement, the Applicants state that various Comcast-NBCU Order Conditions, commitments and obligations will be extended to the TWC cable systems. Provide the following information:

a. List all the conditions, commitments and obligations that will be extended to the assets acquired after consummation of the proposed TWC transaction, and after consummation of the proposed divestiture transactions, and the date the conditions, commitments and obligations will expire.

b. List all the conditions, commitments and obligations that will not be extended to the assets acquired after consummation of the proposed TWC transaction, and after consummation of the proposed divestiture transactions, and explain why each condition, commitment and obligation will not be extended to the acquired assets.

RESPONSE:

51(a):

The Parties' specific statement on page 106 of the Public Interest Statement that certain conditions adopted in the Comcast-NBCUniversal transaction would be extended to this transaction reflected Comcast's view that certain specific Comcast-NBCUniversal conditions would uniquely advance the public interest in connection with this transaction. In particular, Comcast pointed to the obligation to provide standalone Broadband Internet Access Service (Condition IV.D); the program access and related arbitration conditions (Conditions II, VII); the online video condition (Condition IV.A); the broadcast affiliates condition and commitments (Condition IX); the obligation to increase the availability of broadcast content on VOD at no additional charge (Condition XI.7); the requirement to expand VOD programming choices that appeal to children and families (Condition XIII.1); the obligation to provide improved on-screen program ratings icons (Condition XIII.2); the restriction on the use of interactive advertising in programming produced primarily for children (Condition XII.4); the non-commercial educational ("NCE") station carriage condition (Condition XV); and the diversity requirements (Condition X). With the exception of the broadcast condition (Condition IX), which remains in effect until such time as NBCUniversal and Comcast are no longer commonly owned, each of these conditions expires on January 18, 2018. Comcast also stressed that its highly successful Internet Essentials program would be extended (*see* Condition XVI.2.a-m). Although that condition has been satisfied and has expired (other than with respect to grandfathered customers), Comcast announced in March 2014 and in the Public Interest Statement that it would indefinitely extend the program, and that Internet Essentials will be extended to the acquired systems in this transaction. In addition, as Comcast made clear throughout the Public Interest Statement, Comcast's commitment to abide by the Open Internet rules will be extended to the acquired systems.

By referencing these conditions or commitment in particular, Comcast did not intend to imply that none of the *other* conditions and commitments would apply. To be sure, as set forth in subpart b below, some will not: several conditions have expired, have been completed, or have no particular applicability to the assets being acquired in this transaction and thus will not technically be "extended" to them. However, other than those, it is Comcast's intention to comply with the conditions and the commitments with respect to the acquired assets, although Comcast notes that, because these were in many cases tailored specifically to Comcast's cable systems and technologies, compliance may in many instances require some transition time or clarifications relating to the integration of TWC or Charter systems and services (as noted for example at page 110 of the Public Interest Statement).

51(b):

As noted, several conditions have expired and/or have been satisfied in full. In addition, a number of conditions have no particular applicability to the proposed transaction because they are specifically directed to the NBCUniversal assets.

A. Conditions That Have Expired

Condition VI. Replacement of Prior Conditions

VI. Replacement of Prior Conditions. This provision made clear that the conditions supersede the commercial arbitration remedy imposed in the Adelphia Transaction. Because the Adelphia Order has now expired, this provision is moot.

Condition XIV: PEG

XIV.4.a-d. Platform to Host PEG Content On Demand and On Demand Online. Comcast was required to develop a platform to host PEG content On Demand and On Demand Online. Comcast has fully satisfied the terms of this Condition. In addition, this Condition expired at the end of 2013.

Condition XVI: Expanding Broadband Deployment and Adoption

XVI.1.a-c. Comcast Broadband Footprint Expansion. The Comcast-NBCUniversal Conditions required Comcast to expand its then-existing broadband network by at least 1,500 miles per year for each of the three years and to an additional 600 courtesy account locations following the closing the NBCUniversal Transaction (i.e., during 2011, 2012 and 2013). Comcast has fully satisfied the terms of this Condition. In addition, this Condition expired at the end of 2013.

XVI.2.a-m. Expanding Broadband Adoption. This Condition required that Comcast offer its Internet Essentials broadband adoption program for three school years. Comcast has fully satisfied this requirement, and the obligation to continue to offer the program to new customers has expired. Although Comcast is required to continue offering the service to

families who enrolled during the past three years at the fixed $9.95 price, the Condition has otherwise expired. Nevertheless, as Comcast committed on the day the transaction was announced and in its Public Interest Statement, Comcast is committed to expanding its highly successful Internet Essentials program to the acquired systems.

B. Conditions that Apply Specifically to the NBCUniversal Programming Assets

Condition IV.C: Continued access to online content and Hulu

IV.C.1. Continued Programming on nbc.com. Comcast must continue to provide programming over nbc.com. This Condition is applicable to nbc.com and has no applicability to the proposed transaction.

IV.C.3. Provision of Content to Hulu. Comcast must renew its agreements with Hulu on certain terms. This Condition is applicable to NBCUniversal's agreement with Hulu and has no applicability to the proposed transaction.

IV.C.4. Relinquishment of Control Over Hulu. Comcast must relinquish management control over Hulu. This Condition is applicable to NBCUniversal's agreement with Hulu and has no applicability to the proposed transaction.

Condition X: Diversity

X.1. Diversity Channel. Comcast-NBCUniversal was required to launch a new multicast channel on its Telemundo owned-and-operated broadcast television stations utilizing library programming that has had limited exposure. This Condition has been satisfied, and in any event applies only to Telemundo owned-and-operated broadcast television stations.

X.4. New Weekly Business Program. Comcast was required to work with an independent producer to project a new weekly business news program and assist to make the program available through syndication. Comcast has fulfilled the terms of this Condition.

Condition XI: Localism

XI.1. News, Public Affairs, and Other Local Public Interest Programming. Comcast was required to preserve and enrich the output of local news, local public affairs, and other public interest programming on the NBCUniversal-owned stations and cable programming networks. This Condition applies specifically to NBC and Telemundo owned-and-operated broadcast television stations.

XI.2-3. 1,000 Hours of Additional Local News and Information. The NBC owned-and-operated broadcast television stations were required to produce an additional 1,000 hours per year of original, local news and information programming. This Condition applies specifically to NBC owned-and-operated broadcast television stations.

XI.4. News and Information Programming Reports. Comcast is required to file quarterly reports regarding the news and information programming aired on the NBC and Telemundo owned-and-operated broadcast television stations. This Condition applies specifically to NBC and Telemundo owned-and-operated broadcast television stations.

XVI.5. Non-Profit News Partners. The Conditions require that half of the 10 NBC owned-and-operated broadcast television stations establish cooperative arrangements with locally focused non-profit news organizations. This Condition applies specifically to NBC owned-and-operated broadcast television stations.

Condition XII: Journalistic Independence Condition

XII. Journalistic Independence. Comcast is required to continue NBCUniversal's policy of journalistic independence with respect to the news programming organizations of all NBCUniversal networks and stations. This Condition applies only to NBCUniversal news.

Condition XIII: Children's Programming

XIII.1.c. Additional E/I Programming. Requirement to provide one additional hour per week of children's educational and informational programming over the primary channels of all Telemundo owned-and-operated broadcast television stations and over the primary or multicast channels of all NBC owned-and-operated broadcast television stations. This Condition applies only to NBC and Telemundo owned-and-operated broadcast television stations.

XIII.2.e. Online Ratings Icons. Program ratings information is required to be included in programming provided by NBCUniversal to nbc.com, to other NBCUniversal websites, and to Hulu.com. This Condition applies only to nbc.com and other NBCUniversal websites.

52. For each of the conditions and commitments contained in the Comcast-NBCU Order, state whether it has "become part of Comcast's core business ethics and operations," as described on page 107 of the Public Interest Statement, and explain how the Company has implemented each of the identified conditions and commitments.

RESPONSE:

As detailed in Comcast's First, Second, and Third Annual Reports of Compliance with Transaction Conditions, filed in 2012, 2013, and 2014, respectively,[109] Comcast has fully incorporated the commitments and Conditions contained in the *NBCUniversal Order* into its business, and has in numerous cases gone well beyond the bare minimum obligatory compliance steps, exceeding requirements and over-delivering on its obligations. As explained in the *First Annual Compliance Report*, immediately upon release of the *NBCUniversal Order*, Comcast Corporation ("Comcast") and NBCUniversal Media LLC ("NBCUniversal") (collectively, "the Company") put in place a formal compliance infrastructure designed to oversee and guide its compliance with the Conditions and commitments related to the Transaction. Using that structure, Comcast established comprehensive processes and procedures designed to (1) ensure compliance with the requirements described in the Conditions and related commitments; (2) train relevant personnel on their obligations and the applicable guidelines; and (3) oversee reporting. The structure and elements of this compliance framework are summarized below.

Comcast Transaction Compliance Team

To implement and oversee an effective compliance program, the Company created formal organizational structures at both Comcast and NBCUniversal under the ultimate authority of David L. Cohen, Comcast Corporation's Executive Vice President. The Comcast Transaction Compliance Team is composed of two corporate officers, the Senior Vice President, Legal Regulatory Affairs and the Vice President and Chief Transaction Compliance Officer. Additional support is provided by a Deputy General Counsel and Deputy Transaction Compliance Officer and a Transaction Compliance Manager.

The team is responsible for implementing compliance controls and managing day-to-day compliance-related activities for Comcast, and for overseeing and coordinating compliance activities at NBCUniversal. In addition, the Comcast Transaction

[109] Annual Report of Compliance with Transaction Conditions, MB Docket No. 10-56 (filed Feb. 28, 2012), http://corporate.comcast.com/images/C-NBCU-Annual-Report-to-the-FCC-02-28-2012-with-Appendices_sm.pdf ("*First Annual Compliance Report*"); Second Annual Report of Compliance with Transaction Conditions, MB Docket No. 10-56 (filed Feb. 28, 2013), http://corporate.comcast.com/images/C-NBCU-Annual-Report-2012-2013-02-28.pdf ("*Second Annual Compliance Report*"); Third Annual Report of Compliance with Transaction Conditions, MB Docket No. 10-56 (filed Feb. 28, 2014), http://corporate.comcast.com/images/MB-10-56-C-NBCU-Annual-Compliance-Report-2013-2014-02-28.pdf ("*Third Annual Compliance Report*"). All three reports have been provided to the FCC as Exhibits 52.1, 52.2, and 52.3, respectively.

Compliance Team conducts training on compliance requirements, monitors compliance procedures and systems, and prepares and files the reports required under the Conditions.

NBCUniversal Transaction Compliance Team

NBCUniversal has established a parallel compliance team that is responsible for day-to-day oversight of NBCUniversal compliance activities and for coordinating with and reporting into the Comcast Transaction Compliance Team. In addition to being under the ultimate authority of Mr. Cohen, the NBCUniversal Transaction Compliance Team is under the day-to-day oversight of the General Counsel of NBCUniversal. The NBCUniversal Transaction Compliance Team is led by the Senior Vice President, Compliance, NBCUniversal, who is assisted by the Senior Counsel, Transaction Compliance and a Compliance Paralegal.

The NBCUniversal Compliance Team is also supported by the Vice President, Regulatory Affairs, NBCUniversal. In addition, the NBCUniversal Content Distribution Group conducts its own review of licensing deals that may implicate the Conditions and forwards their preliminary conclusions to the Comcast Transaction Compliance Team for review and approval.

To enhance compliance efforts, the Comcast and NBCUniversal Transaction Compliance Teams communicate on a regular basis, including through weekly conference calls, as well as additional ad hoc telephone calls and meetings, to discuss Transaction-related issues. This close collaboration ensures consistency in compliance methods, interpretation, and oversight across the Company's numerous business units. It also ensures that any problems or questions are identified and elevated at an early stage and receive appropriate attention at the highest levels of the Company, when and as appropriate. Finally, the teams are regularly advised by outside counsel versed both in the Conditions and the Company's businesses.

Training of the Relevant Business Units

The Comcast and NBCUniversal Transaction Compliance Teams, together with outside counsel, have devoted substantial time to educating Company personnel about the Conditions. This attention to training began immediately after release of the Transaction Order by notifying business leaders of the "Day One" compliance requirements (and all matters that had to be addressed within the first 90 days after the Transaction), and conducting a training session on all key compliance requirements at a mandatory meeting attended by Comcast senior corporate and business unit leaders representing all business activities implicated by the Conditions.

Since that time, the Comcast Transaction Compliance Team has continued to engage in ongoing training, including tailored, in-person training to the Comcast Video Business Unit staff, the Comcast Content Acquisition group, Comcast Corporation in-house counsel, and Comcast government affairs personnel who work in local markets across the

country; personalized training with new officers; and semi-annual training for business leaders and in-house counsel in relevant business units of the company.

Training activities have been closely coordinated with the attorneys in each affected business unit to broaden compliance oversight and to receive feedback about areas where additional training needs exist.

The NBCUniversal Transaction Compliance Team conducted similar training activities. For example, the team notified business unit leaders of "Day One" compliance requirements with respect to Conditions that were effective immediately; circulated targeted e-mails to executives at all relevant business units outlining specific obligations applicable to those businesses and circulated refresher messages on an annual and semi-annual basis; and, along with in-house legal counsel, conducted dozens of targeted training sessions on the pertinent conditions with all relevant business units.

The NBCUniversal Transaction Compliance Team also has provided and will continue to provide annual or semi-annual training and continues to work with the affected business units to ensure awareness among all employees that may be involved in business decisions relevant to any of the Conditions.

Compliance Monitoring and Auditing

Given the far-ranging scope of the Conditions, the Company established several processes to monitor, track, and audit compliance-related activities. The Transaction Compliance Teams and the relevant business units throughout the Company worked to separate every Condition into its component parts and then into concrete requirements, tasks, and goals to guide business-unit-level compliance activities. These business implementation plans were used to prepare spreadsheets and other manual tracking and calendaring tools that captured all commitment deadlines, as well as the assigned task "owners" and delegates.

In addition, the Company has contract approval processes that have been adapted specifically to ensure compliance with the Conditions. Where a relevant transaction may implicate the Conditions, review and sign off by a member of the Transaction Compliance Team is required before finalizing the agreement.

As Comcast first reported in the *Second Annual Compliance Report*, compliance oversight efforts were further enhanced during the 2012-2013 reporting period by the beta deployment of a compliance database designed to track all Conditions as well as related commitments and agreements (the "Compliance Tracker"). Now fully deployed company-wide, the Compliance Tracker provides business users across the Company a centralized tool for review of business unit progress towards meeting compliance milestones under the Conditions and related commitments and agreements. The Compliance Tracker also allows the Transaction Compliance Teams to manage the lifecycle of all Transaction-related obligations by facilitating review and documentation of task completion or gaps, and permitting ready status reports. The system is configured

to send reminders to relevant business units of the requirements of the specific conditions and commitments that apply to their areas of responsibility.

53. Identify each instance where an OVD has discussed raising, threatened to raise, or has raised, rights to programming under the Comcast-NBCU Order or the Final Judgment entered in U.S. v. Comcast Corp. and NBC Universal, Inc., Civ. Action No. 1:11-cv-00106 (D.D.C. 2011), as a means to obtain the right to distribute the Company's non-broadcast programming, and separately for each type of non-broadcast programming network (i.e., standard or high definition), describe:

a. the nature of the dispute or issue;

b. the persons involved in the dispute; and

c. how and whether the dispute or issue was resolved. To the extent the dispute was settled, explain whether the settlement required the Company to provide program access to the complaining party, and produce all documents relating to each instance identified, and any settlement thereof.

RESPONSE:

[[ ]]

In October 2011, Project Concord, Inc. ("PCI") sent NBCUniversal a notice of intent to arbitrate the terms and conditions of an agreement with NBCUniversal for access to film and television content under the Benchmark Condition. On November 2, 2011, NBCUniversal received notice from the American Arbitration Association that PCI had formally filed for arbitration. On June 15, 2012, the Arbitrator issued an award in which he chose PCI's final offer. Both parties appealed aspects of the ruling: PCI with respect to the arbitrator's determination that PCI was not entitled to attorney's fees and other costs; NBCUniversal with respect to whether the arbitrator (1) improperly concluded that films within their first year of theatrical release were intended to be included under the Benchmark Condition; (2) applied an erroneous standard for the contract defenses authorized by the Benchmark Condition; and (3) incorrectly deferred consideration of the contract defenses until phase two of the arbitration. On December 5, 2012, the Media Bureau released an order on both appeals, rejecting PCI's claim for attorney's fees and costs; affirming the arbitrator's ruling as to first-year films; finding that the arbitrator applied an erroneous standard regarding the contract defenses; and ruling that NBCUniversal had demonstrated by a preponderance of the evidence that providing certain film and television content to PCI would constitute a breach of agreements that are consistent with reasonable, common industry practice. The arbitrator's final award was thus modified accordingly. Both parties appealed aspects of the Media Bureau's decision to the FCC and are awaiting a decision on those appeals.

[[ ]]

Documents responsive to this request will be produced to the FCC. In addition, material responsive to this request is provided as Exhibits 53.1-53.2.

54. Identify the TWC and Charter cable systems where it may take "more time and technological development" to expand access to local programming and children's VOD content and to empower parents, as described on page 110 of the Public Interest Statement; and provide an estimate when these commitments will be fulfilled. Describe in detail why the Company cannot fulfill these "other programming commitments" without additional time.

RESPONSE:

For purposes of this response, it is important to note that Comcast does not have full access to information regarding the composition or status of the systems it is acquiring from TWC and Charter. Therefore, the information contained herein is based solely on Comcast's preliminary assessment of TWC's and Charter's current VOD networks and systems and Comcast's extensive experience in developing its own industry-leading VOD platform.

As explained in the Public Interest Statement, TWC's systems typically offer less than half as many VOD choices than Comcast's – and Charter's systems are comparable to those of TWC. In order to increase substantially the number of VOD choices on these systems, Comcast will need to upgrade the acquired systems' VOD server capacity *and* the bandwidth on each systems that is dedicated to VOD usage (since usage increases when there are more assets to choose from). The latter will depend on digitization of the systems, which is a major endeavor. In addition, the STBs in use on the systems today do not have an interface that can handle a much larger VOD library; if the STBs are not changed out, Comcast will have to develop and download an improved VOD portal to make a larger library searchable. In addition, to share its VOD assets, Comcast will need to integrate its digital locker technology into the systems it will acquire from Charter and TWC, which involves both rights-management and billing issues.

With respect to the on-screen ratings icons, Comcast does not yet know which of the TWC or Charter network programs require such ratings, whether the network facilities are capable of inserting the unique icons required, or to what degree those networks' have or will have to arrange the right to require third-party programming producers to include ratings icons in pre-produced content.

All of this will take some time, though Comcast intends to see that it is accomplished. In the case of both the VOD integration and upgrades and the on-screen ratings icons, Comcast will continue through appropriate integration efforts to learn more about TWC and Charter's systems. Over the next few months, Comcast should have a clearer picture, and most certainly following closing and a full assessment will have a definitive prediction.

55. State the number of local news and information programming hours, as defined in the Comcast-NBCU Order, for (i) the NBC O&Os and (ii) the Telemundo O&Os as of the closing of the Comcast-NBCU transaction.

RESPONSE:

Under Condition IX.2 adopted in the Comcast-NBCUniversal Order, NBCUniversal is required to provide an additional 1,000 hours per year of local news and information programming on each NBC O&O station and each Telemundo O&O station for a period of five years. Also, as required by the Condition, NBCUniversal has reported to the FCC, on a quarterly basis, the number of local news and information programming hours for each NBC O&O station and each Telemundo O&O station since the closing of the Comcast-NBCUniversal transaction. Comcast therefore understands this request to be for the total hours of regularly scheduled local news and information programming in the 12 months *preceding* the closing of the Comcast-NBCUniversal transaction, to serve as a baseline for measuring Comcast's compliance with Condition IX.2.

With this understanding, Comcast responds to this request as follows:

(i) The NBC O&Os produced and aired 15,758 hours of regularly scheduled local news and information programming in the year preceding the closing of the Comcast-NBCU transaction.

(ii) The Telemundo O&Os produced and aired 3,384 hours of regularly scheduled local news and information programming in the year preceding the closing of the Comcast-NBCU transaction.

56. Provide a list of each PEG channel on the cable systems to be acquired pursuant to the proposed TWC transaction and proposed divestiture transactions, and the tier(s) (including analog and digital tiers) on which each of those channels appears. Identify, by cable system being acquired, any PEG programming carried on Video on Demand or an online platform.

RESPONSE:

Comcast's response to this request is contained in an Excel spreadsheet file submitted herewith as Exhibit 56. Responsive data is included for PEG channels currently carried on Comcast cable systems that are being transferred to SpinCo in the Transactions. By agreement among the parties, TWC and Charter will each provide the Commission with similar responsive data for cable systems they each currently own which are proposed to be transferred to Comcast or Charter through the Transactions.

The Excel spreadsheet submitted with this response is organized by Comcast Division, Region, and Headend. The spreadsheet indicates the channel for each PEG channel (column I), whether the channel is carried in analog or digital or both (column J), the tier(s) on which each PEG channel appears (column K), and which of these PEG channels are offered on-demand (column K).

Please note that the spreadsheet includes several PEG channels that are listed as originating from a "Time Warner Cable Midwest" headend (column C). The headend from which these PEG channels originate is in fact a Comcast headend that was acquired from Time Warner Cable in the past.

None of these PEG channels has been carried online on-demand.[110]

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110 For more data on Comcast's online on-demand PEG offerings, *see* Letter from Lynn R. Charytan, Senior Vice President, Legal Regulatory Affairs, Senior Deputy General Counsel, Comcast Corp., to Marlene H. Dortch, Secretary, FCC, MB Docket No. 10-56, Att. B (Jan. 28, 2014), *available at* http://apps.fcc.gov/ecfs/document/view?id=7521068669 (Comcast PEG Pilot Program: Final Report and Evaluation).

57. Describe in detail and produce all documents reflecting or relating to any involvement of any officer, director, or agent of the Company to exert influence or control over the operation of Hulu, including but not limited to discussions, negotiations, or deliberations concerning any potential sale of Hulu, whether resulting in agreement or otherwise.

RESPONSE:

Comcast has not exerted or attempted to exert influence or control over the operations of Hulu. **{{ }}**

58. Produce all documents relating to allegations by any person that Comcast is not complying with any of the conditions or commitments contained in the FCC's Comcast-NBCU Order, excluding any complaints formally filed with the FCC.

RESPONSE:

Documents responsive to this request will be produced to the FCC.

59. Describe and produce all documents relating to data caps, including but not limited to: (i) any data caps imposed by the Company for each tier of Internet access service identified in response to Request 3 in any relevant area and the criteria used for imposing them and selecting the limit; (ii) the size of the data cap and the price of the Company's Internet access service both with and without the data cap; (iii) the Company's usage-based pricing (UBP) trials, rationale for them, and the findings or results of each such trial; (iv) video programming and other services subject to, and not subject to, the cap; (v) the cost, detriments and benefits to the Company and to the Company's subscribers of offering Internet access service with data caps, including the effect of the data caps on the Company's network; (vi) the effect of the data cap on the Company's customer's behavior (e.g., downloading of OVD content, purchase of the Company's PPV and VOD services); (vi) the effect of the data cap on competition for any relevant service and persons who provide video programming; and (vii) whether different UBP trials are planned, and if so, a description and timetable for each.

RESPONSE:

Documents responsive to this request will be produced to the FCC.

With regard to Comcast's data management policy, Comcast provides the following responses to the subparts set forth above.

