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would make it cheaper on a per-customer, or per-potential customer,³⁷ basis for Comcast to develop and deploy new technologies and services. Moreover, because Comcast generally provides a standardized and consistent set of products and services across its entire footprint, all its current and future customers benefit from the deployment of new technologies and services enabled by economies of scale.³⁸ In fact, content providers have already noted that the increased scale from this transaction will likely lead to new technological options for content on more platforms and services.³⁹

54. The Commission does not always credit fixed cost savings arising in transactions because, from a static perspective, price reductions depend on lower marginal costs.⁴⁰ However, the deployment of new technologies depends on a firm's willingness to undertake the fixed costs of research, development, and deployment. As a result, while such costs are "fixed" when viewed through a static lens, they are incremental costs when viewed through the lens of undertaking or accelerating investment and new product deployment.⁴¹ For this reason, the Antitrust Modernization Commission stated that reductions in fixed costs can be an important source of procompetitive benefits: "Failure to take account of and give proper weight to such

³⁷ When undertaking an investment in a new product or service, Comcast cannot be certain of the number of its future customers for that product or service. It must compete for those customers. Therefore, although we refer to "per-customer costs" throughout this declaration, we mean the "per-expected customer costs."

³⁸ Interview with Kevin O'Toole (Senior Vice President and General Manager, New Business Solutions, Comcast Cable).

³⁹ Philippe Dauman, Viacom CEO: "[W]e welcome what Comcast had said about investing in its platform, providing more revenue opportunities with its consumers, investing in the capital infrastructure both in its own systems and the newly acquired system because . . . what is of highest importance to us is to make sure our content is available ubiquitously on different platforms in a measured way." Viacom – Deutsche Bank Investors Conference, 3/10/14; David Zaslav, Discovery Communications President and CEO: "Comcast is a great company. If they're successful in bringing this deal to the finish line, I'm sure that they'll do a great job in offering a lot of different products to consumers to consume content, including TV Everywhere where they're a leader, and that will be advantageous for us." Q4 2013 Earnings Call, 2/13/14; Chase G. Carey, 21st Century Fox President: "[T]here may be some positive [consequences from cable consolidation] . . . new digital platforms in over the top players may grow even more quickly with a consolidated distribution industry." Corrected Transcript Q2 2014 Earnings Call, 2/6/14.

⁴⁰ See, e.g., In the Matter of Applications of Cricket License Company, LLC, et al., Leap Wireless International, Inc., and AT&T Inc. for Consent To Transfer Control of Authorizations Application of Cricket License Company, LLC and Leap Licenseco Inc. for Consent to Assignment of Authorization, WT Docket No. 13-193. Released March 13, 2014, ¶ 132: "Third, the Commission has stated that it 'will more likely find marginal cost reductions to be cognizable than reductions in fixed cost.' The Commission has justified this criterion on the ground that, in general, reductions in marginal cost are more likely to result in lower prices for consumers." [Footnotes omitted] See also, Alaska Wireless Order, 28 FCC Rcd at 10468 ¶ 87; Verizon Wireless-SpectrumCo Order, 27 FCC Rcd at 10735 ¶ 97; AT&T-Centennial Order, 24 FCC Rcd at 13954 ¶ 90.

⁴¹ See, e.g., Hal R. Varian, *Intermediate Microeconomics*, 6th Ed., pp. 371–373: "In the long run a firm can choose the level of its 'fixed' factors—they are no longer fixed."

fixed costs in evaluating a merger could deprive consumers and the U.S. economy of significant benefits from a procompetitive merger.”⁴²

55. Scale can also lead to investments that lower marginal costs. For example, Comcast incurred significant fixed cost investment in developing web-ordering interfaces and self-install and self-help systems that have reduced its marginal cost of serving customers. Comcast has also made fixed cost investments that allow it to provide consistent services throughout its footprint.⁴³ Having a ubiquitous set of services across its entire footprint reduces Comcast’s marginal costs for technicians, customer service agents, billing, and other operational functions, and is a benefit to customers.⁴⁴

56. In addition, the larger scale enabled by the transaction should make the combined company a more attractive partner for device manufacturers seeking to provide apps to deliver video services on a wider range of third-party devices and technology firms seeking to deliver video to consumers in new, innovative ways. Having a larger potential customer base makes developing these apps and services more feasible for Comcast and more appealing for the partnering company.

57. In fact, one of the reasons that Comcast is able to offer some of the highest-quality services among cable operators today (examples of which are discussed in detail below) is that it has relatively large scale compared to other cable operators. Comcast has been able to invest in innovations and high quality service in part due to previous scale-enhancing transactions, including its acquisitions of the AT&T Broadband and Adelphia systems.

2. Expanded Geographic Reach

58. Expanded geographic reach will increase Comcast’s ability to serve customers whose needs span the existing geographic footprints of Comcast and TWC. In addition, geographic

⁴² Antitrust Modernization Commission, Report and Recommendations, April 2007, p. 58. See also U.S. Department of Justice and the Federal Trade Commission, *Horizontal Merger Guidelines*, August 19, 2010, §10.

⁴³ For example, Comcast has made the investments necessary to complete the transition to all-digital, to deploy DOCSIS 3.0 throughout its footprint, and to deploy the X1 platform throughout its footprint.

