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Economic Analysis of the Effect of the
Comcast-TWC Transaction on Broadband:
Reply to Commenters

Mark A. Israel

September 22, 2014

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I. INTRODUCTION AND EXECUTIVE SUMMARY

A. Background

1. Comcast Corporation (“Comcast”) and Time Warner Cable (“TWC”) propose to transfer control of the licenses and authorizations held by TWC and its wholly owned and controlled subsidiaries to Comcast.¹ In addition, Comcast and Charter Communications, Inc. (“Charter”) propose a series of divestiture transactions whereby, contingent on approval of the proposed Comcast-TWC transaction, Comcast will divest systems resulting in a net reduction of approximately 3.9 million residential video customers.² I refer to these transactions collectively as “the proposed transaction” or just “the transaction.”

2. At the request of counsel for Comcast, I have already filed one declaration on this matter.³ My main conclusion in that declaration was that “[g]iven (i) the lack of any valid competitive concerns and (ii) the substantial consumer benefits, the proposed

¹ Comcast Corporation and Time Warner Cable Inc., Description of Transaction, Public Interest Showing, and Related Demonstrations, April 8, 2014.

² Public Interest Statement, In the Matter of Applications of Comcast Corp. and Time Warner Cable Inc. for Consent to Transfer Control of Licenses and Authorizations, MB Docket No. 14-57, June 5, 2014, available at <http://apps.fcc.gov/ecfs/document/view?id=7521215151>, site visited September 17, 2014.

³ Declaration of Mark A. Israel, “Implications of the Comcast/Time Warner Cable Transaction for Broadband Competition,” Attachment to Comcast Corporation and Time Warner Cable Inc., Description of Transaction, Public Interest Showing, and Related Demonstrations, April 8, 2014 (hereinafter, Israel Declaration). This initial declaration provides my qualifications.

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transaction—as it relates to the provision of broadband services in particular—is pro-consumer, pro-competitive, and in the public interest.”⁴

3. Based on the analyses presented in my initial declaration and supplemented in this reply declaration, my main conclusion continues to hold: The largely unquestioned consumer benefits from the proposed transaction easily swamp the largely unsupported claims of harms to competition and consumers.

B.

Assignment

4. For this declaration, counsel for Comcast asked me to review the broadband-related arguments made by economists in the Comments and Petitions to Deny filed in this proceeding, in order to determine whether those arguments provide a basis for amending or reversing the conclusions in my initial declaration.⁵ In addition, counsel has asked me to assess whether the economists identify any likely sources of competitive harm other than those examined in my initial declaration. The analysis, presented in this declaration, is based on my review of the Comments and Petitions to Deny, including the

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Israel Declaration, ¶ 12.

⁵I focus on arguments related to the provision of broadband data services in the following reports by economists: Declaration of David S. Evans, “Economic Analysis of the Impact of the Comcast/Time Warner Cable Transaction on Internet Access to Online Video Distributors,” Attachment to Petition to Deny of Netflix Inc., August 25, 2014 (hereinafter, Evans Declaration); Declaration of Joseph Farrell, Attachment to Petition to Deny of Cogent Communications Group, August 25, 2014 (hereinafter, Farrell Declaration); Declaration of David Sappington, “The Anticompetitive Effects of the Proposed Merger of Comcast and Time Warner Cable,” Attachment to Petition to Deny of DISH Network, August 25, 2014 (hereinafter, Sappington Declaration).

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economic reports associated with those Comments and Petitions to Deny, review of relevant documents, and discussions with industry personnel, as well as my review of the relevant economic literature, application of relevant economic theory, and analysis of relevant empirical evidence.

5. As in my initial declaration, I focus on the effect of the transaction in the broadband segment. I do not qualify all of my conclusions about competitive effects and benefits from the transaction with the words “broadband” or “broadband-related,” but unless otherwise explicitly noted, all statements and conclusions should be taken as referring to effects on broadband.

C.

Primary Conclusion

6. My primary conclusion remains that the proposed transaction is pro-competitive, pro-consumer, and in the public interest. Despite hundreds of pages of argument from economists in this matter—and my own very detailed response in the rest of this report—the key points are actually quite straightforward. First, commenters advance no serious arguments to refute the substantial efficiencies and associated consumer benefits from the transaction, as detailed in my initial declaration and the declarations by Drs. Rosston and Topper.⁶ Hence, any claimed harms must be weighed

⁶Israel Declaration, §§ III-IV; Declaration of Gregory L. Rosston and Michael D. Topper, “An Economic Analysis of the Proposed Comcast – Time Warner Cable Transaction,” Attachment to Comcast Corporation and Time Warner Cable Inc., Description of Transaction, Public Interest Showing, and Related Demonstrations, April 8, 2014

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against these substantial consumer benefits. Second, commenters offer no horizontal theory of harm to broadband customers and, in particular, no evidence that Comcast and TWC compete with or constrain one another in any market today. Third, the vertical theory advanced by some commenters—that the transaction would enable Comcast to foreclose OVDs—does not hold together as a matter of economic theory. Comcast lacks the incentive to stifle the complementary OVD industry, which makes best use of the high speed broadband network in which Comcast has invested tens of billions of dollars, and Comcast lacks the ability to thwart the rapidly growing OVD business, which already includes many of the giants of the high technology and entertainment industries. More importantly, this vertical theory is belied by the facts: Comcast has agreed with Netflix to a long-term contract, which imposes minimal incremental costs on Netflix and has not harmed Netflix’s market performance. Fourth, the remaining “big is bad” argument that the transaction will give Comcast excessive bargaining power is theoretically ambiguous, empirically unsupported, and, in all events, completely swamped by the consumer benefits from the transaction. Perhaps most tellingly, commenters spend dozens of pages alleging that Comcast has substantial market power today, and yet the Comcast

(hereinafter, Rosston-Topper Declaration I), § IV; Declaration of Gregory L. Rosston and Michael D. Topper, “An Economic Analysis of the Proposed Comcast Divestiture Transactions with Charter,” Attachment to Comcast Corporation and Time Warner Cable, Inc., Public Interest Statement, June 4, 2014 (hereinafter, Rosston-Topper Declaration II), § III.

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interconnection charges that lie at the heart of their theories of harm are tiny overall and literally zero for more than 40 “settlement-free” paths into the Comcast network.

D.

Executive Summary

7. Although the logic supporting my primary conclusion is straightforward even without wading through the intricacies of interconnection terms or bargaining economics, in this executive summary and the body of the declaration, I explain my findings in more detail. My main points are all presented in the executive summary, including references to the sections/paragraphs in the remainder of the declaration that further develop each point in more detail for those who are interested.

8. Despite the substantial attention paid by commenters to the combined firm’s share of nationwide broadband customers, commenters have not established the existence of a national broadband market in which the change in national broadband share is an indicator of horizontal competitive effects from the transaction, nor any market in which Comcast and TWC place relevant competitive constraints on one another today:

- Despite repeated appeals to national share statistics, commenters fail to provide a coherent basis to conclude that there is a national broadband market in which such a share calculation is a relevant indicator of horizontal competitive effects. The Horizontal Merger Guidelines are clear that product markets are defined to include “a group of substitute products,” meaning “products that are reasonably

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interchangeable with a product sold by one of the merging firms.”⁷ Applying this logic to geographic market definition, the Guidelines are clear that the market may be “geographically bounded if geography limits some customers’ willingness or ability to substitute to some products, or some suppliers’ willingness or ability to serve some customers.”⁸ In the present case, the market is clearly geographically bounded, as broadband providers cannot serve broadband customers outside the boundaries of their geographically limited footprints. Adding edge providers into the mix does not change this fact; Comcast and TWC each offer broadband platforms to connect edge providers to only those consumers within their distinct footprints, meaning that the Comcast and TWC platforms are not substitutes for the distribution of content to any consumer. Even if an edge provider’s goal is to achieve national distribution, the Comcast and TWC networks serve different areas and are not substitutes for one another: Rather, relevant substitutes for each include the third-party CDNs and transit providers that sell interconnection services into both networks and mean that an edge provider need not negotiate directly with either Comcast or TWC if it chooses not to. Analogies to nationwide markets for cable networks have no substantive effect on this conclusion: At

⁷U.S. Department of Justice and the Federal Trade Commission, “Horizontal Merger Guidelines,” August 19, 2010 (hereinafter, Horizontal Merger Guidelines), 7-9.

⁸ Id., 8, 13.

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most, such an approach would generate a national market in which there is no diversion between the merging parties and thus no transaction-related effect on the ability of customers to divert to a competitor should their ISP degrade their access to edge providers. Finally, although one could potentially define a national Internet backbone market, including the transport of traffic across Internet backbones and associated interconnection services, no commenter has alleged harm in such a market, with competition in backbone services widely acknowledged to be intense. (See Section II.A, ¶¶ 17-26, for more detail.)

- Given the lack of relevance of national broadband shares, potential revisions to the minimum speed required to distinguish broadband from non-broadband Internet access have no bearing on analysis of the transaction's effects. Along with the focus on national broadband shares has come a focus on the minimum speed required for a particular Internet access service to qualify as broadband. Given that the change in national broadband share is not a meaningful indicator of the horizontal competitive effects of the transaction, debates over the definition of broadband—although potentially relevant for transactions that affect competition in local broadband markets and for other important policy issues—are of little relevance to the analysis of the transaction. That said, evidence derived from ordinary course and survey analyses of the products to which marginal customers

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would switch if faced with a broadband price increase (the relevant issue when considering market definition) implies that, to define today's local broadband markets, one should use a speed no higher than 10 Mbps, and likely closer to the current 3 Mbps standard.⁹ This conclusion follows from the adequacy of slower speeds for many uses, including many video applications, and the fact that the marginal customers who would discipline a price increase would likely consider switching to providers that offer lower speeds. Basing the standard on higher speeds (such as 25 Mbps) would exclude important current competitive constraints. Finally, I note that (i) defining broadband based on a 10 Mbps standard (rather than the FCC's current 3 Mbps used in my initial declaration) has little effect on the national share calculations presented in my initial declaration and (ii) switching to a 25 Mbps standard would imply that TWC has relatively few broadband customers today and thus that the proposed transaction would have little effect on Comcast's current national broadband share. (See Section II.B, ¶¶ 27-35, for more detail.)

⁹The Commission defines the current broadband standard as 4 Mbps download speed and 1 Mbps upload speed. However, in practice, to match the data on broadband customers available from the Commission's Form 477, the Commission actually uses a standard of 3 Mbps download speed and 768 Kbps upload speed. Since those cutoffs define the data used to measure broadband customers under the current definition, I refer to the standard as "3 Mbps" throughout.

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•Comcast and TWC do not constrain each other's actions today and thus the transaction will not relax any competitive constraints. The heart of a standard argument for horizontal harm from a merger is that, absent the merger, the merging parties would place significant constraints on one another's behavior and thus that, by eliminating this constraint, the merger would make it easier for the merging parties to raise prices or otherwise harm competition. Yet, despite dozens of pages on alleged market power, available substitutes, recent negotiations with edge providers, and related topics, commenters have provided no evidence of any relevant competitive constraint that Comcast or TWC place on one another today. This includes not only a lack of evidence that the firms constrain one another's retail broadband pricing or related strategies, but also a lack of evidence that any competitive constraints from TWC affected Comcast in its recent negotiations with Netflix, Cogent, or other edge providers or their agents (or vice versa). There is simply no direct evidence that any pricing, strategies, or negotiations would have been different absent some constraint imposed by one merging party on one the other. (See Section II.C, ¶¶ 36-37, for more detail.)

9. Lacking evidence for any incremental harm from the transaction, many commenters attempt to divert attention to Comcast's current broadband market position, a discussion that primarily serves to highlight the reasons Comcast would not want to harm the broadband marketplace and, otherwise, has little relevance for evaluation of the proposed transaction. Commenters collectively spend dozens of pages analyzing Comcast's current market position in broadband, arguing that Comcast faces few competitive constraints as a broadband provider today. This entire discussion is of

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limited relevance: Proper merger analysis focuses on the incremental effect of the merger on the competitive constraints faced by the parties and, as noted above, the parties do not constrain one another today. That said, what is true is that Comcast has spent tens of billions of dollars to develop its (last mile and backbone) broadband network, that as a result it offers very high-quality broadband service with speeds up to 505 Mbps, and that (as explained in my initial declaration), it sees the transaction as a way to extend this high-quality broadband service into additional territories and to expand the footprint over which to deploy future innovations, making more investment in such innovations profitable. The speed enabled by Comcast's broadband network is well suited to—in fact is only fully utilized by—online video content, and thus Comcast's broadband investment is deeply complementary to the growth of online video distributors (OVDs); their side-by-side development being a leading example of the virtuous cycle between improving broadband networks and edge provider services. As a result, any strategy to harm online video distributors would involve Comcast degrading the very applications that its broadband network is built to serve and that best enable Comcast to attract broadband customers and generate a return on its broadband investment.

10. Commenters understate the constraints faced by Comcast, including those that constrain its ability to degrade an edge provider's access to Comcast's last-mile network.

- In an attempt to support claims that Comcast can harm competition via “terminating access” market power, many commenters focus attention narrowly on interconnection points through which traffic travels from the broader Internet backbone into last-mile networks, claiming that Comcast has bottleneck control at these points. Such theories ignore the constraints imposed by the competition on

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both sides of these interconnection points, including competition among last-mile networks and especially in the hyper-competitive Internet backbone. Given Comcast's commitment to adhere to Open Internet rules, theories of competitive harm based on discrimination or degradation of traffic inside the Comcast access network (the "last mile") are not tenable. And given the overall competitiveness of the Internet backbone and the merging parties' relatively small role in that ecosystem, theories of competitive harm to the Internet backbone (including transit) are also not tenable. Hence, commenters' theories of harm are reduced to claims about potential changes to agreements regarding interconnection into the merging parties' last-mile networks—the terms under which edge providers or, more often, their agents (CDNs, transit providers, etc.) are able to transmit traffic into the parties' last-mile networks. However, interconnection points are not immune from the market forces that prevent competitive harm in the last-mile and backbone networks that sit on either side of them; rather, these market forces—explained in detail in the following bullets—prevent competitive harm via potential transaction-induced changes in interconnection agreements as well. (See Section III.A, ¶¶ 40-43, for more detail.)

- Commenters largely ignore the range of options open to edge providers to defeat any attempt to degrade their access to ISP last-mile networks. Due to the competitiveness of backbone services, edge providers—either on their own if they are large enough (and decide to do so) or through CDNs or other agents—can utilize a wide variety of paths into the Comcast network. Hence, no edge provider is forced to negotiate with Comcast or TWC directly. Rather, there are dozens of

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third-party CDNs and transit providers who have interconnection agreements with Comcast and TWC—many of them settlement-free agreements under which interconnection is free—with which edge providers can contract to access the Comcast and TWC last-mile networks. Although commenters attempt to dismiss the importance of alternative paths into the Comcast network, in part based on claims about the recent negotiations between Comcast and Netflix, Comcast’s Kevin McElearney explains in his declaration that these commenters have their facts wrong, and that there were actually many paths with substantial spare capacity available to Netflix, many of which Netflix simply refused to use. More generally, commenters’ claim that Comcast can simply degrade or charge for these interconnection paths ignores the presence of numerous settlement-free paths into the Comcast network and the fact that Comcast would have to compromise significantly its connectivity to the overall Internet to attempt to prevent providers from making use of such paths. (See Section III.B, ¶¶ 44-56, for more detail.)

- Comcast’s broadband customers also have important and growing options, through which they can effectively discipline any attempt by Comcast to degrade edge provider access to its last-mile network. As an initial matter, note that any reduction in demand for broadband service among Comcast customers would be very costly to Comcast. For example, ordinary-course-of-business customer lifetime value (CLV) calculations show that if a customer were to cancel her broadband service, this would eliminate a very large fraction of that customer’s overall lifetime value to Comcast. And should Comcast degrade its customers’

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access to edge providers, the customers can and most likely would react in one of many possible ways. One obvious such reaction—entirely ignored by commenters—is that, if faced with diminished broadband service, a customer could downgrade or even cancel broadband service (an option open to all customers in all areas). Indeed, as noted above and stressed by Netflix, a primary incentive to subscribe to higher speed tiers is to watch more online video, meaning that actions to harm online video would reduce demand for Comcast’s higher speed broadband tiers. Or Comcast customers could switch broadband providers; commenters significantly understate the strength of competitive alternatives available to Comcast customers. In fact, the competitive threat to Comcast’s broadband service, particularly from the full set of options provided by powerful telco competitors, is large and growing. Commenters attempt to downplay this telco competition via a double standard that downplays DSL—which remains highly relevant today—due to claims that its competitive significance is declining, while ignoring the fact that the competitive significance of wireless—while more limited today—is growing rapidly. Together, these options, combined with fiber-to-the-premises (FTTP) options—which AT&T, CenturyLink, and others are committed to expanding, in part as a competitive response to this transaction—form an overall strategy by which the telco providers will remain a highly relevant competitive threat. None of these threats is merely theoretical: Empirical evidence indicates that customers would switch to broadband alternatives in large numbers should Comcast degrade access to edge providers. (See Section III.C, ¶¶ 57-94, for more detail.)

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• Finally, commenters largely ignore the constraints on Comcast due to potential broadband entrants, including Google and certain municipalities, with such entry potentially facilitated by Commission action. To be clear, I am not claiming that such potential entrants are options for most consumers today. But, in considering whether Comcast could profitably harm edge providers, the role of recent or potential entrants like Google cannot be ignored. Indeed, Dr. Evans acknowledges that Comcast's strategies are affected by the possibility of entry by Google and others. However, he reaches the implausible conclusion that, post-transaction, Comcast could thwart the current and planned efforts by firms like Netflix, Google, Amazon, Apple, Sony to establish OVD services and thereby deter broadband entry by Google and others. The more realistic conclusion is that Comcast cannot thwart the OVD efforts of these powerful firms, and that attempts to do so would encourage broadband entry, including by firms like Google that have a vested interest in maintaining competitive broadband markets in support of their enormous edge provider businesses and a proven willingness and ability to enter the broadband business. To the extent that such entry needs any further encouragement, Chairman Wheeler has been quite clear that the Commission intends to provide it, with induced Commission action a further risk Comcast would face should it attempt to harm broadband competition or edge providers. (See Section III.D, ¶¶ 95-99, for more detail.)

11. Some commenters advance a theory of OVD foreclosure, which depends on the dual hypotheses (i) that Comcast has an incentive to harm OVDs and (ii) that the increased size of the combined firm would give it the ability to foreclose OVDs. Neither hypothesis holds: Comcast does not have an incentive to foreclose OVDs, and the combined firm would lack the ability to do so.