59(i)-(ii), (iv)-(vii):

In response to these subparts, Comcast notes it does not currently have any data "caps" in place that actually limit the amount of usage available to a particular user. As described below, Comcast has launched trials of new data usage plans in a limited number of markets; these do not feature a data cap. Specifically in response to subpart (iv), Comcast states that all Internet services accessed through a customer's high-speed data product are subject to usage thresholds.

59(iii):

Prior to 2008, Comcast had an ad hoc data usage policy that did not provide specific guidance on how much data customers could use. This policy was investigated by the Florida Office of the Attorney General, which focused on the fact that Comcast's prior excessive use policy had lacked a specified data usage cap. **[[ ]]** In October 2008, as part of the "Assurance of Voluntary Compliance" settlement agreement, Comcast announced a revised Internet data usage policy that allowed residential customers up to 250 gigabytes ("GB") of data usage per month.

This 250 GB cap was designed to prevent any single residential account from consuming excessive amounts of network resources, **[[ ]]**. The 250 GB cap was set at a level that would not (and did not) interfere with typical (or even very heavy) customer usage. With

an allotment of 250 GB in 2009, customers could send 50 million plain text e-mails, download 62,500 songs, upload more than 25,000 high-resolution photos, or even stream between 100 and 800 hours of video (depending on whether they streamed studio-quality video or good quality, standard-definition video) – far more usage than the typical customer would engage in over a month of residential Internet service. As Netflix noted in April 2011, "Comcast has had 250 gigabytes caps for years without overage charges and that hasn't been a problem for Comcast customers or for us."[111]

In May 2012, Comcast announced that it was suspending the 250 GB cap nationally and instead trialing different, more flexible data usage approaches.[112] The rationale for modifying Comcast's data usage policy was the company's desire to respond to an evolving marketplace, in which other providers (wireless and wireline) were trialing new approaches, and technology, data usage patterns, and consumer online activities had evolved significantly over time. Comcast determined that, in the current marketplace, it made sense to experiment with a more flexible approach that provided consumers with more options and control and to test customer reactions to these plans and impacts on data usage. In particular, Comcast concluded that it would be more pro-consumer and pro-innovation to craft an approach that eliminated the notion of a hard cap on broadband usage and replaced it with a usage-based billing approach that allows customers that want to use more of their broadband Internet access service to pay to use however much what they want.

In developing this new approach, Comcast announced it would launch trials of new data usage plans in certain markets to understand which data management approach worked best. Comcast did not know which specific approach would prove most successful and so wished to trial different options. In markets where Comcast was not trialing a new plan, Comcast would continue to suspend enforcement of its original usage threshold. Currently, Comcast is trialing four different data usage plans in various markets representing approximately **{{ }}** percent of its footprint.[113]

Comcast launched the first trial in the Nashville, TN market in August 2012. The policy provides a 300 GB usage allotment per month for all Internet tiers. The 300 GB threshold is not a "cap"; there is no limit on how much data a customer may consume, and, indeed, Comcast has amended its Acceptable Use Policy to make clear that it is no longer a grounds for termination to use an "excessive" amount of data. Rather, under this

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111 Netflix Inc., Current Report (Form 8-K), at 8 (Apr. 25, 2011), https://www.sec.gov/Archives/edgar/data/1065280/000119312511107751/0001193125-11-107751.txt.

112 Notably, even at the time Comcast suspended the 250 GB cap, Xfinity Internet Service customers' median monthly data usage was only 8 to 10 GB per month (or four percent of the cap), and the cap impacted an extremely small number of customers. Usage trends over time did not suggest any impending spike that would radically change this pattern.

113 Additional information on Comcast's current data usage plan trials is also available on Comcast's website. *See Questions & Answers About Our New Data Usage Plan Trials*, Comcast Corp., http://customer.comcast.com/help-and-support/internet/data-usage-trials (last visited Sept. 10, 2014).

approach, a customer who uses more data than the "threshold" amount is billed for the additional usage – $10 for 50 GB increments in excess of the threshold. Customers are actively notified via e-mail and in-browser notifications at 90 percent and 100 percent of the usage threshold. They can request additional notifications at usage points between 50 percent and 125 percent.

The second trial with a slightly different policy was launched in Comcast's Tucson, AZ market in October 2012. In Tucson, customers receive at least a 300 GB per month initial allotment at every tier of high-speed Internet service. At higher speed tiers, customers receive larger initial allotments. Thus, customers start with a 300 GB usage allotment for the Economy Plus through Performance tiers, and receive higher Internet allotments at each successive tier of high-speed data service (350 GB for Blast tiers, 450 GB for Extreme 50 tiers, and 600 GB for Extreme 105 tiers). Again, the various thresholds are not "caps." Customers may use as much data as they like but are subject to billing for any overage in additional 50 GB increments for $10. Customers on this plan are actively notified via e-mail and in-browser notifications at 90 percent and 100 percent of the usage threshold, and they can request additional notifications at usage points between 50 percent and 125 percent.

The third trial was launched in Comcast's Fresno, CA market in August 2013, designed to provide customers with the opportunity to pay less if they use less. In this trial, customers who subscribe to Comcast's Economy Plus tier are offered a voluntary, flexible data option that allows them to adopt a 5 GB threshold. Usage at 5 GB per month or below results in a $5.00 credit to the customer, while usage above 5 GB results in a $1 overage fee for every 1 GB above 5 GB. Customers are notified at 50, 60, 70, 80, 90, 100, 110, and 125 percent of this threshold.

The remaining trials combine the approach in the Nashville trial, with its 300 GB per month usage allotment for all service tiers, with the option of purchasing more usage, and the voluntary, flexible data option for Economy Plus customers. These trials were rolled out in several of Comcast's markets toward the end of 2013, including: Savannah, GA, Central Kentucky, and Jackson, MS in September 2013; Mobile, AL and Knoxville, TN in October 2013; Memphis, TN, Augusta, GA, Huntsville, AL, and Charleston, SC in November 2013; and Atlanta, GA and Maine in December 2013. As with the trials in Nashville and Tucson, customers can also buy additional gigabytes over their usage allotment in incremental blocks of 50 GB for $10 each. The graphic below depicts all of these current trial markets and their policy.

[[ ]]

As noted above, to ensure that customers are aware of their usage and any potential and actual use in excess of their thresholds, Comcast has developed an enhanced notification process. Customers receive e-mail and in-browser messages that notify them when they are approaching their usage thresholds, and again when they exceed their threshold. Each time additional GBs of usage are added to the customer's account, the customer will

receive another e-mail and an in-browser message notifying her that more usage has been added to her account.

Customers in trial markets are given three courtesy months in which they can exceed the data usage in excess of an initial threshold before being charged; Economy Plus customers that choose the Flexible Data Option do not receive courtesy months. The first month a customer exceeds the threshold, the customer is not billed. The second and third months the customer exceeds the threshold, the customer is billed but provided a matching credit and thus not actually charged. These courtesy months enable a customer to understand how usage-based billing works before actually being charged. If all three courtesy months are not used in a 12-month period, the policy resets. If a customer uses all three courtesy months in a 12-month period and the customer's usage exceeds the initial 300 GB threshold in an additional month, the customer is charged $10 per each 50 GB of data used above 300 GB. Comcast has added to its customers' "My Current Data Usage" webpages each customer's courtesy pass count, indicating how many times the customer has exceeded her usage threshold in the prior 12 months.

Comcast also provides its customers with several tools to predict their usage and to help them avoid going over their usage thresholds. Customers have access to a usage meter and information about their historical usage patterns on their "My Current Data Usage" webpages, which is typically accessible from the "Details" link (under the "Data usage" bar) on the "My Services & Equipment" webpage,[114] so they can monitor and adjust their usage patterns if necessary. The "My Current Data Usage" webpage displays each customer's current usage and her last three months usage history. In addition, to help customers estimate their data usage, Comcast has developed an online usage calculator.[115] And, in the trial markets, Comcast has launched a "usage meter app" that can be downloaded to a PC and that will track usage and display it on a user's PC on an ongoing basis (i.e., without the customer having to log into her Comcast account to access her usage meter details). Whenever Comcast launches a trial in a new market or when a customer signs up for service, Comcast highlights the availability of the usage meter, usage calculator, and in-browser notifications in a variety of ways, including via e-mail. In addition, a dedicated customer support group with expertise on Comcast's usage trials has been created to answer questions and assist with customer inquiries.

As set forth above, the rationale for modifying Comcast's data usage policy was the company's desire to respond to an evolving marketplace, in which other providers (wireless and wireline) were trialing new approaches, and technology, data usage patterns, and consumer online activities have evolved significantly over the years, and in order to ensure that all Comcast's customers are treated fairly such that those customers who choose to use more, pay more, and customers that choose to use less, pay less. Comcast launched these trials in different markets and with different versions of the

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114 The "My Services & Equipment" webpage is accessible from the "My Services" link on the customer's "My Account" homepage.

115 *See How Much Data Do I Use?*, Comcast, http://xfinity.com/datacalculator (last visited Sept. 10, 2014).

policy to experiment with how best to implement a fair and consumer-friendly data management approach. Currently, data usage plan trials have been launched in approximately **{{ }}** percent of Comcast's footprint.

In conducting these trials, Comcast provides all customers with the option to use as much data as they want, which offers more flexibility than the previous 250 GB cap. Throughout the trials, Comcast has researched customer attitudes, perceptions, and usage responses to the trials to help guide the evolution of its data management policy. The trials are also an effort to develop information on the best ways to provide transparency to customers around usage based billing policies. To that end, Comcast has used these trials to determine what information customers need to select the service level and options appropriate to their needs, including the tools necessary to manage their use of high-speed Internet service.

The usage thresholds were set at a high enough level (a minimum of 300 GB) so that they would not impact the vast majority of Comcast's Internet customers, but rather would only affect the very highest users of data. At 300 GB, customers can stream over 500 hours of standard definition video or over 200 hours of high definition video per month, or download over 60 high definition two hour movies. At the time the trials were initiated, median usage was only **{{ }}** per month and approximately **{{ }}** percent of Comcast's customer base used 300 GB or less.

Comcast's goal of setting a usage threshold at a level so that it affects very few customers has been achieved. Typically, only about **{{ }}** percent of Comcast subscribers use 300 GB or more in any given month. Even fewer (approximately **{{ }}** percent) have used 300 GB for more than three months in any 12-month period and thus would actually be charged for additional data. At present, the median monthly usage of Comcast subscribers nationally is approximately **{{ }}**. These numbers are not significantly different in trial markets than in the national footprint.

Comcast considers a variety of factors when choosing a trial market. **{{ }}**

The findings and results of the trials can be summarized as follows: (1) median usage of all Xfinity Internet customers, including those in trial markets, remains **{{ }}**; (2) 300 GB remains an enormous amount of data usage for the typical customer, which is why the **{{ }}** do not come close to that level; (3) only approximately **{{ }}** percent of all of Comcast's customers, including those in trial markets, use 300 GB in any given month and only approximately **{{ }}** percent of those customers in trial markets have used 300 GB per month for more than three months in any 12-month period and have therefore been charged for additional data; and (4) many of the customers that have been charged for additional data have continued to consume more than 300 GB per month despite having to pay for the overage.

In addition, usage behavior has generally not been impacted in markets where Comcast is conducting data usage trials. Usage in trial markets aligns with usage patterns in non-

trial markets, both in terms of overall usage growth, as well as median usage. In other words, the trials have not diminished customers' use of the Internet. Across Comcast's footprint, median use has grown by **{{ }}** percent over the last year as of May 2014 (**{{ }}**). Median usage in two of Comcast's larger trial markets, Atlanta and Nashville, also has grown by **{{ }}** percent, which is typical of many of the trial markets. Further, in the Nashville and Atlanta markets, **{{ }}**, notwithstanding the related charges. **{{ }}** Still, the **{{ }}** of customers in these markets do not exceed 300 GB per month or even come close to that level of usage.

59(viii):

{{ }}

60. Describe and produce all documents relating to traffic management or engineering tools that identify, inspect, label, tag, throttle, rate-limit, shape, discard, block or otherwise control Internet traffic on the Company's network, including but not limited to:

a. network device configurations and applicable network diagrams indicating where such actions are configured on network devices and applied to Internet traffic entering, transiting or exiting the Company's network;

b. traffic engineering actions that differentiate between the Company's services (including but not limited to VoIP – peer-to-peer and video streaming services) and similar services provided by other persons;

c. policies and procedures for managing traffic delivered to and carried by the Company's networks, including documents that analyze the tradeoffs between allocating differing bandwidth levels, latency, routing assignments or other performance engineering to specialized services and whether a particular service qualifies as a specialized service, as that term is defined by the Comcast-NBCU Order, Appendix A § 1, and separately, as defined by this Information and Data Request.

RESPONSE:

Comcast provides its customers with full access to all the lawful content, services, and applications that the Internet has to offer. Comcast does not differentiate between Comcast-owned and non-Comcast owned content for network management purposes. Comcast manages its network with one goal: to deliver the best possible broadband Internet experience to all of its customers. To achieve this goal, Comcast uses reasonable network management practices that are minimally intrusive and are consistent with industry standards. Comcast's network management practices are described on its publicly accessible Network Management Information Center (http://networkmanagement.comcast.net/) and are summarized below.

Congestion Management

Comcast employs a congestion management technique called "FairShare" in its DOCSIS network to ensure that all customers have a fair share of access to the network during any periods of congestion. The congestion management technique works as follows:

If a certain area of the network nears a state of congestion, the technique identifies which customers are using the greatest amounts of bandwidth in that area and temporarily assigns their Internet traffic a lower priority best efforts status until the period of congestion passes. The technique is not employed in areas of the network that are not nearing a state of congestion.

The technique is "protocol-agnostic," which means that the system does not manage congestion based on the Internet applications being used by customers. It is also content neutral, so it does not depend on the type of Internet content that is generating traffic congestion. Said another way, customer traffic is congestion-managed based on current network conditions and the recent volume of data transferred by individual users, *not* based on the Internet applications or Internet content that those users are accessing.

The effect of this technique is temporary and has nothing to do with a customer's aggregate monthly data usage. The large majority of customers are not affected by FairShare, and when the technique is applied to an individual user's account, it is usually only in effect for a very brief period of time (usually 15 minutes) and generally not noticeable.

Diagrams 1-3 attached hereto illustrate the architecture and management flows of the FairShare system. In addition, Comcast described the system in detail to the FCC in 2008, and in an Internet Engineering Task Force document (RFC 6047) in 2010. These documents are publicly available via Comcast's Network Management Information Center at http://downloads.comcast.net/docs/Attachment_B_Future_Practices.pdf and http://datatracker.ietf.org/doc/rfc6057/.

Violations of Acceptable Use Policy

Comcast also uses network management tools to ensure compliance with its Acceptable Use Policy ("AUP").[116] Comcast prefers to resolve violations of the AUP by informing customers of inappropriate activities and giving them a reasonable period of time in which to take corrective action. Comcast also prefers to have customers directly resolve any disputes or disagreements they may have with others, whether customers or not, without Comcast's intervention.

However, if Comcast's broadband Internet access service is used in a way that Comcast or its suppliers, in their sole discretion, believe violates the AUP, Comcast or its suppliers may take any responsive actions they deem appropriate under the circumstances with or without notice. These actions include, but are not limited to, temporary or permanent removal of content stored on Comcast services (such as Comcast's personal web page service), filtering of Internet transmissions to block specific ports which are being abused in an ongoing or recent attack (including large scale spamming), and the immediate suspension or termination of all or any portion of the service.

Security and Abuse-Related Mechanisms

Comcast employs a number of practices to help prevent unwanted communications such as spam as well as protect the security of its customers and network. Comcast limits the

[116] *Acceptable Use Policy for Xfinity Internet*, Comcast Corp., http://www.comcast.com/Corporate/Customers/Policies/HighSpeedInternetAUP.html (last visited Sept. 10, 2014).

number of login, SMTP (if the user sends via Comcast's servers – this does not apply to third party mail services which presumably maintain their own controls), DNS (if the user looks up names via Comcast's DNS – this does not apply to third party DNS services which presumably maintain their own controls), and DHCP transactions per second (at levels far above "normal" rates) that customers can send to Comcast's servers in order to protect them and Comcast's services against Denial of Service (DoS) attacks. Comcast does not disclose the exact rate limits in order to maintain the effectiveness of these measures, which ensure that these critical services are available for all of its customers.

In order to further protect its customers, Comcast blocks a limited number of ports associated with certain protocols that are commonly used to send spam, conduct various types of malicious attacks, or may make a customer vulnerable to an attack or other abuse, for example. Additional details, including a list of the specific ports that Comcast blocks, are provided in response to Request 61. The ports are typically blocked in cable modem configuration files (a.k.a. "boot files") that reside on cable modem devices or in service flow policies on Comcast's CMTSes.

In addition, Comcast conducts several security initiatives, and offers security tools for its customers at http://security.comcast.net/.

Identification and Inspection of Network Traffic

Comcast employs various network tools to analyze traffic volumes, mixtures, and behaviors. Comcast does not use these tools as a form of traffic management to discriminate against lawful, non-Comcast owned content or to discriminate in favor of Comcast-owned content but rather as a passive network analysis tool.

[[ ]]

Xfinity TV and Xfinity Voice

Comcast's XFINITY TV (QAM-based and IP-based) and XFINITY Voice services are not transmitted over the Internet and do not constitute "Internet traffic." These services are not subject to the traffic management tools described above. These services are not "specialized services" as that term is defined by the *NBCUniversal Order*.[117] However, these services do meet the broad definition of "specialized services" set forth in the Information and Data Request because they are "services that share capacity with Internet Access Service over providers' last-mile facilities."

Documents responsive to this request will be produced to the FCC.

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117 *See NBCUniversal Order*, App. A § I (defining "specialized service as "any service provided over the same last-mile facilities used to deliver Broadband Internet Access Service other than (i) Broadband Internet Access Services, (ii) services regulated either as telecommunications services under Title II of the Communications Act or as MVPD services under Title VI of the Communications Act, or (iii) Comcast's existing VoIP telephony service").