⁴⁴ See, e.g., Comcast 2Q 2012 Conference Call, 8/1/2012: “The second quarter CapEx reflects our investment to support the continued growth in business services, which totaled \$162 million. In addition, CPE expenditures decreased 13% as we benefit from improved pricing and near completion of the all-digital project, which recaptures analog bandwidth in a number of our markets. In total, we have deployed over 25 million digital adapters since the inception of this project. *As a result of this project, we continue to realize operating efficiencies and strategic benefits from fully digitizing our systems.*” (Emphasis added)

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agglomeration can lead to operating efficiencies and the ability to provide higher quality services to customers in certain geographic areas.

59. On the consumer side, expanded geographic reach should encourage more extensive provisioning of a public Wi-Fi network in the footprint of the combined company. By aligning the incentives to invest in Wi-Fi service throughout the combined company's footprint, the transaction should lead to more Wi-Fi hotspots and improvements to Wi-Fi service. This expanded Wi-Fi network would allow the combined company's customers more readily to access a full array of high-speed data services when traveling outside their homes.

60. Residential customers (as well as edge providers) should also benefit from Comcast adding TWC systems in regions proximate to its own systems, because Comcast will have a greater incentive to build out more Converged Regional Access Networks ("CRANs") and support those CRANs with new regional data centers, delivering more scalable capacity for broadband and IP cable services; reducing latency in delivering services to customers; making the network more reliable and resilient; and potentially offering new options for regional interconnections. We discuss these examples in more detail in Section IV.B.2 below.

61. On the business side, expanded geographic reach will increase the ability of the combined company to serve super-regional businesses whose operations extend beyond the individual footprints of Comcast or TWC but fall within the combined company's footprint. Examples include Boston/New York/New Jersey/Philadelphia/Baltimore/Washington, DC, Virginia/North Carolina/South Carolina, Los Angeles/Sacramento/San Francisco/Portland/Seattle, and Houston/Dallas/Austin/San Antonio. We discuss the combined company's ability to serve super-regional businesses below in Section IV.C.

62. Having the ability to serve more locations on its own network for a given business should make Comcast a more effective competitor in providing business services. A larger footprint will make Comcast more likely to make investments to build out its network to multi-location businesses within its own footprint because being able to serve multiple locations is complementary for Comcast—having customer location A on Comcast's network gives Comcast more incentive to build out its network to customer location B. Comcast will also be able to

offer lower prices for service on its own network than it could offer when working with a third party due to lower costs and reducing double marginalization.

63. Furthermore, increased network build-out to specific business customers has spillover benefits for other current and potential business and residential customers. When Comcast or TWC makes the decision to build out network infrastructure to serve a specific customer, it does not consider only the impact on that customer.⁴⁵ Instead, each company takes into account other potential customers who will have more on-net locations on the new route. Comcast and TWC both choose the new route to maximize long-run profit, which may not be the most direct route.⁴⁶ As a result of a new route, additional new customers benefit from the newly available service and existing customers can benefit from enhanced service due to increased capacity. Moreover, when Comcast or TWC makes investments in systems and operations for demanding business customers (e.g., wireless carriers in need of backhaul service), there are spillover benefits for other business and residential customers from improved service reliability. Reciprocally, the benefits of improving Comcast's network through building CRANs inure to business customers as well, who would directly benefit from the build-out of fiber deeper through the network, which will deliver more scalable capacity for business services like metro Ethernet.

64. On the advertising side, the combined company's expanded geographic reach and presence in additional advertising markets, such as New York and Los Angeles, should provide a compelling new option for advertisers that wish to take advantage of Comcast's addressable advertising services and can accept the absence of full national reach.

3. Sharing of Technologies and Services

65. By combining the Comcast and TWC portfolios of technologies and services, the combined company should be able to provide more services at lower cost than Comcast or TWC could on its own. It will be more efficient for Comcast and TWC to provide these services as a combined company because the two firms use similar inputs in creating these services. In

⁴⁵ Interview with Kevin O'Toole (Senior Vice President and General Manager, New Business Solutions, Comcast Cable); Interview with Phil Meeks (Executive Vice President and Chief Operating Officer, Business Services, Time Warner Cable).

⁴⁶ Interview with Kevin O'Toole (Senior Vice President and General Manager, New Business Solutions, Comcast Cable); Interview with Phil Meeks (Executive Vice President and Chief Operating Officer, Business Services, Time Warner Cable).

addition, each company brings proprietary technology and specialized knowledge about providing its unique mix of services.⁴⁷

66. Although there may be some costs associated with implementing current Comcast services in TWC territory (and vice versa), and some Comcast services may be technologically incompatible with TWC infrastructure, the specialized knowledge brought by both companies to the transaction should speed up the deployment of advanced Comcast services to consumers in the TWC footprint. For example, Comcast brings specialized knowledge about providing certain advanced video service technologies, such as its X1 platform, to the combined company. Due to that specialized knowledge, it will be less costly to provide that platform and equipment to current TWC systems than it would be for TWC to develop and deploy them on its own.

67. In addition, the quantity and variety of NBCUniversal programming that Comcast obtained in the NBCUniversal transaction gave Comcast management the ability and incentive to invest to increase content availability through a variety of different platforms, services, and business models.⁴⁸ That programming, along with Comcast's investments in upgrading its network and backbone and building out content delivery networks, has enabled Comcast to experiment with, and invest in new program delivery platforms, including TV Everywhere and expanded VOD access for Comcast customers. The combined company will be able to offer those benefits to customers in TWC territory.