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- Given the constraints discussed above, the proposed transaction would not give Comcast the ability to foreclose OVDs. As above, I note that foreclosure is not a last-mile issue because Comcast's commitment to the Open Internet requirements precludes discriminatory conduct inside the last mile. Thus, my focus is again on the supposed ability to manipulate interconnection arrangements into the combined company's last-mile network to achieve OVD foreclosure. Several points each independently refute such ability. First, the discussion above reveals the lack of an effective mechanism to foreclose: Given the ability for OVDs to rely on multiple transit providers or on CDNs that, in turn, can utilize multiple paths, including settlement-free paths, into Comcast's last-mile network, Comcast effectively lacks the ability to limit OVD access to its customers. Any attempt to degrade OVD access to the Comcast network would require substantial disruption to Comcast's overall Internet interconnectivity. Second, the idea that the combined firm could drive enormous edge providers with vested interests in using the OVD business to support core parts of their strategies—including Google, Amazon, Apple, and Sony—out of the OVD business (or significantly degrade their competitive strength) is not credible. And the firm that had received the most attention and is focused primarily on the OVD segment—Netflix—is protected by a multi-year direct interconnection agreement with Comcast. Indeed, for a foreclosure strategy to work, it would need to force out most or all of these large OVDs, as a foreclosure strategy that left some OVDs in the market would

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not eliminate the OVD sector but rather would primarily serve to strengthen the remaining, non-foreclosed OVDs. Third, even accepting the (incorrect) notion that Comcast actually “controls” its customers, analogies to minimum scale levels that the Commission has used in related contexts and to the size of other content providers or MVPDs reveal that the number of non-Comcast/TWC customers is far more than sufficient to sustain a viable OVD. This fact becomes even more obvious when recognizing that OVDs’ global operations are growing rapidly, and still more obvious when recognizing that (as discussed above), even within the combined firm’s footprint, most customers have choices regarding broadband service, with empirical evidence indicating that many would switch ISPs were Comcast to degrade its broadband service. Hence, by the “open field” analysis that the Commission has used in other settings, the combined firm would lack the ability to foreclose OVDs. Finally, no commenter has presented any evidence to support a merger-specific foreclosure claim that the number of customers gained by Comcast via the transaction would make the difference between the ability to foreclose or the lack thereof. (See Section IV.A, ¶¶ 104-115, for more details.)

- The combined firm will lack the incentive to foreclose OVDs, just as Comcast lacks such incentives today. Commenters do not argue that the transaction will create a new incentive to foreclose OVDs, rather they claim that the increased size of the combined firm will enhance its ability to foreclose OVDs. Hence, the revealed lack of incentive to foreclose OVDs today should also dictate analysis of post-transaction incentives. Following Netflix’s recent negotiations with Comcast and TWC, both merging parties gave Netflix { { } }. None of those facts is

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consistent with an incentive to harm OVDs' competitiveness. This should not be surprising; it is explained by fundamental economic logic. OVDs provide services that are highly complementary to Comcast's broadband business, increasing returns from the high-speed broadband network that Comcast has built up through billions of dollars in investments. Moreover, OVDs are significant purchasers of NBCUniversal content, paying hundreds of millions of dollars per year, and thus are complementary to that business as well. Well-established economic theory teaches that strategies to leverage a strong position in one industry (broadband) to foreclose competition in a complementary industry (OVD/video) are rarely profitable, explaining why Comcast lacks the incentive to undertake such a foreclosure strategy pre- or post-transaction. (See Section IV.B, ¶¶ 116-129, for more detail.)

12. Moving beyond theories regarding foreclosure of OVDs, commenters also advance "big is bad" theories based on increased bargaining power. In particular, commenters argue that, even though the merging parties do not overlap, the increased size created by the merger would increase Comcast's bargaining power vis-à-vis edge providers and their agents (e.g., transit providers and CDNs) and thus enable the combined firm to charge higher prices for interconnection into the Comcast network. However, this theory is not supported by theoretical or empirical economic analysis and is rejected by marketplace realities.

- Marketplace realities, including the large number of settlement-free paths into Comcast's network and the extremely small size of interconnection payments to Comcast, contradict theories of harm based on bargaining power. The small size

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of Comcast's charges for interconnection refutes any theory that Comcast's large size as an ISP parlays into anti-competitive power over edge providers or their agents. Most simply, the existence of over 40 settlement-free paths into the Comcast network is inconsistent with the claim that Comcast can impose anti-competitive terms on interconnection. More generally, the amount of money at issue in Comcast's interconnection agreements is {{ }}. For example, Netflix's {{ }} relative to Netflix's variable operating costs and revenue. Indeed, interconnection payments from edge providers or their agents to Comcast fail even to cover {{ }}. (See Section V.A, ¶¶ 132-138, for more detail.)

- Economic theory does not support the claim that the proposed transaction will increase Comcast's bargaining power. Dr. Farrell has presented the one economic theory in this case that yields a clear economic prediction about the effect of the transaction on prices charged to edge providers, and it predicts a price decrease. In discussing the effects of a price increase to OVDs (assuming there would be one), Dr. Farrell presents a model that assumes that OVDs do not price discriminate in the prices they charge to customers with different ISPs, meaning that if one ISP were to raise an OVD's costs (including via higher interconnection payments), that OVD would pass this cost increase through to customers of all ISPs. An implication of this model is that if Comcast or TWC charges more to an OVD today, they effectively impose a tax on each other in the form of higher OVD prices charged to one another's broadband customers. That tax creates an externality on one another, which the combined firm would internalize post-transaction, leading to lower prices to edge providers. Aside from

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Dr. Farrell's model, the larger body of economic theory establishes no conclusion about the effect of a merger of non-overlapping firms on bargaining power, a point commenters do not dispute. (See Section V.B, ¶¶ 139-150, for more detail.)

- Empirical evidence rejects the claim that the proposed transaction will increase Comcast's bargaining power. First, any attempt to use an observed relationship between size and prices to establish that greater size creates greater bargaining power must rule out the obvious alternative explanation, that higher quality firms generally are relatively large and generally charge relatively high prices. That general economic concept applies to the present context—larger ISPs tend to have higher quality networks and, in particular, to offer a richer, more robust set of interconnection services. Second, the analogy to MVPD/content provider negotiations demonstrates the importance of controlling for quality: The greater advertising revenue (and thus greater surplus) that certain MVPDs can generate for content providers more than explains the small observed gaps in affiliate fees across MVPDs. Third, once quality is controlled for, the Cogent data presented by Dr. Farrell actually contradicts the claim that ISP bargaining power due to a greater number of broadband customers leads to higher prices. In particular, once basic measures of ISP quality are accounted for, an ISP's number of broadband customers is no longer even a statistically significant predictor of interconnection prices, with the ISP quality metrics the relevant determinants of price. Finally, the limited details that Dr. Evans provides about Netflix's interconnection prices are meaningless, at most revealing whom Netflix pays for interconnection, but lacking sufficient detail to reveal anything about the relevant question, how much Netflix pays. (See Section V.C, ¶¶ 151-170, for more detail.)

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13. Even if the structure or magnitude of interconnection prices were to change, as some commenters have predicted, this would not be harmful to consumers or competition.

- Direct interconnection agreements between edge providers and ISPs are not harmful to competition, consumers, or edge providers. The recent direct interconnection agreements between Netflix (and other edge providers) and Comcast and TWC have served to “disintermediate” Cogent and other transit providers, an economically efficient and mutually beneficial outcome in many cases. The Netflix direct interconnection contracts also provide a direct test of whether such direct interconnection agreements are harmful to competition, consumers, or edge providers. In fact, (i) there is no evidence that the contracts led to a change in Netflix’s churn, margins, or other such metrics and (ii) the agreements led to no significant change in Netflix’s stock market performance, which indicates that the agreements have not harmed Netflix and are not expected to harm its future performance. (See Section VI.A, ¶¶ 172-179, for more detail.)
- Even if prices to edge providers (or their agents) were to increase further, this would be beneficial to broadband customers and economically efficient. An ISP’s broadband platform is a classic example of a “two-sided market” that facilitates interaction between edge providers and broadband customers, with charges potentially being paid by either side of the market. The economics of two-sided markets provides several reasons why additional charges on the edge provider side of the market would be beneficial to broadband customers and economically

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efficient. These reasons include: (i) the “seesaw” principle says that higher prices to edge providers would result in lower prices to broadband customers,¹⁰ which would benefit customers directly and also reduce cross-subsidization of heavy OVD users by light or non-OVD users; (ii) requiring edge providers to pay a greater share of the incremental cost of the traffic generated by their services would incentivize them to make more efficient decisions about how to provide the services; and (iii) greater charges to edge providers could help to solve distortions created by the large and growing heterogeneity between the largest edge providers and much smaller providers. The theoretical two-sided pricing model presented by Dr. Farrell supports many of these conclusions, as do many prior writings by Dr. Evans on two-sided markets. (See Section VI.B, ¶¶ 180-201, for more detail.)

14. Miscellaneous other arguments advanced by commenters are also without merit:

- There is no evidence that Comcast and TWC have any plans to compete with one another either in the traditional MVPD or OVD space and thus no basis for a concern about potential competition. To the contrary, the relevant potential competitors are fiber-based broadband providers like Google and municipalities, as well as the growth of wireless broadband providers, all of which have

10 Throughout the declaration, when I refer to lower prices, this should be taken as a comparison to the “but-for” world absent the transaction, meaning that the lower prices might manifest themselves as a slowed rate of price increase rather than a reduction in the price level. In either case, the key implication is that prices are lower with the transaction than without it.

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established plans to expand into the merging parties' territories and thus which place actual constraints on the merging parties' behavior. (See Section VII.A, ¶¶ 203-206, for more detail.)

- There is no basis to conclude that eliminating TWC as one of many competitive benchmarks would lead to higher prices or otherwise harm competition. (See Section VII.B, ¶ 207, for more detail.)

15. No commenters challenge the consumer benefits from the transaction in any substantive way. Although some commenters make general assertions that the benefits from the transaction will not come to pass, they offer no substantive refutation of the extensive discussion of broadband benefits in the Israel Declaration, the Rosston/Topper Declarations, and the parties' application. As one striking example, no commenter refutes the significant benefits to business customers, nor the fact that such benefits would lead to network expansion and hardening that would also help residential customers. Nor is there an economic refutation of the fact that investments made by Comcast or TWC are presently "landlocked" by limited footprints, with the geographic expansion due to the transaction thus unlocking value for incremental investments and making more such investments profitable to undertake. As such, there is no refutation of the gains from faster access networks (due to faster rollout of digital service and DOCSIS 3.0/3.1), expanded broadband networks, expanded Wi-Fi networks, or improved home network technology, nor the virtuous cycle that such improvements foster. Any one of these sizable efficiencies would likely be sufficient to overwhelm the small, tenuous claims for adverse competitive effects from the transaction; the combination of consumer benefits surely swamps any alleged harms. (See Section VIII, ¶¶ 208-222, for more detail.)

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II. COMMENTERS HAVE NOT ESTABLISHED THE EXISTENCE OF A NATIONAL BROADBAND MARKET NOR THE EXISTENCE OF ANY MARKET IN WHICH COMCAST AND TWC CONSTRAIN ONE ANOTHER TODAY

16. Much of the public discussion of the transaction to date has appealed to calculations of the combined firm's share of national broadband subscriptions. (I discuss the details of these calculations in Section II.B.2, below.) Such calculations give complaints about the transaction the patina of traditional horizontal merger analysis in which it is standard practice to consider "the merging parties' market shares in a relevant market, the level of concentration, and the change in concentration caused by the merger."¹¹ However, as I explain in this section, no commenter has established the existence of a national broadband market in which such market shares would be a relevant indicator of horizontal competitive effects nor, for that matter, any market in which Comcast and TWC compete to any significant degree today. Moreover, no commenter has provided any evidence that Comcast and TWC constrain one another's behavior today. In fact, the contrary conclusion holds: Comcast and TWC do not constrain one another to any significant degree in any well-defined antitrust market today.

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Horizontal Merger Guidelines, 3.

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A. Commenters provide no coherent basis to define a national broadband market in which national broadband shares would be relevant indicators of horizontal competitive effects

17. Several commenters present calculations of national market shares (based on various definitions of what constitutes broadband).¹² However, in presenting such shares, commenters fail to establish the existence of a national broadband market in which such shares would be relevant.

18. The lack of support for a national market in the present case is made clear by considering the Horizontal Merger Guidelines (“Guidelines”). The Guidelines indicate that product market definition is about “customers’ ability and willingness to substitute away from one product to another,” and that product markets are defined to include “a group of substitute products,” meaning “products that are reasonably interchangeable with a product sold by one of the merging firms.”¹³ The Guidelines are also clear that “the same principles apply” to geographic market definition and that the market may be “geographically bounded if geography limits some customers’ willingness or ability to substitute to some products, or some suppliers’ willingness or ability to serve some customers.”¹⁴

¹²Evans Declaration, ¶¶ 31 and Table 6; Farrell Declaration, ¶¶ 92 and Figure 5; Sappington Declaration, ¶¶¶ 20, 58 and note 29.

¹³Horizontal Merger Guidelines, 7-9.

¹⁴Id., 8, 13.

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19. In the present case, the market is clearly geographically bounded by individual provider's local service areas. Broadband providers do not make sales to broadband customers outside the boundaries of their geographically limited footprints and thus there is no cross-region substitution.

20. Adding edge providers into the mix does not change this conclusion. The relevant venue for analysis of potential competitive effects on edge providers involves options for interconnection into the Comcast and TWC last-mile networks; the broader venue of Internet backbone service is recognized to be highly competitive,¹⁵ and has not been raised as an area of concern by commenters. With regard to interconnection into last-mile networks, the Comcast and TWC networks reach only customers within their footprints, and their footprints do not overlap. Hence, from the point of view of edge providers, interconnection services into the Comcast and TWC last-mile networks are not substitutes for purposes of reaching any consumers.

21. An alternative perspective on market definition may cause some confusion and thus deserves additional comment. One could posit that Comcast and TWC are both buyers of content from edge providers and thus both participate in a national market for content purchases. However, this analogy does not withstand scrutiny. One way to see

¹⁵ See, e.g., Memorandum Opinion and Order and Declaratory Ruling, In the Matter of Applications filed by Global Crossing Limited and Level 3 Communications, Inc. for Consent to Transfer Control, IB Docket No. 11-78, September 29, 2011 (hereinafter, Level 3-Global Crossing Order), ¶ 27.

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this is to note that, in actuality, ISPs are not generally buyers of services from edge providers, but rather edge providers (or their agents) negotiate to interconnect with ISP networks, and the networks of Comcast and TWC are not substitutes but rather geographically separate, as explained above. However, even if one continues to rely on the analogy of ISPs to buyers of content (like MVPDs buying from cable networks), the same conclusion derives from the fact that content is not a “rival” input in the sense that there are not units of content—like widgets—that are sold to a particular buyer in a market. Rather, once the content is created, it can be accessed by an unlimited number of viewers, and what is sold to MVPDs are rights to show the content. When dealing with MVPDs with separate footprints, those rights cover distinct footprints and thus are not substitutes for one another.

22. Again, the Horizontal Merger Guidelines are on point. They indicate that in defining relevant markets for mergers of buyers, “the Agencies focus on the alternatives available to sellers in the face of a decrease in the price paid by a hypothetical monopsonist.”¹⁶ Continuing with the analogy to MVPDs as buyers of content, if Comcast were to reduce the price paid for content (or not take the content at all), selling it to TWC would not be a meaningful “alternative” for a content provider. Presumably the content provider would already have a deal with TWC regarding access to the content for TWC’s customers and, more generally, a deal with TWC would not replace the customers lost to

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Horizontal Merger Guidelines, 32-33.

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the content provider if no deal with Comcast were reached. Rather, the alternatives for the content provider to reach Comcast's customers would be deals with other MVPDs covering the Comcast footprint, some of which may have national footprints (e.g., DBS providers), others of which may have distinct but overlapping geographic footprints (e.g., telco providers), but none of which would be cable providers with non-overlapping footprints.

23. Indeed the Commission grappled with and resolved a similar issue in the Comcast-NBCUniversal transaction. There the issue was whether NBCUniversal, due to its affiliation with Comcast, would have an incentive to raise prices for content to those content buyers (e.g., MVPDs) that compete with Comcast. Although there was great disagreement on many aspects of this question, there was consensus that the relevant measure of competition with Comcast was the diversion rate—the fraction of customers leaving a given MVPD due to higher content prices that would switch to Comcast. As such, there was agreement that the set of MVPDs who competed with Comcast were those that overlapped geographically with Comcast and thus presented a true “alternative” for a content provider to reach the Comcast customers. Hence there was no allegation that non-overlapping cable providers, including TWC, would face higher prices from

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NBCU—they were not seen as competitors for Comcast, even in a market for purchase of content.¹⁷

24. Notably, because national cable networks operate on a nationwide basis and some of the MVPDs buying content have national footprints, it may be most convenient to talk about a national market for sale of national cable networks, and this language may be tempting to apply to edge providers.¹⁸ However, even if one were to adopt this language, this would be purely a semantic change with no substantive effect on merger analysis. Instead of defining separate local markets for Comcast and TWC, one would have defined a national market in which there is no diversion between Comcast and TWC and thus no competitive interaction between the two firms and thus no transaction-related effect on the ability for customers to divert to competing ISPs. This conclusion is confirmed by the

¹⁷Memorandum Opinion and Order, In the Matter of Applications of Comcast Corporation, General Electric Company and NBC Universal, Inc. For Consent to Assign Licenses and Transfer Control of Licensees, MB Docket No. 10-56, January 20, 2011 (hereinafter, Comcast-NBCU Order), ¶¶ 40, 42, and Technical Appendix, ¶¶ 13, 47; Department of Justice, Competitive Impact Statement, US vs. Comcast, Docket No. 1:11-cv-00106, January 18, 2011, 14, available at <http://www.justice.gov/atr/cases/f266100/266158.pdf>, site visited September 12, 2014; William P. Rogerson, "Economic Analysis of the Competitive Harms of the Proposed Comcast-NBCU Transaction," In the Matter of Applications of Comcast Corporation, General Electric Company and NBC Universal, Inc. for Consent to Assign Licenses and Transfer Control of Licensees, MB Docket No. 10-56, June 21, 2010, 24-25.

¹⁸ See, e.g., Sappington Declaration, § III.B.

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Comcast-NBCUniversal analysis where a national market for national cable networks was used but where no competitive effects were found on non-overlapping cable providers.¹⁹

25. Finally, some commenters argue that because certain edge providers “require national distribution” or “enter the market with national distribution in mind,” and because “any edge provider that requires national distribution would have to deal with the combined company,” there is a market for the “national high-speed broadband distribution of edge provider content.”²⁰ Even if one accepts that some edge providers “require” national distribution—an unsupported assertion—this argument is incoherent. Comcast and TWC provide completely distinct, non-substitutable inputs to an edge provider that seeks national distribution. If an edge provider truly “requires” national distribution and fails to obtain access to the TWC network, the Comcast network is not a substitute. Indeed, if commenters’ argument were correct and some edge providers required national distribution and needed to work directly with ISPs to obtain it, then both Comcast and TWC would have the alleged power today, as failure to reach a deal with either of them would prevent national distribution. In fact, however, the same alternatives exist today as will exist post-transaction—the dozens of CDNs and transit

¹⁹Comcast-NBCU Order, Technical Appendix, ¶ 13 (in the context of assessing vertical incentives associated with national broadcast networks).