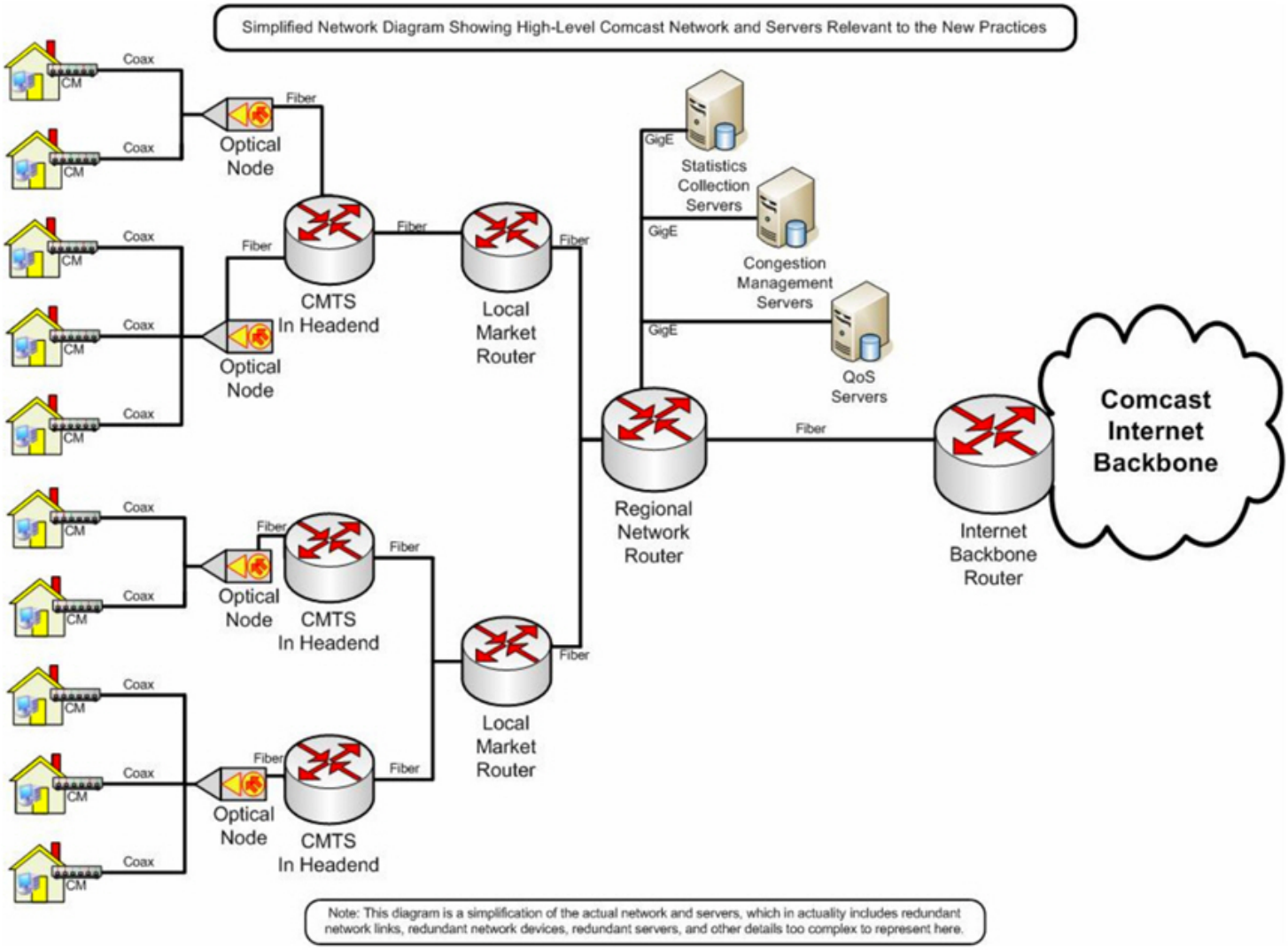

Diagram 1: Comcast Network Design

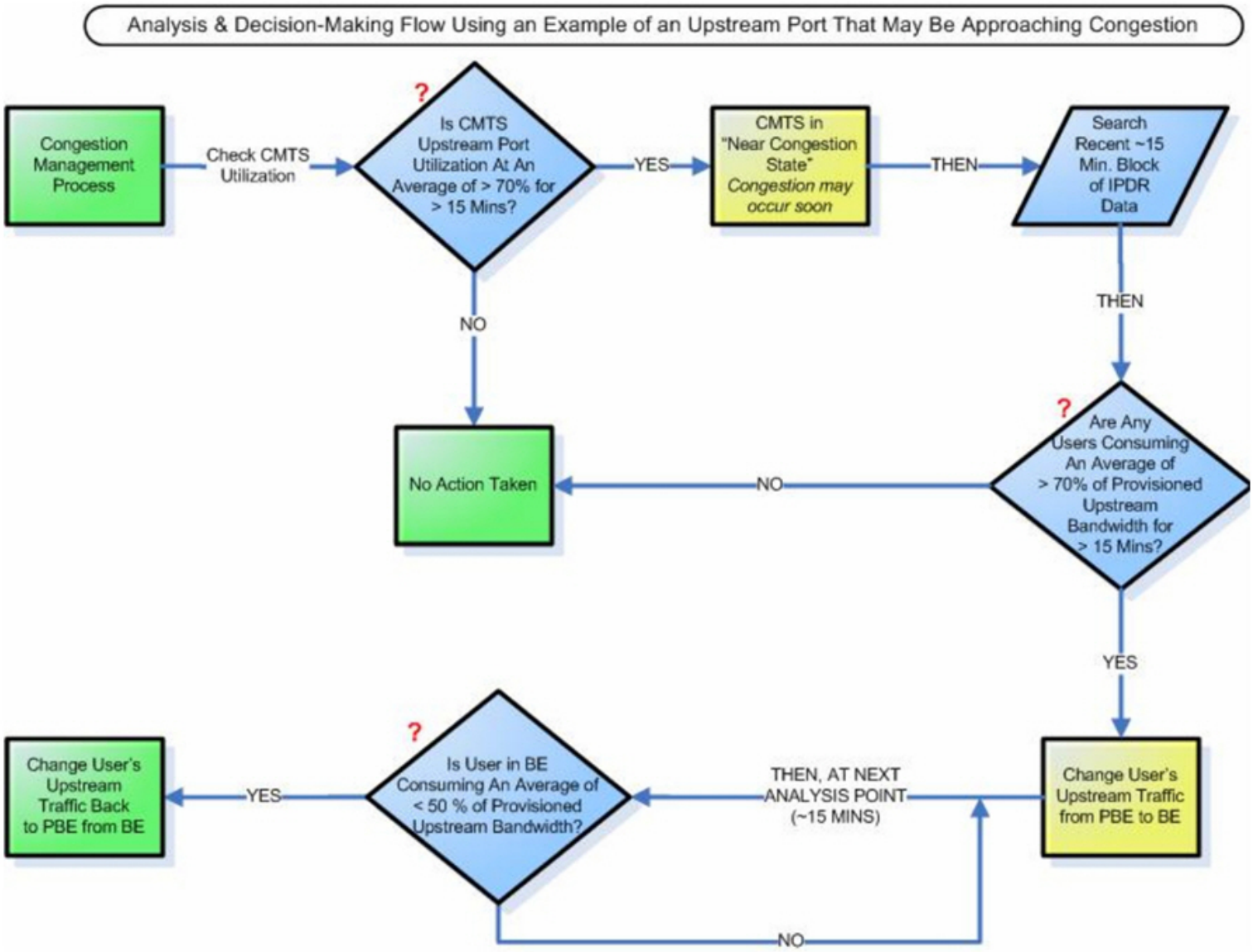

Diagram 2: Upstream Congestion Management Decision Flowchart

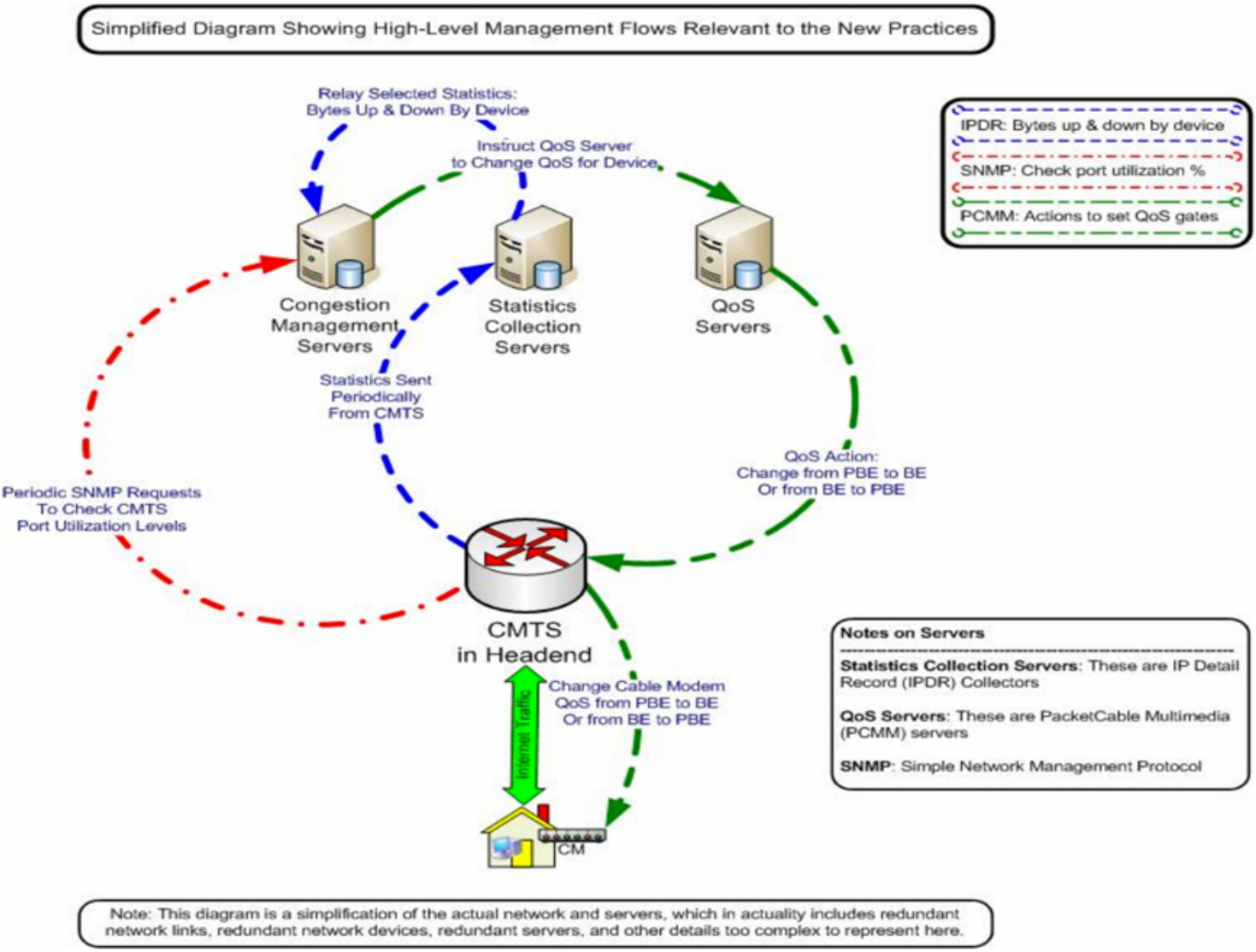

Diagram 3: High Level Management Flows

61. List all IP addresses, domain names, ports, edge applications, edge services or, categories of services where the Company has applied any traffic engineering actions described in response to Request 60 to improve or limit performance from January 1, 2011 to the present.

RESPONSE:

Other than as noted below, Comcast does not block specific IP addresses, domain names, and applications, services, or other categories of services. In fact, as it pertains to domain names, Comcast implements DNS security (DNSSEC), which would present technical incompatibilities if domain name blocking were attempted.[118]

As discussed in its response to Request 60, Comcast blocks the following ports for network management purposes. This information is publicly available at http://customer.comcast.com/help-and-support/internet/list-of-blocked-ports/.

Port	Transport	Protocol	Inbound/Outbound	Reason for Block
25	TCP	SMTP[119]	Both	Port 25 is unsecured, and Botnet spammers can use it to send spam. This does not affect XFINITY Connect usage. Comcast recommends that customers configure their email programs to use Port 587.
68	UDP	BOOTP, DHCP	Inbound	UDP Port 68, which is used to obtain dynamic Internet Protocol (IP) address information from Comcast's dynamic host configuration protocol (DHCP) server, is vulnerable to malicious hacks.
135-139	TCP/UDP	NetBios	Both	NetBios services allow file sharing over networks. When improperly configured, Ports 135-139 can expose critical system files or give full file system access (run, delete, copy) to any malicious intruder connected to the network.

118 *See* Jason Livingood, *Comcast Completes DNSSEC Deployment*, Comcast Voices (Jan. 10, 2012), http://corporate.comcast.com/comcast-voices/comcast-completes-dnssec-deployment.
119 *See* Michael O'Reirdan, *Updated Management of SMTP Port 25*, Comcast Voices (Aug. 1, 2012), http://corporate.comcast.com/comcast-voices/updated-management-of-smtp-port-25.

161-162	TCP/UDP	SNMP[120]	Both	SNMP is vulnerable to reflected amplification distributed denial of service (DDoS) attacks.
445	TCP	MS-DS, SMB	Both	Port 445 is vulnerable to attacks, exploits and malware such as the Sasser and Nimda worms.
520	TCP/UDP	RIP	Both	Port 520 is vulnerable to malicious route updates, which provides several attack possibilities.
1080	TCP	SOCKS	Inbound	Port 1080 is vulnerable to, among others, viruses, worms and DoS attacks.

In addition, consistent with standard industry practices, Comcast temporarily blocks certain IP addresses in response to direct attacks on its infrastructure. IP addresses are only blocked once they are confirmed to be the source of such an attack. These IP addresses are blocked for intervals of 24 hours and are released once the attack subsides. Due to the volume of attacks across its infrastructure daily, Comcast does not maintain records of the IP addresses that have been subject to these actions.

Finally, some Xfinity Internet wireless gateways that are installed in Comcast's customers' homes include firewall capabilities.[121] As a result, a customer may choose on her own to set up additional blocking, which Comcast does not control. A screenshot of the interface with which customers can customize their firewall settings is attached hereto.

Documents responsive to this request will be produced to the FCC.

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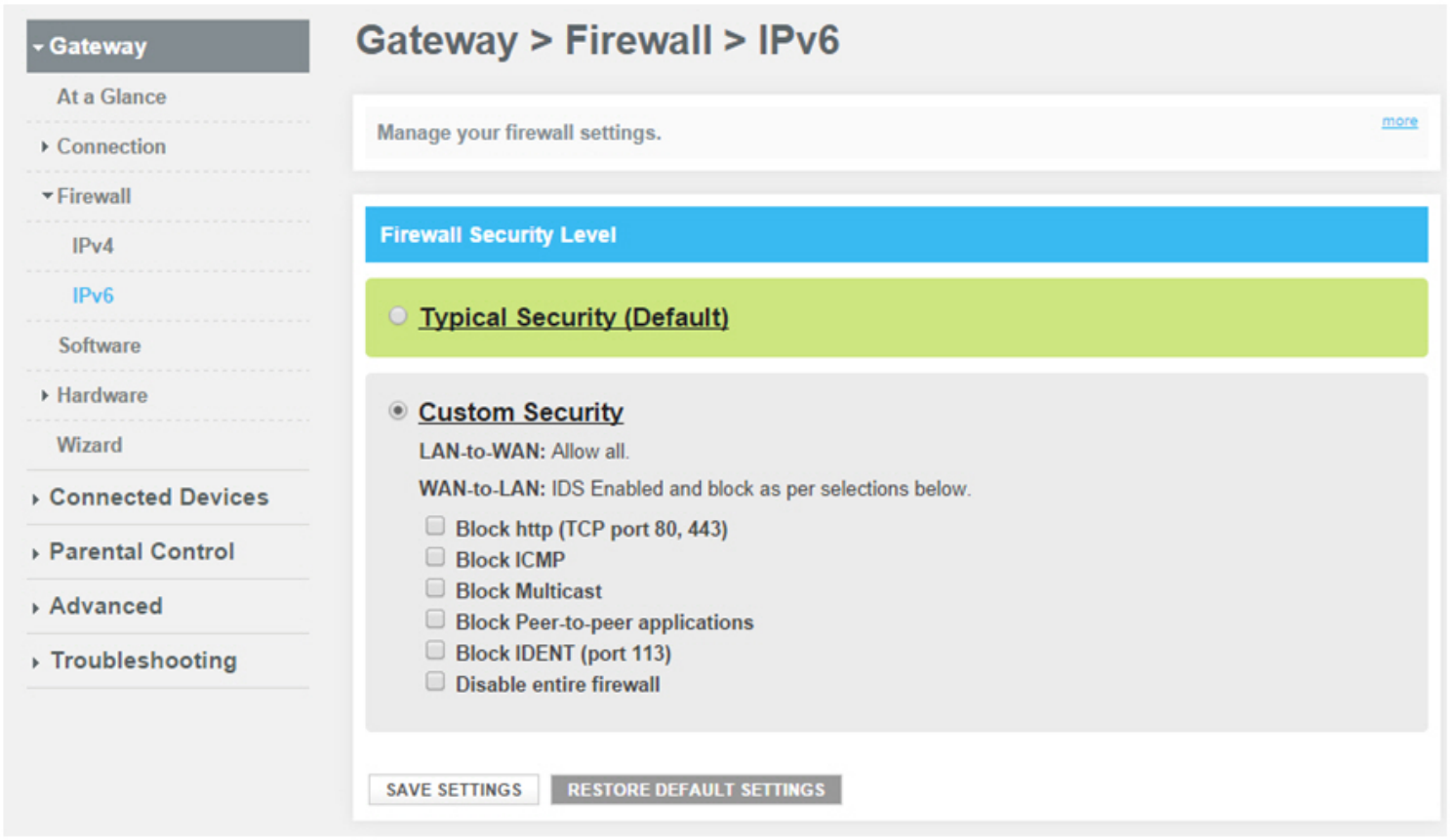
120 *See* Jason Livingood, *Taking Steps to Prevent Unintentional Network Abuse*, Comcast Voices (Aug. 1, 2012), http://corporate.comcast.com/comcast-voices/taking-steps-to-prevent-unintentional-network-abuse.

121 *See Advanced Wireless Gateway Features*, Comcast Corp., http://customer.comcast.com/help-and-support/internet/advanced-xfinity-wireless-gateway-features/ (last visited Sept. 10, 2014).


Gateway
At a Glance
Connection
Firewall
IPv4
IPv6
Software
Hardware
Wizard
Connected Devices
Parental Control
Advanced
Troubleshooting
Gateway > Firewall > IPv6
Manage your firewall settings.
more
Firewall Security Level
Typical Security (Default)
Custom Security
LAN-to-WAN: Allow all.
WAN-to-LAN: IDS Enabled and block as per selections below.
Block http (TCP port 80, 443)
Block ICMP
Block Multicast
Block Peer-to-peer applications
Block IDENT (port 113)
Disable entire firewall
SAVE SETTINGS
RESTORE DEFAULT SETTINGS

62. Describe and produce all documents relating to the policies, procedures and practices the Company follows in processing trouble reports from edge providers or subscribers concerning the Company's Internet access services.

RESPONSE:

(i) Edge Providers

When edge providers that are customers of Comcast (e.g., those that purchase on-net or full transit services from Comcast) wish to raise concerns regarding their service, they do so through formal channels. Such customers can contact their designated representative within the company or submit a trouble report to the Business Services Network Operations Center via email or phone. The same is true for Comcast's settlement-free peers.

However, the vast majority of edge providers whose traffic is transmitted over Comcast's network are not customers of Comcast. If they wish to raise concerns regarding Comcast's connectivity to their site or service, they typically use indirect or informal channels to reach Comcast. For example, they might contact their service provider (e.g., a transit provider or a CDN) that interconnects with Comcast, and that service provider can relay the concern to Comcast if necessary (although in the normal course, the issue likely can be addressed directly by the edge provider's service provider). In addition, an edge provider may post on Comcast's web forum,[122] post on other Comcast-specific web forums on websites such as Broadband Reports[123] or Reddit,[124] contact Comcast through its social media accounts on Facebook[125] or Twitter,[126] send emails to lists such as NANOG,[127] or even post comments on Comcast's blog.[128] Representatives of edge providers may also have personal connections to Comcast engineers (such as via industry fora such as MAAWG, IETF, BITAG, NANOG, etc.) and so may reach out to those engineers directly.

Subscribers

Subscribers typically contact Comcast's customer service organization by calling us at 1-800-COMCAST, visiting a Customer Service Center, or interacting with a customer

122 *Comcast Help and Support Forums*, Comcast, http://forums.comcast.com/comcastsupport/ (last visited Sept. 10, 2014).
123 *Comcast Forum*, Broadband DSL Reports, http://www.dslreports.com/forum/comcast (last visited Sept. 10, 2014).
124 *ComcastHelp*, reddit, http://www.reddit.com/r/comcasthelp (last visited Sept. 10, 2014).
125 *Xfinity Facebook Account*, Facebook, http://www.facebook.com/xfinity (last visited Sept. 10, 2014).
126 *Comcast Twitter Account*, Twitter, http://twitter.com/comcast (last visited Sept. 10, 2014).
127 *See* The NANOG Archives, http://mailman.nanog.org/pipermail/nanog/ (last visited Sept. 10, 2014).
128 Comcast Voices, http://corporate.comcast.com/comcast-voices/ (last visited Sept. 10, 2014).

service representative in an online chat session.[129] In addition, like edge providers, subscribers sometimes report concerns through certain informal channels described above.

Trouble reports are handled by thousands of agents across phone, chat, social media, and other support channels. A robust customer service application leads these agents through workflows that help diagnose and fix the problem. To aide agents in troubleshooting, the application includes hundreds of Interactive Trouble Guides and thousands of articles for agents to reference, many of which can also be shared directly with customers via email. In cases where these agents cannot resolve a problem themselves, they open tickets for "fix" agents or technicians to provide further assistance either remotely or, when necessary, by visiting the subscriber's premises. Trouble tickets are tracked to closure, and the information associated with a trouble ticket remains in the customer's account history for future reference.

Documents responsive to this request will be produced to the FCC.

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129 *Comcast Chat*, Comcast, http://www.comcastsupport.com/ChatEntry/Protected.aspx (last visited Sept. 10, 2014).

63. Produce all documents relating to subscriber access to edge providers that reference: (i) congestion of the Company's Internet access service; (ii) how quality of the Company's Internet access service affects subscriber churn and retention and the acquisition of new subscribers; and (iii) how the existence of edge providers affects demand for Internet access service.

RESPONSE:

Documents responsive to this request will be produced to the FCC.

64. Provide a list and produce a copy of all interconnection agreements, formal or informal, the Company has entered into with CDNs, edge providers, Internet access service providers and Internet backbone services providers, and all documents discussing factors the Company considers or considered in negotiating the terms of any interconnection agreement.

RESPONSE:

A list of the interconnection agreements the Company has entered into with the stated counterparties has been provided in machine-readable Excel spreadsheet format as Exhibit 64. Further, documents responsive to this request will be produced to the FCC.

65. Describe any performance, service delivery guarantees or service level agreements that the Company offers to edge providers and CDNs, including but not limited to guarantees relating to latency, data rate (bandwidth/speed), steady state, peak, burst, dynamic variation or other qualifiers, packet loss, jitter, and entry points into the network.

RESPONSE:

Comcast generally includes service level agreements ("SLAs") in its contracts with on-net transit and full transit customers, including edge providers and content delivery networks ("CDNs"). The standard SLA is available on the Internet at www.comcast.com/dedicatedinternet/sla. Almost all of Comcast's Internet interconnection counterparties agree to these standard SLA terms. **{{ }}**

Comcast's standard SLA provides three types of service commitments: (1) port availability, (2) latency, and (3) packet loss. Comcast does not measure latency or packet delivery for the specific ports over which it exchanges traffic with each on-net transit or full transit counterparty or for data packets specific to any counterparty. Instead, Comcast measures the latency and packet delivery of its Internet backbone network by periodically sending sample data packets between routers that hang off its backbone nodes and measuring the latency and delivery of those packets. If the measured performance of its Internet backbone falls below certain thresholds, Comcast offers service level credits. This methodology is commonly used by other Internet service providers and it affords no special treatment to anyone on Comcast's network.

For each of the service level commitments, Comcast's standard SLA provides a schedule of "service level credits." A service level credit is a credit equal to a portion of the actual billed monthly recurring or usage charges for the affected port. Thus, if the service level for a particular commitment falls below a certain level, the customer receives a percentage discount off its monthly usage bill. The standard SLA provides the following service level credit schedules:

Availability

Availability is the percentage of minutes in a calendar month during which the customer's port has not incurred a service outage. A service outage is a period during which the customer's port is unable to send or receive traffic (except for scheduled maintenance outages). Availability for each port will not fall below 99.9 percent in any given month. If availability is less than that amount, Comcast will issue a service credit based on the cumulative amount of outage time in a calendar month as set forth in the table below:

Cumulative Service Outage Time	Service Level Credit
00:00:01 – 00:45:00	No credit

00:45:01 – 0:4:00:00	10%
0:4:00:01 – 08:00:00	15%
08:00:01 – 12:00:00	20%
12:00:01 or more	25%

Latency

Latency is the average roundtrip time for sample IP data packets to traverse the Comcast backbone network. Latency for the service on average in any given month will not exceed 55 milliseconds (ms). If latency exceeds 55 ms, Comcast will issue a service credit based on the amount the average measured latency exceeds 55 ms as set forth in the table below:

Latency in Excess of Service Level	Service Level Credit
5 – 10 ms	No credit
10.1 – 15 ms	5%
15.1 – 20 ms	10%
20.1 ms or more	20%

Packet Delivery

Packet delivery is the percentage of sample IP data packets that are successfully delivered over Comcast's backbone network. Packet delivery for the service will not fall below 99.5 percent in any given month. If packet delivery is less than 99.5 percent, Comcast will issue a service credit as set forth in the table below:

Packet Delivery	Service Level Credit
99.5 – 99.494%	0%
99 – 99.49%	10%
98.99 or less	20%

{{ }} Copies of these agreements will be produced to the FCC.

66. List (i) the 40 "settlement free routes" into the Company's network described on page 159 of the Public Interest Statement, and (ii) all settlement-free peering agreements or arrangements that the Company has entered with any other person for each year since January 1, 2009, and identify which of these settlement-free links have been used to deliver Netflix, Inc.'s content to the Company's network.

RESPONSE:

In response to subpart (i), a list of the current settlement free routes into Comcast's network has been provided in machine-readable Excel spreadsheet format as Exhibit 66.1. In response to subpart (ii), a list of all settlement-free peering agreements or arrangements that Comcast has entered with any other person for each year since January 1, 2009, has been provided in machine-readable Excel spreadsheet format as Exhibit 66.2. Comcast may not be in a position to know which routes a party uses to deliver traffic to Comcast's network if it does not interconnect directly with Comcast, and Netflix may at times have routed traffic over settlement-free routes of which Comcast is unaware. **[[ ]]**

67. Produce all documents relating to:

a. Netflix, Inc.'s Internet traffic;

b. the Company's interconnection agreement with Netflix, Inc., and the negotiations for that agreement, including but not limited to, discussions regarding traffic volumes, traffic quality, Netflix's Open Connect CDN, and network capacity; and

c. changes, if any, in policies and procedures for technical methods related to Netflix, Inc.'s traffic on the Company's Internet access service or Internet backbone services, including but not limited to, methods related to packet classification, admission control and resource reservation, rate control and traffic shaping, congestion management, packet dropping and packet scheduling.

RESPONSE:

Documents responsive to this request will be produced to the FCC.

68. Describe the Company's CDN, including the products and services it offers, and the contractual terms, and produce all documents relating to the Company's CDN, including but not limited to, interconnection agreements with other networks, business plans, expansion plans, budgets, forecasts of sales, costs and profits, and analyses of the market, competition or competitors.

RESPONSE:

Comcast runs a CDN that is designed purely for carriage of its Video on Demand (VOD) assets for its Title VI cable service, within the Comcast network.

Comcast also operates a separate CDN designated for Internet content, which Comcast assumes is the focus of this request. Until recently, Comcast used that CDN purely within the Comcast network for its own internal content delivery purposes. More recently, Comcast has begun trialing provision of those CDN services to third parties. Comcast CDN offers customers the ability to store and deliver their Internet content from caches housed entirely within Comcast's network. The content stored at these caches provides delivery primarily to Comcast subscribers, although Comcast CDN also has limited off-net capability. The offering supports key streaming protocols for seamless delivery to all HTTP-compliant players and devices.

Comcast's CDN leverages a highly scalable, secure, and intelligent platform comprised of integrated hardware and software. The platform is based on open-source Apache Traffic Server technology infrastructure. Comcast CDN's key features currently include token-based authentication for security, support for HTTP-based progressive and adaptive downloads (i.e., HLS, HDS and Smooth), DNS and HTTP-based content routing, and a set of user-facing APIs which provide capabilities such as content purging and basic usage reporting.