68. Sharing of technologies works in both directions. For example, TWC brings knowledge about providing certain advanced business services, including certain metro Ethernet services, to the combined company. Customers in current Comcast territory should benefit from Comcast's enhanced ability to provide these services after the transaction.

⁴⁷ The benefits due to sharing technology and knowledge can be thought of as economies of scope in the production of these products and services. For more on economies of scope, see, e.g., Dennis W. Carlton and Jeffrey M. Perloff, *Modern Industrial Organization*, 4th Ed., pp. 21, 45.

⁴⁸ Declaration of Gregory L. Rosston, Ph.D., "An Economic Analysis of Competitive Benefits from the Comcast-NBCU Transaction," 5/4/10, ¶¶ 48–50.

4. Economies of Scale, Geographic Reach, and Sharing of Technology and Services in Previous Comcast Transactions

69. Comcast's customers have benefitted from the increased scale and expanded geographic reach Comcast has obtained in prior transactions. The results of two previous transactions, Comcast's acquisitions of AT&T Broadband and Adelphia, illustrate the gains Comcast was able to achieve by adding systems. Following the 2002 AT&T Broadband transaction, Comcast was able to realize economies of scale that allowed it to undertake larger fixed cost investments. The Commission recognized that benefit of the transaction:

We also agree with the Applicants that the greater scale and scope of the merged entity is likely to spur new investment. The development and deployment of new technologies often entails a significant up-front, fixed investment. The merged company should have a greater ability to spread those fixed costs across a larger customer base, which should in turn foster incentives for investment by the merged entity, as well as other businesses that seek to sell equipment, technology, and services to the merged entity.⁴⁹

70. In 2006, a few years after the AT&T Broadband transaction was completed, the Commission found that the transaction had resulted in the accelerated deployment of facilities-based high-speed Internet service, digital video, and other broadband services to the AT&T Broadband systems acquired by Comcast.⁵⁰ At the time, the Commission was reviewing Comcast's and Time Warner Cable's application to acquire Adelphia's systems. The Commission found the evidence from the AT&T Broadband transaction persuasive enough to conclude that it was "likely that Comcast and Time Warner will improve the quality and

⁴⁹ In re Applications for Consent to the Transfer of Control of Licenses from Comcast Corporation and AT&T Corp., Transferors to AT&T Comcast Corp., Transferee, Memorandum Opinion and Order, 17 FCC Rcd. 23246, ¶ 184.

⁵⁰ "We also find it likely that Comcast and Time Warner will improve the quality and availability of advanced services on Adelphia's systems and that Adelphia subscribers will benefit from the transactions in this regard. Comcast's and Time Warner's timely deployment of advanced services on their own systems, especially those systems that Comcast acquired from AT&T Broadband, suggests that they will further deploy advanced video services, facilities-based telephony service, and high-speed Internet service on Adelphia's systems. We also find that the Applicants have provided sufficient information to conclude that the upgrades likely will occur in the near future." *In re Applications for Consent to the Assignment and/or Transfer of Control of Licenses Adelphia Communications Corporation (and Subsidiaries, Debtors-In-Possession), Assignors, to Time Warner Cable Inc. (Subsidiaries), Assignees, Adelphia Communications Corporation, (and Subsidiaries, Debtors-In-Possession), Assignors and Transferors, to Comcast Corporation (Subsidiaries), Assignees and Transferees*, Memorandum Opinion and Order, 21 FCC Rcd 8203 ¶ 23 (2006) ("Adelphia Order"), ¶ 257.

availability of advanced services on Adelphia's systems and that Adelphia customers will benefit from the transactions in this regard."⁵¹

71. After the Adelphia transaction, Comcast and Time Warner Cable substantially increased their capital expenditures to upgrade the former Adelphia systems so that customers in those territories could receive advanced digital services.⁵²

5. Contracting as an Alternative

72. A potential alternative to achieve the benefits of increased scale and expanded geographic reach could be through partnerships or licensing arrangements among cable companies operating in different geographic regions. In fact, cable operators have in the past attempted to achieve greater scale through partnerships, licensing, and joint ventures. These efforts demonstrate the importance of having large scale to justify investments in new technologies. But for several reasons set forth below, as these past efforts demonstrate, the full benefits of scale afforded by this transaction could not be attained through contracting.

73. Many times, it makes sense for companies to enter into contracts—in fact a large share of the economy is built on firms making such decisions. However, there are a number of reasons for difficulties and frictions in reaching agreements through contracts, including different expectations about costs, demand, and profits, different perceptions of and attitudes toward risk, different business models, and the complexity and uncertainty of the technology involved.⁵³ The existence of these transactional frictions can make it more efficient for firms to integrate than to operate through contracts.⁵⁴ These frictions may arise because different companies have different sources of information, different experiences, different strategies, different embedded technologies, and different networks. The uncertainty inherent in developing new technologies

⁵¹ Adelphia Order, ¶ 257.

⁵² SNL Kagan, "Double-Digit CapEx Increases In Line For 2007," 3/20/07.

⁵³ For more on frictions associated with contracting, see, e.g., Oliver Williamson (1979), "Transaction-Cost Economics: The Governance of Contractual Relations," *Journal of Law and Economics*, Vol. 22, No. 2, pp. 233–271; Oliver Williamson (1971), "The Vertical Integration of Production: Market Failure Considerations," *The American Economic Review*, Vol. 61, No. 2, pp. 112–123.