²⁰Petition to Deny of Netflix, Inc., In the Matter of Applications of Comcast Corp. and Time Warner Cable Inc. for Consent to Transfer Control of Licenses and Authorizations, MB Docket No. 14-57, August 25, 2014, § III.A.

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providers who offer edge providers the ability to transmit traffic onto the TWC network and thus who provide a substitute to a direct agreement with the merging parties.²¹

26. In short, there is no meaningful national broadband market in which Comcast and TWC constrain one another today. Hence, national market shares lose the value they would have if there were a national market: The Guidelines make clear that it is market definition that “allows the Agencies to identify market participants and measure market shares and market concentration.”²²

²¹ It is true that the transit services offered by Comcast and TWC are among this large set of alternatives for reaching one another’s network. But, as discussed throughout this declaration, the Internet backbone is highly competitive, with Comcast and TWC small players in this overall ecosystem and with no commenter alleging harm to Internet backbone services.

²² Horizontal Merger Guidelines, 7. Some commenters have attempted to rely on the AT&T/MediaOne transaction (conditionally approved by the FCC and Antitrust Division of the U.S. Dept. of Justice (“DOJ”) in 2000) to support the existence of a national market for broadband. (See, e.g., Sappington Declaration, ¶ 21 and note 31). However, that case is not comparable to the present one, as has been noted by careful observers of the debate. (See Paul de Sa, et al., “Comcast/Time Warner Cable: How Persuasive Are Arguments Against the Merger?” Bernstein Research, September 2, 2014.) In the AT&T/MediaOne matter, the merging parties were the two largest providers in a national market for the provision of portals for accessing and interacting with the Internet, and they could compete to be the exclusive portal on unaffiliated cable systems. (See, e.g., Competitive Impact Statement, US vs. AT&T and MediaOne, US District Court, District of Columbia, 1:00cv00176, May 25, 2000; Memorandum Opinion and Order, In the Matter of Applications for the Consent to the Transfer of Control of Licenses and Section 214 Authorizations from MediaOne Group, Inc., Transferor, to AT&T Corp., Transferee, CS Docket No.99-251, June 6, 2000). The fact that providers of exclusive portals to the Internet competed in a national market has no bearing on whether broadband providers with non-overlapping footprints compete in a national market or whether interactions between national edge providers and regional broadband providers give rise to a national broadband market.

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B. Potential revisions to the minimum speed standard used to define broadband change none of my conclusions about the proposed transaction

27. Along with the focus on national broadband shares has come a focus by some commenters on the minimum speed required for a particular Internet access service to qualify as broadband.²³ Given that national broadband shares are not a meaningful indicator of horizontal competitive effects of the transaction, debates over the definition of broadband—while potentially relevant for analysis of broadband-related mergers with local market overlap and for other policy issues—are of limited relevance to the analysis of the transaction. No matter which Internet access services are defined as “broadband,” there is no market in which Comcast and TWC compete or constrain one another in the provision of such services, and thus the transaction raises none of the standard horizontal merger concerns.

28. Nevertheless, in the remainder of this section, I make two points regarding the minimum speed used to define broadband. First, although it makes sense to set policy goals that continue to strive for faster broadband—and indeed, as explained below, the realization of such faster speeds for more customers is an important goal and benefit of the proposed transaction—standards of market definition point either to the current 3

²³For more discussion of this issue, see Tom Wheeler, “The Facts and Future of Broadband Competition,” prepared remarks at 1776 Headquarters, Washington, DC, September 4, 2014, available at http://transition.fcc.gov/Daily_Releases/Daily_Business/2014/db0904/DOC-329161A1.pdf, site visited September 11, 2014 (hereinafter, Wheeler Remarks).

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Mbps standard or, taking a more conservative, forward-looking view, to speeds no higher than 10 Mbps as the appropriate definition of broadband to use when defining markets. And even if I conservatively adopt the 10 Mbps standard, the national broadband share figures presented in the Israel Declaration (based on the FCC's current standard) change at most slightly, meaning the substantive discussion of shares in my initial declaration remains correct. Second, if one were to ignore the evidence presented in this section and insist on a standard of 25 Mbps to define broadband, one implication would be that TWC has few broadband customers today and thus that the transaction would have only a small effect on Comcast's current number of broadband customers.

1. The appropriate speed for defining local broadband markets is at most 10 Mbps, with the current standard a reasonable alternative

29. In recent statements, the Commission has pointed toward speeds of 25 Mbps as a goal for broadband service, based on speeds that may be required in certain high-use cases in which multiple users make simultaneous use of high-bandwidth broadband applications. Although it certainly makes sense for the Commission to continue to encourage faster broadband speeds to support high-use cases, some commenters have advocated using these high-use cases to define the broadband market for analysis of the present transaction.²⁴ However, while such high-use cases certainly can occur, they do

24 Sappington Declaration, ¶¶ 15-16; Evans Declaration, ¶¶ 48-51.

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not define markets. To the contrary, the decisions made by the marginal customers who are likely to switch providers or reduce broadband usage, and thereby discipline a theoretical price increase or quality reduction, define the boundaries of (local) broadband markets. As explained in this section, a broadband definition that excludes all broadband services below 25 Mbps would miss important competitive constraints that each of Comcast and TWC faces in its footprint and thus produce an overly narrow market definition. Rather, a speed threshold of no more than 10 Mbps (and perhaps the current 3 Mbps standard) provides a more reasonable definition of broadband for use in defining (local) broadband markets.

30. Perhaps the simplest evidence regarding the effect of excluding broadband service below 25 Mbps comes from the parties' own customers. A sizeable fraction of customers at both companies are currently on service tiers with speeds below 25 Mbps. In particular, according to the December 2013 FCC Form 477 data, [[]] percent of TWC customers and [[]] percent of Comcast customers (in combination, 41 percent of the post-transaction customers of the combined firm) are on speed tiers below 25 Mbps even though speeds over 25 Mbps are generally available.²⁵ Hence, to ignore speeds below 25 Mbps would be to ignore 41 percent of the customers of the combined firm.

²⁵Comcast offers a 105 Mbps downstream tier in all of its markets (see Israel Declaration, ¶ 167). TWC offers a 30 Mbps downstream tier in nearly all of its markets (see, e.g., TWC document summarizing speed tiers available by geographic area: Speeds Tiers Pricing 2014 Q1.xlsx).

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31. When considering substitution by the marginal customers who would discipline price increases or other competitive strategies, other recent commentary from the Commission is on point. In its recent NOI, the Commission defines usage cases that would require a speed of no more than 10 Mbps, and perhaps less.²⁶ In particular, the FCC estimates that a speed of 4 Mbps would be sufficient for a “light use” broadband household engaged in up to four Internet-related activities, a speed of 7.9 Mbps would be sufficient for a “moderate use” household engaged in up to four Internet-related activities, and a speed of 10 Mbps would be sufficient for a “high use” household engaged in up to four internet-related activities.²⁷ Thus, even for the “high use” case, customers would be

26 See Tenth Broadband Progress Notice of Inquiry, In the Matter of 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, GN Docket No. 14-126, August 5, 2014. In a comment to the Commission, AT&T noted that the Commission’s calculations did not take into account common network management practices, such as statistical multiplexing, which would lessen the amount of bandwidth required by several applications running simultaneously. Thus, the 10 Mbps figure is likely an overestimate of throughput needs, even for the high-use case. See Comments of AT&T, In the Matter of 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, GN Docket No. 14-126, September 4, 2014, 9-10.

27 The four activities for each type of household include: (a) one user watching a standard definition (SD) movie, one user making a high-quality voice call, one user browsing on the web, and syncing of email, alerts, and weather information taking place in the background (low use); (b) one user watching a high definition (HD) movie, one user taking an online education course, one user browsing on the web, and syncing of email, alerts, and weather information taking place in the background (moderate use); (c) one user watching a super high definition (SHD) movie, one user making a HD video call, one user saving files to and from the cloud, and syncing of email, alerts, and weather information taking place in the background (high use).

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able to make use of broadband service offering speeds of 10 Mbps, indicating that such options are part of the relevant market. To the extent that “light use” or “moderate use” customers represent the marginal users who would switch following a price or quality change, the appropriate speed threshold for market definition would be even lower.

32. In addition, evidence (presented in detail in Section III.C, below) shows a significant likelihood of customer switching to slower speed services, which means that slower speed services place relevant competitive constraints on Comcast today. As one example, a survey commissioned by Comcast shows that the vast majority of customers would be willing not only to switch but to switch to slower speed service (including DSL or wireless) if their broadband provider were to degrade access to edge providers in a material way. And, notwithstanding Chairman Wheeler’s concern about switching costs, substantial switching does occur: Comcast’s churn data indicate that over the course of a single year, approximately {{ }} of Comcast’s broadband customers churn.²⁸ As explained in more detail in Section III.C.1, below, such switching would be quite costly to Comcast, indicating that the competitive constraint from these slower speed services is relevant to Comcast pricing and other strategies.

²⁸As noted below, even conservatively excluding movers from this total, roughly {{ }} percent of Comcast broadband customers churn each year.

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33. Many industry participants consider broadband download speeds at (or near) 3 Mbps to be sufficient for many of their services today. For example, Netflix's website recommends a download speed of 3 Mbps per stream for playing movies and TV shows in standard definition quality, 5 Mbps per stream for high definition quality, and 25 Mbps only for Ultra HD quality.²⁹ Similarly, Hulu's website recommends a speed of 3 Mbps for high definition videos and 1.5 Mbps for standard definition video, and Amazon Prime's website recommends a speed of 3.5 Mbps for high definition videos and 900 Kbps for standard definition videos.³⁰

2. Alternative broadband definitions do not affect my conclusion that changes in national broadband share provide no basis for a finding of horizontal competitive effects from the transaction

34. Given that there is no meaningful national market for broadband, national broadband shares are not indicative of horizontal competitive effects of the transaction in any well-defined market. Nevertheless, even if I compute national shares using a 10 Mbps threshold, they are quite similar to the shares presented in the Israel Declaration based on the 3 Mbps standard. As Table 1 shows, using a 10 Mbps threshold, the share of

²⁹See Netflix Internet Connection Speed Recommendations, available at <https://help.netflix.com/en/node/306>, site visited September 12, 2014.

³⁰See Streaming issues with Hulu Plus on your TV, available at <http://www.hulu.com/help/articles/20196801>, site visited September 12, 2014; System Requirements for Streaming on Your Computer, available at <http://www.amazon.com/gp/help/customer/display.html?nodeId=201422810>, site visited September 12, 2014.

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the merged firm (after accounting for the divestitures in the three-way Comcast-TWC-Charter transaction) is 40 percent ignoring mobile broadband competition. If mobile wireless customers are included in the share calculation, the post-transaction share with the proposed divestiture is 22.5 percent.

Table 1: National Broadband Shares Using 10 Mbps Threshold

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35. Although I consider a broadband definition based on a downstream speed of 25 Mbps overly narrow and hence inappropriate, it should be noted that TWC currently has fewer than one million broadband customers with speeds at 25 Mbps or higher, whereas Comcast has more than 12 million such customers. Consequently, if broadband is defined as requiring 25 Mbps, the transaction has little effect on Comcast's current share of national broadband customers. Table 2 shows that, under a 25 Mbps definition, without accounting for mobile broadband, Comcast's share increases by only 0.7 percentage points following the transaction; with mobile broadband included Comcast's share increases by only 0.5 percentage points.

Table 2: National Broadband Shares Using a 25 Mbps Threshold

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C. Commenters present no evidence of competitive constraints that Comcast and TWC impose on one another and thus no transaction-induced relaxation of competitive constraints

36. The Horizontal Merger Guidelines focus on mergers that lead to enhancements of market power and substantial lessening of competition. As the Horizontal Merger Guidelines note, "[a] merger enhances market power if it is likely to encourage one or more firms to raise price, reduce output, diminish innovation, or otherwise harm

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customers as a result of diminished competitive constraints or incentives.”³¹ For this reason, evidence that merging parties act as competitive constraints on one another is generally at the heart of merger analysis.

37. Such evidence of competitive constraints is entirely absent from commenters’ analysis of the transaction. In particular, commenters have not advanced any direct evidence of a competitive constraint imposed by one of the merging parties on the other, or any indirect evidence of substitution between the merging parties on any dimension (either acting as sellers or buyers). As such, there is no evidence for the standard horizontal theories of harm, in which constraints imposed by one merging party prevent the other from profitably taking an action unilaterally, or taking an action in coordination with other competitors, with this constraint relaxed due to the transaction. This includes not only the obvious lack of evidence that the firms constrain one another’s retail broadband pricing or strategies, but also a lack of evidence that any competitive constraints from TWC affected Comcast in its recent negotiations with Netflix, Cogent, or other edge providers or their agents. There is simply no evidence that any pricing, strategies, or negotiations would have been different absent some constraint imposed by the other merging party.

31 Horizontal Merger Guidelines, § 1 [emphasis added].

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III. THE MERGING PARTIES FACE LARGE AND GROWING COMPETITIVE CONSTRAINTS, INCLUDING ON THEIR ABILITY TO AFFECT EDGE PROVIDER ACCESS TO THEIR LAST-MILE NETWORKS

38. Commenters dedicate dozens of pages to allegations of Comcast's market power, including substantially overstated claims about the lack of competitive alternatives available to Comcast broadband customers.³² Commenters' focus on current market power is of limited relevance, particularly absent any showing that the transaction enhances that power. However, because I disagree with commenters' conclusions and because those conclusions also infect their foreclosure and bargaining theories, I refute the conclusions that commenters attempt to draw from Comcast's current broadband market position at some length in this section.

39. Before turning to this refutation, I note that commenters and I do agree on one fact: Comcast has an extremely high-quality broadband network and thus offers very high-quality broadband service to its customers. Comcast has spent tens of billions of dollars to develop its network and now offers broadband speeds up to 505 Mbps. Furthermore, as explained in the Israel Declaration, Comcast sees this transaction as a way to extend its high-quality broadband service into additional territories and to expand

³²For example, Dr. Evans concludes that "there are no significant competitive constraints" on Comcast and TWC and "[a]pplicants' subscribers have nowhere else to turn" (Evans Declaration, ¶¶ 21, 89). Dr. Sappington states that "most residential customers have little or no meaningful choice among suppliers of high-speed broadband Internet access service." (Sappington Declaration, ¶ 37).

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its footprint for future investments, thus making more such investments profitable. The speed enabled by this broadband network is well suited to—in fact is only fully utilized by—online video content, and thus Comcast’s broadband investment is deeply complementary to the emergence and growth of online video distributors (OVDs). This means that any strategy to harm online video distributors would involve Comcast degrading the very applications that its broadband network is built to serve and that best enable Comcast to attract broadband customers and thus generate a return on its broadband investment.

A. The merging parties’ ability to affect edge provider access to their last-mile networks is constrained by competition in the internet backbone and among last-mile networks

40. Commenters dedicate substantial attention to the large number of customers who make use of Comcast’s last-mile broadband networks and, from its size as a retail broadband provider, attempt to make the leap to claims about the combined firm’s ability to harm edge providers’ access to its last-mile network.³³ In this section, I explain why this logical leap does not follow, with further details in Sections III.B through III.D.

41. As an initial matter, note that the commenter theories of harm apply neither to last-mile networks nor to transit services on backbone networks through which (among other things) edge provider content is carried to the last-mile networks.

33 Evans Declaration, § III.A; Farrell Declaration, § V.B; Sappington Declaration, § IV.B and § IV.E.

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- The lack of any overlap between Comcast’s and TWC’s last-mile networks, and Comcast’s stated willingness to adhere to Open Internet principles—which prevent selective degradation of particular traffic in the last mile—effectively eliminates any concern about harm in the last mile.
- Although Comcast and TWC participate in the backbone as transit providers, I have seen no allegation that either Comcast or TWC has any market power—or that the transaction would have any anti-competitive effect—in the Internet backbone. To the contrary, as noted, the Commission has previously found that Internet backbone services are highly competitive.³⁴ No commenter has contested that finding nor argued that this transaction will change that reality.

42. Hence, the possibility of competitive effects from the transaction collapses to the possibility of competitive effects at the “interconnection points” where last-mile and backbone networks intersect. In general, commenters’ theories of harm are theories about possible changes to interconnection agreements—the terms under which edge providers, (or more often their CDN or transit provider agents) obtain access into the Comcast and TWC last-mile networks.

43. Much of the remainder of this declaration is explicitly or implicitly about why the transaction creates no harmful effects on interconnection agreements—and more importantly, no harmful effects on the terms under which edge providers can access the

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Level 3-Global Crossing Order, ¶ 27.

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Comcast or TWC last-mile networks—certainly no effects that come anywhere near the magnitude of benefits from the transaction. At core, the logic follows from a simple idea: Interconnection points are not immune from the competitive forces that prevent competitive harm in the last-mile and backbone networks that sit on either side of them. Most importantly, as explained in Section III.B, the recognized intense competitiveness of backbone services places strong constraints on an ISP's ability to manipulate interconnection terms in a way that would harm edge providers, whatever the size of its last-mile network. And, as developed in Section III.C, consumers do have important and growing choices between last-mile networks and thus have options should an ISP degrade edge provider access to its last-mile network. Finally, as developed in Section III.D, efforts to harm edge providers' access to last-mile networks would likely only hasten the development of new, alternative last-mile networks, sponsored directly by edge providers themselves (e.g., Google), by municipalities, or by Commission action.

B. Constraints arising from the highly competitive internet backbone

1. The wide range of interconnection options means that attempts to degrade interconnection options open to edge providers would be highly disruptive to the combined firm

44. Comcast lacks the ability to degrade edge provider access to its last-mile network to any significant degree. Due to the competitiveness of backbone services, there are many options for an edge provider to obtain access to Comcast's last-mile network. In particular, as detailed in the declarations of Kevin McElearney and Constantine Dovrolis, there are dozens of third-party CDNs and transit providers that have interconnection agreements with Comcast and with which edge providers can contract to access the

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Comcast last-mile network. 35 And, importantly, it is the edge provider, not Comcast (or any receiving ISP), that makes all the choices about which of these many paths to use to deliver content.³⁶

45. Hence, no edge provider is forced to negotiate with Comcast directly. Rather, edge providers—either on their own if they are large enough (and choose to do so) or through CDNs or other agents—can use any of multiple paths onto the Comcast network.³⁷ Access through third-party routes is not just a theoretical possibility: I understand that the overwhelming majority of edge providers reach the Comcast last-mile network through indirect connections rather than through direct interconnection with Comcast. And indirect connection is not an option pursued only by small edge providers; for example, Yahoo { { } }.³⁸

46. Notably, more than 40 of the third parties offering access to the Comcast last-mile network have settlement-free interconnection agreements with Comcast, meaning that Comcast charges nothing to the provider for interconnection services. The existence of so many settlement-free arrangements belies any claim that Comcast is exercising significant market power via interconnection today.