Comcast offers its CDN customers a variety of pricing options, including billing by the total traffic delivered (e.g., per GB billing) or sustained volume (e.g., 95th percentile building), volume discounts, length of contracts, and pro-rated billing for partial use. Pricing is dependent on a number of factors, including term, traffic profile, features, and services.

Comcast's CDN is well suited for entities that deliver large files and video using HTTP-based technologies, deliver material traffic volumes to Comcast, and have the ability and willingness to multi-source their CDN partners (i.e., pairing Comcast CDN with other CDN providers to handle large scale delivery needs to ISPs other than Comcast or delivery to international destinations). In particular, the CDN offering might be attractive to industry segments such as live broadcasters and sports networks, premium on-demand video providers and studios, music streaming and Internet radio providers, game distributors, and software and other download media. The offering would not be ideal for customers who have extensive international delivery requirements, customers who are

heavily dependent on their CDN provider for client-side analytics, customers who use CDNs for value-added services such as application acceleration, or customers whose platforms are based on non-HTTP-based technologies. Comcast does not support or provide these services.

{{ }}

Documents responsive to this request will be produced to the FCC.

69. Describe, and produce all documents relating to the determination by the Company that a potential or current settlement-free peer has met or continues to meet the following obligation described in the Company's settlement-free peering policy: "The end to end network investment to carry traffic between Applicants customers and Comcast customers should be relatively similar to justify settlement free network trade." The description of the methodology and associated document submission should include, but should not be limited to, the metrics, processes, protocols, tools, software and systems used to determine if data traffic with a settlement-free peer is "relatively similar," and the underlying data used to formulate the methodology.

RESPONSE:

The criteria in Comcast's Settlement-Free Interconnection ("SFI") Policy include certain operational requirements intended to ensure that providing settlement-free interconnection to the applicant is mutually beneficial for Comcast and the applicant.[130] This is consistent with historical norms in Internet network interconnection, where parties seeking settlement-free interconnection have traditionally been expected to demonstrate that they can provide an appropriate level of mutual value and similar network investment to one another.

The roughly 40-plus entities with which Comcast has established settlement-free peering arrangements are overwhelmingly international or domestic ISPs.[131] That category includes providers that serve primarily as residential ISPs, and others that serve primarily as providers of Internet access and transit to edge providers, web and content hosting companies, and other networks. Some of these entities also operate their own CDNs (content delivery networks), though most do not. Comcast has not devised a quantitative formula to precisely determine a network's cost burden, but all of these settlement-free peers have invested in the backbone, metro, customer access, and exchange facilities that enable the essential interconnectivity of the Internet, and in facilities to serve their customers. Smaller ISPs, CDNs, website hosting companies, content providers, and other Internet players have not contributed to the Internet through direct investment in end-to-end network or facilities that other providers can utilize, and they accordingly contribute directly or indirectly by buying paid transit, content delivery, or other interconnection arrangements.

The relative volume of traffic in both directions across interconnection links is one factor that affects whether the interconnection arrangement offers mutual value to both parties. Specifically, the policy requires that the applicant must "maintain a traffic scale between

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130 The language quoted in Request 69 is from a previous version of Comcast's SFI Policy. However, the current version contains a similar requirement that reflects the same underlying policy. It states that "the network cost burden for carrying traffic between networks shall be similar to justify SFI."

131 **{{ }}**

its network and Comcast that enables a general balance of inbound versus outbound traffic." Balance of traffic is a fluid concept that is reviewed on a monthly basis, and while ratios are not specified, in Comcast's experience a persistent ratio of **{{ }}** or more over a prolonged period of time is generally understood as an indication that a settlement-free relationship is no longer in balance. As discussed in response to Request 60, **[[ ]]** Comcast uses these tools to determine its traffic ratios with its interconnection partners.

With its settlement-free peers, Comcast has a general balance of traffic and network investment, i.e., incoming traffic from the peer's customers is in general balance with the outgoing traffic Comcast sends to the peer's customers. In fact, Comcast has roughly an equivalent number of settlement-free peers to which it sends more traffic than it receives as those to which it receives more than it sends. While this may seem surprising to those who consider Comcast a consumer "eyeball" network, the reality is that Comcast serves as a transit provider to many CDNs, ISPs, content providers (including NBCUniversal content), and others that send large amounts of traffic off-net, destined for other providers' networks.

Documents responsive to this request will be produced to the FCC.

70. Identify each instance, since January 1, 2009, where the Company entered negotiations for an interconnection agreement where the negotiations did not result in a formal or informal contract. Produce all documents relating to such negotiations between the Company and any other person, including, but not limited to, documents related to the Company's or any other party's interconnection policies or practices or change in such policies or practices, such as imposing charges or other conditions and the effects of such changes.

RESPONSE:

Comcast does not maintain a comprehensive list of situations in which interconnection agreements were requested but the parties failed to reach some type of agreement. The following is a list and explanation of such events that Comcast identified after reasonable inquiry. This response is restricted to circumstances where there was some level of actual discussion between the parties concerning possible terms and conditions. Some of these examples concern arrangements requested by Comcast, some by the other party:

{{ }}

- In June of 2013, Comcast and one of its customers amicably ended their transit relationship after the parties were unable to agree on a mutually acceptable price point for a renewal of their agreement.[132]

{{ }}

Documents responsive to this request will be produced to the FCC.

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132 Comcast's relationship with this customer is subject to a nondisclosure agreement, and the customer objected to disclosure of its identity to the FCC.

71. For each settlement-free peering arrangement entered into by the Company from January 1, 2009, to date, (i) describe each instance when the Company initiated a discussion that resulted in replacement of a settlement-free peering arrangement with paid peering or transit service agreement, including a description of the settlement-free peer, the date the change was made and of the reasons the change was made, and (ii) identify each person who initiated a discussion that resulted in the replacement of a settlement-free peering arrangement with the Company with a paid peering or transit service agreement, including a description of the settlement-free peer, the date the change was made and of the reasons the change was made.

RESPONSE:

71(i):

{{ }}[133] **[[ ]] {{ }}**. The terms of this arrangement are set forth in **[[ ]]**.

71(ii):

[[ ]] With all of its settlement-free peers, Comcast seeks to maintain (and has) a general balance of traffic, i.e., incoming traffic from the peer is in general balance with the outgoing traffic Comcast sends to the peer. To that end, Comcast has worked to manage its traffic to avoid getting out of balance or overloading the capacity on the routes it has with its peers, even when that means suggesting to a transit customer that it take advantage of another provider's path. Comcast maintains an open and constructive dialogue with all of its peering partners about capacity needs and traffic growth on an ongoing basis, as well as with its transit customers, and continues to invest in and build out its Internet backbone facilities.

133 **{{ }}**

72. Describe, and produce all documents relating to:

a. the Company's policies with respect to upgrading, declining to upgrade, or downgrading interconnections between the Company and any person;

b. the Company's policies, processes and procedures for addressing congestion at interconnection links, including but not limited to: (1) how far in advance the Company plans for upgrades of interconnection links; (2) the criteria used to determine whether to upgrade capacity when requested, whether requests from settlement-free peers, paid peers, transit service providers, and transit service customers are evaluated using different criteria, and how requests for and installation of upgrades of interconnection links are prioritized; (3) whether the Company automatically seeks to add additional capacity when interconnection links reach a certain level of traffic (and if so, where that level is set); and (4) the costs, processes, and length of time involved in provisioning additional capacity, including a description of, and how the Company determines, which party should bear which costs;

c. any metrics that the Company uses in order to determine whether to upgrade or downgrade an interconnection (e.g., maximum acceptable network utilization or congestion, maximum acceptable packet loss, port availability, bandwidth capacity at particular points, latency, etc.), including what metrics are gathered and what measurement intervals are used;

d. requests, from January 1, 2010 to the present, by settlement-free peers to upgrade capacity that were not implemented within 90 days; and

e. any criteria by which the Company chooses a particular type of upgrade or downgrade (e.g., addition or subtraction of an interconnection site, or addition or subtraction of capacity at an existing site).

RESPONSE:

Comcast's policy for adding capacity with settlement-free partners is different from Comcast's policy for adding capacity for its customers that purchase transit services (both full transit or on-net transit (the latter also frequently referred to as "paid peering")). Both are addressed below. As an initial matter, however, it is important to stress that the question is to some degree at odds with the realities of *both* settlement-free and paid interconnection arrangements. Settlement-free peering arrangements are inherently two-way. As a result, one party cannot augment the interconnection arrangement on its own; rather, both parties must add new ports when an interconnection link must be augmented, which generally involves joint planning and discussion. Further, in any particular settlement-free interconnection arrangement, Comcast could be the party experiencing

traffic growth that makes *it* the party that *requests* the augmentation rather than "granting" it.

Likewise, paid arrangements are not augmented at the whim of the ISP; the customer requests additional capacity to meet its needs. Different customers may be satisfied with different levels of utilization of their interconnection ports, as explained in more detail below.

In addition, Comcast does not unilaterally "downgrade" the capacity of its interconnection points. Comcast only removes ports from an interconnection point if the interconnection point no longer requires the capacity (e.g., because the traffic make up has materially changed, justifying capacity redeployment). This is operationally expensive, has only occurred on a few occasions, and has been implemented in close coordination with Comcast's interconnection partners.

It is also important to note that neither party can predict the amount of capacity they will need at any given moment with complete accuracy. This is because, among other things, large edge providers or other traffic sources can shift their traffic at a moment's notice and arbitrarily create (or avoid) network capacity issues. In the case where a large traffic source suddenly creates congestion, the peers would require time to engineer, purchase, and install equipment to address the newly created capacity problem. That same large traffic source may then shift the traffic to another path, requiring new capacity augments while stranding capacity with the first peer or at the first location.

{{ }}[134] **{{ }}**

Settlement-Free Partners

Internet traffic is constantly growing, and Comcast and its interconnection partners strive to account for this growth proactively. Comcast's Settlement-Free Interconnection ("SFI") Policy requires that applicants "must agree to participate in joint capacity reviews at pre-set intervals and work towards timely augments as identified." Comcast and its settlement-free peers hold these reviews approximately every six weeks, along with ad-hoc communications in between, to discuss operational and infrastructure needs. These discussions include capacity requests and ongoing assessments of each party's compliance with the other's peering policy, as well as discussions about additional technology needs or geographic locations. Comcast's business practice is to maintain a healthy interconnection relationship with each of its partners and manage traffic growth as anticipated by both parties. And while different parties have different preferences, Comcast's goal is to have no more than **{{ }}** percent utilization of available capacity in any settlement-free interconnection arrangement to provide sufficient headroom for spikes in traffic, unexpected events, and normal growth.

[134] **{{ }}**

When one of the two parties projects (or experiences) growth that would require additional capacity and communicates that to the other party, the other party evaluates the request to determine whether the addition of capacity would be consistent with its peering policy. As noted above, the requesting party might be Comcast or might be the peer. Of course, in some cases, both parties may project relatively equivalent growth, which makes augmentation straightforward. Upon receiving a straightforward request for augmentation (either because the request is mutual or because it is compliant with the SFI Policy), Comcast will promptly begin the process of provisioning the requested capacity. This process entails evaluating whether the additional capacity is readily available at the relevant exchange points (i.e., whether there are available ports, available line cards, available capacity on the relevant router, and available optical capacity to carry the traffic onto Comcast's backbone network and redundantly to metro destinations). If the requested capacity is readily available, Comcast generally can provision it within as little as a week. SFI upgrades are prioritized based on a number of factors including engineering forecasts, measured demand, available infrastructure, and whether or not the request complies with Comcast's SFI policy. Assuming that both parties meet the criteria and are ready to upgrade capacity, requests are usually prioritized on a first-in-first-out basis.

If the requested capacity is not readily available, Comcast will begin the process of network design and capital orders required to make the new capacity available as soon as practicable. In some cases, the required changes are minor, but in others, Comcast may need to install a new router, arrange for more space and power (though this is less common given Comcast's efforts to deploy spare capacity in these facilities), or provide additional backbone capacity to reach metro locations. Overall, the process of provisioning additional capacity when none is available often takes approximately six to eight weeks, depending on the work required.

Comcast also frequently seeks to establish interconnection sites in new geographic locations with its peering partners. So long as a party continues to meet the SFI Policy, Comcast prefers to establish interconnection links in major metropolitan areas in which Comcast and the peering partner maintain a presence in order to enable more efficient delivery of traffic.

On rare occasions (and not unique to Comcast), a substantial change in a peer's business practices or traffic flows will cause the peer to exceed the bounds of the SFI Policy – most typically in the context of an imbalance of traffic flowing across an interconnection link. For example, if a peer begins selling high-volume transit services when it had not done so previously, this might dramatically alter the balance of traffic flows. And this increasingly one-way relationship would impose far more burden on the party receiving the inbound traffic, which would have to carry all that traffic over its backbone and metro facilities, all the way to customers, while, in contrast, the delivering provider is typically

collocated in the third-party peering site with the relevant edge provider, and is simply carrying its content a few feet at most.[135]

If a peer's request for capacity exceeds the amount of capacity that would be covered by the mutuality required by Comcast's SFI policy, Comcast will invite the company to engage in "out-of-policy" discussions, through which the company can purchase additional capacity on a commercial basis (while leaving the existing SFI arrangement in place to cover the preexisting traffic). In the interim, because Comcast typically has longstanding, productive relationships with its peers, Comcast may provide a complimentary augmentation of the interconnection to help alleviate the congestion, at the same time as the parties put commercial terms in place for additional supplemental capacity. Those terms are typically straightforward and do not differ dramatically among Comcast's customers that send roughly equivalent amounts of traffic. The prices are market-based, and are constrained by the transit pricing offered by third parties (which has declined markedly in recent years).

In response to subpart (d) of this request, Comcast believes that the overwhelming majority of requests consistent with the peering policy are upgraded within 90 days. In instances where capacity upgrades take longer, it is generally because either the peer or Comcast does not have sufficient ready capacity or equipment at the relevant exchange point, which in turn requires additional time to activate such capacity; Comcast is not aware that any such circumstances were prolonged or led to significant concerns or disputes.

For the instances in which Comcast invites the peer to engage in commercial discussions regarding purchasing additional capacity, whether such upgrades are completed within 90 days of the request depends upon the course of the particular commercial negotiations. Settlement-free peers that requested upgrades to links during this time period but whose requests were clearly inconsistent with Comcast's peering policy include **{{ }}** and **{{ }}**, and the requested capacity was not delivered within 90 days given the inability to reach an agreement, although Comcast provided significant additional capacity while these discussions were ongoing.

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135 The most immediate costs involved in an ISP's provisioning additional capacity at an exchange point include adding ports, adding line cards, adding routers, adding cross-connects, and adding optical capacity to carry the traffic from the interconnect point to the ISP's backbone facilities, as well as space and power costs for the equipment and any associated labor expenses. Comcast and its settlement-free peers generally bear the cost of their own network equipment at the exchange point (such as the line cards and routers on their respective sides of the interconnection link) and share the costs of jointly used equipment (such as cross-connects). Beyond this, as traffic increases, Comcast must also provision capacity on its global backbone network, its metro networks, and its access networks.

Full Transit or On-Net Transit Customers

When companies purchase full transit or on-net transit services from Comcast, they enter into contracts that define the terms and conditions under which Comcast must add additional capacity to the interconnection arrangement. As a general matter, these contracts provide that the parties may request that Comcast add additional capacity, and (subject to the terms of the contracts) Comcast must do so in the manner described above. Simply put, it is not Comcast's choice to add (or refuse to add) additional capacity for these customers. It is the customer's decision whether or not to add additional capacity. Some customers prefer to run their interconnection links "hot" (i.e., at or close to 100 percent utilization) because they closely monitor their various links and use all of them as much as possible. Others prefer to maintain spare capacity for sustained spikes in utilization or to allow for growth. Customer requests are generally handled on a first-in-first-out basis, and delivery of customers ports are subject to a thirty day install SLA.

Documents responsive to this request will be produced to the FCC.

73. List, for any upgrades or downgrades to interconnection links from January 1, 2011, to the present, for the 25 largest networks that interconnect with the Company measured by maximum capacity usage measured using the industry standard 95th percentile method: (i) the dates of the upgrades or downgrades; (ii) the amount of capacity added or removed; (iii) the type of upgrade or downgrade; (iv) whether the upgraded was initiated by a request from the network operator, or undertaken by the Company on its own initiative; and (v) the reason for the upgrade or downgrade.

RESPONSE:

In response to this Request, Comcast provides a list of capacity added ("upgrades") or removed ("downgrades") to interconnection links and the amount of capacity added or removed from January 1, 2011 to June 30, 2014, in machine-readable Excel spreadsheet format as Exhibit 73. In response to subparts (iii), (iv), and (v) of this Request, Comcast provides the following general response and incorporates its response to Request 72 herein. For settlement-free peers, Comcast typically augments the interconnection links in partnership with those peers as both parties must add new ports when an interconnection link is augmented. This generally involves joint planning and discussion, and capacity is typically added in line with increased traffic that the parties discuss and forecast, as well as migrations in traffic across locations. In any particular settlement-free interconnection arrangement, Comcast could be the party experiencing traffic growth that makes it the party that requests the augmentation.

For on-net transit and full transit customers, **[[ ]]** As a general matter, these contracts provide that the parties may request that Comcast add additional capacity, and (subject to the terms of the contracts) Comcast must do so in the manner described above. Simply put, it is not Comcast's choice to add (or refuse to add) additional capacity for these customers. It is the customer's decision whether or not to add additional capacity and capacity upgrades are requested by the customer.

The same approach for upgrades applies with respect to any "downgrades" to capacity, which are rare, as the data in Exhibit 73 reflect. For settlement-free links, Comcast works in partnership with its settlement-free peers to provision capacity and only turns down capacity for links with counterparties if the parties no longer interconnect and exchange traffic or if the counterparty peer and Comcast agree to turn down ports. The peer (in consultation with Comcast) may elect to migrate capacity to different IP points of presence or autonomous system networks ("ASNs"), which is not a downgrade but just a migration of existing capacity. For on-net transit and full transit counterparties, as is the case with upgrades, it is the customer's decision whether or not to add or remove capacity at any interconnection link, and any capacity "downgrades" are requested by the customer **{{ }}**

74. The Applicants claim that "any action that the combined firm might undertake to harm edge providers would degrade its broadband service and reduce the profits it could earn. … Providing high-quality broadband service provides Comcast with the significant percentage of its revenue and an even higher percentage of Comcast's and TWC's operating cash flow…" Public Interest Statement at page 157, and Dr. Israel states that the "alternative of attempting to harm OTT providers by erecting "tollbooths" or otherwise foreclosing access to Comcast's broadband subscribers … would harm Comcast's broadband business." April 8, 2014 Israel Declaration at par. 37.

a. Describe in detail how harming edge providers would degrade Comcast's Internet access service and would reduce the profits Comcast could earn, and produce the data and calculations performed to support this statement, including, but not limited to, stating the "profit," "revenue" and "operating cash flow," and changes thereto, used in reaching the conclusion recited in this Request, and the quantification of the amount that the degradation of the Internet access service would reduce Comcast's profit;

b. Describe in detail the harm to Comcast's Internet access service business that would result from "erecting tollbooths" or "foreclosing access to Comcast's Internet access service subscribers," including but not limited to all quantifications of the harms;

c. Describe in detail the support for the statement that providing high quality Internet access service generates for the Company a "significant percentage of Comcast's revenue and an even higher percentage of Comcast's and TWC's operating cash flow;"

d. State whether the Company weighed any of the harms described in the statements recited in this Request against any benefits received from the harm to competition a lower quality or slower Internet access service could cause, and if so, describe the weight given to each element and produce all documents relating to the balancing undertaken by the Company; and

e. Produce all data and documents relied upon in making the statements quoted in this Request, and the calculations that support these statements.

RESPONSE:

Like other ISPs, Comcast has significant disincentives to harm edge providers for many reasons, foremost among them that blocking or degrading access to streaming video, applications, or other online content likely would cause significant numbers of customers to switch providers and thus compromise Comcast's broadband business. As discussed in the parties' April 8, 2014 Public Interest Statement,[136] Dr. Israel's declaration,[137] and Dr. Israel's presentation to staff,[138] consumers want consistent and reliable access to whatever Internet content they desire, and Comcast risks alienating and losing subscribers if it restricts or degrades this access in any way. The quotations from the Public Interest Statement and Dr. Israel's declaration recited in the question were based on general

136 Public Interest Statement at 156-164.
137 Israel Decl. ¶¶ 31-39.
138 Israel Presentation at 9.

knowledge within Comcast rather than specific data and calculations. But the following analysis and data confirm the truth of these statements.

(i) Role of Broadband in Comcast's and Time Warner Cable's Businesses

There can be no doubt that broadband plays a central role in Comcast's and Time Warner Cable's ("TWC's") businesses. As shown by the tables below, which are based on publicly reported 2013 figures for Comcast and TWC, respectively, broadband comprises a significant share of revenue and an even larger share of operating profit for both companies.[139] In particular, residential broadband accounted for approximately 25 percent of total revenues for both companies. In addition, the vast majority of programming expenses, which accounted for 37 percent of total operating expenses for Comcast and 46 percent of operating expenses for TWC, apply to the companies' video segments. The fact that programming constitutes such a high percentage of total operating expenses implies that video's share of operating profit is smaller than its share of revenues. Thus, it also implies that broadband's share of operating profit is higher than its share of revenues.

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[139] The tables are based on the most recent full-year data for each company. Year-to-date data indicate that these percentages have remained similar in 2014. Moreover, these figures are merely a current snapshot of the companies' operations. As discussed below, a longer term view through customer lifetime value makes clear that broadband is a critical business for the companies.

Comcast Segment-Level Revenues and Expenses in 2013

	Revenues ($ millions)	Share of Revenues
Revenues		
Residential:		
Video	20,535	49.1%
High-Speed Internet	10,334	24.7%
Voice	3,657	8.7%
Business Services	3,241	7.7%
Advertising	2,189	5.2%
Other	1,880	4.5%
Total Revenues	41,836	100.0%
Expenses		
Programming	9,107	37.0%
Technical and product support	5,349	21.7%
Customer service	2,097	8.5%
Franchise and other regulatory fees	1,246	5.1%
Advertising, marketing and promotion	2,896	11.8%
Other	3,936	16.0%
Total Expenses	24,631	100.0%

Source: Comcast 2013 10K, pg 53

TWC Segment-Level Revenues and Expenses in 2013

	Revenues ($ millions)	Share of Revenues
Revenues		
Residential:		
Video	10,481	47.4%
High-Speed Internet	5,822	26.3%
Voice	2,027	9.2%
Other	72	0.3%
Business Services	2,312	10.5%
Advertising	1,019	4.6%
Other	387	1.7%
Total Revenues	22,120	100.0%
Expenses		
Video programming	4,782	46.2%
Employee	3,019	29.2%
High-speed data	175	1.7%
Voice	554	5.4%
Video franchise and other fees	500	4.8%
Other direct operating	1,312	12.7%
Total Expenses	10,342	100.0%

Source: TWC 2013 10K, pgs 38, 39, 42

Consumer Response to Diminished Access to Internet Content

Consumers expect and demand unrestricted access to the entire Internet and are highly responsive to changes in the quality of such access. It is thus firmly in Comcast's economic interest to meet its customers' demand by providing high-quality access to any Internet content consumers want (including popular high-bandwidth video content), so that existing customers continue to demand its service (or upgrade to even faster service) and new consumers choose Comcast. Harming consumers' access to edge providers would result in harm to Comcast's broadband service by encouraging broadband customers to switch to an alternative provider or to cancel or downgrade their Comcast broadband service, which would quickly affect not only Comcast's revenues, but also its brand reputation, jeopardizing this central component of the company's business.