⁵⁴ See, e.g., Oliver Williamson (1979), "Transaction-Cost Economics: The Governance of Contractual Relations," *Journal of Law and Economics*, Vol. 22, No. 2, pp. 233–271; Francine Lafontaine and Margaret Slade (2007), "Vertical Integration and Firm Boundaries: The Evidence," *Journal of Economic Literature*, Vol. 45, No. 3, pp. 629–685. See also, Declaration of Gregory L. Rosston, Ph.D., "An Economic Analysis of Competitive Benefits from the Comcast-NBCU Transaction," 5/4/10.

as well as the varying experiences of individual cable operators can lead to very different expectations across the operators.

74. Even if companies are able to enter into partnerships, customers may face a higher price for the resulting service than they would face from a single entity due to the phenomenon of “double marginalization.”⁵⁵ Double marginalization, or double markup, occurs when there are at least two entities in the distribution chain above the customer. Because each company in the distribution chain needs to cover its total costs, it will generally impose a markup over the direct costs it faces to provide the service. That is, both companies will earn a positive margin above marginal cost. Double marginalization leads to higher prices for consumers and lower combined profits for providers compared to the case of an integrated provider. When the service is provided by a single provider directly to the customer, the provider internalizes all costs and imposes only one markup to cover its costs, which leads to a lower price for the customer. We discuss the double marginalization that can occur when Comcast or TWC partner with each other to serve super-regional businesses in Section IV.C below.

75. Cable operators may be hesitant to invest in new facilities or technologies in their regions if the return on such investment is dependent on other cable operators making complementary investments in other regions at the same time. In addition, cable operators may be uncertain about how demand for their services will develop and how returns from the investment will be shared amongst the operators making the investments. Developing new platforms and technology, whether they are for video, broadband, voice, or some other service, often requires risky, business-specific investment.⁵⁶ Each company in a partnership or licensing agreement will be wary of making investments whose return hinges on the future behavior of other companies, especially because the other companies could potentially take advantage of the irreversibility of the company’s business-specific investment. This is a standard problem in the economics of contracts known as the “hold-up” problem.⁵⁷ Of course, if the contracting companies were able to write “complete” contracts that took into account all possible states of the world, there would

⁵⁵ See, e.g., Jean Tirole, *The Theory of Industrial Organization*, pp. 174–175.

⁵⁶ Declaration of Gregory L. Rosston, Ph.D., “An Economic Analysis of Competitive Benefits from the Comcast-NBCU Transaction,” 5/4/10, ¶ 19.

⁵⁷ See, e.g., Jean Tirole, *The Theory of Industrial Organization*, pp. 24–25; Dennis W. Carlton and Jeffrey M. Perloff, *Modern Industrial Organization*, 4th Ed., pp. 400–403.

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be no scope for post-contractual opportunistic behavior and hold-up would not be a problem. However, due to transaction costs and the inherent complexities and uncertainties involved in creating new technologies and services, in practice, contracts are usually incomplete.⁵⁸ Fear of hold-up can lead companies to delay investment, underinvest, or even not to invest at all.

76. Other factors that can lead to difficulty in creating partnerships between cable operators are the diverse activities of each company, the different plans each company has for the many facets of its business, and the fast pace of technological change in the industry. Because partnerships are often narrow in scope, it is difficult to establish partnerships that can be flexible enough to accommodate evolving technologies and align with the many aspects of each company's business. For example, a partnership on one aspect of TV Everywhere services might face setbacks and delays because different companies have different underlying technologies and different beliefs about how their TV Everywhere service would fit into their overall product portfolios. Because cable companies often foresee such impediments, many potential partnerships are not undertaken.

77. For some industry-wide cable technologies, CableLabs, a research and development consortium supported by some cable companies, has been able to facilitate agreement on standards such as DOCSIS and CCAP.⁵⁹ While it has been effective at developing common standards for some technologies, CableLabs is not responsible for making the investments necessary to develop and deploy actual products and services. Creation of actual products and services, while enabled by technology standards, requires substantial additional investment. For example, while CableLabs was able to facilitate agreement on the DOCSIS standard, it did not have to develop and deploy the DOCSIS 3.0 modems now being deployed.

78. In addition, CableLabs does not obviate the need to ensure compatibility in business relationships where cable companies need to cooperate to serve customers across regions. Such

⁵⁸ See, e.g., Oliver Hart and John Moore (1988), "Incomplete Contracts and Renegotiation," *Econometrica*, Vol. 56, No. 4, pp. 755–785; Benjamin Klein, Robert G. Crawford, and Armen A. Alchian (1978), "Vertical Integration, Appropriable Rents, and the Competitive Contracting Process," *Journal of Law and Economics*, Vol. 21, No. 297, pp. 297–326.

⁵⁹ CableLabs "work[s] in cooperation with cable companies and cable equipment manufacturers, ... [to develop] sets of publicly available interface specifications to facilitate interoperability of cable devices, including cable modems, set-top boxes, digital televisions, and various telephony devices." CableLabs.com, "Specifications," available at <http://cablelabs.com/specs>.

arrangements can become very complex, requiring agreement on technology, pricing, investment, and customer relationships amid a large degree of uncertainty.