35Declaration of Kevin McElearney, September 19, 2014 (hereinafter, McElearney Declaration), ¶ 3; Declaration of Constantine Dovrolis, “The Evolution and Economics of Internet Interconnections,” September 21, 2014 (hereinafter, Dovrolis Declaration), 24.

36 McElearney Declaration, ¶¶ 3, 17; Dovrolis Declaration, 5.

37 Israel Declaration, § II.B.1.c.

38Peter Stern, Executive Vice President & Chief Strategy Officer, TWC, September 3, 2014, interview; “September 11, 2014 Responses of Comcast Corporation to the Commission’s Information and Data Request,” RFI 70, 184.

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47. Commenters' claim that Comcast can simply degrade or charge for these paths significantly underplays the import of the large number of settlement-free paths onto the Comcast network. In particular, to support a claim that Comcast could raise interconnection prices across the board, one would have to claim that Comcast would have sufficient power to disrupt its more than 40 settlement-free paths and force positive interconnection payments onto enough of them to disrupt significantly the spare capacity into Comcast's network, of which "there is more than enough...to carry all of Netflix's Comcast-bound traffic."³⁹ No commenter has presented any evidence that this is possible.

48. To the contrary, given that commenters' discussion focuses on the alleged lack of constraints that Comcast faces today, the evidence points in the opposite direction: Comcast has maintained all of these settlement-free paths despite its alleged market power. This Comcast behavior follows from the fact that Comcast depends on these links to maintain connectivity to the broader Internet, not just in the U.S., but globally. Attempting to disrupt them to harm particular edge provider traffic would be extremely disruptive.

49. The upshot of this wide range of paths onto the Comcast network remains what I explained in my initial declaration: To degrade significantly the access of particular edge

39 McElearney Declaration, ¶ 3.

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providers to its last-mile network would require significant disruption to Comcast's own access to the broader Internet, at extremely high cost to Comcast. In particular, as the Israel Declaration explained,⁴⁰ the ability of edge providers to pool their traffic with other providers (via the use of transit providers or CDNs) and to make use of multiple paths onto an ISP's network (either on their own or via a CDN) together mean that Comcast would have to degrade its connection to the overall Internet to a significant extent to prevent a particular edge provider from accessing its last-mile network.

2. Contrary to commenters' claims, events during the recent Comcast-Netflix negotiations confirm that Comcast has little ability to harm edge providers' access to its last-mile network

50. Experts for Cogent and Netflix argue that during the recent Comcast-Netflix negotiations, Comcast was able to prevent Netflix from obtaining sufficient capacity to deliver a high-quality experience to Comcast customers.⁴¹ I understand that this is false, with this apparent lack of capacity driven by artificial limitations placed by Netflix on the providers with which it would work. As Kevin McElearney explains in his declaration:⁴²

Netflix appears to have adopted a self-serving strategy of using limited transit providers that never purchase interconnection services from their destination ISP. The result of this self-imposed limitation is that many transit suppliers with available capacity and potentially comparable market pricing, were excluded from Netflix's consideration. This Netflix transit strategy severely limited Netflix's delivery capability and its ability

40 Israel Declaration, § II.B.1(c).

41 Evans Declaration, § III.A.2 and § III.A.3; Farrell Declaration, § V.C.

42 McElearney Declaration, ¶¶ 23-24.

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to deliver a high-quality service. No other large content provider that I know of – including several in the same space as Netflix – has adopted the same restrictive delivery requirements. The small handful of providers to which Netflix limited itself simply were not capable, by themselves, of handling delivery of one-third of peak Comcast-bound Internet traffic without arranging for massive capacity augmentations that would have far exceeded normal growth and put those providers outside of their peering policies or not in a position to augment at the speed that Netflix wanted to shift traffic. Had Netflix instead taken advantage of the many other routes into Comcast's network, including the many settlement-free routes on which Comcast had (and has) abundant available capacity, as noted above, it could have delivered its traffic to Comcast's network with high quality and no performance issues.

51. Netflix's experience with other ISPs was similar. For example, Verizon recently stated that Netflix chose to transmit traffic over congested transit paths, even while other paths into its network were uncongested and had substantial available capacity.⁴³

52. More generally, Mr. McElearney confirms my understanding that Netflix had access to a wide range of interconnection points into the Comcast network, with the ability to pick and choose from those paths, such that Comcast would have needed largely to shut down its connection to the Internet to degrade Netflix's access significantly.⁴⁴

⁴³See "Why is Netflix Buffering? Dispelling the Congestion Myth," Verizon Policy Blog, July 10, 2014, available at <http://publicpolicy.verizon.com/blog/entry/why-is-netflix-buffering-dispelling-the-congestion-myth>, site visited September 15, 2014. ("While the links chosen by Netflix were congested (congestion occurs when use approaches or reaches 100% capacity during peak usage periods), the links from other transit providers (carrying non-Netflix traffic) to Verizon's network did not experience congestion and were performing fine. The maximum amount of capacity used (or peak utilization) over the links between these other networks and Verizon's network ranged from 10% to 80% (with an average peak utilization of 44%).")

⁴⁴ McElearney Declaration, ¶¶ 3, 36.

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Comcast reaches well over 99 percent of the Internet's networks through more than 40 settlement-free peers and numerous other commercial interconnection agreements, and across our interconnection partners there is more than enough capacity into our network – even enough to carry all of Netflix's Comcast-bound traffic...even in the face of the Netflix-related congestion, Comcast's utilization with its peers during the last 12 months was less than {{ }} percent on average during peak times – and those peers do not pay Comcast – which undermines Netflix's suggestion that it sought out all routes where no payment to Comcast was required. Netflix chose routes that it knew were insufficient, and created performance issues for itself and its customers.

3. The array of interconnection options are relevant for all providers and may be especially valuable for small edge providers

53. The wide range of options for getting traffic onto the Comcast network are relevant for all providers; no edge provider is required to negotiate directly with Comcast to access its network. That said, some large edge providers such as Netflix and Google are sufficiently large that they choose to invest in their own CDNs and then to negotiate directly with ISPs for interconnection, rather than pay third-party CDNs or transit providers to provide indirect access.⁴⁵ Not surprisingly given that such providers are large, powerful firms in their own right, the terms they have reached with the merging parties have not proven harmful to them, but rather have represented mutually beneficial disintermediation. (See Sections IV.B and VI.A for further discussion.)

⁴⁵Such “self supply” makes sense when the costs of distributing servers around the backbone, and paying multiple ISPs for direct access to their individual networks, is less (or no more) expensive than paying for third-party CDN services or transit. I understand that direct links also may provide additional control, oversight, and dependable capacity that a larger provider may be willing to pay for.

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54. Cases like Netflix and Google are definitely the exception: The vast majority of edge providers are sufficiently small that negotiating direct access with ISPs would be inefficient. Instead, such edge providers, no matter how small, can contract with CDNs such as Akamai and Limelight to deliver content to ISPs' networks (or can use web hosting companies that in turn use CDNs, or can purchase transit from transit providers).⁴⁶ The third-party agent arranges direct interconnection with various ISPs, perhaps on its own, or perhaps working with yet another third-party transit provider that has a direct connection with the ISP.

55. By delivering traffic via third parties, small edge providers are effectively able to pool their content with other providers who use a given CDN, web hosting company, or transit provider. Moreover, because edge providers (small or large) can route their traffic over multiple redundant transit and CDN routes, in order to degrade any given edge providers' access to an ISP's network, the ISP would have to degrade a significant amount of the other traffic it receives or sends over these same links, and in the process degrade its interconnectivity with the overall Internet. Hence, small edge providers have a level of protection that distinguishes Internet interconnection arrangements from other contexts, including negotiations for carriage of traditional video offerings.

⁴⁶Such third parties have plenty of capacity to accommodate traffic from small edge providers. For example, MIT CSAIL Information Policy Project recently found that "[f]or smaller providers of content and applications, who would normally reach their customers across the Internet either by using a third-party content delivery platform or by using the paths provided by peering and transit links, the lack of widespread congestion means they have adequate ways to reach their customers." (MIT/CAIDA, "Measuring Internet congestion: A preliminary report," available at <https://ipp.mit.edu/sites/default/files/documents/Congestion-handout-final.pdf>, site visited September 22, 2014).

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4. Attempts by the merged firm to degrade interconnection into its network in any material way would be extremely costly

56. Recent real world experience illustrates that degradation of edge provider access to the Comcast network—whether inadvertent, intentional, or a temporary side effect of unresolved commercial negotiations—would be harmful to Comcast’s business interests. For example, although the recent “event” in which Netflix quality on the Comcast network declined (at least for traffic delivered over certain routes) was fairly short lived and affected multiple ISPs at the same time—thus limiting the impact on customer churn—the Comcast complaint data indicate that customers noticed and reacted negatively to the event, directing complaints to Comcast and, at a minimum, imposing customer service costs on Comcast. In particular, during the brief period in late 2013/early 2014 when Netflix’s quality on Comcast network declined (at least for traffic sent over certain routes), Comcast experienced a surge in Netflix-related customer-service calls with customers complaining about Comcast’s broadband service. Figure 1 shows that the Netflix-related service calls spiked by approximately [[]] percent, from [[]] per month before the onset of the dispute to more than [[]] per month during the dispute period, which lasted from November 2013 through February 2014. The number of customer calls declined in March and thereafter as Netflix performance improved with the re-routing of its traffic after the resolution of the dispute.

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[[]]

C. Constraints imposed by customers, making use of the full range of choices regarding broadband service

57. In this section, I explain that even if, despite the analysis above, Comcast attempted and managed to degrade edge provider access significantly, customers would react in a wide range of ways that would impose substantial costs on Comcast, thus further reducing the chance that Comcast could undertake such actions profitably.

1. Any reduction in customers' demand for broadband services would be quite costly to the merging parties

58. Although certain commenters spend substantial time arguing that customers have limited ability to reduce their consumption of Comcast broadband services—a point I refute below—they fail to acknowledge the substantial cost that such reductions in consumption of broadband service would have on Comcast. Customers taking broadband service are extremely valuable to Comcast, both in absolute terms and relative to customers not taking broadband service. Given the high value associated with broadband service, the converse also holds—the loss of a broadband customer is quite costly to Comcast.

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59. Ordinary-course-of-business customer lifetime value (CLV) calculations show that the addition of broadband service increases a customer's lifetime value to Comcast [[]].⁴⁷ Comcast has computed the following CLVs for standalone and bundled products:⁴⁸

{{ }}

60. Notable from this table is the high CLV associated with broadband relative to other products and thus the high cost to Comcast if a customer were to drop broadband service. For example, if a broadband/video double-play customer were to drop broadband service, her CLV would fall from {{ }}, thus eliminating more than {{ }} percent of her expected lifetime value. No such effect is seen for traditional video: If the double-play customer drops video and thus switches to "data only," this eliminates less than {{ }} percent of the double-play CLV ({{ }} in double play CLV). A similar pattern holds for

47 In interpreting these high broadband CLVs, it is important to remember that, as explained in Section II, there is no coherent theory of horizontal harm in broadband competition in this case. If there were such a theory (as in a merger of overlapping broadband providers), then standard "upward pricing pressure" logic might imply that the presence of high broadband CLVs heightens the horizontal concern. In the present case, however, with no coherent theory of horizontal harm, the relevant implication of the high broadband CLVs is that Comcast would be unlikely to find it profitable to harm its profitable broadband business to help its much less profitable video business. Moreover, one also cannot use the broadband CLVs to infer that Comcast has sufficient market power in broadband to foreclose OVD competition. Rather, as explained in Section IV.A, Comcast lacks this ability due to factors including the range of options open to OVDs (including powerful established OVDs like Google, Apple, and Netflix) to access Comcast's network; the large number of non-Comcast/TWC broadband customers outside Comcast's footprint and around the world; and the substantial harm that any attempt to degrade edge provider access would do to demand for Comcast's broadband services.

48 The table is based on slide 17 of Comcast's October 2013 presentation titled "Customer Lifetime Value (CLV)." I understand that this presentation was developed by the Finance Department at Comcast and that the CLV is based on the [[]].

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single-play customers. Losing a single-play broadband customer leads to an expected reduction in CLV of {{ }} loss from losing a single-play video customer. These figures indicate that Comcast suffers substantial losses with each loss of a broadband customer, even if some fraction of those customers chose to replace broadband service with video service.

61. Given that 44 percent of all Comcast broadband customers subscribe to a triple-play package, including video and voice in addition to broadband, the conclusions in this section become even stronger.⁴⁹ For any triple-play customers who react to downgraded Comcast broadband service by disconnecting their overall service—as some surely would—Comcast loses {{ }} in value, an amount equivalent to the value from more than {{ }} standalone video customers (or from more than {{ }} customers adding video to what had been a standalone data subscription). Hence, any material risk of loss of triple-play customers would act as a significant deterrent to strategies to downgrade broadband.

2. Customers can substitute away from ISPs along multiple dimensions

62. In evaluating the extent to which customers have the ability to substitute away from Comcast's broadband services, commenters fail to consider all relevant margins of substitution. In particular, commenters focus only on the extent to which Comcast and

49 See Comcast data produced in FCC Information and Data Request – Exhibit 4.2(e).

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TWC customers can substitute to alternative high-speed, wireline ISPs (i.e., one part of the “extensive margin”), ignoring the fact that, if faced with diminished or more expensive broadband service, any Comcast customer in any region could downgrade or even cancel broadband service altogether (i.e., the intensive margin).

(a) Adjusting the Intensity of Usage/Tier of Service (Intensive Margin)

63. Even without switching providers, customers could react to downgraded Comcast broadband service along the intensive margin in a variety of ways, at least two of which would harm Comcast:

- First, if their access to OVDs and other edge providers were degraded, customers might decide they no longer need broadband service from Comcast at all, perhaps relying on mobile service instead, combined with Internet access at work.
- Second, customers could choose to downgrade to a lower tier of Comcast’s broadband service (or fail to upgrade to a higher tier). Indeed, both the Commission and industry participants recognize that access to OVD offerings is an important driver of demand for high speed broadband service, so an inability to utilize higher speeds for such access could very well undermine the value of those tiers.⁵⁰ Comcast currently offers broadband products that include (among others)

⁵⁰Reed Hastings (Netflix, Inc. CEO), 4Q13 Earnings Call, January 22, 2014. The Commission also recognizes that HD-quality streaming is one of the key edge uses that requires high-speed data networks. (See Broadband Speed Guide, available at <http://www.fcc.gov/guides/broadband-speed-guide>, site visited September 12, 2014).

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the 3 Mbps Economy Plus product (\$39.95 per month), the 6 Mbps Performance Starter product (\$49.95 per month), and the 150 Mbps Extreme 150 package (\$89.99 per month).⁵¹ Comcast indicates that customers who watch video extensively online disproportionately choose higher-speed tiers.⁵² Hence, if a reduction in the quality (or increase in the cost) of OVD offerings on the Comcast network were to cause a customer to downgrade broadband service from, for example, Extreme 150 to Economy Plus (which is more than fast enough for most non-video applications), this would cost Comcast \$50 per month in revenue—or \$1200 over a two-year period. Not surprisingly, then, Netflix CEO Reed Hastings recently explained how Netflix services help cable companies by noting: “I think the more that you own cable companies, you want great broadband services, you want consumers to take higher and higher priced tiers.”⁵³

64. In sum, then, even those customers who might choose not to switch broadband providers if their service were degraded can (and likely would) react to such degradation by downgrading

51 See <http://www.comcast.com/internet-service.html>, site visited September 12, 2014.

52 John Schanz, Executive Vice President and Chief Network Officer, Comcast Corporation, September 18, 2014, interview.

53 Reed Hastings (Netflix, Inc. CEO), 4Q13 Earnings Call, January 22, 2014 (emphasis added). The Commission also recognizes that HD-quality streaming is one of the key edge uses that requires high-speed data networks. (See Broadband Speed Guide, available at <http://www.fcc.gov/guides/broadband-speed-guide>, site visited September 12, 2014).

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or canceling broadband service, a decision which would be quite costly to Comcast. And importantly, the threat to substitute along the intensive margin in this way is open to all Comcast customers, not just those in areas where Comcast faces a particular set of broadband competitors.

(b) Switching to Another Provider (Extensive Margin)

65. Despite overstated assertions that “[f]or all intents and purposes, the Applicants’ subscribers have nowhere else to turn,”⁵⁴ the evidence presented by commenters is actually quite consistent with the evidence that I presented in the Israel Declaration, showing that most subscribers definitely do have “somewhere else to turn.”⁵⁵ In particular, Dr. Evans indicates that, on average, Comcast customers have one other fixed high-speed (greater than 10 Mbps) broadband option.⁵⁶ Similarly, Dr. Farrell acknowledges that most local markets have at least two competitors.⁵⁷ Thus, by commenters’ own evidence, the majority of Comcast and TWC customers do have at least one alternative that would meet even these commenters’ standards for a relevant competitor, a finding consistent with the evidence in my original declaration. In addition,

54 Evans Declaration, ¶ 89.

55 See Israel Declaration, ¶ 43 (citing to FCC data showing that “approximately 97 percent of households are located in census tracts in which two or more fixed broadband providers report offering at least 3 Mbps downstream and 768 kbps upstream and approximately 70 percent are located in census tracts in which two or more providers report offering at least 10 Mbps downstream and at least 1.5 Mbps upstream.”).

56 Evans Declaration, Table 2.

57 Farrell Declaration, ¶ 55.

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as indicated in the June 2013 FCC Internet Access Report, the inclusion of wireless options—which are becoming increasingly relevant, with new developments announced nearly every day, as I will explain below—substantially increases the set of options, as 98 percent of US households are located in census tracts that have access to two or more fixed and mobile broadband providers offering speeds of at least 10 Mbps.⁵⁸

66. In Section III.C.4, I present empirical evidence that, faced with a reduction in the quality of broadband service, customers would, in fact, switch to such alternatives—including lower speed, DSL, and wireless options—in large numbers, thus imposing substantial costs on Comcast per the CLV numbers presented above. Before turning to that, I provide some additional details on the set of alternatives and recent developments that continue to strengthen these alternatives.

3. There exists a large and growing set of competitive broadband alternatives

(a) Overview of Telco Options

67. Commenters discuss two of the broadband options offered by telco providers (DSL and wireless) separately, thus creating an incomplete perspective on the full competitive threat imposed by telco providers. Among other things, this one-off evaluation of these telco options leads commenters to a double standard in which they

⁵⁸See Figure 5b in FCC's Report titled "Internet Access Services: Status as of June 30, 2013," available at https://apps.fcc.gov/edocs_public/attachmatch/DOC-327829A1.pdf, site visited September 20, 2014).