Empirical evidence confirms that consumers are highly responsive to changes in the quality of their access to Internet content. **{{ }}**

The fact that Comcast customers reacted so strongly to this temporary and isolated event, which involved no change in Comcast's business practices or policies, is quite telling. If Comcast were to affirmatively adopt a practice or policy that diminished subscriber access to Internet content, the company would face an immediate and powerful backlash.

Notably, Comcast's policies do not make it difficult for a disgruntled customer to switch to another ISP. For example, less than **{{ }}** percent of Comcast's current residential broadband subscribers are subject to a contractual commitment. Thus, over **{{ }}** percent of these customers would face no early termination fees for switching at any point. Indeed, many of Comcast's customers avail themselves of the opportunity to switch providers. Comcast's monthly broadband churn rate for broadband subscribers has been in the **{{ }}** percent range for several years. Put differently, over the course of a single year, approximately **{{ }}** of Comcast's broadband subscribers churn.[140]

According to a survey recently conducted by Global Strategies Group at Comcast's counsel's request, most consumers would readily switch ISPs if their provider were to interfere with their access to Internet content.[141] The survey produced three key findings: First, significant majorities of cable and phone companies' broadband subscribers would likely switch broadband providers – including to a DSL or wireless provider, or to an ISP with slower speeds – if their provider blocked, degraded, or otherwise slowed access to Internet content.[142] Second, many consumers today are using wireless broadband service as a substitute for fixed broadband service, including for high-bandwidth activities like watching video, providing them with another option if they are unhappy with Comcast's service. Third, switching among ISPs is occurring frequently. Comcast elaborates on each of these findings below. These survey results explicitly confirm Comcast's

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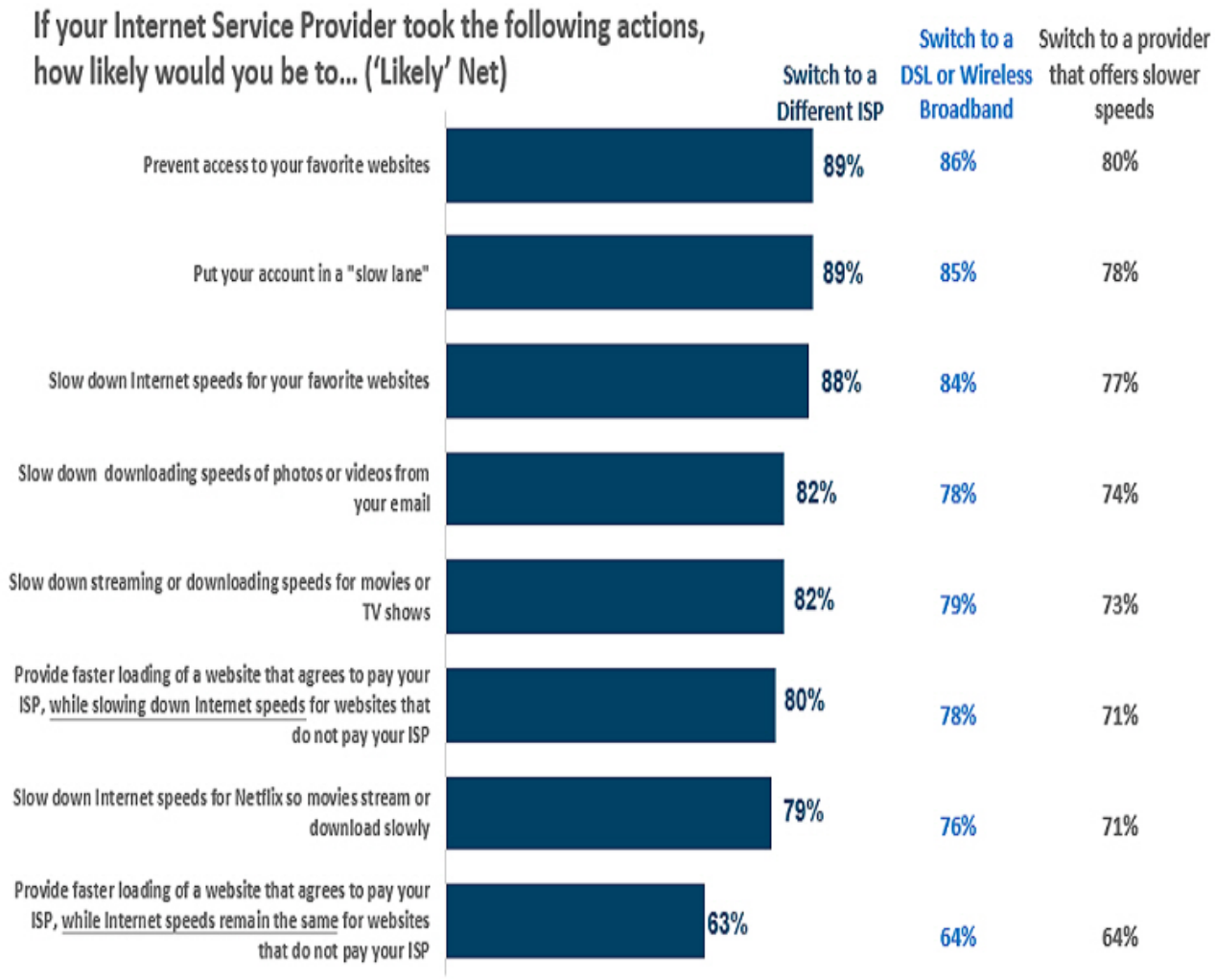
140 Comcast is aware of and has apologized for the recent actions of a Comcast representative in his communication with a customer seeking to cancel Comcast service. This customer's experience does not reflect the experience of the millions of customers who churn each year, and this representative's actions were not consistent with how Comcast trains its customer service representatives.

141 The complete survey results and the underlying survey response data are being produced in response to Request 74(e), as is a declaration from Jefrey Pollock, President of Global Strategies Group. In his declaration, Mr. Pollock explains that the survey sample was selected to be statistically representative of the population under study, which is adults in households that subscribe to non-DSL broadband service offered by a cable company or telephone company and who are decision-makers as to that service. The survey has a margin of error of 3.1 percent.

142 This finding is in line with the results of a survey conducted by Consumer Reports earlier this year. According to the Consumer Reports survey, 71 percent of respondents said they would switch to an alternative ISP if their provider were to try to block, slow down, or charge more for services such as Amazon Instant Video, Netflix, Pandora, and Skype. The nationally representative survey was conducted by the Consumer Reports National Research Center in February of 2014 and sampled 800 U.S. households with broadband service. Glenn Derene, *71% of U.S. Households Would Switch from Providers That Attempt to Interfere with Internet*, Consumer Reports, Feb. 18, 2014, http://www.consumerreports.org/cro/news/2014/02/71-percent-of-households-would-switch-if-provider-interferes-with-internet-traffic/index.htm#survey.

operating business assumptions with respect to its high speed data service, which govern Comcast's conduct of that business.

Most subscribers would be likely to switch ISPs if their access to content were degraded. That conclusion holds regardless of the nature of the degradation or the type of ISP considered as an alternative, as shown in the following summary of the Global Strategy Group survey results.[143]



In particular, consumers overwhelmingly expressed their willingness to switch ISPs in the event of adverse action even where the alternative provider was not an equally fast fixed broadband ISP. The finding that most consumers would be likely to switch to a DSL or wireless provider, or to a provider that offers slower overall speeds but does not

143 *See* Survey at 2-5.

degrade access to content, strongly substantiates Dr. Israel's hypothesis that the "absence of (or limitations on) particular edge *providers* would be more important to consumers than speed differences."[144] As Dr. Israel has explained, many alternative broadband providers, which offer service using a range of technologies and with different attributes, serve as viable competitive alternatives to Comcast and TWC; consumers can and would switch to those providers if Comcast were to block or degrade access to content the consumer wished to reach.[145]

For many consumers, wireless is a viable substitute for fixed broadband. Consumers seeking to switch broadband providers can choose among a range of providers offering broadband services across different technologies. In addition to competition from wired competitors, such as those offering services over fiber-based and traditional DSL platforms, the Global Strategy Group survey also shows that wireless substitution for fixed broadband service is substantial,[146] as shown in the following summary. This provides consumers with another option to switch away from Comcast, or simply use *less* Comcast broadband service (which could mean downgrading to lower speeds or foregoing upgrades), if they are unhappy.

For high-bandwidth activities such as streaming media applications like YouTube, Netflix, Hulu, etc.

A full 10 percent of the survey respondents use wireless as a substitute for fixed broadband service today, answering that they *always* opt to use their wireless or mobile broadband service even for accessing high-bandwidth streaming services like Netflix, YouTube, and Hulu (slightly more always use wireless service for low-bandwidth

144 Presentation by Dr. Mark A. Israel to FCC Staff, at 9 (May 6, 2014) ("Israel Presentation"); Israel Decl. ¶ 40.
145 Israel Presentation at 9; Israel Decl. ¶ 40.
146 *See* Public Interest Statement at 51-56; Israel Decl. ¶¶ 61-67.

activities).[147] Moreover, 17 percent[148] use wireless service for high-bandwidth activities either all the time or most of the time (23 percent do so for low-bandwidth activities); even more use wireless broadband an equal amount as they use fixed broadband (36 percent for low-bandwidth activities, and 25 percent for high-bandwidth activities).[149] In sum, the survey found that 59 percent of cable broadband consumers use wireless or mobile broadband either as frequently as or more frequently than they use cable broadband service for low-bandwidth activities, and 41 percent use wireless or mobile broadband either as frequently as or more frequently than they use cable broadband for high-bandwidth activities. These results confirm that a significant share of broadband consumers already view wireless to be a satisfactory alternative to fixed broadband services. With advances in wireless technologies and greater bandwidth flexibility, these trends will only accelerate in the future.

Broadband consumers frequently switch ISPs. The survey found that consumers switch broadband providers frequently. One-third of survey respondents switched providers in at least the past two years, and nearly half (49 percent) switched providers within the past four years.[150] These results are in line with the results of a survey commissioned by the FCC in 2010. In the FCC survey, over the prior three years, 36 percent of Internet users indicated that they had switched their provider, with 13 percent of users switching providers more than once, and almost one-third of those who had not switched providers having considered doing so.[151] Both in the Global Strategies survey and in the FCC's 2010 survey, consumers cited moving residences, better speed or performance from an alternative provider, better pricing from an alternative provider, and the availability of other services, as the primary reasons for switching.[152]

All of these findings indicate that consumers consider various technologies to be alternatives to cable broadband service, and they are likely to take advantage of those alternatives if they cannot access all of the Internet content they want, at the speeds and performance they desire, via their current provider.

Financial Impact to Comcast of Consumers Switching Broadband Providers

If Comcast were to impede access to Internet content and cause subscribers to switch to other broadband providers, this would prove highly costly to Comcast over time. For

147 Survey at 2.
148 Due to rounding, the ten percent and 6 percent noted in the table above add to 17 percent. *See id*.
149 *Id*. Notably, for purposes of this answer, the respondents who indicated that they use wireless were instructed that wireless does not include cable Wi-Fi accessible on mobile devices – i.e., they were indicating usage of a wireless data plan.
150 Survey at 6.
151 Federal Communications Commission, *Broadband Decisions: What Drives Consumers to Switch—Or Stick With—Their Broadband Internet Provider* at 2-3 (FCC Working Paper, Dec. 2010) ("*2010 FCC Survey*").
152 Survey at 6; *2010 FCC Survey* at 9.

example, an internal Comcast analysis of customer lifetime value ("CLV") in the table below demonstrates that **{{ }}**[153]

{{ }}

Furthermore, Comcast does not believe that it would receive any benefit from impairing subscriber access to Internet content, and it does not consider any such purported benefits when making business decisions. Even under the theoretical assumption that Comcast could gain video subscribers by impairing access to OVDs, the data above clearly demonstrate that Comcast would have no incentive to engage in this practice. **{{ }}** Especially in light of the survey results set forth above, this result would be highly unlikely.[154] Finally, Comcast has no reason to expect that a customer frustrated by Comcast's practices as a broadband provider would choose to subscribe to Comcast's video service; that customer could easily choose a DBS provider or telco provider instead.

Documents responsive to this request will be produced to the FCC.

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153 The table is based on slide 18 of Comcast's October 2013 presentation titled **{{ }}** which was developed by the Finance Department at Comcast. While this does not represent the only possible way of calculating CLV, it demonstrates one way that the company has made this calculation in the past. CLV is based on the calculation of the Net Present Value (NPV) of future cash flows associated with a customer over the expected tenure of the customer with Comcast. The calculation uses data on recurring and non-recurring elements of revenues and operating costs (current and projected), customer acquisition costs, and churn rates to estimate the NPV for each type of customer.

154 Moreover, any action to degrade access to Internet content, such as online video, may cause subscribers to substitute away from Comcast along multiple dimensions. For example, any subscriber could downgrade its broadband service in response to such an action. This option is not speculative, given that a primary reason that consumers subscribe to higher speed tiers is to watch online video.

75. For each day during the period from January 1, 2012, to May 31, 2014, and for each DMA where the Company provides VOD and PPV services, identify each IP point of presence through which traffic from (i) Cogent Communications Inc., and (ii) Level 3 Communications Inc., was delivered to the Company's Internet access service subscribers in that DMA.

RESPONSE:

Comcast provides a list of the DMAs in which it provided VOD and PPV services from January 2012 to May 2014 and the IP points of presence through which traffic from Cogent and Level 3 was delivered to Comcast during this period in machine-readable Excel spreadsheet format as Exhibit 75. The locations are provided monthly as Comcast may not know the particular date on which it first began exchanging traffic at a new IP point of presence, but once activated, Comcast would have exchanged traffic with Cogent and Level 3 every day during that month at that point of presence.

Under its settlement-free peering policy, Comcast announces the same set of network destinations at all IP points of presence in which it exchanges Internet traffic with other networks. For settlement-free peers, the typical default behavior for Internet routing is to send traffic to the IP point of presence nearest to where it received the data, regardless of that traffic's ultimate destination. This action is commonly referred to as "shortest exit" or "hot potato" routing.[155] While this conduct is the default, it is possible for the sending network to override the typical decision process to direct the traffic in some other way. **[[ ]]** Wherever Comcast received traffic from Cogent and Level 3, as with any counterparty, it would deliver that traffic as efficiently and quickly as possible across its Internet backbone and down to its regional aggregators (known as converged regional aggregated networks ("CRANs")) to reach its Internet subscribers. Comcast's goal is to deliver traffic it receives to its subscribers as quickly and efficiently as possible and it does not discriminate with respect to any traffic it receives.

Comcast's preference is to localize Internet traffic exchange as much as possible so that traffic is delivered to the IP point of presence nearest to the end customer. **{{ }}**

155 Content delivery networks ("CDNs"), by contrast, typically work to deliver traffic to the IP point of presence closest to the requesting party.

76. Identify and describe each type of customer class that the Company serves, or desires to serve, outside its service areas, and describe how it markets business services or monitors the sales of such services to each customer class identified. In your description of each identified customer class (including small, medium, enterprise and cellular backhaul customers as defined on page 85 of the Public Interest Statement), include specific characteristics that distinguish each class (e.g., revenue size, geographic scope) and describe how the Company markets and monitors the sale of business services. Produce all documents relating to competition to provide services to each customer class defined on page 85 of the Public Interest Statement.

RESPONSE:

As a general matter, with limited, minor exceptions, Comcast does not serve customers outside its service area, business or residential. Based on the reference to page 85 of the Public Interest Statement, however, this request appears primarily to be exploring Comcast's plans for business customers that are out of Comcast's service area today but would be serviceable post-transaction. The remainder of this answer accordingly provides information relevant to the types of business customers Comcast serves today and would like to better and more broadly serve in the expanded service areas that would be available to Comcast's business service post-transaction.

Comcast does not rigidly define classes of business customers that it serves or desires to serve. Rather, Comcast markets and provides business services generally to four general types of businesses: small businesses; medium-sized businesses; enterprise or national accounts; and carrier services, which include cellular tower backhaul service. These segments are loosely defined based primarily on the number of employees and the number and location of the business's sites.

- Small businesses generally have fewer than 20 employees and operate out of a single location.
- Medium-sized businesses are generally companies with between 20 and 500 employees and that operate out of multiple sites in different geographic locations, often dispersed throughout a Comcast region or with locations outside of a Comcast region.
- Enterprise/national accounts are generally companies with over 500 employees operating out of multiple sites across widely dispersed locations across Comcast's regions or across the nation.
- Carrier services are cellular tower backhaul, carrying data from a wireless provider's cell towers to its core network, and Ethernet customer access, providing customer access circuits to telecommunications providers.

As of the end of 2013, small businesses accounted for approximately **[[ ]]** percent of Comcast's business services revenue (exclusive of carrier services), with medium-sized businesses accounting for the remainder, and no material revenue from large enterprises.

Small Businesses

Comcast offers small businesses a competitive alternative for their data, voice, and video needs. In this regard, Comcast provides business-class billing, provisioning, and customer interface systems and has built out its network to millions of premise-based (rather than home-based) small businesses in its service areas and continues to expand this investment.

Comcast markets its small business services **[[ ]]**

Medium-sized Businesses

In the last several years, Comcast has also entered the medium-sized market segment and has made some gains serving medium-sized businesses with locations in its service territory.

Comcast is able to offer more advanced services to medium-sized businesses in its service territory, including Metro Ethernet service, which is designed to provide high-bandwidth connectivity to a business customer. Indeed, Comcast provides dedicated Internet access to businesses over its fiber network, offering speeds of up to 10 Gbps. Where fiber is not an option, Comcast has helped pioneer the offering of "Ethernet over HFC" (hybrid fiber/coax) that delivers Metro Ethernet at guaranteed speeds of up to 10 Mbps symmetrical and provides a cost-effective Ethernet option for many customers.

To date, however, geographic constraints have hindered Comcast from competing effectively for medium-sized business customers that have office locations outside of Comcast's service areas. Where a customer's business spans multiple areas, Comcast's limited service areas are often not an option. While Comcast can negotiate agreements with other cable companies and Incumbent Local Exchange Carriers to allow Comcast to serve customers that span both cable companies' service areas, such offerings are often difficult to arrange and manage and are less attractive for the customer. These customers typically prefer the higher level of reliability that results when the service is provided using a common set of technical standards, is managed by a single network operations center, and offers a single point of contact for technical or other customer-service issues.

It is these medium-sized businesses with locations both within and outside of Comcast's service areas that the proposed combination with TWC will help Comcast serve. By increasing the areas covered by its network, Comcast's combination with TWC will increase the number of companies with sites served by the combined company's network and will enable the combined company to provide an attractive unified service to businesses with sites adjacent to or clustered around areas previously split between the Comcast and TWC markets. Further, the combined companies will be able to build

super-regional Metro Ethernet clusters, thereby further consolidating key parts of the companies' networks and fostering more efficient delivery of services. The combination also will facilitate more investment and enhance the combined company's ability to compete with the incumbents. And these additional network infrastructure investments will also make it easier to serve business customers located within Comcast's footprint as well as residential customers.

Given the more sophisticated nature of the medium-sized business customers and the services offered to such customers, **[[ ]]**

Enterprise/National Accounts

The enterprise/national account segment is a catch-all category of businesses that include large businesses with locations across multiple Comcast regions as well as nationwide. While Comcast has been able to win some enterprise business in the past, its success has been limited by the same geographic limitations outlined above. In addition, serving enterprise customers will require significant additional investment in network infrastructure, data centers, and other facilities and the additional scope and scale of the combined companies will support that necessary investment. Also, the increased amount of on-net fiber and "Ethernet over HFC" networks that can reach multi-site customers, as well as the increased scale, integration, and operational efficiencies will help establish the combined company as a meaningful alternative for enterprise companies that have many locations throughout the expanded Comcast-TWC service areas. An enterprise customer may still need to rely on an "aggregator" for some of its locations to fill in the holes outside the combined company's service areas. However, with its greater service areas post-transaction, the company will more likely be a contender for enterprise accounts more generally and act as or work with aggregators to be the primary provider to enterprise customers with a nationwide footprint. And as the primary provider, the company would be the single point of contact and play a bigger role in ensuring quality service and reducing cost for enterprise customers.

Given that these businesses are all characterized by having locations in multiple Comcast regions, **[[ ]]**

Carrier Services

Comcast provides cellular tower backhaul service to wireless providers and customer access service to telecommunications providers more generally.

With regard to cellular tower backhaul, Comcast is a relatively new entrant in the provision of such services. It began offering backhaul services to mobile wireless providers in approximately 2008 and currently provides backhaul to more than **[[ ]]** cell sites or about **[[ ]]** percent of the cell towers in its service territories. **[[ ]]** Mobile data traffic is growing rapidly and wholesale wireless backhaul is thus an emerging and significant national service. The proposed combination with TWC will better position the combined entity to serve this rapidly expanding market segment. The combination

will improve the network reach, support additional infrastructure investment, and allow the combined company to offer consistency in technology and approach to mobile wireless operators with sites served by the broader service areas of the combined company.

Comcast also sells customer access circuits to telecommunications providers, providing last-mile connectivity between carriers and their customers where the customers are located outside the carrier's footprint. Comcast provides Ethernet customer access either by its fiber network or by Ethernet over HFC, depending on availability and the carrier customer's speed requirement. With many carriers adopting Ethernet as the preferred customer access technology, this service too represents a rapidly expanding business segment with strong future growth potential. **[[ ]] {{ }} [[ ]] {{ }} [[ ]] {{ }} [[ ]]** The proposed combination with TWC will therefore allow the combined company to offer to these carriers customer access services across a much more expanded service area.

As with the enterprise/national accounts, the specialized, technical nature of carrier services necessitates **[[ ]]**

Monitoring Business Sales

[[ ]]

Documents responsive to this request will be produced to the FCC.

77. Produce all documents relating to bids submitted in response to requests for proposals to supply business services to customer locations outside the Company's service areas, including, but not limited to, the bids, and discussions with other persons whose service area includes customer locations outside the Company's service areas.

RESPONSE:

Documents responsive to this request will be produced to the FCC.

78. Describe in further detail, and produce all documents relating to, the business services initiative mentioned in paragraph 152 of the Israel Declaration submitted in support of the proposed TWC transaction, in which the Applicants will "partner to serve national accounts that span the footprints of the two firms by aggregating services," and state when the planning for this partnership began, the identity of any persons that Comcast's intends to offer to provide services to after consummation of the proposed TWC transaction and proposed divestiture transactions, the services Comcast plans to provide and what next steps, if any, will be taken.

RESPONSE:

The business services initiative referenced at paragraph 152 of the Israel Declaration is **[[ ]]**

Comcast **[[ ]]** To date, this arrangement has resulted in Comcast securing only one small account, which confirms the point that such are less attractive for the customer (**[[ ]]**)

After consummation of the proposed TWC transaction and the divestiture transactions, Comcast plans to rapidly expand its provision of business services to enterprise/national accounts. The combined company will be able to compete more effectively for medium-sized and enterprise business customers by combining Comcast's and TWC's respective product offerings to capitalize on their complementary strengths throughout their combined service areas. For example, Comcast currently offers some services to business customers that TWC does not, including Comcast's Business VoiceEdge ("BVE"), which provides web-based PBX functionality with a host of nomadic features. This includes a "Be Anywhere" feature that allows customers to make and receive calls from any device at any location with one phone number, and to use 4-digit extensions to contact colleagues from their mobile phones. BVE also includes "Teleworker," which enables seamless integration of remote and work-at-home employees into a company's phone infrastructure. TWC, on the other hand, provides a range of cloud-based solutions that appeal to medium-sized and enterprise businesses, including "Infrastructure as a Service" and "Desktop as a Service," and customized managed hosting, managed application, and message solutions, along with other related IT solutions and professional services. TWC also offers Session Initial Protocol ("SIP") trunking, data center services, and other high-end business services products.