79. Several attempted collaborations between cable operators have been less successful and demonstrate the difficulty cable operators have had in effectively gaining scale through arms-length collaborations and partnerships. The transactional frictions associated with some negotiations have made it difficult for Comcast, TWC, and other cable operators to develop technologies in partnership or to reach licensing agreements for new technologies. These challenges are described below in Sections IV.B and IV.C in the context of efforts to license the X1 platform, Comcast's and TWC's efforts to collaborate on a common "front door" for TV Everywhere services and a "Download to Go" feature, and the Canoe Ventures advertising consortium.

6. Competitive Response

80. Comcast's and TWC's existing customers have several competitive options for MVPD, broadband, voice, and advertising services, and will continue to have those same options after the transaction. The transaction gives Comcast the ability to compete for customers in an expanded footprint, but it will need to compete for these customers with national-scale companies like DIRECTV and DISH; companies with broad geographic reach like AT&T, Verizon, and CenturyLink; and for some services with companies like Google, Apple, and Amazon, which have a national (or even global) scale and presence; as well as with other video, broadband, voice, and advertising providers.

81. In the following sections, we provide examples of how the increase in scale, geographic reach, and shared technologies and services afforded by this transaction will facilitate and accelerate deployment of new and enhanced products and services. These enhanced products and services will likely encourage a competitive response from DBS operators, telcos, and other competitors for video, voice, broadband, technology, and advertising. For example, the Commission notes that, "[t]o attract new subscribers and retain existing subscribers, MVPDs use various competitive strategies, including . . . freeing up bandwidth for additional services,

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delivering video to computers, tablets, and mobile devices, and differentiating their services from those of competitors.”⁶⁰

82. Competitive response can lead to new or improved video services, higher broadband speeds and greater reliability, new voice offerings, new technologies and equipment offerings, and lower prices. For example, in response to the announcement of the Comcast–TWC merger, AT&T stated that the transaction puts a “heightened sense of urgency” on its “network infrastructure commitment” to build out its Internet-protocol fiber network and LTE network.⁶¹ Verizon also noted that it is “ready to compete” against Comcast after the merger.⁶² In response to competition from Comcast’s and TWC’s broadband offerings, Verizon introduced a “double up” promotion, which bundles wireless with wireline broadband.⁶³ AT&T recently redesigned its U-verse user interface with some features similar to Comcast’s X1.⁶⁴ DIRECTV is exploring ways to offer a national OTT video service.⁶⁵ Around the same time Comcast began deploying X1, DISH started deploying advanced DVRs that include its “Hopper” technology,⁶⁶ and is reportedly planning to roll-out a new OTT video service as well, having recently signed a deal with Disney.⁶⁷ Verizon FiOS is focusing on improving its TV Everywhere and Redbox services.⁶⁸

⁶⁰ FCC 15th Video Competition Report, ¶ 86.

⁶¹ Randall L. Stephenson, President and CEO of AT&T, Inc., Morgan Stanley Technology, Media & Telecom Conference Call Transcript, 3/6/14. See also Thomas Gryta, “Comcast Has AT&T Worrying About the US,” *The Wall Street Journal*, 3/6/14.

⁶² Jim Barthold, “Comcast’s Smit: MSO, Time Warner Cable are ‘very well aligned,’” *Fierce Cable*, 3/10/14, available at <http://www.fiercecable.com/story/comcasts-smit-mso-time-warner-cable-are-very-well-aligned/2014-03-10>.

⁶³ Sean Buckley, “Verizon’s Shammo: We’ll look at FiOS expansions once it returns the cost of capital,” *Fierce Cable*, 3/10/14, available at <http://www.fiercetelecom.com/story/verizons-shammo-well-look-fios-expansions-once-it-returns-cost-capital/2014-03-10>.

⁶⁴ Jim Barthold, “AT&T juices up U-verse on-demand features, redesigns user interface,” *Fierce Cable*, 5/16/13, available at <http://www.fiercecable.com/story/att-juices-u-verse-demand-features-redesigns-user-interface/2013-05-16>.

⁶⁵ SNL Kagan, “The top 20 reasons why it makes sense today for cable MSOs to consolidate,” 12/16/13.

⁶⁶ See, e.g., Amar Toor, “Dish Network announces Hopper DVR system, Joey set-top box, launched broadband, Test Drive services,” *Engadget*, 1/9/12, available at <http://www.engadget.com/2012/01/09/dish-network-announces-hopper-dvr-system-joey-set-top-box-laun>; Andy Vuong, “Set-top box battle: Dish’s Hopper with Sling Vs. Comcast’s Xfinity X1,” *The Denver Post*, 3/11/13, available at http://www.denverpost.com/ci_22750649/set-top-box-battle-dishs-hopper-sling-vs.

⁶⁷ Liana B. Baker and Varun Aggarwal, “Dish eyes Internet TV services in landmark Disney deal,” *Reuters*, 3/4/14, available at <http://www.reuters.com/article/2014/03/04/us-dish-disney-idUSBREA222A720140304>.

⁶⁸ Steve Hawley, “CES: Verizon Updates FiOS, Redbox Instant to Meet Borderless Lifestyle Demands,” *Telecompetitor*, 1/15/13, available at <http://www.telecompetitor.com/ces-verizon-updates-fios-redbox-instant-to-meet-borderless-lifestyle-demands/>.