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downplay DSL—which is highly relevant today—due to claims that its competitive significance is declining, while ignoring the fact that the competitive significance of FTTP and wireless options—while somewhat more limited today—is growing rapidly. Hence, in this section, I present a more unified view of the competitive strategies and offerings of telco providers. This unified view reveals, unsurprisingly, that firms like AT&T, Verizon, CenturyLink, and others remain powerful broadband competitors and are poised to become even more powerful, in a continuation of the “leapfrogging” that has long characterized broadband competition.⁵⁹

68. Leading the way among the full set of telco options, fiber to the premises (“FTTP”) is offered by telcos in a growing set of geographic areas, with some of the growth being tied directly to the need to respond competitively to the proposed transaction.⁶⁰ And in areas where FTTP is not presently available, telcos are substantially improving their DSL service. Layered on top of those options, high-speed wireless

⁵⁹FCC Chairman Wheeler recently described this leapfrogging phenomenon as follows: “The path from narrowband, to broadband, to high-speed broadband, was forged by competition. In order to meet the competitive threat of satellite services, cable TV companies upgraded their facilities. When the Internet went mainstream, they found themselves in the enviable position of having greater network capacity than telephone companies. Confronted by such competition, the telcos upgraded to DSL, and in some places deployed all-fiber, or fiber-and-copper networks. Cable companies further responded to this competition by improving their own broadband performance. All this investment was a very good thing.” (Wheeler Remarks, 3).

⁶⁰Thomas Gryta, “AT&T to Build Out Ultrafast Internet in North Carolina,” Wall Street Journal, April 10, 2014, available at <http://online.wsj.com/news/articles/SB10001424052702303873604579492103338327532>, site visited September 15, 2014.

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broadband is available nearly ubiquitously. As discussed in the Israel Declaration,⁶¹ the combined set of approaches to providing broadband service makes telco firms highly significant competitors.

69. Actual data on market growth rates belie any claim that, appropriately considered as a whole, telco options are falling behind relative to cable; to the contrary, wired telco options are growing faster than cable, and the telco growth rates are even higher when wireless is included. Table 3 shows broadband customer counts from June 2009 through June 2013 and average annual growth rates for FTTP, DSL, mobile wireless, and cable technologies using the FCC's current definition of broadband (based on speeds of 3 Mbps downstream and 768 Kbps upstream). I rely on the existing broadband definition in order to let the data tell the story—if, for example, telco products are more concentrated in the lower speed ranges, and therefore are less popular, telco growth rates should be correspondingly lower.⁶² They are not.

⁶¹ Israel Declaration, ¶¶ 49-68. I note that data available at the time of the Israel Declaration understated the overlap between the Comcast/TWC footprints and the telco footprints. Newly available data indicate greater overlap than reported in ¶¶ 50 and 56 of the Israel Declaration (See Letter from Comcast, TWC, and Charter to the FCC, June 25, 2014, p. 4, which shows, for example, overlap between the Comcast footprint and AT&T's U-verse footprint of [] percent, and overlap between the TWC footprint and the U-verse footprint of [] percent, compared to overlaps of [] percent and [] percent, respectively, reported in my original declaration.).

⁶² In addition, if I were to use a higher speed cutoff, it would largely capture upgrades by some customers rather than overall growth rates, and it would only capture growth rates for the highest speed telco options without answering the question about the overall set of telco options.

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70. Across both wired options (i.e., FTTP + DSL), the total number of wired telco customers grew at an annual rate of 26.9 percent during this period, and when wireless is included, the total number of telco customers grew at an annual rate of 89.6 percent. Hence, with or without including wireless options, the telco broadband growth rate is substantially higher than the cable broadband growth rate of only 17.9 percent.

71. In the following sections, I provide more details on the full set of telco broadband options that are generating this growth.

Table 3: Customer Growth Rates for Connections with Speeds at least 3 Mbps-downstream and 768 Kbps-upstream, June 2009 through June 2013

(b)

FTTP

72. Commenters all seem to agree that FTTP options pose a significant competitive threat to cable. As such, the recent and planned growth in these options is of particular note. For example, the Israel Declaration noted that AT&T had begun to deploy FTTP (specifically, its GigaPower product with speeds up to 1 Gbps) in certain cities, including

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Austin, Texas.⁶³ In the context of its proposed merger with DirecTV, AT&T stated the following in a submission to the Securities and Exchange Commission (SEC):⁶⁴

The economics of this transaction will allow the combined company to upgrade 2 million additional locations to high speed broadband with Gigapower FTTP (fiber to the premise) and expand our high speed broadband footprint to an additional 13 million locations . . .

73. Prior to the announcement of its proposed merger with DirecTV, AT&T had already been advancing the deployment of FTTP. In April of this year, in an announcement similar to that of Google Fiber's, AT&T announced plans to expand GigaPower in as many as 100 candidate cities in 21 metropolitan areas.⁶⁵ Since then, it has launched service in Austin and Dallas/Ft. Worth and has reached agreements with 11

63

Israel Declaration, ¶ 53.

64 AT&T Inc., Current Report (Form 8-K), Item 8.01 Other Events, June 3, 2014. See also, Applications of AT&T Inc. and DIRECTV for Consent to Transfer Control of Licenses and Authorizations, Description of Transaction, Public Interest Showing, and Related Demonstrations, June 11, 2014 ("Specifically, the combined company will commit to provide FTTP wireline broadband service to 2 million more customer locations. In addition, the combined company will commit to deploy fixed wireless local loop ("WLL") technology to bring high-speed broadband to approximately 13 million largely rural customer locations. By using a fixed antenna, this service is designed to perform as well as services with advertised speeds of 15-20 Mbps. This fixed WLL deployment will include areas outside AT&T's wireline footprint and areas within that footprint that currently do not receive the U-verse broadband and video bundle.").

65 Jon Brodtkin, "AT&T Copies Google, Names 100 Cities Where It Could Offer Gigabit Fiber," Ars Technica, April 21, 2014, available at <http://arstechnica.com/business/2014/04/att-copies-google-names-100-cities-where-it-could-offer-gigabit-fiber/>, site visited April 23, 2014.

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additional cities in California, Kansas, North Carolina, Tennessee, and Texas.⁶⁶ AT&T Chief Executive Randall Stephenson stated that AT&T's work in Austin, along with the proposed Comcast/TWC merger, "has encouraged the company to be 'a little more aggressive and assertive in deploying that technology around the country.'" ⁶⁷

74. In addition to AT&T, other providers have launched or are planning to expand their FTTP services. As I discuss in more detail in Section III.D below, Google Fiber and numerous municipalities are expanding their offerings or entering the FTTP broadband space. Among telco providers, Verizon's CEO has just indicated that "he is more open now than before to expanding the company's FiOS broadband Internet service in new markets."⁶⁸ Cincinnati Bell has launched "Fioptics Gigabit" in its footprint and explicitly

⁶⁶See <http://www.att.com/att/gigapowercities/>, site visited September 19, 2014; Scott Moritz, "AT&T Plots Zippiest Internet Speed in Google's Backyard," Bloomberg, August 20, 2014, available at <http://www.bloomberg.com/news/2014-08-20/at-t-plots-zippiest-internet-speed-in-google-s-backyard.html>, site visited August 21, 2014; Jeff Baumgartner, "AT&T Adds Overland Park To 'GigaPower' Targets", August 8, 2014, available at <http://www.multichannel.com/news/technology/att-adds-overland-park-gigapower-targets/382993#sthash.dqo3m6o9.dpuf>, site visited September 19, 2014.

⁶⁷Thomas Gryta, "AT&T to Build Out Ultrafast Internet in North Carolina," Wall Street Journal, April 10, 2014, available at <http://online.wsj.com/news/articles/SB10001424052702303873604579492103338327532>, site visited September 15, 2014.

⁶⁸Ryan Knutson, "Verizon Eyes Digital Video Service by Mid-2015," Wall Street Journal, September 11, 2014, available at <http://online.wsj.com/articles/verizon-ceo-eyes-digital-video-service-by-mid-2015-1410467151>, site visited September 11, 2014.

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compares its top download speeds to those of TWC.⁶⁹ And CenturyLink has launched gigabit service to both residential and business customers in ten cities, where it competes with Cox, Mediacom, Bright House, and Comcast, and to just business customers in six additional cities.⁷⁰

(c)

DSL

75. For many customers, DSL remains a highly relevant competitor to cable broadband today, one that is likely to continue to remain relevant in the future given advances in DSL technology. As noted in the Israel Declaration, advanced DSL technologies like VDSL, which are based on “fiber-to-the-node” (“FTTN”) architecture, offer speeds up to 100 Mbps while non-FTTN DSL technology can deliver speeds up to 45 Mbps, which certainly qualifies as broadband service and is more than sufficient to meet the requirements of many broadband customers.⁷¹ Furthermore, the competitive pressure imposed by DSL is likely to increase over time as telcos continue to make investments in upgrading their DSL footprints.⁷² As discussed in detail below, ordinary course business documents as well as customer surveys indicate substantial switching

69 Alan Breznick, “Cincinnati Bell Preps for 1-Gig,” Light Reading, August 20, 2014, available at <http://www.lightreading.com/broadband/fttx/cincinnati-bell-preps-for-1-gig-/d-id/710411>, site visited August 21, 2014.

70 Jeff Baumgartner, “CenturyLink Pushes 1-Gig Expansion,” Multichannel News, August 5, 2014, available at <http://www.multichannel.com/news/technology/centurylink-pushes-1-gig-expansion/382971>, site visited August 7, 2014.

71 Israel Declaration, ¶ 55.

72 Id., ¶¶ 57-59.

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from Comcast to DSL, thus confirming that DSL would impose a competitive constraint on Comcast if it were to consider degrading its broadband service.

(1) DSL is a viable alternative

76. DSL easily meets the 10 Mbps threshold in many areas. As is evident in Figure 1, nearly 65 percent of the population has access to a DSL provider offering speeds of 10 Mbps or more, and over 18 percent of the population has access to a DSL provider offering speeds of 25 Mbps or more.

Figure 1: Distribution of Population in Comcast Footprint by DSL Speed

77. In his report, Dr. Evans points to the fact that {{ }} occurs on mobile devices today as evidence that wireless service is not an important substitute for wireline options, {{ }}. I discuss the limitations of this analysis below (including the fact that it is a backward-

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looking analysis at a time when extremely rapid changes in mobile video require a forward-looking perspective). Here, I note that Dr. Evans fails to provide a similar statistic for the current share of Netflix viewing that occurs on DSL connections, a telling omission. Although I do not have the required Netflix data to compute the percentage of Netflix viewing on DSL, it is noteworthy that of the 60 broadband providers included on Netflix's "USA ISP Speed Index," approximately 20 provide DSL service.⁷³ Perhaps even more telling, in Netflix's most recent Speed Test (July 2014), the average speed of many of the DSL providers was greater than the average speed offered by some cable providers, including TWC. For example, the average Netflix speeds for Shentel, Lumos, Cincinnati Bell, and Sonic—all DSL providers—were higher than the average speeds for TWC, Brighthouse, and Mediacom.

78. Commenters have also claimed that differences in prices between cable broadband products and DSL suggest that they are in different product markets.⁷⁴ However, antitrust economists have long recognized that what matters for product market definition is the degree of substitutability between the products, not differences in their prices.⁷⁵ Differences in prices do not necessarily mean that products are not substitutes or are not

73 Netflix USA ISP Speed Index, available at <http://ispspeedindex.netflix.com/usa>, site visited September 5, 2014.

74 Sappington Declaration, ¶¶ 18-19.

75 See, for example, Gregory J. Werden and Luke M. Froeb (1993), "Correlation, Causality, and All that Jazz: The Inherent Shortcomings of Price Tests for Antitrust Market Delineation," *Review of Industrial Organization*, 9: 329-353.

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in the same market. To the contrary, in cases like the present one where one product (DSL) may be of relatively lower quality than some other products, the price differences often serve to make up for the quality gap, making quality-adjusted prices more similar and thus generating more substitution among the products.⁷⁶ Hence, the pricing of DSL provides a mechanism for telco providers to make DSL more attractive to customers, further enhancing DSL's role as an important part of telco providers' overall broadband strategy and an important competitive constraint on cable ISPs.

79. Commenters, including Dr. Evans, claim that the lack of DSL growth indicates that DSL is not an important competitive threat.⁷⁷ In particular, Dr. Evans argues that the loss of DSL customers between 2011 and 2013 for AT&T (non-U-verse), Verizon (non-FiOS), and other telco providers suggests that DSL is no longer a viable competitor for cable broadband. Although I agree that growth rates can be one indicator of competitive strength, this indicator, when correctly measured, actually points to the overall strength of telco, as shown above. As an example of the misleading nature of Dr. Evans' narrow

⁷⁶See, e.g., Motta (2004) who states that "using price differences as a criterion to define the relevant market is unsound...It might well be, for instance, that the price of product A is twice as much as the price for product B, but that it would be unprofitable to raise the price of A even by a small amount since most of those buying it would switch to B. Markets that exhibit quality differentials are likely to be a case in point. Organic bananas might command a large price premium over bananas grown in plantations that use pesticides...However, a further increase in price of organic bananas (say, because of a merger) is not profitable if there is a sizeable proportion of consumers less keen on organic food who will then switch to non-organic bananas." (Massimo Motta (2004), Competition Policy: Theory and Practice, Cambridge University Press, 109-110.)

⁷⁷ Evans Declaration, ¶¶ 59-61; Sappington Declaration, ¶ 18 and note 25.

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focus on DSL, he failed even to account for DSL customers who have been upgraded by their telco providers to higher speed technologies. Such customer transitions actually represent overall telco strength, but Dr. Evans ignores that point with his narrow focus on non-U-verse and non-FiOS customers.⁷⁸

80. Even if one chooses to focus on DSL growth by itself (rather than overall telco growth), Dr. Evans' results are incorrect. For example, he excludes U-verse even though U-verse is acknowledged to be an advanced form of DSL.⁷⁹ Table 3 shows overall DSL growth rates including all DSL options. As seen in the table, using the current 3 Mbps definition of broadband, the growth rate in DSL subscribership exceeded the growth rate in cable subscribership between June 2009 and June 2013. During this time, the average annual subscribership growth rate was 30.7 percent for DSL relative to 17.9 percent for cable. The difference in annual growth rates is even more pronounced under the 10 Mbps downstream definition of broadband: 150.6 percent for DSL, relative to 52.8 percent for cable. In sum, these differences in growth rates suggest that DSL remains a significant competitive threat to cable broadband.

⁷⁸For example, U-verse subscribership increased from 5.2 million in 2011 to 7.7 million in 2012 and to 10.4 million in 2013, implying growth rates of 47.7 percent and 34.4 percent, respectively.

⁷⁹The FCC Internet Access Reports, for example, consider U-verse a DSL technology and include U-verse's customer figures in the counts of DSL customers.

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(2) Empirical evidence indicates substantial substitution from cable to DSL

81. Analysis in the ordinary course of business by Comcast also indicates substantial switching to DSL, meaning that, based on its own analyses, Comcast cannot ignore DSL as a competitive threat. In particular, Comcast conducts quarterly studies on customers who voluntarily disconnect or downgrade their broadband, video, or voice services.⁸⁰ Error! Reference source not found. below presents results for customers who disconnected their broadband service in early 2011, 2012, 2013, and 2014. The results indicate that a sizeable fraction of disconnects were accounted for by switches to DSL. For example, most recently in Q1 2014, [[]] percent of the disconnects switched to a DSL provider, and in prior years no less than [[]] percent of the disconnects switched to a DSL provider. Thus, DSL remains an important destination for broadband customers leaving Comcast, which is also confirmed by the customer survey evidence discussed in Section III.C.4, below.

⁸⁰These studies are based on phone surveys of approximately 2000 households who disconnected services in the prior month.

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[[]]

(d)

Wireless

82. Some commenters also assert that wireless Internet access is not a good alternative for wired Internet access.⁸¹ In support of this view, Table 1 in Dr. Evans' declaration indicates that in May 2014, only {{ }} percent of Netflix viewing hours were accounted for by mobile wireless. However, Dr. Evans' argument represents a backward-looking view of mobile wireless video usage in a world where conditions are changing so rapidly that only a forward-looking view will suffice. Indeed, industry analysts recognize that mobile is the number one growth area for Netflix itself: "[M]ost Netflix content is still watched on TV screens, but . . . mobile is seeing the biggest growth, in part because of the way phones have been changing."⁸² Similarly, Netflix's OVD rival Hulu recently called wireless a "really critical" part of its business and also noted that in just three years, "content on Hulu has jumped from zero percent to 20% viewership using mobile

81 See, e.g., Farrell Declaration, ¶¶ 28, 49; Sappington Declaration, ¶¶ 14-15; Evans Declaration, ¶¶ 45, 47.

ers, "Netflix May Add Short-form Content to Increase Mobile Usage," GIGAOM, September 5, 2014, available at http://www.gigaom.com/2014/09/05/netflix-short-clips/?utm_medium=social&utm_campaign=socialflow&utm_source=twitter&utm_content=netflix-sho September 11, 2014.

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devices.”⁸³ As another example, Verizon is poised to launch a new mobile-focused OTT business in 2015:⁸⁴

Verizon is envisioning a service that would be akin to Netflix . . . but also would likely stream some live channels . . . it would deliver content from major broadcasters and live sporting events to smartphones via a technology called multicasting, which avoids congesting the network because it essentially allows the carrier to broadcast content over a single stream of airwaves that consumers can tune in to.

Other industry representatives also recognize the growing importance of video over wireless. For example, Ericsson notes: “[v]ideo is the largest and fastest growing

⁸³Deborah Yao, “Wireless Operators Getting Serious about Mobile Video,” SNL, September 10, 2014, available at <http://www.snl.com/InteractiveX/article.aspx?CDID=A-29163017-14378&KPLT=4>, site visited September 11, 2014.

⁸⁴Ryan Knutson, “Verizon Eyes Digital Video Service by Mid-2015,” The Wall Street Journal, September 11, 2014, <http://online.wsj.com/articles/verizon-ceo-eyes-digital-video-service-by-mid-2015-1410467151>, site visited September 11, 2014. For background, see, e.g., “September 11, 2014 Responses of Comcast Corporation to the Commission’s Information and Data Request,” RFI 13.A.2.f., 35 (“For example, in February 2012, Verizon formed a joint venture with the parent company of Redbox to provide over-the-top services. 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.”). See also, Verizon Communications at Goldman Sachs Communacopia Conference, edited transcript, September 11, 2014, p. 5 (“So if you look at an over-the-top, I [Lowell McAdam, Chairman and CEO of Verizon] think you could end up with a bundle that will have the major broadcast content providers and we would use our network around multicast to handle that very efficiently. And then you’d have a lot of these sort of custom channels that people can do the video demand, the IPTV much more interactive that you could have on these individual channels . . . So that whole ecosystem . . . is coming together; it has been primed for a while. But as I say, over the last six months to a year, that dialogue is changing dramatically.”).