After consummation of the merger, Comcast plans to market the combined Comcast and TWC business services aggressively to the Fortune 1500 companies. Indeed, **[[ ]]**

Documents responsive to this request will be produced to the FCC.

79. Identify the each of Company's programming contracts that will supersede the contracts for programming applicable to the cable systems it is acquiring as a result of the proposed TWC transaction and proposed divestiture transactions, and for each programming contract identified, quantify the amount of annual savings or additional expense, separately for each year over the seven year period following consummation of the proposed TWC transaction and the proposed divestiture transactions, that will be generated as a result of the acquisition and the application of the Company's programming contracts.

RESPONSE:

[[ ]]

80. To the extent the Applicants contend that the proposed TWC transaction and the proposed divestiture transactions will result in (i) savings in any costs or expenditures, (ii) geographic efficiencies, (iii) an enhanced ability to introduce new products, provide more products and services to customers and to improve service quality and management of communications security risks, and (iv) any other synergies:

a. describe in detail all of the claimed efficiencies, savings, new and improved products and synergies that are projected by the Applicants to result from the proposed TWC transaction and the proposed divestiture transactions, and submit a timeline for when these efficiencies, savings, new or improved products and synergies will be generated and recognized by the Company;

b. produce all plans, analyses, and reports, models, assumptions, and spreadsheets, relating to the estimates of savings in costs, new or improved products the Company will introduce, and all synergies referred to in the Applicants' filings in the record;

c. describe in detail, and produce all documents relating to, how the proposed TWC transaction and the proposed divestiture transactions "should result in cost savings and other synergies worth approximately $1.5 billion in increased earnings before interest, taxes, depreciation and amortization within three years, and recurring every year thereafter" and "approximately $400 million in capital expense efficiencies." (Public Interest Statement at page 27);

d. provide, for each operational savings or cost synergy identified by the Applicants in determining their total savings and annual savings referred to in the Public Interest Statement and supporting declarations: (1) a quantification of the operational savings or cost synergy and an explanation of how the quantification was calculated; and (2) the steps that the Company anticipates taking to achieve that operational savings or cost synergy, and the estimated time and costs required to achieve it;

e. state, for each cost savings, whether it is a fixed cost saving or a variable cost saving and explain the reasoning. State separately the one-time fixed cost savings, recurring fixed cost savings, and variable cost savings (in dollars per subscriber and dollars per year);

f. produce all documents analyzing, estimating, justifying, providing the basis for, or otherwise discussing: (1) the operating and capital expense efficiencies and additional revenue synergies referred to in Paragraphs 6-11 in the Angelakis Declaration; (2) the increased economies of scale and scope, enhanced ability to increase investment and innovation, and the expansion

and acceleration of infrastructure development as described in Paragraphs 12-39 of the Angelakis Declaration; (3) the benefits to businesses as described in Paragraphs 31-39 of the Angelakis Declaration; (4) the benefits to advertisers as described in Paragraphs 40-42 of the Angelakis Declaration; and (5) the improvements in broadband quality as described in Paragraphs 171-180 of the Israel Declaration; and

g. for each new and improved product or service that the Company claims it will be able to offer as a result of the proposed TWC transaction and the proposed divestiture transaction, state specifically the amount the Company will need to invest and spend to provide the new or improved product or service, identifying each element of the cost, including but not limited to, research, development, licensing fees, equipment and manufacturing costs.

RESPONSE:

80(a):

1. Time Warner Cable Transaction

The proposed transaction between Comcast and TWC will bring important benefits to consumers nationwide by enhancing consumer choice; facilitating greater investment in Comcast's and TWC's combined network through greater scale; generating substantial transaction-specific efficiencies and cost savings; enhancing competition for small, medium, and large businesses; and accelerating investment in and the roll out of advanced video, digital voice, and high-speed data services, such as Comcast's X1 video service and greater Internet speeds. In particular, Comcast has concluded that the enhanced scale created by the transaction should result in synergies and related efficiencies that will lead to greater innovation and an enhanced consumer experience.

Comcast estimates that the efficiencies resulting from the proposed transaction will total approximately $1.5 billion in operating expenses and approximately $400 million in capital expenditures by the third year, with operating expense efficiencies recurring at or above the $1.5 billion level each year thereafter (capital expenditure efficiencies are not expected to continue beyond year three).

Comcast expects to achieve $750 million of the $1.5 billion in operating efficiencies in the first year after closing, another 25 percent in year two, and the remaining 25 percent in year three. These operating efficiencies fall into the following categories:

- **Corporate overhead:** The transaction will decrease the aggregate amount of overhead currently spent by Comcast and TWC in many duplicative areas that are related to corporate staff and operational functions. By consolidating such functions and services within a single corporate management structure, the combined company should realize approximately **{{ }}** in expense efficiencies for corporate and operational overhead over a three-year period.

- **Cable Operations:** This integration of Comcast's and TWC's cable operations will also contribute to these operating expense efficiencies. Eliminating duplicative networks, assets, and functions and creating, for example, one backbone and one content delivery network, will yield approximately an additional **{{ }}** in operating expense efficiencies over a three-year period.

- **Programming Costs:** The remaining **{{ }}** in operating expense efficiencies are expected to come from savings on programming costs over a three-year period, to the extent and at such time as more favorable rates and terms in some of Comcast's programming agreements supersede some of TWC's existing contracts.

In addition to operating efficiencies, Comcast's business involves significant capital expenditures for network elements, such as fiber-optic cable, software, modems, set-top boxes, servers, and vehicles, as well as other customer equipment. Comcast expects that the combined company will likely enjoy a lower per-unit cost when purchasing network and customer equipment in larger quantities. The capital expenditure savings represent approximately 10 percent of TWC's total anticipated expenditures in 2014.

Finally, Comcast believes there are strong opportunities for revenue synergies through the combined entity's enhanced ability to compete for residential and business customers. Some of those opportunities are explained in detail below. Comcast operating and capital expenditure efficiencies described above do not include these revenue synergies.

There are three primary economic mechanisms that will drive benefits from the transaction: economies of scale, expanded geographic reach, and sharing of technologies and services. Scale can make the difference between investing in a new product and service and not investing, and it can speed up the pace of product and service introductions and enhancements, as discussed further below. Expanded geographic reach allows firms to compete more effectively for customers, especially business customers whose operations span multiple regions. Sharing best practices and services can increase consumers' access to cutting edge services.

a. Increased Ability to Deploy Advanced Technologies and to Develop New and Innovative Products and Services

By creating additional efficiencies, economies of scale, and an expansion of Comcast's geographic footprint, the proposed transaction will provide the combined company with a greater ability to invest and innovate, not only to serve its existing customers better, but also to respond more effectively to the increasing competitive forces that Comcast faces. Comcast, which employs over 1,000 engineers and developers, needs to continue to invest in advanced technologies and in developing innovative products and services. The bulk of Comcast's approximately $1 billion in annual spending on intangible assets is devoted to software research, development, and deployment. The transaction will allow the combined company to spread the cost of these investments in new products and

services over a larger customer base and more efficiently market these services. This additional base and scale increases the incentive to invest and take risks in developing innovative products and services.

Because of its scale and desire to compete more effectively, Comcast already leads the cable industry in innovation and investment. For example, Comcast made a large upfront investment of **{{ }}** to develop its advanced X1 video platform. This platform provides customers a state-of-the-art user interface with integrated search features, personalized recommendations, access to the Internet through the TV, and the ability to use voice commands to navigate the programming guide. The X1 platform also enables a live TV streaming feature that allows customers to stream a meaningful part of their cable channel lineup to computers and mobile devices, and a new cloud DVR feature that allows them to watch DVR recordings on any X1-connected TV, computer, and mobile device in the home and download recorded content to mobile devices to take "on-the-go." No other cable company has developed a comparable product. Through the proposed transaction, Comcast expects to roll out this new video platform throughout TWC's footprint as soon as practically possible once the merger is complete, providing customers of the combined entity with a substantially improved video experience. The availability of X1 would not be possible in the absence of the transaction, as the cost of developing and rolling out such a platform on a similar timeline would be prohibitive for TWC.

The proposed transaction further enhances Comcast's ability to invest in new products and services and will extend the benefits of Comcast's scale to TWC's systems and customers. For example, increased scale may enable Comcast to justify additional investments in products and services that are speculative and have high fixed costs, such as Streampix, Comcast's subscription video-on-demand ("VOD") service, new VOD and DVR technology, and other new offerings. Moreover, the ability to amortize development costs over more systems means that Comcast can deploy new products and services more rapidly. Indeed, an ongoing strategic priority in the cable industry is to find creative ways to increase scale to justify and enable higher levels of investment and innovation.

The transaction will also provide Comcast the added scope and scale to more fully realize the significant investment in human capital that Comcast – uniquely in the cable industry – has undertaken in recent years. As noted above, Comcast now employs over 1,000 engineers and developers and vigorously competes for new technology talent with the likes of Google, Apple, Facebook, Netflix, Microsoft, and Twitter. With greater scale in key markets, Comcast will have a broader base of subscribers over which to spread research and development costs and to test-market and ultimately deploy new and innovative products and services. And a larger team of engineers and developers facilitates faster innovation as they can work with third-party manufacturers to develop a range of technology solutions.

Finally, the transaction will provide geographic scope efficiencies. For example, following the transaction, Comcast will have access to several markets geographically aligned near existing markets, allowing Comcast to more efficiently invest in high-fixed-cost infrastructure to serve those areas. Denser geographic coverage will also create marketing efficiencies that are particularly important with respect to the roll out of services like TV Everywhere that may require extensive and expensive marketing campaigns to educate and attract consumers.

b. Transaction Efficiencies for Residential Customers

The transaction-related synergies and economies of scale described above will justify more investment and more cost-effective allocation of resources than either TWC or Comcast could do on its own in three critical areas for consumers: (1) broadband, (2) video, and (3) voice. Comcast is committed to adding substantial incremental investments to what TWC had planned for network and service upgrades and enhancements over the next three years. These additional investments in network infrastructure and enhancements will improve the reliability and security of the network and expand its bandwidth to deliver, for example, faster broadband speeds; increased Wi-Fi gateway and hotspot deployment; wider deployment of the X1 platform, cloud DVR, and IP cable services; and enhanced voice services.

Broadband. The acquired TWC systems – and the company as a whole – will benefit from the ability to translate large fixed-cost development and investments into better deployment and returns across a broader customer base. Comcast expects that one of the combined company's primary focuses will be upgrading TWC's broadband plant to Comcast's technical standards in order to deliver improved broadband services to consumers.

For its own systems, Comcast is planning to spend approximately **{{ }}** on capacity and network-related initiatives over the next three years, including Converged Cable Access Platform ("CCAP"), Cable Modem Termination Systems ("CMTSes"), faster modems, and better Wi-Fi gateways.

Post-transaction, Comcast intends to increase investment in TWC's systems, with the combined company able to scale these investments more efficiently. Comcast expects to increase standard broadband speeds for all TWC customers to standard speeds customers in Comcast systems enjoy, faster than TWC could do on its own. This will be achieved by accelerating investment in upgrading TWC's plant. For example, TWC customers on the 15 Mbps/1 Mbps tier will see their speeds increased to 25 Mbps/5 Mbps, and likely beyond that as Comcast continues to increase its broadband speeds as it has done consistently since it first began offering Internet service.

A critical step involves upgrading all of TWC's systems from a part-analog to an all-digital platform in order to provide improved quality as well as additional capacity for broadband and other advanced services. Several years ago, Comcast undertook a five-

year all-digital effort called "Project Cavalry" to improve its quality and reclaim bandwidth by transitioning all Comcast systems to an all-digital platform. Comcast completed this transition two years ahead of schedule, and this effort has led to Comcast being able to bond more than eight QAM channels in most of its markets for the delivery of broadband services. With the introduction of CCAP-enabled CMTSes, which Comcast expects to deploy to **[[ ]]** percent of its footprint by the end of 2015, Comcast will be able to bond 48 QAMs, and 96 QAMs in 2016 (after implementing DOCSIS 3.1). TWC has only begun deploying CCAP technology in a few discrete markets and has plans to roll it out to 75 percent of its footprint over several years. With TWC part of Comcast's efforts post-transaction, Comcast should be able to deploy CCAP-enabled equipment to TWC's systems on an accelerated and more cost-efficient basis than TWC could accomplish on its own.

While TWC recently announced its TWC Maxx plans to upgrade its broadband speeds to 75 percent of its footprint over three years, Comcast intends to extend its higher speeds and related consumer benefits to all of the TWC systems on an accelerated and more cost-efficient basis than TWC could accomplish on its own. Comcast additionally plans to bring consumers the next generation of upgrades across its footprint in the next few years. Comcast is actively pursuing next-generation technologies that will provide additional significant speed benefits to its broadband customers. It already has plans to invest significantly in capacity and network-related initiatives over the next three years; post-transaction, TWC's systems will be part of those plans (at appropriate incremental levels of investment). The company as a whole will be able to scale such investments more efficiently than TWC or Comcast could do individually.

Beyond faster broadband speeds and improved reliability, the transaction-related scale and scope efficiencies will enable Comcast to expand Wi-Fi gateway distribution and hotspot deployment across the entire Comcast-TWC footprint, particularly in areas where there will be greater density and geographical alignment of systems. Comcast and TWC are part of a CableWiFi partnership, together with other cable industry partners, that allows customers to access public Wi-Fi hotspots in other partners' territories. Although the CableWiFi partnership has worked relatively well for each of Comcast and TWC's customer bases, Comcast is driving deployment of Wi-Fi hotspots more aggressively than TWC, especially when considering Wi-Fi modem deployments that augment the Wi-Fi network with home hotspot locations. The company's intent is to fill in the gaps in the Wi-Fi network across Comcast's and TWC's combined footprint. Greater Wi-Fi access would mean that customers could use advanced devices and enjoy bandwidth-intensive applications in more places, and a more ubiquitous Wi-Fi network would also provide the combined company with a stronger platform for other potential innovation and offerings.

Advanced Video. The transaction will allow the combined company to continue to innovate and deepen the value proposition of the video services for consumers in a competitive marketplace (marked by greater competition than ever before from both traditional MVPDs and emerging online providers). Comcast's transition of TWC's systems to an all-digital platform will be accomplished more rapidly than TWC could do

it alone. As a result, TWC's systems will benefit from greater capacity for new and innovative video products.

The increased bandwidth associated with a widely scaled all-digital network has enabled Comcast to develop – and deploy across its footprint – Comcast's next-generation cloud-based X1 platform (described above). Post-transaction, taking into consideration integration issues, Comcast should be able to begin deploying the X1 platform (and the X2 interface upgrade to that platform) to the acquired systems within a year of the transaction, so that TWC's video subscribers enjoy the benefits of this advanced technology and so that those systems are able to compete more effectively against innovative and aggressive competitors.

The TWC systems will also benefit from the extension of Comcast's greater TV Everywhere rights and industry-leading VOD service (following necessary upgrades to the TWC systems). Today, Xfinity On Demand has 400 million views each month, includes over 50,000 programming choices (a number that is constantly growing), and over 80 percent are free of charge. Comcast also offers a leading TV Everywhere experience with access to over 300,000 streaming choices, including over 50 live linear TV channels on XfinityTV.com and the Xfinity TV Go app. Although the operational and contractual integration issues are not trivial, these benefits should directly and relatively quickly extend to the TWC systems following the approval and consummation of the transaction.

Digital Voice. Post-transaction, the combined company will benefit from the best aspects of both companies' robust and innovative voice services. The post-transaction company will be better suited to offer an array of advanced IP voice services in competition with ILECs and other providers, and to continue to drive innovation and competition in this market.

c. Transaction Efficiencies for Businesses

The synergies and scale and scope efficiencies discussed above will also significantly enhance the ability of the combined firm to compete for and serve business customers of all sizes.

Comcast and TWC are more recent entrants in the business services market, and Comcast believes that this market presents a significant growth opportunity. Comcast first entered the business services market in 2006, focusing primarily on small businesses (i.e., primarily those with fewer than 20 employees). TWC, on the other hand, has more experience with medium-sized businesses in its footprint. Despite the fact that both companies are growing in their respective segments, Comcast and TWC together represent a small share of the small and medium-sized business market segment (maybe 10 to 15 percent within their footprints) for telecom voice and data services (excluding video and cloud-related services), and a *de minimis* share of national (enterprise) businesses.

This transaction will provide the combined company the scale and scope needed to invest and compete more effectively against well-established incumbents for two business customer categories: (1) medium-sized, regional, super-regional, and even enterprise businesses; and (2) wireless backhaul services.

Medium-Sized, Regional, Super-Regional, and Enterprise Business. The proposed transaction will help establish the combined company as a significant competitor with a stronger foothold in the medium-sized, regional, and super-regional business marketplace. As discussed above, the transaction will enable Comcast to accelerate and enhance the build-out of its network infrastructure in its service areas, bolstering its ability to compete for business customers. In particular, medium-sized businesses generally require more "on-net" building connections. Historically, these businesses have had to rely on companies like AT&T, Verizon, and CenturyLink, which have been the only providers with the scale and scope to provide these connections.

Economies of scale will enable the combined company to drive down the costs of procurement and network build-out, and will help achieve the marketing and operating efficiencies that are necessary for Comcast to be a more effective competitor. In addition, the companies will be able to combine their complementary service offerings (e.g., hosted voice service, cloud-based services) and further develop advanced service offerings like point-to-point and multi-point Ethernet services, in order to provide a more attractive suite of services to potential business customers.

The transaction will also enable the combined company to serve super-regional companies with operations that span Comcast's and TWC's existing footprints. In the past, geographic constraints have limited cable companies from competing effectively against incumbent LECs that have served this market for decades given their greater scale and scope. Today, neither Comcast nor TWC can generally provide services to businesses that cross territories as efficiently as either can provide services to businesses within their respective territories. Thus, businesses with operations in both Comcast's and TWC's footprints that seek an alternative to the incumbent LEC face two equally unappealing options: (1) rely on an aggregator that pieces multiple services together (at a markup) or (2) negotiate and manage multiple accounts with separate providers. The transaction will help address this lack of choice, bringing greater competition to this marketplace.

Post-transaction, Comcast will be able to compete more effectively with incumbent LECs by offering a unified set of seamless products and services throughout its extended footprint with greater operational and cost efficiencies. For example, Comcast will be able to serve larger multi-site customers in a uniform fashion, and will also be able to build super-regional Metro Ethernet ("metro-E") clusters, thereby further consolidating key parts of the company's network and fostering more efficient delivery of services. Comcast also will be able to increase the number of "on-net" sites the company serves, which will further reduce the costs and operational barriers for businesses with multiple sites and facilitate investment in adding sites to Comcast's network.

For the same reasons, Comcast's larger geographic reach post-transaction will also make it a meaningful option for enterprise companies that have multiple locations throughout the combined Comcast-TWC footprint, and currently rely either on incumbent LECs or third-party aggregators. With more of these companies' locations covered by Comcast's expanded geography, it will now make more economic sense for the company to pursue this national business. This market segment should benefit from a new near-national competitive entrant that can provide superior service and value.

Wireless Backhaul Services. With mobile data traffic growing rapidly, wholesale wireless backhaul is emerging as a national service. Comcast and TWC have both recognized that the increasing need for wireless carriers to offload wireless traffic from their cell towers onto high-capacity fiber facilities presents a business opportunity for the companies. Currently, TWC and Comcast provide wireless backhaul to only a small fraction of the total number of cell sites (less than three percent).

The transaction will improve Comcast's ability to compete in the wireless backhaul market, particularly because of its larger geographic footprint and scale post-transaction. TWC's expertise and assets in this market factor into this strategic assessment. For example, with its acquisition of DukeNet, TWC obtained an 8,700-mile regional fiber-based network that provides wholesale wireless backhaul and other business services to customers in North Carolina, South Carolina, and five other states in the Southeast. The combined company's additional scale after the transaction will provide it with the resources and expertise to build fiber even further and make substantial reinvestments in provisioning and backhaul infrastructure.

Finally, investment in this area not only creates competition for critical cell backhaul and wholesale carrier infrastructure, but directly benefits medium-sized and enterprise business customers by accelerating the deployment of a more redundant and resilient network. More generally, the combined investments and network upgrades that are necessary to serve medium-sized, enterprise, and wholesale wireless backhaul customers across the combined company's footprint will also inure to the benefit of small business and residential customers in a number of ways. For example, since products developed for the medium-sized or enterprise segments can often be offered to/repackaged for small businesses, new product development driven by greater competition for larger businesses will also benefit small business customers. Moreover, small businesses and residential customers will enjoy the "spillover effects" from investments, plant upgrades, and network reliability enhancements made to serve larger businesses.

d. Transaction Efficiencies for Advertisers

The transaction will also foster the deployment and adoption of next-generation cable advertising technologies that will benefit advertisers and consumers. The transaction will allow Comcast to spread the costs of developing these new technologies over a broader customer base, and will enable Comcast to deploy them over a wider footprint and showcase them in the important New York and Los Angeles markets.

One such platform is dynamic ad insertion for VOD, which allows a cable operator to dynamically insert fresh ads into VOD programming (as well as TV Everywhere and cloud DVR content) to make these ads more relevant to the consumer. This transaction will allow Comcast and TWC to expand their dynamic ad insertion efforts, not only because it will allow Comcast to add much more VOD and TV Everywhere content to the TWC systems, but also because it may spur advertisers and ratings agencies to unite around common approaches and measurement tools in dealing with a larger company with a deep commitment to VOD. Dynamic ad insertion technology may incentivize programmers, with the increased buy-in from advertisers and ratings agencies, to make valuable programming more broadly available on this robust and convenient VOD platform.

Similar benefits may result with respect to addressable advertising technology, which allows for the serving of micro-targeted ads to a consumer based on various non-personally identifiable attributes and with due regard for privacy considerations. As a matter of scale and scope, the combined company will have a broader set of customers across which to deploy this technology, and within which advertisers can target critical masses of discrete consumer micro-groups, including those located in important advertising markets.

These advancements in advertising technologies will also benefit consumers, such as by making it more likely that programmers can and will make more popular programming available, including "banking" entire past seasons on VOD. Consumers will also receive advertisements, promotions, and discounts that are more relevant to them and their families.

e. Absent the Transaction, Comcast Will Not Be Able to Achieve the Same Efficiencies

Based on the above factors and analysis, Comcast has concluded that the meaningful consumer and business benefits described above can be achieved only by combining Comcast and TWC. Each of the benefits outlined above is based in part on increased scale, substantial investment, innovation and experience, and an expanded geographic scope for the combined company. In Comcast's considered judgment, there is no other reasonable or attainable pathway to achieve these types of substantial benefits for consumers and businesses.

Contracting is a common mechanism to achieve some of the benefits of increased scale, expanded geographic reach, and sharing of technologies and services. However, in many cases contracting does not achieve all of the potential benefits because of well-known difficulties that arise in contracting, including transactional frictions and costs, differences in strategy, double marginalization, and the requirement for large investments specific to collaboration with another company in which returns hinge on the future behavior of the other company. Indeed, as discussed below, Comcast and TWC have sought to achieve efficiencies via contracting or consortium approaches in several

contexts with mixed results, and the complexity and uncertainty of such arrangements has reduced the benefits relative to what the parties can achieve through the transaction.