83. In addition to making Comcast a better competitor with its traditional facilities-based MVPD and broadband rivals, the increased investment in advanced video services due to the transaction will allow Comcast and cable providers generally to be stronger competitors to major national and global technology companies and OVDs like Apple, Samsung, Sony, Google, Netflix, Amazon, and others who also sell video products, technologies, and services to consumers—and who serve many more users and employ many more developers than Comcast and TWC combined.⁶⁹ Not only will Comcast be better situated to serve customers in competition with these companies, but it will also be better positioned to attract technology and content partners looking for a broad new platform and customer base for innovation and distribution of their products and offerings, as we discuss in Section IV.B.1.

B. Benefits to Residential Customers

84. We now consider some of the specific competitive benefits and efficiencies likely to be realized from the transaction. In this section, we discuss how increased scale, expanded geographic reach, and sharing of technologies and services from the transaction will bring benefits to residential customers across the footprint of the combined company. These benefits include increased investment and innovation and, in turn, new and improved services that increase consumer welfare.⁷⁰

1. Economies of Scale

85. As cable operators provide more advanced technologies and services to residential customers (e.g., advanced video services, digital voice services, and faster broadband speeds), they have been required to make significant investments in R&D and in network infrastructure and customer premises equipment that free up bandwidth, increase delivery speeds, and improve the user interface. Many of these investments are fixed costs that lead to economies of scale. In

⁶⁹ The race for new ways to deliver video to consumers includes streaming media devices like AppleTV, Google's Chromecast, and the Roku player, in addition to attempts by multiple companies to create "smart TV" products. Tim Bjarin, "How Apple Will Disrupt the TV Market," *Time*, 6/17/13, available at <http://techland.time.com/2013/06/17/how-apple-will-disrupt-the-tv-market/>. See Greg Bensinger, *Amazon Unveils Video-Streaming Device Fire TV*, Wall St. J., Apr. 2, 2014..

⁷⁰ For more on how new services increase consumer welfare, see, e.g., Jerry A. Hausman (1996), "Valuation of New Goods Under Perfect and Imperfect Competition," in *The Economics of New Products*, T.F. Bresnahan and R.J. Gordon, eds. Chicago: University of Chicago Press; Jerry A. Hausman (1997), "Valuing the Effect of Regulation on New Services in Telecommunications," *Brookings Papers on Economic Activity: Microeconomics*, pp. 1–38.

this subsection, we provide examples of how the transaction will lead to economies of scale in developing and deploying technologies and services, allowing Comcast to bring innovative offerings to residential customers.

86. Comcast's investment in its X1 platform provides an example of how the increased scale enabled by the transaction can facilitate investment in advanced services. The X1 is a set-top box platform that substantially enhances the cable TV experience by providing more interactivity than a traditional program guide, including a powerful and convenient way to search for programming, voice search, a user-friendly interface for VOD, Internet-delivered apps, and access to the Internet.⁷¹ Also, because many of the capabilities of the X1 platform reside in the cloud, the system can be more easily upgraded without needing to replace the set-top box; in fact, Comcast has already started to roll out an updated interface for X1 (with the internal name X2) without any change in hardware or the need for a lengthy software download to the set-top box, as would be necessary with almost all cable operators' legacy set-top boxes.⁷²

87. Developing the X1 technology along with the updated X2 interface required a large up-front investment of {{ }}, most of which involved fixed research and development costs.⁷³ Even with this large investment, Comcast was limited in the features it could develop for the new platform without incurring delay or additional expense. Of the three major advancements it wanted to bring to video customers—a new application platform, new equipment, and new IP video delivery system—Comcast was only able to accomplish two at the outset.⁷⁴ Comcast was not able to make the investments necessary to develop its IP video platform with X1 fully, and only recently began deploying that IP video platform earlier this year (almost two years after it first launched the X1 platform).⁷⁵ Had Comcast been able to justify an

⁷¹ Comcast began rolling out its advanced X1 platform in 2012, and it has been available in all Comcast systems since January 2014. Richard Lawler, "Comcast officially launches next-gen X1 DVR platform and iPhone remote app," *Engadget*, 5/21/12, available at <http://www.engadget.com/2012/05/21/comcast-x1-dvr-iphone-app-launch>. Comcast.com, "Xfinity TV's Next-Gen X1 Platform: The Future of Television," available at <http://corporate.comcast.com/news-information/news-feed/xfinity-tvs-next-generation-x1-platform-the-future-of-tv>.

⁷² Jeff Baumgartner, "Comcast Ramps Up 'X2' Rollout," *Multichannel News*, 2/3/14, available at <http://www.multichannel.com/distribution/comcast-ramps-%E2%80%98X2%20rollout/148083>; Comcast Press Release, "Introducing X2: The Next Generation of Comcast's X1 Operating System," 6/11/13, available at <http://corporate.comcast.com/news-information/news-feed/introducing-x2>.

⁷³ Interview with Tony Werner (Executive Vice President and Chief Technology Officer, Comcast Cable).

⁷⁴ Interview with Sree Kotay (Senior Vice President, Chief Software Architect, Comcast Cable).