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segment of mobile data traffic. It is expected to grow around 13 times by 2019, by which time it is forecasted to account for over 50 percent of all global mobile data traffic.”⁸⁵

83. I present more information on the growth of wireless usage below. Before doing so, I note that, in terms of speed, wireless users can already obtain broadband-level performance today. For example, according to NTIA data, the percentage of U.S. population with access to a mobile wireless provider offering broadband speed of at least 10 Mbps downstream increased from 7.9 percent in December 2010 to 97.5 percent in June 2013.⁸⁶ Given the widespread availability of wireless networks with broadband-level speed, the main obstacles to increased wireless usage relate to costs and capacity constraints, but these obstacles are diminishing rapidly, as discussed below.

⁸⁵“Ericsson Mobility Report: On the Pulse of the Networked Society,” Ericsson, June 2014, available at <http://www.ericsson.com/res/docs/2014/ericsson-mobility-report-june-2014.pdf>, site visited September 4, 2014. See also “Global Video Index: Q1 2014,” Ooyala, available at <http://go.ooyala.com/rs/OOYALA/images/Ooyala-Global-Video-Index-Q1-2014.pdf>, site visited September 4, 2014.

⁸⁶Israel Declaration, ¶ 62. National Broadband Map data indicates that 97.5 percent of the U.S. population has access to wireless broadband at speeds greater than 10 Mbps downstream. (“Broadband Statistics Report: Access to Broadband Technology by Speed,” July 2014, available at <http://www.broadbandmap.gov/download/Broadband%20Availability%20in%20Rural%20vs%20Urban%20Areas.pdf>, site visited September 12, 2014.)

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(1) Wireless is growing rapidly in its viability as a broadband alternative

84. As noted in the Israel Declaration, estimates of the degree of substitution from wireline broadband to wireless broadband have been increasing over time.⁸⁷ Consistent with these estimates, a recent report on Internet trends notes that mobile usage as a percentage of web usage (defined as the percentage of page views coming from mobile devices) increased from 11 percent in May 2013 to 19 percent in May 2014 in North America.⁸⁸

85. Furthermore, industry research indicates that gains in wireless capacity and reductions in cost will make wireless broadband an increasingly relevant alternative over time.⁸⁹ As detailed (with reference to industry sources) in the Israel Declaration, additional spectrum will be released via the upcoming spectrum auctions (e.g., AWS-3 auction and 600 MHz incentive auction), and average spectral efficiency is expected to improve with further LTE deployment and advances in LTE technology. The spectrum auctions and greater LTE deployment and innovation will increase the capacity of

87 Israel Declaration, ¶ 65.

88 Mary Meeker, "Internet Trends 2014 – Code Conference," KPCB, May 28, 2014, available at http://s3.amazonaws.com/kpcbweb/files/85/Internet_Trends_2014_vFINAL_-_05_28_14-_PDF.pdf?1401286773, site visited September 12, 2014, Slide 9.

89 See, e.g., the [[]] studies discussed in Israel Declaration, ¶¶ 64-65.

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wireless networks, which will put downward pressure on cost and price per gigabyte.⁹⁰ Continuing recent trends of declining prices to consumers, wireless providers' costs are expected to fall roughly [[]] percent over the next several years which should reduce consumer prices substantially.⁹¹ The increasing threat of wireless broadband is also noted in a recent [[]]⁹²

86. New wireless technologies are further increasing their competitive relevance, particularly for video applications. For example, LTE multicast, based upon evolved Multimedia Broadcast Multicast Service (eMBMS), allows identical content to be sent to many customers at the same time, thus enhancing network efficiency and increasing effective network capacity.⁹³ As noted in a recent press report, "Verizon Communications CFO Fran Shammo called the advent of Multicast 'the pivotal point that starts to change the way content is delivered over a mobile handset which opens up content into the wireless world.'"⁹⁴ AT&T announced in August of this year that it plans to launch LTE multicast some time in 2015, and Verizon Wireless plans to begin seeding its devices with

90 Israel Declaration, ¶ 67.

91 Id., ¶ 67. See also [[]].

92 [[]].

93 For background information concerning LTE multicast, see, e.g., Jeff Baumgartner, "Verizon CFO: LTE Multicast 'Pivotal' To Mobile Video," August 12, 2014, available at <http://www.multichannel.com/news/technology/verizon-cfo-lte-multicast-pivotal-mobile-video/383137>, site visited September 11, 2014.

94 Phil Goldstein, "AT&T to Launch LTE Multicast in 2015," FierceWireless, August 13, 2014, available at <http://www.fiercewireless.com/story/att-launch-lte-multicast-2015/2014-08-13>, site visited August 15, 2014.

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technology that can support multicast in the fourth quarter of this year, with plans to launch the service in 2015 as well.⁹⁵

87. Advances in fixed wireless technology provide additional support for expected improvements in wireless capacity and the corresponding downward pressure on wireless network costs and prices. As discussed in the Israel Declaration, fixed wireless is a special type of wireless service that uses radio spectrum (generally licensed to wireless telecommunications providers) to communicate between two fixed points.⁹⁶ AT&T recently announced plans to bundle DirecTV with 15 Mbps fixed wireless broadband service by dedicating spectrum to a fixed wireless broadband complement to satellite TV service.⁹⁷ In an AT&T SEC filing in June of this year, AT&T discussed fixed wireless as an anticipated benefit of its planned merger with DirecTV:⁹⁸

⁹⁵ Ibid. See also, Jim Barthold, "Report: Verizon will Deliver Cable TV over 4G LTE," FierceCable, August 13, 2014, available at <http://www.fiercecable.com/story/report-verizon-will-deliver-cable-tv-over-4g-lte/2014-08-13>, site visited August 15, 2014.

⁹⁶ Israel Declaration, ¶ 63.

Daniel Frankel, "AT&T plans to bundle DirecTV video with satellite-delivered wireless broadband for rural customers," FierceCable, September 12, 2014, available at http://www.fiercecable.com/story/att-plans-bundle-directv-video-satellite-delivered-wireless-broadband-rural/2014-09-12?utm_medium=nl&utm_source=twitter, September 15, 2014 ("Pending approval of its \$49 billion takeover of DirecTV (NASDAQ: DTV), AT&T will bundle the satellite operation with a wireless-broadband product capable of delivering download speeds of 15 Mbps and above, then deliver the package via a single dish starting in 2015.")

⁹⁸ AT&T Inc., Current Report (Form 8-K), Item 8.01 Other Events, June 3, 2014.

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With the cost synergies and increased revenue from this transaction, AT&T will expand its high speed broadband build to offer a competitive bundle of high speed fixed wireless broadband and satellite video service.

Similarly, Dish Network indicated in August of this year that it will begin a trial of a fixed broadband service with Sprint. According to Dish's CEO, "[o]ne of the great things I love about Sprint is their spectrum is tailor-made, I believe, for many homes to be a substitute for a fixed line to the house for broadband. And we're experimenting both with nTelos and Sprint."⁹⁹

(2) Empirical evidence indicates extensive usage of wireless options for high-bandwidth activities

88. A recent survey commissioned by Comcast documents extensive usage of wireless broadband today, including for "high-bandwidth" activities such as video. In particular, Comcast recently commissioned a survey by Global Strategy Group (GSG) which, among other things, measured current usage of wired and wireless broadband services. Among those with access to wireless broadband, approximately 42 percent of survey respondents indicated that they use wireless broadband at least as much as wired broadband for high-bandwidth activities, and 60 percent or more use wireless broadband at least as much as

⁹⁹ "Dish Network's (DISH) CEO Joseph Clayton on Q2 2014 Results - Earnings Call Transcript," Seeking Alpha, August 6, 2014, available at <http://seekingalpha.com/article/2391475-dish-networks-dish-ceo-joseph-clayton-on-q2-2014-results-earnings-call-transcript?part=single>, site visited August 7, 2014. I note that there are various fixed wireless options available today, and these offerings may get better in the near future. For example, a recent [] (See []).

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wired broadband for low-bandwidth activities.¹⁰⁰ This degree of wireless usage indicates that wireless is a relevant alternative to wireline today for at least some customers, with the degree of substitutability increasing rapidly.

4. Customers would respond to decreased Comcast broadband quality by utilizing these various options, disciplining any attempt to degrade edge provider access

89. Ultimately, the relevant question regarding the availability of competitive broadband providers is whether consumers would switch to such providers in significant numbers in response to any Comcast attempt to degrade access to edge providers or otherwise harm broadband service. If so, this would subject Comcast to the large loss of customer value described above and thus discipline the attempt. Any broadband provider to which a sufficient number of consumers would switch in response to a strategy to harm edge providers is a relevant competitive constraint on Comcast's ability to undertake such a strategy, even if its speed is slower than Comcast's.

¹⁰⁰See Appendix I for a more detailed summary of the survey results. Note that the survey requires that a respondent has previously confirmed having access to wireless broadband, so these results are based on a subset of all respondents (683 of 1,012 or 67 percent of all survey respondents). I understand that the survey is careful to avoid confusion between mobile broadband, the subject of the question, and Wi-Fi. In particular, the text of the wireless usage question in the survey includes the following language: "'Wireless or mobile broadband service' allows you to connect to the internet with a mobile device (this does not include devices that only connect to Wi-Fi). Examples of wireless or mobile broadband service include an AT&T data plan for your smartphone, iPad, or tablet; or a Verizon data plan for your Jetpack mobile-hotspot device."

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90. The survey by Global Strategy Group (GSG), discussed above, assesses consumers' willingness to switch broadband providers if access to edge providers were limited—including their willingness to switch to particular types of broadband providers (e.g., DSL or wireless) or, more generally, broadband providers providing slower service. The survey finds that the vast majority of broadband users are likely to switch to another ISP, even an ISP offering slower speeds, if their current ISP were to take any of the following actions: “prevent access to favorite websites”; “slow down Internet speeds for your favorite websites”; or “slow down Internet speeds for Netflix.” Specifically, the percentage of survey respondents likely to switch to an ISP offering slower speeds if any of the three actions described above were taken ranges from 71-80 percent for all users; 72-79 percent for heavy Internet users, and 75-81 percent for frequent streaming video users (see Figure 2).¹⁰¹

¹⁰¹ Note that “likely to switch to another ISP” includes “very” and “somewhat” likely to switch responses, and frequent streaming video users are respondents who stream video at least once per month.

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Figure 2: Percentage of Survey Respondents Likely to Switch to an ISP Offering Slower Speeds if Their ISP Takes Selected Actions

91. The results of the survey are striking: If a customer's broadband provider were to limit access to edge providers, the vast majority of customers would switch to an alternative broadband provider, even one that offers slower speed.¹⁰² Put differently, access to edge providers (which is possible on lower speeds, as discussed above) appears to trump speed as a driver of consumer choice for most consumers. Hence, the

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See Appendix I for a more detailed summary of the survey results.

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availability of alternative broadband providers, even those providing slower speeds, places an important competitive constraint on the behavior of Comcast or other broadband providers toward edge providers.

92. The percentage of survey respondents likely to switch to another ISP like DSL or Wireless Broadband if any of the three actions listed above ranges from 77-86 percent for all users; 79-85 percent for heavy Internet users, and 81-87 percent for frequent streaming video users. Hence, empirical evidence indicates that DSL and wireless are relevant competitive constraints.

93. Some commenters have also argued that once a consumer chooses a broadband provider, she generally does not change the provider because of switching costs (Chairman Wheeler also referenced switching costs in recent remarks).¹⁰³ However, the empirical evidence on customer switching does not bear out this concern. For instance, the GSG survey found that consumers switch broadband providers frequently. As Table 9 in the Appendix shows, 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.¹⁰⁴

94. Furthermore, Comcast's data shows that the monthly churn rate for broadband customers has been in the [[]] percent range for several years.¹⁰⁵ This implies that over the course of a single year, approximately {{ }} of Comcast's broadband customers churn, which is in line with the results of the GSG survey.¹⁰⁶

103 Evans Declaration, § II.E; Sappington Declaration, ¶ 38 and note 48; Wheeler Remarks, 4.

104 The percentages in Table 9 include survey respondents who departed following a move. To the extent that customers switch ISPs when they move, this means that moves break whatever switching costs exist and give ISPs a chance to compete for moving customers. Nonetheless, even if I exclude all respondents that moved, I still obtain evidence indicating substantial switching. In particular, results without movers indicate that approximately one-quarter of survey respondents switched providers in at least the past two years, and more than 40 percent switched providers within the past four years.

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D. Constraints imposed by potential entry or expansion by powerful new broadband providers with vested interest in competitive broadband markets

95. In evaluating the competitive threats that shape Comcast's strategy, one cannot disregard the important role played by potential entry or expansion by new broadband alternatives. The leading example of such a new entrant is Google Fiber.¹⁰⁷ The Israel

¹⁰⁵ See Comcast data produced in FCC Information and Data Request – Exhibit.4.2(e), Exhibit.4.6(a), Exhibit.4.9(a).

¹⁰⁶ The churn data from Comcast also includes movers, which, as explained above, is not problematic because moves appear to break any switching costs and give other ISPs an opportunity to compete for customers. Nevertheless, the churn remains high even if I remove the component associated with movers. In particular, Comcast data indicates that approximately of aggregate broadband churn is due to customers moving. Hence, I remove movers from the churn data as follows: Assuming that the aggregate monthly churn rate is percent (midpoint of percent), monthly churn excluding movers is percent (i.e.), and therefore the implied churn excluding movers is approximately percent annually.

¹⁰⁷ For further discussion of current and expected entry and expansion plans, see, e.g., "Telcos Extend Lead in 1 Gbps Race," SNL Kagan, September 2, 2014 ("A look at the landscape for the fastest residential HSD offerings from top U.S. providers shows AT&T Inc.'s GigaPower in the lead, Google Inc.'s Google Fiber primed for expansion, and cable slow to enter. Based on a compilation of company announcements, the top telcos combined have targeted almost 40 major metropolitan areas for 1 Gbps services and have deployed the offering in 14 of those areas as of August."). See also, Bryan Nichols, "3 Reasons Why Investors Should Avoid Comcast Corporation," The Motley Fool, September 8, 2014, available at <http://www.fool.com/investing/general/2014/09/08/3-reasons-why-investors-should-avoid-comcast-corporo.aspx>, site visited September 8, 2014. ("In the past, Comcast had one maybe two competitors, often Time Warner Cable included, but now both Google and AT&T are rapidly building faster networks to compete. So, Comcast could lose customers; to avoid that fate, it'll have to lower prices, affecting revenue or margins either way.")

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Declaration discussed the launch of Google Fiber, which offers broadband speeds of up to 1 Gbps in both directions.¹⁰⁸ Evidence since that declaration has confirmed Google Fiber's success. In Kansas City, one of the first cities with Google Fiber, survey results indicate Google Fiber's penetration rate has exceeded 50 percent of homes passed, with substantially higher rates in higher income neighborhoods.¹⁰⁹ Furthermore, customer satisfaction with Google Fiber has been extremely high; the median score for "likelihood to recommend Google Fiber" is 10 out of 10 (10 = always recommend it) according to a survey.¹¹⁰ Given this success, a recent Bernstein research report concludes: "there are material chances that Google could build a network passing 20 or 30 million US homes and small businesses in the US profitably."¹¹¹

108 Israel Declaration, ¶ 51.

109 "Google Fiber: How Well Is It Doing in Kansas City," Bernstein Research, May 6, 2014.

110 Ibid.

111 "Google Fiber: Scale Matters – How Large Could It Be? How Fast Could It Grow? Introducing Bernstein's BIGR Model," Bernstein Research, May 7, 2014.

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96. Municipal overbuilds are also potential broadband entrants, and they are supported by the FCC and others. For example, a recent article in Law360 noted:¹¹²

Netflix Inc. is throwing its weight behind the effort to get the Federal Communications Commission to override state laws barring or restricting local municipalities from building their own broadband networks . . . FCC Chairman Tom Wheeler, who has repeatedly said that such laws conflict with his agency's statutory mandate to increase consumer access to broadband, has warned that he might use his authority to preempt them.

97. In addition, in a recent speech Chairman Wheeler could not have been much clearer: “Where greater competition can exist, we will encourage it... where meaningful competition is not available, the Commission will work to create it.”¹¹³ One would expect that Comcast heard this message and thus would consider the possibility of Commission action before taking any post-transaction actions to harm broadband competition or edge providers.

98. To be clear, I am not claiming that Google Fiber, municipal broadband offerings, or other such providers are alternatives for a large percentage of Comcast broadband customers today. Although these competitors are relevant in certain markets, their current footprint remains limited. Instead, the threat to Comcast comes from the long-term strategies of these potential entrants or expanders. These entrants are entities with a

¹¹²Bill Donahue, “Netflix Jumps Into Fight Over City-Run Broadband,” Law360, September 3, 2014. See also, e.g., Masha Zager, “Number of Community FTTP Networks Reaches 143,” Community Broadband, August/September 2014, available at <http://bbcmag.epubxp.com/i/374665>, site visited September 9, 2014, 10-14.

¹¹³ Wheeler Remarks, 6.

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vested interest in ensuring that broadband remains competitive and that broadband offerings continue to improve—Google to support its various businesses, as perhaps the most prominent edge provider, and municipalities to support local economic growth and attract businesses to the community.¹¹⁴ As such, if Comcast fails to continue to upgrade its broadband service or degrades the quality of its service by harming edge providers, it would face a heightened risk that these providers would enter or expand to thwart such efforts. Moreover, to the extent that any actions by Comcast were to degrade its broadband service, the evidence presented above indicates that this would cause many customers to wish to switch providers. If those customers do not have good competitive alternatives—as some commenters allege—this would create a source of potential profits

¹¹⁴ See, e.g., Jon Brodtkin, “AT&T: Cities Should Never Offer Internet Service Where ISPs Already Do or Might Later,” *Ars Technica*, September 2, 2014, available at <http://arstechnica.com/business/2014/09/att-cities-shouldnt-offer-broadband-where-private-isps-already-do-or-might-later/>, site visited September 11, 2014 (“Community broadband isn’t widespread, but local governments have sometimes built their own networks when service offered by private ISPs was too slow, expensive, or both.”); Heather Bellini, Jason Armstrong, Drew Borst, Brian Baytosh, and Dan Pelligrini, “Google Fiber – Build or Bluff,” *Goldman Sachs*, June 28, 2013, 1 (“Fiber’s vastly greater speeds have the potential to drive more processing to the cloud and accelerate HTML5 adoption These last two moves could serve to cement Google’s dominance as a provider of enhanced web-services on both mobile devices and PCs Google is ultimately indifferent to whether it or incumbent broadband providers deliver fiber-optic internet speeds since either case supports the company’s vision of an open, services-based web.”); Jon Brodtkin, “Fed up with Slow and Pricey Internet, Cities Start Demanding Gigabit Fiber,” *Ars Technica*, November 22, 2013, <http://arstechnica.com/business/2013/11/fed-up-with-slow-and-pricey-internet-cities-start-demanding-gigabit-fiber/>, site visited March 13, 2014 (“Louisville government officials believe, as many other municipal officials in US cities do, that fiber networks are crucial for attracting and retaining businesses, which increasingly need copious amounts of bandwidth to remain competitive.”).