2. Divestiture Transaction

The proposed transaction between Comcast and Charter will facilitate the synergies and related efficiencies associated with the Comcast-TWC transaction and create additional transaction-specific efficiencies for Comcast and Charter.

As an initial matter, the Transaction delivers on Comcast's commitment to divest subscribers following the TWC Transaction. In addition, the Transaction between Comcast and Charter – in particular, the system swaps – will generate additional benefits beyond those associated with the Comcast-TWC transaction by increasing economies of scale at a regional level and providing for a broader contiguous footprint in various geographic regions. Comcast will be able to leverage existing infrastructure in these geographic regions (such as customer service centers, billing and provisioning infrastructure, routers and optics for last-mile Internet access service, and others) to better serve the systems it acquires from Charter, thereby lowering overall costs of operations in that region. For example, greater contiguous footprints and increased concentration of subscribers allow for optimized locations of service centers and retail stores. This allows for technicians and service trucks to be closer to customers, reducing driving time and providing for more service per a given time period.

In addition to reducing existing operational expenses, increased regional footprints allow for enhanced investments that improve the consumer experience. This is particularly true for regional services that require significant fixed-cost investment at a regional level (rather than national level), such as cloud-based DVR. Deploying cloud-based DVR requires a significant investment at the regional level, including purchasing and installing network infrastructure and transcoding channel lineups. Such costs on a regional level are essentially fixed regardless of the number of subscribers in the region. The proposed transaction, therefore, will enable Comcast to make such investments at a lower per-customer cost. By reducing the per-customer cost of regional fixed-cost investments, the proposed transaction will encourage Comcast to make investments in regions where such investments might not have been economical otherwise, as well as accelerating the development and roll-out of such advanced services.

Comcast's footprint in particular localities will also generate efficiencies in marketing. Comcast will acquire systems in various designated market areas ("DMAs") where it currently has relatively few subscribers. Presently, Comcast cannot cost-effectively utilize radio and local broadcast to market its services in many areas because it has a limited presence in those DMAs. By enhancing its footprint within certain DMAs, Comcast will be able to make efficient use of local broadcast and radio for advertising because a greater portion of potential customers who receive such broadcasts will reside in areas Comcast serves. Comcast may also be able to reduce other costs associated with

marketing by concentrating on DMA-wide advertising and reducing use of online or direct-mail marketing campaigns.

The proposed transaction will expand Comcast's geographic reach in certain regions where Comcast provides services to some businesses that conduct operations in areas outside of Comcast's footprint. Comcast purchases services wholesale from providers in those areas and packages those services with its own to offer to business customers. This arrangement results in prices that include double marginalization, which would be reduced or eliminated if Comcast were able to serve more businesses directly. Comcast can also eliminate certain costs associated with connecting its services with an out of footprint provider. Thus, businesses in regions where Comcast will have an expanded presence after the transaction will benefit from lower prices and more effective competition.

An expanded regional footprint will also allow Comcast to provide superior services to business customers by reducing inconsistencies associated with purchasing services from multiple providers in a region. A business customer that purchases services from multiple providers to serve operations in different areas will have to interact with separate operations centers, different processes for ordering and billing, separate support centers, and different product definitions. This added complexity may impose costs on business customers' operations, which puts Comcast at a competitive disadvantage compared to competitors with a larger geographic reach. By expanding Comcast's reach in certain regions, the proposed transaction will lead to greater competition between Comcast and existing providers for business services.

Residential customers will also benefit from the proposed transaction. After the transaction, Comcast will be better able to launch expansive Wi-Fi networks in regions where it will gain systems from Charter. Greater geographic scope will make investing in broader, more ubiquitous Wi-Fi networks more cost effective than it would be for either Comcast or Charter as separate entities.

In addition to this response this subpart, Comcast hereby incorporates by reference its Public Interest Statement and the Declaration of Michael J. Angelakis, Declaration of Dr. Gregory L. Rosston and Dr. Michael D. Topper, and Declaration of Dr. Mark A. Israel attached thereto and its June 5, 2014 Application and Public Interest Statement and the Supplemental Declaration of Dr. Gregory L. Rosston and Michael D. Topper attached thereto.

80(b)-(f):

Documents responsive to this request will be produced to the FCC. In particular, analyses of the "cost savings and other synergies worth approximately $1.5 billion in increased earnings before interest, taxes, depreciation and amortization within three years and recurring every year thereafter" and "approximately $400 million in capital expense efficiencies" will be produced to the FCC.

80(g):

Any plans for any new and improved products or services that Comcast will be able to offer as a result of the proposed transactions are still in a preliminary state. Final plans regarding any such products and services have not yet been developed, including with regard to costs.

Documents responsive to this request will be produced to the FCC.

81. Produce all documents (i) relating to any communication between employees of the Company and any other person with respect to any potential cost savings, efficiencies or synergies, (ii) provided by any other person to the Company relating to any potential cost savings, efficiencies or synergies, and (iii) provided by the Company to any other person relating to any potential cost savings, efficiencies or synergies.

RESPONSE:

Documents responsive to this request will be produced to the FCC.

82. Produce all documents discussing categories of cost savings realized as a result of the Company's acquisition of an ownership interest in a joint venture involving NBC Universal, Inc. and for each category of cost savings, state whether and how much of the cost savings were passed onto the Company's subscribers.

RESPONSE:

Documents responsive to this request will be produced to the FCC. In addition, Comcast provides the following response:

Comcast does not track cost savings related to the efficiencies arising out of the Comcast/NBCUniversal transaction. Indeed, as was stated at the time, cost savings were not a principal rationale of the transaction.

There are, however, several general areas detailed below where, in the company's view, the transaction has produced cost savings. In addition to the efficiencies detailed below, the transaction has resulted in the reduction or elimination of double marginalization, which inevitably benefits consumers.[156] There has been (and continues to be) a general rise in programming costs across the industry. Given this general increase, some of the cost savings achieved likely are reflected in prices that are lower than they otherwise would have been. It is a basic tenant of economics that, any cost reductions, or lower increases, achieved by Comcast with regard to programming will serve to counter to some degree the general trend in increased video programming prices.[157]

Numerous non-cost-saving efficiencies realized as a result of the transaction have also benefited Comcast's customers, including, for example, through greater availability of programming across platforms and services (e.g., VOD, online) and enhanced programming quality (e.g., increased investments in local newscasts).

Reductions in Transaction Costs

Vertical integration between NBCUniversal as a supplier of content and Comcast Cable as a distributor of content has served to reduce transaction and contracting costs between the different levels of the supply chain. These transaction costs between unaffiliated programmers and cable distributors can be particularly acute to the extent that the changing technology in this market makes certainty and predictability in forward-looking distribution contracts difficult to achieve. Drafting contracts that are flexible enough to allow for different models of distribution and to permit experimentation in platforms is

156 *See* Gregory Rosston, An Economic Analysis of Competitive Benefits from the Comcast-NBCU Transaction ¶¶ 80-90, *Applications of Comcast Corporation, General Electric Company and NBC Universal, Inc. for Consent to Assign Licenses or Transfer Control of Licenses*, MB Docket No. 10-56 (filed May 4, 2010).

157 *See* Rosston/Topper Decl. ¶ 197 ("As is well-known in economics, a reduction (or slower increase) of marginal cost of a supplier tends to get passed through to consumers in whole or in part, whether or not the supplier has market power.").

difficult, burdensome, and can increase the costs of distributing content on new platforms. The merger has reduced transaction costs, which has ultimately increased the availability of content on different platforms at lesser costs than would otherwise be the case. For example, post-merger, Comcast has increased its display of VOD offerings for currently-airing NBCUniversal programming.

Sharing of Resources

The NBCUniversal transaction has facilitated the sharing of resources among the programming networks of the formerly separate Comcast and NBCUniversal programming groups in a way that would not happen between and among independent media companies. In particular, the new entity has been able to share programming, production facilities, supporting personnel and executives, reporting, and on-air talent across multiple platforms, leading to efficiency gains and superior product offerings. Furthermore, the new entity has been able to save business expenses by combining hardware, software, and the services of third-party vendors.

NBC Sports, post-transaction, provides an example of the efficiencies created by the sharing of resources. Prior to the transaction, NBC lacked an affiliated cable network dedicated to sports programming, and the NBC broadcast network was the only viable outlet for airing sporting events on a regular basis. Accordingly, the production costs of covering sports events, as well as the air time for showing those sporting events, had to come exclusively from the NBC broadcast network. Moreover, due to limitations on NBC's ability to show sports events during certain times, e.g., times dedicated to affiliate newscasts, NBC was unable to air certain sports events. After the transaction, NBC was able to share production and other sports coverage costs with NBC Sports Network (formerly known as Versus) and other sports-oriented networks owned by Comcast prior to the transaction.

For example, NBC and NBC Sports Network each exhibit NHL games. The same production teams are used for both networks, which helps save money on the extensive costs associated with producing a live, professional sports broadcast (e.g., announcers, reporters, multiple high-definition cameras, instant replay technology, audio-visual effects, production employees). As many of these costs (such as for equipment) are fixed, it is more efficient to exhibit games on the combined entity than it would be to exhibit the same quantity of games across independent cable and broadcast outlets. This is also true of PGA Tour events (which are exhibited on both the Golf Channel and NBC), English Premier League soccer games (which are typically exhibited on NBC Sports Network and NBC, as well as every single game, every week available online through the NBC Sports Live Extra app or the NBC Sports Live Extra website), and other sporting events, such as NASCAR, Formula One, and the Tour de France. Having multiple networks for sports also helps spread the costs of such production over a broader revenue base. NBC Sports plans to continue growing this model of using multiple networks (as well as online platforms) to display additional sporting events at lesser

incremental costs than independent networks could provide, which creates value for both rights holders and consumers

Comcast/NBCUniversal's Olympic coverage is another example of these synergies. The combined entity was able to utilize a full range of cable networks and online platforms to provide comprehensive coverage and help recover the large fixed costs of obtaining and producing the content. Adding increased hours of programming to cable networks, in particular NBC Sports Network, was accomplished at a limited incremental cost. In sum, several hundred hours of additional Olympic programming were made available on linear television alone than were available prior to the merger, in addition to the thousands of hours available online. The sharing of resources across the combined programming group has provided the best possible Olympics viewing experience at a lower cost than would otherwise have been possible.

By reducing the expenses necessary for creating and maintaining network programming, the company is able to pass these savings downstream to distributors and, ultimately, consumers, including customers of Comcast Cable.

Economies of Scale

By creating a larger programming supplier, Comcast/NBCUniversal has been able to create economies of scale in the provision of video programming. Due to these scale efficiencies, Comcast/NBCUniversal programming has been able to invest greater amounts in programming and has made this programming available through its programming networks as well as online, VOD, and mobile platforms to consumers, including Comcast Cable's subscribers, at reduced costs than would have otherwise been possible. For example, while Comcast only offered 17,000 VOD choices total prior to the NBCUniversal transaction, in 2013, Comcast's free VOD choices averaged 38,991 per month (nearly double the amount needed to satisfy the three-year condition of the transaction).

Enhanced and Diverse Programming

The combination of Comcast and NBCUniversal has enabled the company to increase the quality and diversity of programming options by increasing its scale across content categories. In particular, this has allowed for increased offerings that are more finely tuned to the interests of specific audience groups (e.g., sports programming, children's programming, minority-focused programming). For example, Comcast's VOD platform now provides on average 6,871 children's programming choices per month. This represents over 4,000 more choices than were available prior to the transaction.

Further, due to the greater cross-promotion opportunities created by the transaction, there are more avenues (at less cost) for informing consumers about these programming options. Achieving any – let alone all – of these ends in the absence of the Comcast/NBCUniversal transaction would likely have necessitated increased prices.

83. The Public Interest Statement states, at pages 124-125, that the transaction will enable the merged firm to invest additional resources in communications security and extend Comcast's advanced cybersecurity technologies and practices. Produce all documents supporting this assertion, including but not limited to:

a. how customers of the combined entity will benefit from Comcast's commitment to utilize the National Institute of Standards and Technology (NIST) Framework for Improving Critical Infrastructure Cybersecurity, specifically citing the difference in cybersecurity benefits between current customers of the applicants and customers of the merged entity;

b. cybersecurity risk management challenges and improvements associated with the transaction, including (1) combining network infrastructure, enterprise risk management functions, procurement processes, and communications security personnel; (2) the current states and target states of cybersecurity risk management, and present cybersecurity gaps; and (3) any actions and timeframes identified to close the gaps;

c. implementation of DNSSEC and IPv6 to all Comcast and TWC systems;

d. the methods and technologies the combined entity will use to enable real-time awareness of cyber risk across its combined network; and

e. how the combined entity will enhance communications security for the combined entity's customers and for the "overall broadband ecosystem," including, but not limited to, the performance, integrity and reliability of public safety communications imperatives that may rely on its networks or applications, such as E911, NG911, text-to-911, and emergency alerts.

RESPONSE:

Documents responsive to this request will be produced to the FCC.

84. Produce all documents (except documents solely relating to environmental, tax, human resources, OSHA, or ERISA issues) relating to the proposed TWC transaction and the proposed divestiture transactions, and provide for each transaction:

a. a timetable for each transaction, a description of all actions that must be taken prior to consummation of each transaction, and any harm that will result if the transactions are not consummated;

b. a description of (including the rationale for, and identification of all documents directly or indirectly used to prepare the Company's response to this sub-part) all plans for changes in the Company's or TWC's operations, structure, policies, strategies, corporate goals, financing, business, officers, employees or any other area of corporate activity as a result of the transaction;

c. a description of, and all documents relating to (a) each alternative to the transaction by which the Company could achieve the efficiencies and cost-savings identified in Request 80 above and for each, why the company could not achieve that efficiency without the transaction; and

d. a description of any other terms or conditions of the transaction that are not reflected in the transaction agreements between the parties.

RESPONSE:

84(a):

1. Time Warner Cable Transaction

As set forth in the Agreement and Plan of Merger, dated as of February 12, 2014 (the "Merger Agreement"), between the parties, the consummation of the merger will occur as follows: At the time of the closing, Merger Subsidiary will be merged with and into TWC, whereupon the separate existence of Merger Subsidiary will cease and TWC will survive as a wholly owned subsidiary of Comcast. In order to effect the merger, TWC and Merger Subsidiary will file a certificate of merger with the Delaware Secretary of State (along with any other filings or recordings required under Delaware law). The merger will become effective upon filing of the certificate of merger, unless a later time is specified in the certificate of merger. The merger is subject to customary closing conditions, including consents and approvals of the FCC and certain state-level and local franchising authorities and public utility commissions, the timing of which is uncertain and will govern the timetable for completion of the merger.

A number of harms would result from a failure to consummate the proposed merger, including the inability to realize the significant anticipated cost savings and other benefits of the merger. In particular, and most importantly, the customer and other public interest benefits described in response to Request 80 would not be realized if the proposed merger were not consummated. In addition, the approximately $1.5 billion of annual cost savings and synergies Comcast currently estimates it would realize within three years from completion of the merger, net of implementation costs, would be lost. Failure to

consummate the merger also would mean that significant non-recoupable transaction costs will have been expended and that Comcast and TWC management will have committed substantial time and resources to matters relating to the merger (including integration planning) which would have otherwise have been devoted to day-to-day operations and other opportunities that may have been beneficial to either Comcast or TWC as an independent company, all with no resulting benefit to either entity. Finally, Comcast and TWC may also experience negative reactions from the financial markets and from their respective customers, regulators, and employees as a result of a failure to complete the merger.

2. Divestiture Transactions

As set forth in the Transactions Agreement, dated as of April 25, 2014 (the "Transactions Agreement"), between Comcast and Charter Communications, Inc. ("Charter"), the consummation of the transactions (collectively, the "Divestiture Transactions") will occur as follows: Following the merger with TWC, and subject to the satisfaction or waiver of numerous conditions detailed below, Comcast will contribute certain cable systems (representing approximately 2.5 million subscribers) and related assets into a newly-formed entity ("SpinCo") in exchange for newly issued SpinCo debt and SpinCo shares. Following the contribution, Comcast will distribute all of the SpinCo shares to Comcast shareholders (including former TWC stockholders who received shares in the Comcast-TWC merger and continue to hold those shares through the record date for the spin-off) (the "Spin-Off"). Following the Spin-Off, Comcast and Charter will consummate three transactions. First, a newly formed, wholly owned subsidiary of a Charter successor entity ("New Charter") will merge with and into SpinCo, with SpinCo surviving the merger (the "SpinCo Merger"). In connection with the SpinCo Merger, New Charter will receive shares of SpinCo common stock, and SpinCo's stockholders immediately prior to giving effect to the SpinCo merger will receive shares of New Charter common stock. Second, Comcast and Charter will consummate an exchange of certain former TWC cable systems for certain Charter cable systems, together with relevant subscribers and certain other assets and liabilities. (Charter and Comcast will exchange cable systems serving approximately 1.5 million former TWC video customers for cable systems serving approximately 1.6 million Charter video customers.) Third, Comcast will sell to Charter certain former TWC cable systems (representing approximately 1.5 million subscribers) not included in the like-kind exchange, together with relevant subscribers and certain other assets and liabilities.

In addition, in connection with these transactions and prior to the Spin-Off, Comcast, Charter, and SpinCo will cause SpinCo to incur new indebtedness to (i) fund a cash distribution to Comcast, and (ii) enable Comcast to complete a debt-for-debt exchange. In connection with such debt-for-debt exchange, one or more financial institutions will conduct a third-party tender offer for certain of Comcast's existing publicly traded debt securities, and will then exchange the tendered debt securities for new SpinCo debt held by Comcast. It is expected that the financial institutions would then resell the SpinCo debt they receive in a Rule 144A private placement to qualified institutional buyers.

The Divestiture Transactions are subject to the satisfaction or waiver of a number of conditions, including receipt of all required regulatory approvals; accuracy of each party's representations and warranties and the performance of covenants; absence of legal impediments; approval by Charter's stockholders; absence of certain adverse changes; receipt of opinions as to the tax-free nature of the transactions; listing of SpinCo's shares; and effectiveness of a registration statement for New Charter. The timing of the regulatory approvals is uncertain and will govern the timetable for completion of the Divestiture Transactions.

If the Divestiture Transactions are not completed, Comcast is still prepared to honor its voluntary commitment to divest subscribers so that it remains at or below 30 percent of U.S. MVPD subscribers. Comcast might pursue an alternative transaction to effect such divestiture, which may be on terms different from the Divestiture Transactions. In particular, an alternative transaction may not be consummated in a tax-efficient manner or otherwise be as favorable to shareholders. In addition, failure to consummate the Divestiture Transactions would mean that significant non-recoupable transaction costs will have been expended and that Comcast and Charter management will have committed substantial time and resources to matters relating to the Divestiture Transactions (including integration planning) that would have otherwise been devoted to day-to-day operations and other opportunities that may have been beneficial to Comcast or Charter, all with no resulting benefit to either entity. Comcast and Charter may also experience negative reactions from the financial markets and from their respective customers, regulators and employees as a result of a failure to complete the Divestiture Transactions. In addition, if the Divestiture Transactions are not completed, the efficiencies and benefits described below will not be realized.

84(b):

Plans for changes in the combined operations, structure, and strategies of Comcast and TWC are still in a very preliminary state and final plans have not yet been developed. Documents relating to any such plans will be produced to the FCC.

84(c):

Alternatives to the proposed TWC transaction – such as joint ventures or licensing arrangements – have generally been unable to deliver the types of efficiencies detailed in response to Request 80 above. From time to time, Comcast has attempted to collaborate with other cable companies in the development of new products and services through joint ventures, joint development products, and licensing arrangements. Many such efforts have failed or stalled because of the difficulties of coordination across separate organizations. For instance, Comcast participated in an initiative with other cable companies to create a unified site for customers to access their respective provider's TV Everywhere content, and to work with third-party device manufacturers such as Microsoft to implement that application. However, this attempt at collaboration failed as

the cable companies could not agree on technical specifications, investment decisions, deployment, etc.

Alternatives to the proposed divestiture transactions are similarly unlikely to generate the efficiencies discussed in response to Request 80 above. For example, a partnership between Comcast and Charter to offer services over a broader area to businesses with operations across the two companies' footprints would not as effectively avoid the inconsistencies that arise when a customer purchases services from multiple providers. Comcast has previously attempted to collaborate with other cable companies to develop new products across a broader footprint but such efforts have not generally succeeded.

84(d):

1. Time Warner Cable Transaction

Comcast believes that all terms and conditions of the merger are reflected in the Merger Agreement. **[[ ]]**

To the extent that any other terms or conditions not reflected in the Merger Agreement exist and were reduced to writing and found in the files of the individuals in the Second Request search group, they will be produced to the FCC.

2. Divestiture Transaction

Comcast and Charter are still negotiating the details and form of the long-form Transaction Agreements. Upon their completion, these Agreements will be provided to the FCC. To the extent that any other terms or conditions not reflected in the Transactions Agreements exist and were reduced to writing and found in the files of the individuals in the Information Request search group, they will be produced to the FCC.

85. Produce all documents relied upon or referred to in the Angelakis Declaration. In addition, produce all documents provided to, reviewed by, relied upon, or referred to by Dr. Gregory L. Rosston, Dr. Michael D. Topper, Dr. Mark A. Israel, and Richard R. Dykhouse in their respective declarations.

RESPONSE:

Subject to further discussions with FCC staff, Comcast will produce all documents referred to or relied upon by its experts.

86. Produce all vertical foreclosure analysis, or other vertical competitive effects analysis, econometric modeling, or similar analyses, including those regarding market concentration or pricing, that have been undertaken by the Company or any consultant or expert hired by the Company to analyze the effect of the proposed TWC transaction and the proposed divestiture transactions, including all documents and data used in these analyses.

RESPONSE:

In response to this request, Comcast refers in part to its responses to Requests 23, 24, and 25. Additionally, any other non-privileged documents responsive to this request will be produced to the FCC.

87. Produce a copy of (i) The Nielsen Report, (ii) ComScore report, (iii) SNL Kagan report, (iv) Centris report, and (v) any other third party report on MVPD service, video programming or OVD video usage regularly used by the Company and all research using any of these reports.

RESPONSE:

Documents responsive to this request will be produced to the FCC.

88. Describe in detail the Company's plans to migrate subscribers acquired as a result of the proposed TWC transaction and the proposed divestiture transaction, including but not limited to:

a. a projected timeline for the transition of all the acquired customers;

b. any plans for relevant services and devices necessary to access the services to be offered to the acquired subscribers, including but not limited to (1) a detailed description of the Company's plans to provide these subscribers with devices that may be used on the Company's network and any associated charges to an acquired customer who is required to acquire such a device, and (2) the service plans, bundled services and pricing to be offered to the acquired customers;

c. any plans for the acquired customers to retain their current service plans and if so, the length of time the acquired customers may remain enrolled under their existing service plans;

d. the features and services accessible from each device that will be offered to acquired customers;

e. any services or features that an acquired subscriber received from its previous provider that it will not be able to obtain from the Company after the consummation of the proposed TWC transaction and the proposed divestiture transactions, and plans to introduce that lost service or otherwise compensate the subscriber; and

f. all documents discussing customer migration and transition of the acquired customers to the Company.

RESPONSE:

88(a):

For purposes of this response, it is important to note that Comcast does not have full access to information regarding the composition or status of the systems it is acquiring from TWC and Charter. Therefore, the information contained herein is based solely on Comcast's preliminary discussions with TWC and Charter and Comcast's extensive experience upgrading cable systems and integrating them into the company.