⁷⁵ Interview with Sree Kotay (Senior Vice President, Chief Software Architect, Comcast Cable). Comcast Press Release, "Comcast Launches X1 DVR with Cloud Technology and Live In-Home Streaming in Boston," 2/4/14,

even larger upfront investment in research and development, as well as a larger investment in equipment and network infrastructure, it could have either (1) brought the technology to market sooner, (2) added more advanced features and functionality to the initial release (for example, IP video), perhaps by hiring more developers to work in parallel and/or by purchasing more equipment for developers, or (3) invested in IP video technology, such as multicasting—an investment neither Comcast nor TWC has yet been able to make—to hasten the transition to full IP even faster.⁷⁶

88. If Comcast had a larger scale, it could have justified additional upfront investment in X1 because having additional X1 customers leads to greater positive net cash flows.⁷⁷ Comcast estimated an internal rate of return of {{ }}% from increasing the penetration of X1 within its footprint.⁷⁸ This rate of return for expanding X1 to more customers within its own footprint indicates that Comcast would likely see a similarly high rate of return from expanding X1 to the incremental customers added by the transaction, which could justify an increased fixed cost investment in the platform. And of course, not just Comcast but customers would benefit from increased fixed cost investment in the platform by obtaining access to innovative technology sooner or with more advanced features.

89. Another area in which the increased scale enabled by the transaction will facilitate investment is in developing applications for third-party devices. The entire development of such applications is a fixed cost investment. Moreover, because consumer interest has shifted to watching video on a range of devices, cable operators have to develop different apps for different third-party devices, increasing development costs. In addition, newer versions of third-party devices can also result in additional development costs for updating the apps. Although Comcast and TWC have apps available for some third-party devices, the increase in scale due to the transaction will allow Comcast to provide fully-featured apps for more third-party devices more

available at <http://corporate.comcast.com/news-information/news-feed/comcast-launches-x1-dvr-with-cloud-technology-and-live-in-home-streaming-in-boston>.

⁷⁶ Interview with Sree Kotay (Senior Vice President, Chief Software Architect, Comcast Cable).

⁷⁷ Specifically, when making its decisions about deploying X1 based on its current scale, Comcast took into account that additional customers lead to additional revenues by reducing churn, increasing VOD revenue, increasing DVR rental revenue, increasing set-top box rental revenue, and increasing revenue from purchases of bundled services. Along with these increased revenues, there are also additional costs, including the costs of providing the additional services as well as increased tech support and customer service costs. Interview with Marcien Jenckes (Executive Vice President, Consumer Services, Comcast Cable).

⁷⁸ Interview with Marcien Jenckes (Executive Vice President, Consumer Services, Comcast Cable).

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quickly by spreading these fixed costs across a greater number of customers, enhancing the benefits it provides to its customers.

90. At its current scale, Comcast has only been able to devote limited resources and a limited number of developers to creating apps, which means it has had to focus on developing apps for platforms that will serve what it believes is the largest segment of its customers. For example, Comcast has [[]] the development of apps for Apple products to be ready at launch but development of the same apps for Android devices has consistently lagged.⁷⁹ The new Xfinity TV app was available for Apple products when Comcast launched its live TV streaming feature and cloud DVR service, but there was a delay in the launch of the same app for older Android phones and even a longer delay in the launch of the same app for newer Gingerbread Android phones.⁸⁰

91. Comcast's and TWC's current scales give third-party manufacturers of consumer devices, such as Microsoft and Sony, less incentive to pre-install apps and Comcast's services in their devices than they would for the combined company.⁸¹ For example, although Comcast and TWC both currently offer TV Everywhere service to customers within their respective footprints, Comcast believes an increased scale would give the service greater national visibility and make it easier to market TV Everywhere services to device manufacturers.⁸² The increased scale and visibility enabled by the transaction should make device manufacturers more willing to pre-install a TV Everywhere app because the TV Everywhere service accessible via that app will be available to more of the manufacturer's customers.⁸³ In addition, the transaction may allow Comcast to get more momentum behind this effort, which may sway other cable operators into participating to help create a national TV Everywhere "front door" for cable operators, benefitting consumers through broader and easier access to more of the content their cable provider offers.⁸⁴

⁷⁹ Interview with Sree Kotay (Senior Vice President, Chief Software Architect, Comcast Cable).

⁸⁰ Interview with Sree Kotay (Senior Vice President, Chief Software Architect, Comcast Cable).

⁸¹ Interview with Marcien Jenckes (Executive Vice President, Consumer Services, Comcast Cable).

⁸² Interview with Marcien Jenckes (Executive Vice President, Consumer Services, Comcast Cable).

⁸³ Although both Comcast and TWC currently offer some apps for third-party devices, including Microsoft's Xbox, these apps are usually not pre-installed.

⁸⁴ MoffettNathanson Report, "Comcast and Time Warner Cable: What Will it Cost to Seal the Deal in D.C.?" 3/5/14, p. 20.

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92. Similarly, the larger scale enabled by the transaction should make the combined company a more attractive partner for technology firms seeking to design equipment that enables delivery of video and other services to consumers in new, innovative ways. Technology companies and others also might be more interested in investing in creating apps or web content for the X1 platform, if the combined company offered the ability to reach more homes.