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for new entrants, increasing the likelihood that broadband investments would be profitable. The success of existing Google and municipal efforts, even if in only a few markets to date, means these are not threats Comcast can simply ignore.¹¹⁵

99. Notably, Dr. Evans supports the view that Comcast will consider medium-/long-term entry threats in assessing its strategy today. In particular, he argues that Comcast may attempt to harm OVDs today in order to deter long-term broadband entry.¹¹⁶ Dr. Evans and I agree that long-term entry decisions by potential broadband providers influence Comcast's decisions today, but we reach opposite conclusions on the implications. To understand why my version is correct, one simply needs to recognize that Google and/or municipalities would step in to prevent Comcast from impeding broadband competition and OVD development and that firms like Google would take advantage of the ability to steal dissatisfied Comcast customers to enter and expand profitably, a possibility supported by industry observers. To believe Dr. Evans' version, one would have to believe that (i) Comcast has the ability to thwart the development of the OVD industry and (ii) seeing Comcast doing so, Google, municipalities, and others would reduce their efforts to enter and expand and choose simply to let this occur. As

¹¹⁵Comcast has recognized this threat in its internal documents (see, e.g., [[]]). Comcast's reaction to the threat has also been documented by third parties (see, e.g., Karl Bode, "Comcast Fights Google Fiber in Provo with New Pricing," DSLReports.com, August 15, 2013, available at <https://secure.dslreports.com/shownews/Comcast-Fights-Google-Fiber-in-Provo-With-New-Pricing-125390>, site visited September 11, 2014).

¹¹⁶ See, e.g., Evans Declaration, ¶¶ 178-179.

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already discussed, point (ii) is implausible. Point (i) may be even more implausible. Comcast would need to prevent the development of successful OVDs by powerful firms like Google, Apple, Amazon, Netflix, Sony, and others.¹¹⁷ And it would have to do so despite having recently agreed to a long-term interconnection contract with Netflix (thus protecting Netflix from foreclosure), and despite the fact that firms like Google, Apple, Amazon, and Sony all view OVD offerings as a way to support other parts of their core businesses. I discuss Comcast's lacks of incentive and ability to foreclose OVDs in more detail in the next section.

Netflix and Amazon are, of course, already highly successful OVDs (see, e.g., Richard Greenfield, "HBO's Amazon Agreement Illustrates Netflix Is a Competitive Media Brand, Amazon Is Not ... for Now," BTIG Research, April 24, 2014, available at <http://www.btigresearch.com/2014/04/24/hbos-amazon-agreement-illustrates-netflix-is-a-competitive-media-brand-amazon-is-not-for-now/>, site visited September 1, 2014 ("HBO fears Netflix's growing industry power. We suspect HBO wanted to balance Netflix's growing market industry hegemony by helping to bolster their largest direct-to-consumer, SVOD competitor – Amazon."). Sony's ongoing efforts to develop and launch an OVD service are well documented in the public domain (see, e.g., note 127 of this declaration, which indicates that Viacom will be providing "22 channels to Sony's upcoming virtual pay-TV service."). Regarding Apple's OVD plans, it was recently reported that "[f]or several months now, rumors have continually suggested Apple is working on a new television product, which may be an updated Apple TV top box with capabilities like support for games and apps and expanded access to television content." (See Juli Clover, "New Apple TV Likely Delayed Until 2015 Due to Negotiation Difficulties," July 30, 2014, available at <http://www.macrumors.com/2014/07/30/apple-tv-launch-delayed/>, site visited September 11, 2014).

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IV. COMMENTERS' FORECLOSURE-BASED THEORIES OF HARM ARE WITHOUT MERIT

100. Some commenters allege that post-transaction, Comcast would intentionally degrade (or deny) OVD access to the combined firm's broadband network (or other assets)¹¹⁸ in order to weaken OVD competition. For example, Dr. Sappington states that Comcast has an "arsenal of weapons" to "reduce the quality of competing OVD services, as perceived by Comcast's broadband customers."¹¹⁹ Dr. Evans concludes that "Comcast has the ability and incentive to degrade significantly the quality of service that its subscribers obtain from an OVD" and that Comcast's incentives to foreclose OVDs are heightened because, among other reasons, "its subscribers are likely to increase their viewing of Comcast video content if they cannot view content from OVDs."¹²⁰

101. In the economic literature, such a theory is known as "foreclosure." In basic terms, the theory is that a firm may be able to leverage market power in one market (the "primary market") to foreclose competition in a second "adjacent market."¹²¹ In some

¹¹⁸I note that, as a general matter, foreclosure could take the form of reducing OVD access to broadband customers or limiting OVD access to NBCUniversal content. Comments mainly focus on the former, but much of the logic described below applies to both and the conclusion is the same: The combined firm would lack both the ability and incentive to foreclose OVDs.

¹¹⁹ Sappington Declaration, ¶ 30.

¹²⁰ Evans Declaration, ¶¶ 91, 117 [emphasis added]. See also, e.g., Farrell Declaration, ¶¶ 78-86.

¹²¹Patrick Rey and Jean Tirole (2007), "A Primer on Foreclosure," in Handbook of Industrial Organization, Volume 3, Mark Armstrong and Robert Porter, eds., Amsterdam: Elsevier (hereinafter, Rey and Tirole (2007)).

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cases, the foreclosure takes the form of “tying,” in which sale of a firm’s product in the adjacent market is “tied together” with sale of a product in the primary market, in order to drive competitors out of the adjacent market. The theories advanced in this case are quite similar to tying—if Comcast can prevent OVDs from using its broadband network then Comcast customers would have to use Comcast’s various video services (e.g., its traditional linear video services, perhaps combined with non-linear options such as VOD), effectively tying those services to Comcast’s broadband and thus, if the effort were successful, leveraging Comcast’s position in broadband to drive out OVD competition.

102. For a theory of vertical foreclosure to make sense, the firm engaging in the foreclosure strategy (“the foreclosing firm”) must have both the ability and the incentive to foreclose the “target.”¹²² The ability to foreclose generally requires that the foreclosing firm has sufficient scale and market power to drive the target out of business (or prevent it from entering in the first place).¹²³ The incentive to foreclose requires that the strategy will sufficiently benefit the foreclosing firm in the adjacent market to make up for the loss incurred in the primary market. For example, under commenters’ foreclosure theory that

122 Note that Dr. Evans himself uses this “ability and incentive” formulation in the quotation above.

123 In theory, one could also consider strategies to weaken the competition without driving them out of the market, but if competitors are not driven from the market but rather just weakened, this may simply cause them to become intense price competitors, generally not a good outcome for the firm engaging in foreclosure. See, e.g., Rey and Tirole (2007), 2185. In the present case, this could be a particularly bad outcome for Comcast, as weaker OVDs may also reduce their purchases of NBCUniversal content.

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the combined firm would restrict OVD access to its customers, one would need to show both that this could significantly weaken OVD competition (ability) and that Comcast's gain from so doing would offset the (likely significant, based on the analysis in Section III.C) reduction in broadband profits (incentive).

103. Although economic theory is clear that a coherent foreclosure theory requires that the combined firm have both the ability and the incentive to foreclose OVDs, I show in this section that the combined firm would actually have neither. In particular, available evidence indicates that the transaction would not provide the combined firm with the ability to harm OVD competition to any significant degree, and an analysis of both Comcast's behavior (and thus revealed preferences) and the complementary relationship between the OVD and broadband businesses demonstrates that it does not have the incentive to engage in foreclosure.

A. The combined firm would lack the ability to foreclose OVDs

104. For several reasons, the combined firm would lack the ability to foreclose OVDs. Many of these reasons make use of the evidence presented in Section III on the constraints that edge providers, customers, and emerging broadband alternatives place on Comcast; others are unique to theories of vertical foreclosure.

105. First and most basically, as explained above, Comcast lacks the ability to deny OVDs access to its network without enormous disruption to its Internet service. Comcast's commitment to the Open Internet rules (vis-à-vis the last mile) and the competitiveness of the Internet backbone means that any efforts to degrade edge provider access would have to occur at interconnection points between the two. But, as explained in Section III.B, OVDs (and edge providers generally) can rely on one or more transit

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providers or CDNs, which pool their traffic with the content from many other edge providers, to deliver their content to Comcast or other ISPs. Hence, to deny (or significantly impair) access to a particular OVD, Comcast would have to deny (or significantly impair) access to all (or at least most) major CDNs and transit links, else the OVD could rely on those alternatives to reach the Comcast network. Denying or significantly impairing access to multiple routes would be a hugely costly step for Comcast, greatly limiting its customers' access to much of the Internet's content. Notably, Netflix's recent disputes with Comcast occurred only after Netflix chose to stop using third-party CDNs and to limit its massive traffic to six transit providers.¹²⁴ And, even in this case, Netflix and Comcast eventually agreed to terms for direct interconnection, with Netflix now protected from foreclosure for the next { { }}¹²⁵

106. Second and more generally, the idea that Comcast could foreclose the set of OVDs that already (or will soon) exist is beyond credibility. At this point, the leading OVDs are far from small start-ups that might be driven out of the market; many are extremely large, well-established firms, several with market capitalization that exceeds

¹²⁴Declaration of Ken Florance, Attachment to Petition to Deny of Netflix Inc., August 25, 2014 (hereinafter, Florance Declaration), ¶¶ 30-50; McElearney Declaration, ¶¶ 23-24 and 36-42.

¹²⁵ See Letter from Kathryn A. Zachem, Comcast Corporation, to Marlene H. Dortch, Secretary, FCC, MB Docket No. 14-57 (Sept. 17, 2014) (enclosed documents on CD-ROM); Letter from Matthew A. Brill, Latham & Watkins, LLP, Counsel to Time Warner Cable Inc., to Marlene H. Dortch, Secretary, FCC, MB Docket No. 14-57 (Sept. 17, 2014) (enclosed documents on CD-ROM).

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Comcast's.¹²⁶ Examples include Google, Amazon, Sony, Apple, Netflix, and Dish Network.¹²⁷ Moreover, as noted above, many of these are firms for which OVD service supports fundamental parts of their business, including search and related services and ad revenue for Google, the overall sales platform and "Prime" service offered by Amazon, hardware sales by Apple, and so on. It is not credible that Comcast could drive these firms out of the market.

107. Third, the lack of credibility of a successful foreclosure strategy is heightened by the fact that, in practice, the ability to foreclose OVDs effectively requires the ability to foreclose all OVDs. If some combination of the powerful and/or contractually protected OVDs listed above were to survive, any foreclosure efforts by Comcast would at most affect only additional OVDs beyond the core set. A primary effect of such partial

¹²⁶Comcast's market capitalization at market close on September 10, 2014, was \$147 billion compared to \$153 billion for Amazon, \$401 billion for Google, and \$605 billion for Apple (WolframAlpha, available at <http://wolframalpha.com>, site visited September 11, 2014).

¹²⁷See, e.g., Daniel Frankel, "Viacom to deliver channels to Sony's new OTT service," FierceCable, September 10, 2014, available at http://www.fiercecable.com/story/viacom-deliver-channels-sonys-new-ott-service/2014-09-10?utm_medium=nl&utm_source=internal, site visited September 10, 2014 ("Viacom has struck a deal to provide 22 channels to Sony's upcoming virtual pay-TV service . . . Viacom has agreed to provide live-streaming access to leading channels such as BET, Comedy Central, MTV and Nickelodeon, as well as TV Everywhere authentication and video-on-demand rights. It's the first major announcement relating to Sony's secrecy-shrouded over-the-top service since it was first announced in January . . . In what is shaping up to be a rival OTT pay-TV initiative, Dish Network has secured similar digital rights to Disney and A&E Networks programming for its own upcoming OTT service."). See also e.g., "September 11, 2014 Responses of Comcast Corporation to the Commission's Information and Data Request," RFI 13.A.2., 32-33, which includes a list of potential OVD entrants.

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foreclosure would be to benefit the core, existing set of OVDs, who would likely capture many of the customers departing other, foreclosed OVDs. As such, Comcast would bear the costs of a strategy that would largely benefit other OVDs. Such a strategy is unlikely to be profitable.

108. Fourth, following the “open field” logic that the Commission has used in other settings,¹²⁸ the pool of non-Comcast/TWC broadband customers in the marketplace provides more than sufficient scale for an OVD to succeed even if (counterfactually) that OVD had no access to the combined firm’s customers. In particular, even if one considers only domestic customers—obviously an overly narrow view given that OVDs are generally global—and even if one assumes that the combined firm would “control” its customers—an incorrect view given their available alternatives and demonstrated willingness to switch—there are still plenty of other broadband customers to support an OVD, making a foreclosure theory implausible.

¹²⁸I note that I am not evaluating or endorsing this logic but rather investigating how it applies to the present setting. See Fourth Report & Order and Further Notice of Proposed Rulemaking, In the Matter of The Commission’s Cable Horizontal and Vertical Ownership Limits; Implementation of Section 11 of the Cable Television Consumer Protection and Competition Act of 1992; Implementation of Cable Act Reform Provisions of the Telecommunications Act of 1996; Review of the Commission’s Regulations Governing Attribution of Broadcast and Cable/MDS Interests; Review of the Commission’s Regulations and Policies Affecting Investment in the Broadcast Industry; Reexamination of the Commission’s Cross-Interest Policy, MM Docket No. 92-264, MM Docket No. 92-264, CS Docket No. 96-85, MM Docket No. 94-150, MM Docket No. 92-51, MM Docket No. 87-154, December 18, 2007, available at https://apps.fcc.gov/edocs_public/attachmatch/FCC-07-219A1.pdf, site visited September 19, 2014. I also note that the D.C. Circuit reversed this order in *Comcast Corp. v. FCC* (2009) (*Comcast Corp. v. FCC*, 579 F.3d 1, 9 (D.C. Cir. 2009)).

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109. Table 5 provides the numeric support for this conclusion. In particular, the table compares customer levels that have proven themselves to be sufficient for viability in various analogy cases to the number of customers available to an OVD that (counterfactually) did not have access to Comcast and TWC customers. In particular:

- Lacking direct data on the number of customers an OVD needs to succeed, the table considers a wide range of possible benchmarks, including the threshold the Commission has used for required scale in the MVPD context, the number of customers currently served by a range of successful premium channels and MVPDs, and Netflix itself.
- To determine the number of customers available to an OVD, the table relies on the existing 3 Mbps broadband definition. Whatever one's view on the definition of "broadband," Netflix has stated publicly and demonstrated that it can provide video at broadband speeds as low as (or lower than) 3 Mbps, making this the relevant threshold for considering customers available to an OVD.¹²⁹

¹²⁹See Netflix Internet Connection Speed Recommendations, available at <https://help.netflix.com/en/node/306>, site visited September 12, 2014. See also Michael Nathanson, Robert Fishman, and Andrew Izaguirre, "Netflix: The Law of Large ... and Small Numbers," MoffettNathanson, February 26, 2014, 3 ("When we first launched on the company, we made the underlying assumption that Netflix's addressable U.S. universe was tied to the underlying U.S. broadband market excluding the homes where broadband is sourced by slower DSL technology. However, in thinking about the addressable universe further (and discussing usage trends with internet-connected device manufacturers), we are revisiting our initial assumption that excluded DSL from these penetration curves. It would appear that the DSL user experience is still acceptable for streaming Netflix at lower speeds and, as such, we need to revise the underlying U.S. addressable market for broadband.")

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110. As seen in the table, when counting wireless customers, the benchmark cases are always less than 30 percent and generally less than 20 percent of the “open field” of non-Comcast/TWC broadband customers. Even without counting wireless customers (something that is becoming increasingly hard to justify given OVD focus on this segment, as explained above), the benchmarks are substantially below (generally less than half of) the open field.

Table 5: Providers' Scale Compared to Non-Comcast and TWC Broadband (Residential + Commercial) Customers Nationwide (2012, HSD Speed of 3 Mbps/768 Kbps)

111. For completeness, Table 6 presents the overly conservative results based on a 10 Mbps threshold. The benchmarks continue to be smaller than the “open field,” and in most cases, substantially so.

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Table 6: Providers' Scale Compared to Non-Comcast and TWC Broadband (Residential + Commercial) Customers Nationwide (2012, HSD Speed of at Least 10 Mbps Downstream)

112. In sum, the “open field” is more than sufficient to support an OVD’s business without any customers from the combined firm. This conclusion holds even though this analysis has considered only the domestic market. In fact, the footprints of OVDs such as Netflix, Google, Amazon and others are clearly global, with global markets rapidly becoming as or more important than the US. For example, Netflix ended the second quarter of 2014 with 13.8 million international subscribers, a 78 percent increase over the second quarter of 2013. That represents 27.6 percent of its total subscribers. This month (September 2014) Netflix is launching in Germany, France, Austria, Switzerland, Belgium, and Luxembourg, markets with more than 60 million broadband households. Executives say the move will “raise our current international addressable market to over

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180 million broadband households, or 2x the number of current U.S. broadband households.”¹³⁰ Over the longer term, estimates indicate that the “company will have nearly 104 million subscribers globally by 2020.”¹³¹ It is implausible to think that a cable provider covering a subset of the US could foreclose an OVD with large and growing global operations.

113. Fifth, as documented in Section III.C, it is simply false that Comcast “controls” its customers. As commenters have shown, the typical Comcast customer has at least one broadband alternative, more in some cases, particularly when growing wireless options are included.¹³² Furthermore, the vast majority of surveyed broadband customers indicate they would switch providers if their provider attempted to downgrade access to edge providers, even if that meant switching to a lower speed alternative, including DSL or wireless. And roughly { { } } of Comcast’s broadband customers do churn every year. As such, it is incorrect to model Comcast as a monopolist that “controls” its customers; the vast majority of such customers have alternatives, and thus the “open field” of customers

ed Hastings and David Wells, Netflix Letter to Shareholders, July 21, 2014, available at http://files.shareholder.com/downloads/NFLX/0x0x769748/9b21df7f-743c-4f0f-94da-9f13e384a3d2/July2014EarningsLetter_7.21.14_fin e visited September 18, 2014 [emphasis added].

rankel, “Netflix Euro rollout puts it on track to 100M-plus international subs by 2020,” FierceCable, September 22, 2014, available at www.fiercecable.com/story/netflix-euro-rollout-puts-it-track-100m-plus-international-subs-2020/2014-09-22?utm_medium=nl&utm_source=twitter ed September 22, 2014.