It should be emphasized that the integration process remains quite fluid, as the parties are still in the process of exchanging and evaluating information to the degree possible given gun jumping and general antitrust concerns, and Comcast is continuing to learn about the systems, assets, and customers it will acquire. As such, the planning with respect to the migration of customers remains subject to change.

Comcast's plans to migrate customers to be acquired from TWC and Charter to provide them the Comcast customer experience are subject to a host of complex and inter-related technological, business, and legal issues. To name just one example, Comcast cannot transition TWC customers to all of Comcast's services until the market in question has been migrated to all-digital, so those customers can access and utilize all of Comcast's

offerings; various other activities and processes, such as back-office support systems and operating support systems, among others, must be integrated as well. The responses below thus reflect information known to Comcast as of the date of this submission and are subject to change.

Based on the information Comcast has obtained so far, it projects that the acquired customers in all of the markets at issue will have access to all of Comcast's products and services within **{{ }}**.

Comcast expects to proceed with this customer migration on a market-by-market basis. Further, the migration may proceed within each market on a service-by-service basis. For instance, Comcast may be able to provide higher broadband speeds to customers in a particular market before it has fully deployed its video service in that market.

Comcast is coordinating with state public utility commissions and local franchising authorities, as appropriate, about the provision of notice to customers in connection with their migration, including in jurisdictions in which such notices are not legally required.

88(b):

Comcast expects to provide several types of devices to migrated customers, including set-top boxes compatible with the X1 platform, DOCSIS 3.0 modems capable of supporting Comcast's services (including with Wi-Fi capability), and high-definition ("HD") digital transport adapters ("DTAs"). As a general matter, plans with respect to pricing and services (including bundled services) are still being evaluated and considered by the company. However, there have been some specific conversations about pricing, and in particular, about transitioning TWC customers to Comcast equipment pricing as summarized in the attached documentation.

88(c):

Any such plans are still being evaluated and considered by Comcast.

88(d):

The devices that Comcast expects to provide to customers following their migration to Comcast are set forth above in response to subpart (b).

88(e):

Comcast continues to evaluate this issue and has yet to make any decisions. Comcast's plans in this respect depend in large part on information not presently within Comcast's possession or on matters outside of its control. **{{ }}** Finally, Comcast offers some features that as a functional matter are comparable to certain TWC-specific features – such as TWC's LookBack – **{{ }}**

88(f):

Documents responsive to this request will be produced to the FCC. In addition, material responsive to this request is provided as Exhibits 88.1-88.4.

89. Provide the Company's data as specified in Attachment A, which seeks data relating: to active and potential business service addresses; internet traffic exchange and interconnection; subscriber and plan data; daily data on the capacity and use of IP points of presence; and, for Comcast, Charter and SpinCo after the consummation of the proposed divestiture transactions, monthly data for cable service on subscribers and locations served.

RESPONSE:

Comcast provides the following responses to this Request:

(i) "CTWC Congestion spreadsheet table Final"

Information and data responsive to this exhibit request have been provided in machine-readable Excel spreadsheet and CSV format as Exhibit 89.1 through Exhibit 89.4.

Exhibits 89.1 through 89.3 provide the requested data separately for Level 3 (ASN 3356), Cogent (ASN 174), and Global Crossing (ASN 3459), which was acquired by Level 3 in late 2011. The data include, for each IP point of presence ("POP") and date, the total capacity and the inbound and outbound (1) total data traffic during peak and non-peak hours (in GB), (2) 95th percentile traffic during peak and non-peak hours (in Mbps), and (3) 50th percentile traffic during peak and non-peak hours (in Mbps). The data were summed across interfaces and routers to arrive at figures for each IP POP. The data have been provided for each day of the requested period and each IP POP in which Comcast exchanged traffic with any of the three counterparties.

Exhibit 89.4 provides, for each DMA and date: (1) total daily transactional Video-on-Demand ("TVOD") revenue during peak and non-peak hours for each day during the requested period; (2) total daily PPV revenue for each day during the requested period;[158] and (3) the total number of hours of free Video-on-Demand viewed during peak and non-peak hours for each day from September 1, 2013, to May 31, 2014, **[[ ]]**

(ii) "Interconnection Table – HB"

Information and data responsive to this exhibit request have been provided in machine-readable Excel spreadsheet as Exhibit 89.5.

The data provided in Exhibit 89.5 on capacity, utilization in, and utilization out are provided from January 2012 to the present, **{{ }}** The data provided reflect best estimates where such estimates could be provided.[159]

158 Comcast does not maintain time-stamped transactional data for PPV and thus cannot disaggregate the data to distinguish between peak and non-peak hours.
159 As discussed with the FCC staff, **{{ }}**

Further, as discussed with and agreed to by the FCC staff, Comcast has not provided "total inbound traffic in gigabytes (gb) handed off by the customer to the Company during the month," the "inbound traffic in gigabytes (gb) handed off by the customer to the Company that will terminate on the Company's network," or the "total outbound traffic in gigabytes (gb) handed off by the Company to the customer during the month." Furthermore, pursuant to discussions with the staff, the FCC has agreed to defer Comcast's obligation to provide the "contract document identification code used to identify the applicable contract in the Information Request;" the "date when transit service arrangement commenced;" and the "date when transit service arrangement is set to end."

Transit Sale Worksheet

The data provided in "Transit Sale" include the date, customer name, customer name used when doing business with Comcast, capacity, utilization in, utilization out, total revenue, non-recurring revenue, and recurring revenue. The capacity data reflect the total amount of capacity between a customer and Comcast across all IP Points of Presence where Comcast interconnects with that customer. Capacity is typically provisioned through 1GigE (1 Gbps) or 10GigE (10 Gbps) ports. Utilization in and utilization out are inbound and outbound traffic measured at the 95th percentile in Mbps, which is an industry standard for measuring traffic with interconnection counterparties and the measure typically reflected in the interconnection agreements Comcast has with such parties. Comcast calculated the 95th percentile inbound and outbound for each interface and aggregated those measurements across interfaces and routers to arrive at total figures for each counterparty.

As discussed with the FCC staff, **{{ }}**

Total revenue is the sum of non-recurring revenue and recurring revenue. Non-recurring revenue reflects money paid by a customer to Comcast for charges that are not expected to be incurred on a regular basis in other months. For example, non-recurring revenue may include charges for additional ports. Recurring revenue is the amount of money billed other than non-recurring revenue. **{{ }}**

[[ ]] Where a counterparty purchases multiple services from Comcast, **{{ }}**, all data for that counterparty are reflected in both worksheets (e.g., **{{ }}**).[160, 161]

160 **{{ }}** These parties appear on multiple tabs of Exhibit 89.5.
161 **{{ }}**

Transit Purchase Worksheet

The data provided in "Transit Purchase" include the date, provider name, provider name used when doing business with Comcast, capacity, utilization in, utilization out, and total revenue.

Total revenue is the amount Comcast has paid to counterparties for transit services. Comcast does not maintain data separately for non-recurring and recurring revenue paid to transit providers.[162] The figures provided for capacity, utilization in and utilization out follow the same format and methodology as described in the "Transit Sale" section of this response.

Paid Peering Sales Worksheet

The data provided in "Paid Peering Sales" include date, customer name, customer name used when doing business with Comcast, capacity, utilization in, utilization out, total revenue, non-recurring revenue, and recurring revenue. With respect to these data, Comcast incorporates the response to the "Transit Sale" section of this response.[163]

Paid Peer Node Worksheet

The data provided in "Paid Peer Node" include the date, facility name, street address, city name, zip code, ownership, ASN, customer name, customer name used when doing business with Comcast, node capacity, node utilization in and node utilization out. Comcast incorporates the descriptions of the data set forth above in the "Transit Sale" section of this response.

Node capacity reflects the amount of capacity between a customer and Comcast at an IP Point of Presence where Comcast interconnects with that customer. Node utilization in and node utilization out are measured at the 95th percentile, and the figures are summed and then aggregated across interfaces and routers to provide figures for the IP POP.

In response to the request for the "Internet Protocol version at the IP point of presence where interconnection takes place," **[[ ]]** Information and data responsive to this request have been provided in machine-readable Excel spreadsheet as Exhibit 89.6. Exhibit 89.6 provides a current list of paid peers and settlement-free peers that use IPv6 with Comcast and the IP Points of Presence where they do.

Free Peer Traffic Worksheet

The data provided in "Free Peer Traffic" include the date, peer name, peer name used when doing business with Comcast, peer capacity, utilization in, and utilization out with Comcast's settlement-free peers. With respect to these data, Comcast incorporates the explanation set forth in the "Transit Sale" section of this response.

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162 **[[ ]]**
163 **{{ }}**

The peer capacity data reflect the total amount of traffic volume capacity that either Comcast or a peer can send or receive to the other's network. As discussed above, capacity is typically provisioned through 1GigE or 10GigE ports. Accordingly, peer capacity and company capacity figures are identical.

{{ }}

Free Peer Node Worksheet

The data provided in "Free Peer Node" include the date, facility name, street address, city name, zip code, ownership, ASN, peer name, peer name used when doing business with Comcast, node capacity, node utilization in and node utilization out. With respect to these data, Comcast incorporates the explanation set forth in the "Transit Sale" portion of this response. Finally, Comcast incorporates by reference its response in the "Paid Peer Node" on IP technology and Exhibit 89.6, which provides a current list of paid peers and settlement-free peers that use IPv6 with Comcast and the IP Points of Presence where they do.

"CTWC Cable Services Final"

Comcast continues to work on its response to this request and will provide responsive information and data to the FCC as soon as practicable.

"TWC Subscriber Final"

Comcast continues to work on its response to this request and will provide responsive information and data to the FCC as soon as practicable.

"CTWC Dedicated Services spreadsheet - Final"

Comcast continues to work on its response to this request and will provide responsive information and data to the FCC as soon as practicable.

90. Submit all documents analyzing the (i) the proposed acquisition of DirecTV, Inc. by AT&T, Inc., (ii) the acquisition of TWC by Charter, and (iii) the distribution agreement between The Walt Disney Company and Dish Network Corporation.

(a) RESPONSE:

Documents responsive to this request will be produced to the FCC.

91. Produce one copy – in electronic form if available, otherwise in hard copy – of each document, database, or data set used or maintained by the Company at any time after January 1, 2009, without regard to custodian, that constitutes, records, or discusses for each relevant service: (i) subscriber acquisition cost; (ii) subscriber churn, service level change, cancellation or additions; (iii) audience or viewership measurement; (iv) advertising sales personnel call reports; (v) prices, discounts, quotes, estimates, or bids submitted to any customer or potential customer; (vi) sales; (vii) Internet traffic; (viii) billing; (ix) customer relationship databases; and (x) network performance. For each database or data set produced in response to this Request, submit any accompanying data dictionary, and any software product or platform required to access the database or data set.

RESPONSE:

Data dictionaries for select databases will be produced to the FCC. Comcast agrees to continue discussions with the FCC regarding Comcast's databases and to provide additional information regarding databases upon request from the FCC.

92. For each relevant service, identify each electronic or other database or data set used or maintained by the Company at any time after January 1, 2009, without regard to custodian, that contains information concerning the Company's (i) sales; (ii) prices; (iii) margins; (iv) costs, including but not limited to, programming costs, distribution costs, standard costs, expected costs, and opportunity costs; (v) patents or other intellectual property; (vi) research or development projects; (vii) licensing of video programming; (viii) customers; and (ix) network performance, to the extent such customer information is not provided in response to Request 91. For each such database, identify (a) the database type, i.e., flat, relational, or enterprise; (b) the size in both number of records and bytes of information; (c) the fields, query forms, and reports available or maintained; and (d) any software product or platform required to access the database.

RESPONSE:

Data dictionaries for select databases will be produced to the FCC. Comcast agrees to continue discussions with the FCC regarding Comcast's databases and to provide additional information regarding databases upon request from the FCC.

93. For all databases or data sets produced, describe in detail the relationship of the different tables in the database (e.g., an entity relationship diagram and all foreign keys) and produce documents sufficient to show the tables that are populated by the Company, and the following items for each table: (i) the size of the table in both number of records and bytes of information; (ii) the table name; (iii) a general description of the information contained in the table; (iv) a list of field names; (v) a definition for each field as it is used by the Company, including the meanings of all codes that can appear as field values; (vi) the format, including variable type and length, of each field; and (vii) the primary key in a given table that defines a unique observation.

RESPONSE:

Data dictionaries for select databases will be produced to the FCC. Comcast agrees to continue discussions with the FCC regarding Comcast's databases and to provide additional information regarding databases upon request from the FCC.

APPENDIX

MODIFICATIONS AND UNDERSTANDINGS OF THE REQUEST AND INSTRUCTIONS AS AGREED BY FCC STAFF AND COMCAST

Commission staff and Comcast have agreed to certain modifications and understandings of the Request and accompanying Instructions, subject to the Commission's ability to request additional information as it may deem necessary. These modifications and understandings are reflected in the pertinent responses and also include the following:

1. Unless otherwise specified, the relevant time period of the documents that will be submitted in response to the Request extends back to January 1, 2012, instead of January 1, 2009 as indicated in Instruction No. 1.

2. Instruction No. 12 is modified to reflect that Comcast may assign a single document control number on its privilege log for each document withheld on the basis of privilege.

3. Instruction No. 13 is modified to reflect that Comcast is not required to identify the number(s) of the Request to which a document on Comcast's privilege log is responsive.

4. Instruction No. 14 is modified to defer the requirement that Comcast identify the anticipated litigation or trial upon which an assertion of attorney work product is based. In addition, Instruction No. 14 is modified to defer the requirement that Comcast produce a copy of its privilege log in hardcopy form.

5. The Metadata Table of Requested Fields is modified to defer the requirement that Comcast identify the number(s) of the Request to which a document is responsive. In addition, the Metadata Table is modified to reflect that Comcast is not required to produce the FOLDERLABEL or FILEPATH metadata values for duplicate custodians. Comcast will provide those metadata values for the primary custodian of the document.

6. Request No. 3 is modified to reflect that the Commission will accept predominant rate cards for each sub-region in lieu of listing and describing each tier of MVPD, Internet, and voice service, including pricing and Internet speeds.

7. Request No. 4(o) is modified to reflect that Comcast is not required to provide "other variable costs" beyond what it will provide in response to Request Nos. 4(k), 4(l), and 4(m).

8. Request No. 4(p) is modified to reflect that Comcast will provide the Commission with presentations regarding customer lifetime value ("CLV") created periodically by various business units within Comcast.

9. Request Nos. 8, 56, and 89 are modified to reflect that Comcast will provide information and data for its current cable systems only, including the systems that will be assigned or transferred to SpinCo.

10. Request Nos. 18, 19, 26-28, and 36-38 are modified to reflect that the Commission will accept data on an annual basis rather than a monthly basis. These requests are also modified to reflect that Comcast is only required to provide data separately with respect to the top 25 MVPDs by subscribers and will aggregate an "other" figure for subscribers from the remaining MVPDs.

11. Request No. 21 is modified to exclude instances where an MVPD has merely "discussed" raising a program access complaint.

12. Request Nos. 22 and 33 are modified to defer the obligation to "identify and describe" the agreements that are the subject of each respective request. Comcast will identify the production numbers where its programming agreements can be located within the document production. Comcast will further provide a general description of its contracting practices in response to the Requests.

13. Request No. 28(f) is modified to limit the list of MVPDs that do not carry a particular regional sports network ("RSN") to the top 25 MVPDs by subscribers and to defer the requirement that Comcast identify a particular reason why any given MVPD does not distribution an RSN.

14. Request No. 26 is modified to clarify that it is limited to "marquee sports."

15. Request Nos. 29(d) and 70 are modified to be limited to substantive negotiations that resulted in an exchange of draft agreements, but where the parties failed to reach an agreement.

16. Request No. 31 is modified to defer the requirement to identify separately the information requested in subparts (a) through (e). The Commission has agreed to accept a list of networks for which Comcast has received requests for carriage and a list of networks that Comcast has launched. For each of the launched networks, Comcast will provide the network name, initial launch date, genre, tier, and reason for launch.

17. Request No. 53 is modified to exclude instances where an OVD has merely "discussed" raising rights to programming under the Comcast-NBCU Order or the Final Judgment entered in *U.S. v. Comcast Corp. and NBC Universal, Inc.*, Civ Action No. 1:11-cv-00106 (D.D.C. 2011).

18. Request No. 89 is modified to reflect that Comcast will provide the inbound traffic at the 95th percentile, the outbound traffic at the 95th percentile, and capacity for each counterparty. The Commission defers its request for total inbound traffic and total outbound traffic for each counterparty and its request to identify the applicable contracts and contract start and end dates for each counterparty.

19. In certain limited instances, work is ongoing on certain responses and data submissions. These materials will be submitted shortly. The written response notes where that is the case.

20. The remaining documents requested will be submitted shortly following adjustments to reflect ongoing discussions with Commission staff.

Important Information For Investors And Shareholders

This communication does not constitute an offer to sell or the solicitation of an offer to buy any securities or a solicitation of any vote or approval. In connection with the proposed transaction between Comcast Corporation ("Comcast") and Time Warner Cable Inc. ("Time Warner Cable"), Comcast has filed with the Securities and Exchange Commission ("SEC") a registration statement on Form S-4, including Amendments No. 1, 2, 3, 4, 5 and 6 thereto, containing a joint proxy statement of Comcast and Time Warner Cable that also constitutes a prospectus of Comcast. The registration statement was declared effective by the SEC on September 5, 2014, and Comcast and Time Warner Cable commenced mailing the definitive joint proxy statement/prospectus to shareholders of Comcast and Time Warner Cable on or about September 9, 2014. INVESTORS AND SECURITY HOLDERS OF COMCAST AND TIME WARNER CABLE ARE URGED TO READ THE DEFINITIVE JOINT PROXY STATEMENT/PROSPECTUS AND OTHER DOCUMENTS FILED OR THAT WILL BE FILED WITH THE SEC CAREFULLY AND IN THEIR ENTIRETY BECAUSE THEY CONTAIN OR WILL CONTAIN IMPORTANT INFORMATION. Investors and security holders may obtain free copies of the registration statement and the definitive joint proxy statement/prospectus and other documents filed with the SEC by Comcast or Time Warner Cable through the website maintained by the SEC at http://www.sec.gov. Copies of the documents filed with the SEC by Comcast are available free of charge on Comcast's website at http://cmcsa.com or by contacting Comcast's Investor Relations Department at 866-281-2100. Copies of the documents filed with the SEC by Time Warner Cable are available free of charge on Time Warner Cable's website at http://ir.timewarnercable.com or by contacting Time Warner Cable's Investor Relations Department at 877-446-3689.

In addition, in connection with the proposed transaction between Comcast and Charter Communications, Inc. ("Charter"), Charter will file with the SEC a registration statement on Form S-4 that will include a proxy statement of Charter that also constitutes a prospectus of Charter, and a definitive proxy statement/prospectus will be mailed to shareholders of Charter. INVESTORS AND SECURITY HOLDERS OF COMCAST AND CHARTER ARE URGED TO READ THE PROXY STATEMENT/PROSPECTUS AND OTHER DOCUMENTS THAT WILL BE FILED WITH THE SEC CAREFULLY AND IN THEIR ENTIRETY BECAUSE THEY WILL CONTAIN IMPORTANT INFORMATION. Investors and security holders will be able to obtain free copies of the registration statement and the proxy statement/prospectus (when available) and other documents filed with the SEC by Comcast or Charter through the website maintained by the SEC at http://www.sec.gov. Copies of the documents filed with the SEC by Comcast are available free of charge on Comcast's website at http://cmcsa.com or by contacting Comcast's Investor Relations Department at 866-281-2100. Copies of the documents filed with the SEC by Charter will be available free of charge on Charter's website at charter.com, in the "Investor and News Center" near the bottom of the page, or by contacting Charter's Investor Relations Department at 203-905-7955.

Shareholders of Comcast and Time Warner Cable are not being asked to vote on the proposed transaction between Comcast and Charter, and the proposed transaction between Comcast and Time Warner Cable is not contingent upon the proposed transaction between Comcast and Charter.

Comcast, Time Warner Cable, Charter and their respective directors and certain of their respective executive officers may be considered participants in the solicitation of proxies in connection with the proposed transaction between Comcast and Time Warner Cable, and Comcast, Charter and their

respective directors and certain of their respective executive officers may be considered participants in the solicitation of proxies in connection with the proposed transaction between Comcast and Charter. Information about the directors and executive officers of Time Warner Cable is set forth in its Annual Report on Form 10-K for the year ended December 31, 2013, which was filed with the SEC on February 18, 2014, its proxy statement for its 2014 annual meeting of stockholders, which was filed with the SEC on April 29, 2014, and its Current Report on Form 8-K, which was filed with the SEC on June 13, 2014. Information about the directors and executive officers of Comcast is set forth in its Annual Report on Form 10-K for the year ended December 31, 2013, which was filed with the SEC on February 12, 2014, its proxy statement for its 2014 annual meeting of stockholders, which was filed with the SEC on April 11, 2014, and its Current Report on Form 8-K, which was filed with the SEC on July 1, 2014. Information about the directors and executive officers of Charter is set forth in its Annual Report on Form 10-K for the year ended December 31, 2013, which was filed with the SEC on February 21, 2014, its proxy statement for its 2014 annual meeting of stockholders, which was filed with the SEC on March 27, 2014, and its Current Report on Form 8-K, which was filed with the SEC on May 9, 2014. These documents can be obtained free of charge from the sources indicated above. Additional information regarding the participants in the proxy solicitations and a description of their direct and indirect interests, by security holdings or otherwise, are contained in the definitive joint proxy statement/prospectus of Comcast and Time Warner Cable filed with the SEC and other relevant materials to be filed with the SEC when they become available, and will also be contained in the preliminary proxy statement/prospectus of Charter when it becomes available.

Cautionary Statement Regarding Forward-Looking Statements

Certain statements in this communication regarding the proposed acquisition of Time Warner Cable by Comcast and the proposed transaction between Comcast and Charter, including any statements regarding the expected timetable for completing the transactions, benefits and synergies of the transactions, future opportunities for the respective companies and products, and any other statements regarding Comcast's, Time Warner Cable's and Charter's future expectations, beliefs, plans, objectives, financial conditions, assumptions or future events or performance that are not historical facts are "forward-looking" statements made within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. These statements are often, but not always, made through the use of words or phrases such as "may", "believe," "anticipate," "could", "should," "intend," "plan," "will," "expect(s)," "estimate(s)," "project(s)," "forecast(s)", "positioned," "strategy," "outlook" and similar expressions. All such forward-looking statements involve estimates and assumptions that are subject to risks, uncertainties and other factors that could cause actual results to differ materially from the results expressed in the statements. Among the key factors that could cause actual results to differ materially from those projected in the forward-looking statements are the following: the timing to consummate the proposed transactions; the risk that a condition to closing either of the proposed transactions may not be satisfied; the risk that a regulatory approval that may be required for either of the proposed transactions is not obtained or is obtained subject to conditions that are not anticipated; the parties' ability to achieve the synergies and value creation contemplated by the proposed transactions; the parties' ability to promptly, efficiently and effectively integrate acquired operations into their own operations; and the diversion of management time on transaction-related issues. Additional information concerning these and other factors can be found in Comcast's, Time Warner Cable's and Charter's respective filings with the SEC, including Comcast's, Time Warner Cable's and Charter's most recent Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q and Current Reports on Form 8-K. Comcast, Time Warner Cable and Charter assume no obligation to update any forward-looking statements. Readers are cautioned not to place undue reliance on these forward-looking statements that speak only as of the date hereof.