132 Evans Declaration, § II.C and Table 2; Farrell Declaration, § III.E.

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for an edge provider certainly includes Comcast's own customers, further demonstrating that the combined firm lacks the ability to foreclose OVDs.¹³³

114. Dr. Evans' Table 7 appears to be an attempt to refute the above two points, as he uses it to claim that the ability of "very large" ISPs to harm OVDs increases "dramatically" with ISP size.¹³⁴ However, notably, Dr. Evans does not claim that the combined firm could actually foreclose Netflix or other OVDs from competing; in fact, he acknowledges that Netflix would still be able to operate even if it did not come to terms with the merged firm.¹³⁵ Further, Dr. Evans' analysis in Table 7 is flawed because he ignores the fact that Netflix customers have choices among ISPs, and that if Comcast were no longer an option for obtaining Netflix service, some customers would switch to another ISP. Switching to another ISP would harm Comcast, not Netflix. Table 7 also excludes all of Netflix's global operations, a rapidly growing source of revenue and profit for Netflix that Comcast cannot affect, as discussed above.

115. Finally, none of the theories presented by commenters has pointed to any transaction-specific evidence of harm. In particular, no one has presented any evidence

133I also note that "Comcast does not unilaterally 'downgrade' the capacity of its interconnection links with counterparties and rarely, if ever, decommissions ports." (See, e.g., "September 11, 2014 Responses of Comcast Corporation to the Commission's Information and Data Request," RFI 73, 193-194.).

134 Evans Declaration, ¶ 140.

135Id., ¶ 168 and note 123. As noted above in footnote 123, as a matter of economics, a foreclosure strategy that leaves OVDs in the marketplace is unlikely to be profitable, even more so because any reduction in NBCUniversal content purchased by the OVD would be harmful to Comcast.

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that the incremental number of customers that Comcast would gain from the transaction (post-divestiture) would make the difference between Comcast having or not having the ability to foreclose customers.

B. The combined firm would lack the incentive to foreclose OVDs, just as the merging parties lack this incentive today

116. Not only does the first necessary condition for a foreclosure theory (ability to foreclose) fail, so does the second necessary condition (incentive to foreclose).

1. The merging parties' behavior reveals that they have no incentive to foreclose OVDs

117. When considering whether the combined firm has an incentive to foreclose OVDs, I start by noting that no commenter has advanced a theory that explains why the transaction would create an incentive that does not, by the same logic, exist for Comcast today. That is, any theory under which the video gains would offset the broadband losses and thus support a foreclosure strategy would also apply to Comcast today. Hence, the actions that Comcast has taken on its own, to date, provide the clearest answer to the question of whether Comcast has an incentive to foreclose OVDs, as suggested by some commenters. And, in fact, those actions demonstrate that Comcast does not have such an incentive.

118. As part of regular business operations, Comcast has engaged in negotiations with various edge providers and their agents over interconnection terms—the most publicized

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being with Netflix.¹³⁶ The outcome of those negotiations indicates that Comcast has not sought to foreclose Netflix. In particular, as explored in more detail in Section V.A, {{ }}. In its post-agreement communications with Comcast, Netflix agreed that it was not harmed by the agreement.¹³⁷ This behavior is not consistent with Comcast having an incentive to harm Netflix.

119. Two features of the Comcast-Netflix agreement demonstrate Comcast's lack of incentive to harm Netflix's competitiveness most clearly:

- {{ }}.
- {{ }}.¹³⁸ {{ }}.

120. Moving beyond just the Netflix agreement, another indicator of the merging parties' lack of intention to harm OVDs comes from {{ }}.

121. {{ }}: 139

- {{ }}.

¹³⁶Despite commenters' inferences to the contrary (Evans Declaration, ¶ 117; Farrell Declaration, ¶¶ 10, 13, 130, and 177), it is not surprising (or indicative of any foreclosure incentives) that Comcast did not put additional interconnection capacity in place until these negotiations were completed and thus the terms for payment for such capacity expansions were resolved. To the contrary, this is an entirely standard process: When additional capacity beyond that contemplated in an existing agreement is needed, a commercial negotiation is required, and once terms are reached, capacity can be added. (See McElearney Declaration, ¶¶ 18, 32).

¹³⁷ See McElearney Declaration, ¶ 44.

¹³⁸ Sam Schwartz, Chief Business Development Officer, Comcast Cable, July 22, 2014, interview.

¹³⁹ The OVDs considered in the sample include {{ }}.

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• {{ }}.

{{ }}

2. Economic theory explains why the merging parties have shown no incentive to foreclose OVDs

122. OVDs are obviously complementary to Comcast's broadband business. As such, Comcast's revealed lack of incentive to foreclose OVDs (pre- or post-transaction) is fully consistent with economic theory. In particular, economic theory is clear that it is generally not profitable to leverage market power in one market to foreclose competition in a closely complementary market, even when competitors produce high-quality and/or low-cost products. As Rey and Tirole explain, firms with market power in a primary market do not want to exclude "low-cost and high-quality varieties" from the adjacent market "since their presence makes its own [primary] product more attractive to consumers."¹⁴⁰

123. The basic logic against foreclosure of complementary products is straightforward: The strong competitive OVDs add value and thus grow the overall "pie" of profits

¹⁴⁰Rey and Tirole (2007), 2182. Note that Dr. Evans himself refers to the possibility of "offsetting factors" that would lessen incentives to foreclose. Presumably he has in mind the harm to broadband profits. Notably the empirical analysis above makes clear that these offsetting factors have eliminated any theoretical incentive to foreclose OVDs. And the theory is also clear. Although Dr. Evans argues vaguely and weakly that because "MVPD and broadband services are not consumed in fixed proportion...the Chicago single-monopoly profit theorem does not necessarily hold," I do not rely on a general reference to that theorem to show there is no incentive to foreclose, but rather demonstrate it for this specific case, including via specific discussion of the import of the negotiation between Comcast and Netflix. (See Evans Declaration, ¶ 176 and n. 131.)

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available to the OVDs and Comcast collectively, and thus Comcast is better off letting them do so and then profiting from this via its broadband business, rather than attempting to foreclose OVD competition and shrinking the overall pie. The simplest version of this theory applies to the hypothetical case where Comcast would seek to foreclose OVD competition in order to enhance its own OVD business—the theory indicates that this would generally not be profitable, as Comcast would be better off letting the competing OVDs grow the overall pie and profiting through its established broadband service. But the logic also applies to a theory that Comcast would foreclose OVDs to drive customers to its traditional video offering. Indeed, in this case, foreclosure would likely be even worse for Comcast’s broadband business (since traditional video does not rely on broadband and thus would not prop up its value as OVDs are removed) while (as shown in the CLV calculations in Section III.C.1), above, it would offer limited profits to make up for this loss.¹⁴¹

124. Finally, the fact that Comcast negotiates directly with OVDs (or their agents) completes the point. Bottom line, for those OVDs that grow the overall pie, fundamental economic logic indicates that Comcast and the OVD can always find a “middle ground” that leave them both mutually better off than they would be under a foreclosure

¹⁴¹ It is also worth noting that such a foreclosure theory would imply that OVDs are in the same market with traditional video. This theory would still involve Comcast harming complementary products (OVDs) in an adjacent market (all video), rather than letting successful OVDs continue to grow and capturing this value via the complementary broadband service.

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strategy.¹⁴² And notably this is precisely how Netflix described the outcome of the negotiations in communications with Comcast.¹⁴³

125. To be sure, Comcast may have incentives to develop strong, in-footprint over-the-top video offerings to compete more effectively with OVDs, though it has not entered that market today in any meaningful way. But such competition is fundamentally different from foreclosure—it is good for the broadband business and, should OVDs respond with their own competitive initiatives, that is all the better for broadband. This is much like the case of Google entering the broadband business; Google may well have anticipated the competitive response from other broadband providers but its core edge provider business benefits from this competitive response. This logic is what makes Google such a strong competitive threat in broadband. And the same logic applies to Comcast in the OVD business—Comcast has incentives to compete aggressively with OVDs, in part because stimulated responses are good for broadband, unlike any attempts at foreclosure.

126. Dr. Farrell advances the hypothesis that Comcast could have an incentive to hurt complementary OVD offerings if, in so doing, it hurts other competitors (e.g., other ISPs

¹⁴²This logic has been long understood in economics, dating back to Nobel Prize winner Ronald Coase. As summarized by another Nobel Prize winner, George Stigler, “Ronald Coase taught us, what of course we should already have known, that when it is to the benefit of people to reach an agreement, they will seek to reach it.” (George J. Stigler (1989), “Two Notes on the Coase Theorem,” *The Yale Law Journal*, 99.3: 631-633.)

¹⁴³ McElearney Declaration, ¶ 44.

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or MVPDs) more than it hurts itself.¹⁴⁴ Although theoretically possible, such a hypothesis does not apply to the facts of this case: Harming broadband inputs would harm Comcast more than other ISPs or MVPDs, not less. Comcast has spent tens of billions of dollars to develop its high-quality broadband network, which now offers very high-quality broadband service with speeds up to 505 Mbps, with the quality of this broadband network an important source of competitive differentiation that Comcast uses to win customers.¹⁴⁵ The existence of a vibrant OVD sector is complementary to this strategy, as it provides the applications that make best use of Comcast's high-speed broadband network. Moreover, given that, under such a strategy, Comcast would have degraded access to OVDs, it seems far-fetched that angry Comcast broadband customers would then turn to (or increase their use of) Comcast video offerings; rather, it seems more likely that customers would prefer to turn to offerings from other providers. For all these reasons, a strategy to foreclose OVDs by harming their access to the Comcast broadband network would harm Comcast more than the competition. By Dr. Farrell's own logic, this means that Comcast does not have an incentive to foreclose OVDs.

127. Alternatively, one might hypothesize that Comcast would foreclose OVDs in order to benefit itself in some largely independent market (rather than one that is complementary to Comcast's broadband offerings). One possible hypothesis would be

144 See, e.g., Farrell Declaration, ¶ 83.

145 Israel Declaration, ¶ 167.

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that Comcast wants to foreclose OVDs in order to support expansion of its own OVD (or other video) offerings into new geographic markets. However, such a theory does not withstand scrutiny because Comcast has no plans to offer online video offerings outside its footprint. Historically, {{ }}.¹⁴⁶ Further, Comcast has no plans to extend its geographic footprint by overbuilding another cable operator's territory. Indeed, to my knowledge, no incumbent cable operator has overbuilt another cable operator's territory. As discussed more extensively in Section VII.A, the primary reason that Comcast and other cable companies have not opted to expand into each other's franchise areas is that the fixed costs are too high, causing the return on investment to be either negative or insufficient relative to other strategic options.

128. Alternatively, one could hypothesize that Comcast would have an incentive to foreclose OVDs to protect its NBCUniversal broadcast and cable networks from competition that would reduce their revenues.¹⁴⁷ However, this claim also does not withstand scrutiny. First, OVDs do not threaten NBCUniversal to any significant degree. As Netflix as well as other industry participants and analysts have acknowledged, OVDs such as Netflix compete primarily with premium channels like HBO and Showtime, and not with NBCUniversal, which does not offer such premium channels.¹⁴⁸ Even more

146 See, e.g., {{ }}.

147 See, e.g., Sappington Declaration, ¶ 51.

148 See, e.g., Michael Nathanson, Robert Fishman, and Andrew Izaguirre, "2Q Preview: We Interrupt the M&A Show For Earnings," MoffettNathanson Research, July 21, 2014, at 1 ("We believe Netflix will, over time, look like HBO in content offerings, margin, pricing strategy, and, one day, subscriber growth."); Reed Hastings, Facebook post, August 6, 2014, available at <https://www.facebook.com/reed1960/posts/10152414721999584>, site visited September 1, 2014 ("Minor milestone: last quarter we passed HBO is [sic] subscriber revenue (\$1.146B vs \$1.141B). They still kick our ass in profits and Emmy's, but we are making progress. HBO rocks, and we are honored to be in the same league."); and according to Netflix's chief content officer, the company's goal "is to become HBO faster than HBO can become us." (See Bryan Bishop, "Netflix wants at least five new shows a year: 'The Goal is to become HBO faster than HBO can become us,'" The Verge, January 29, 2013, available at <http://www.theverge.com/2013/1/29/3930560/netflix-wants-at-least-five-new-shows-a-year-the-goal-is-to-become>, site visited June 5, 2014.)

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fundamentally, there are dozens of existing broadcast and cable networks, so the notion that foreclosing OVDs would have a material effect on the profitability of any NBCUniversal network is far-fetched. And finally, this theory ignores the complementarity between OVDs and NBCUniversal content, which arises from the fact that OVDs purchase hundreds of millions of dollars per year in content from Universal studios and NBCUniversal's broadcast and cable networks, and is a source of complementarity that applies to any theory under which Comcast would seek to foreclose OVDs.¹⁴⁹

129. In sum, the features of the broadband marketplace, Comcast's observed behavior, and economic theory all confirm that Comcast lacks both the incentive and the ability to foreclose OVDs.

¹⁴⁹In 2013, NBCUniversal earned { { } } in revenues from OVDs. (See Comcast data produced in FCC Information and Data Request- Exhibit 19.5(a).)

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V.COMMENTERS' CLAIMS THAT INCREASED BARGAINING POWER WILL LEAD TO HIGHER PRICES TO EDGE PROVIDERS OR THEIR AGENTS ARE NOT SUPPORTED BY ECONOMIC THEORY OR EMPIRICAL EVIDENCE

130. The discussion thus far shows that commenters have advanced no coherent horizontal or vertical theory of harm from the transaction, including no coherent theory of OVD foreclosure. Moving beyond these more standard antitrust theories, commenters also advance “big is bad” claims that increasing Comcast’s size—even in the absence of any overlap with TWC—would increase its bargaining power vis-à-vis edge providers or their agents and thus increase its ability to demand higher payments for interconnection.¹⁵⁰ Such bargaining theories are distinguished from the (already refuted) foreclosure theories addressed in Section IV in that they do not depend on a claim that Comcast seeks to defend its video business, but rather on a claim that Comcast’s increased size post-merger will enable it to demand higher interconnection prices. The higher interconnection prices in such a theory need not occur as part of direct interconnection agreements with edge providers; instead they might be charged to edge providers’ agents (e.g., CDNs or transit providers who handle edge providers’ traffic). But for such higher prices to even potentially form a coherent theory of competitive harm, a necessary (but far from sufficient, as seen below) condition is that they must result in higher prices to edge providers. In contrast, a situation in which an ISP sets up a direct interconnection

150 Evans Declaration, § III.E; Farrell Declaration, § VI; Sappington Declaration, § IV.E.2.

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agreement with an edge provider—which may enable the ISP to secure incremental interconnection revenues, but which, due to the efficiencies from disintermediating a previously-used transit provider (e.g., Cogent), enables the edge provider to secure lower quality-adjusted prices than before the agreement—cannot be the basis of a valid theory of harm.

131. In this section, I explain why marketplace realities, economic theory, and empirical evidence—including that presented by commenters, once properly interpreted—all reject this “big is bad” bargaining theory. Then, in Section VI, I explain why even if some outcomes predicted by commenters—including more direct interconnection deals between Comcast and edge providers or, more generally, higher prices to edge providers or their agents—were to occur, these outcomes would not harm competition or consumers.

A. Marketplace realities contradict theories of harm based on bargaining power

132. Perhaps the most striking feature of commenters’ discussion of harms due to bargaining power is that they largely focus on allegations regarding Comcast’s current size as an ISP and associated market power.¹⁵¹ Of course, claims about Comcast’s current bargaining power cannot establish incremental harms from the proposed combination with TWC. But even more telling, if Comcast has such bargaining power today, then

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Ibid.

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current marketplace outcomes provide a direct test of commenters' theories: Do current marketplace outcomes demonstrate high interconnection prices and limited interconnection options, as one would expect to see if commenters' claims that large size as an ISP parlay into excessive power over edge providers and their agents? The answer is decidedly no.

133. First, the fact that there are over 40 settlement-free paths into the Comcast network demonstrates that having a large number of broadband customers does not parlay into the ability to charge high prices for interconnection services. Indeed, the existence of that large number of paths substantially restricts Comcast's ability to exercise bargaining power on interconnection terms, even post-merger. In particular, if Comcast were to raise the price for only one or a small number of paths into its network, traffic would naturally flow to other paths. And a claim that Comcast could force higher prices on all paths—even though more than 40 are settlement-free today—would depend on an implausibly large and entirely unproven increase in bargaining power over the entire Internet backbone due to the proposed transaction.

134. Second, even where Comcast has entered into paid commercial agreements for direct interconnection, its prices have been very low, generally at or below market prices for transit, which themselves have plummeted over time.¹⁵² Consistent with this fact, payments for direct interconnection make up only a tiny sliver of the costs paid by edge

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See McElearney Declaration, ¶ 18; see also Appendix III.

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providers and an even smaller percentage of edge providers' revenue (the relevant comparison to assess what effect such charges could possibly have on price, even if fully passed through). Interconnection payments are dwarfed by content costs in particular: As Netflix CFO David Wells recently explained, "I think for Netflix content is our largest cost. It dwarfs all the other costs..."¹⁵³ Such a pattern is not consistent with a claim that Comcast controls a critical input (direct interconnection into its last-mile network) without which Netflix cannot compete successfully.

135. Table 8 documents the small size of interconnection payments. It shows the interconnection charges paid to Comcast as a percentage of cost of revenue (or cost of sales) as reported by three large edge providers, {{ }}.

136. Even more importantly, the payments for direct interconnection from these edge providers are substantially {{ }} their traffic imposes on ISP networks. This comparison is particularly telling because standard theories regarding harm from the alleged exercise of market power involve setting marginal prices over marginal costs, thus inefficiently reducing output. Because Comcast currently charges customers nothing for subscribing

153 "Netflix's (NFLX) CEO Reed Hastings on Q2 2014 Results – Earnings Call Transcript," July 21, 2014, available at <http://seekingalpha.com/article/2327585-netflixs-nflx-ceo-reed-hastings-on-q2-2014-results-earnings-call-transcript>, site visited September 2, 2014.

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to a given edge provider and little if anything for consuming additional data,¹⁵⁴ the marginal revenue associated with an increase in traffic from edge providers comes primarily from the edge provider side of the market. Hence, unless interconnection fees are above marginal cost, then there is no basis to say that such fees are consistent with a standard market power claim of marginal prices greater than marginal costs.

137. The recent Netflix interconnection agreements provide good examples from which to perform compare direct interconnection prices to associated marginal costs. Based on Comcast's estimates of the network costs incurred to serve Netflix traffic, I calculate the marginal costs (per Mbps) associated with Netflix traffic and compare these costs to the direct interconnection fees paid to Comcast by Netflix (also per Mbps).¹⁵⁵ The results show that Netflix's payments to Comcast for direct interconnection are less than { { } } percent of the marginal network costs that the Netflix traffic imposes on Comcast's network. Similarly, TWC indicates that the price that it is charging Netflix for direct interconnection is below the marginal costs of serving Netflix's traffic "by orders of

¹⁵⁴ Although Comcast is experimenting with usage-based pricing in certain markets, the monthly data allowances are high r