93. A third example of the benefits of scale is Comcast's fixed cost investment in creating metadata for its video programming assets. This metadata relating to programming content (information describing the attributes of a programming asset) has become increasingly necessary as Comcast offers more advanced video services in addition to standard linear channels—metadata is needed for storing and searching assets efficiently.⁸⁵ While Comcast has made searching for content easier, as X1 search capabilities demonstrate, bringing more advanced services such as deep metadata tagging and advanced accessibility features to products will benefit from increased scale to amortize the cost.⁸⁶ With Comcast's increased scale after the transaction, the per-customer cost of such an investment will be lower. This lower per-customer cost will allow Comcast to accelerate the development of these technologies faster than it would be able to with smaller scale. This in-depth metadata will benefit customers by making programming content searches more granular and allow customers to get to their content or specific locations within the content faster.⁸⁷

94. Comcast's and TWC's investments in whole home management tools, such as parental controls or antivirus software, that can be implemented in a device-independent way provide another example of scale economies. When each household had only a few PCs connected to the Internet, it was sufficient to install software on those computers to provide services like parental controls and antivirus protection. As more and more devices in the home are connected to the Internet, tools for managing network traffic that operate on only one device are becoming less useful.⁸⁸ Both Comcast and TWC have considered offering whole home cloud-based services

⁸⁵ A programming asset's metadata provides the information surrounding that asset that would allow a user or computer to find very specific content. For example, enhanced metadata would allow a user to search for something as specific as movies starring John Wayne released between 1940 and 1950 and set in Florida.

⁸⁶ Interview with Tony Werner (Executive Vice President and Chief Technology Officer, Comcast Cable).

⁸⁷ Interview with Tony Werner (Executive Vice President and Chief Technology Officer, Comcast Cable).

⁸⁸ The average U.S. Internet household has 5.7 Internet-connected devices. NPD Group, "Internet Connected Devices Surpass Half a Billion in U.S. Homes, According to The NPD Group," 3/18/13, available at

that are not device-specific.⁸⁹ These might include parental controls, antivirus software, and customer-controlled network traffic prioritization within the home. Developing these tools requires fixed cost investments in technology that would allow these services to run at the modem level or in the cloud.⁹⁰ The additional scale afforded by the transaction would allow the combined company not only to develop and deploy these and future home management services more efficiently, but also market the services more effectively and educate consumers about them.⁹¹

2. Expanded Geographic Reach

95. Expanded geographic reach and agglomeration should increase Comcast's ability to serve residential customers in multiple ways. Greater geographic reach should allow Comcast to provide its customers with a more valuable and capable network of Wi-Fi access points; it should provide incentive for Comcast to increase the performance of all of its services in certain geographic areas by installing regional access networks and corresponding regional data centers; and it should allow Comcast to provide more compelling electronic sell-through and TV Everywhere services.

96. First, expanded geographic reach should increase Comcast's investment in Wi-Fi access points. Comcast's current Wi-Fi network provides high-speed data access outside customers' homes and businesses through public Wi-Fi gateways, hotspots in commercial establishments, and "Neighborhood hotspots" that Comcast customers make available for public use.⁹² A Wi-Fi network becomes more valuable as its coverage becomes more ubiquitous.

97. To attempt to address the problem of lack of coverage outside of their own footprints, Comcast, TWC, and three other cable operators (Bright House Networks, Cox Communications,

<https://www.npd.com/wps/portal/npd/us/news/press-releases/internet-connected-devices-surpass-half-a-billion-in-u-s-homes-according-to-the-npd-group/>.

⁸⁹ Interview with Marcien Jenckes (Executive Vice President, Consumer Services, Comcast Cable); Interview with Peter Stern (Executive Vice President and Chief Strategy Officer, Time Warner Cable).

⁹⁰ Interview with Marcien Jenckes (Executive Vice President, Consumer Services, Comcast Cable); Interview with Peter Stern (Executive Vice President and Chief Strategy Officer, Time Warner Cable).

⁹¹ Interview with Marcien Jenckes (Executive Vice President, Consumer Services, Comcast Cable); Interview with Peter Stern (Executive Vice President and Chief Strategy Officer, Time Warner Cable).

⁹² **[[** offers 867,000 Wi-Fi access points in its footprint.

]]. Comcast currently

and Cablevision) created a partnership called “Cable WiFi.” This partnership allows the customers of any of the member operators to access the other operators’ Wi-Fi hotspots.⁹³

98. However, the “Cable WiFi” partnership does not require all cable operators to invest extensively in a Wi-Fi network. For example, TWC has not invested in Wi-Fi for its own customers as extensively as Comcast. In addition, allowing for access by any customer to any cable operator’s Wi-Fi hotspot through the Cable WiFi partnership has required layering an additional set of technologies on top of each cable operator’s existing Wi-Fi network, and therefore it is less efficient than running the Wi-Fi network on a common technology within the combined company’s footprint.⁹⁴

99. The increased geographic reach from the transaction will give Comcast a greater incentive to invest in its Wi-Fi network because it will be able to internalize the benefits for travelling customers that arise from creating a more ubiquitous network. For example, TWC’s Wi-Fi network is a benefit to its own customers and to Comcast’s travelling customers. However, TWC only considers the benefits to its own customers (and not those of its Cable WiFi partners) when deciding where to add Wi-Fi hotspots. After the transaction, Comcast will not only take account of the TWC customer benefits, but also the benefits to customers travelling from the original Comcast service areas. Comcast will thus have a greater incentive to deploy Wi-Fi hotspots in TWC service areas. These incentives are reciprocal, so the increased build-out incentive will cover the entire footprint of the combined firm. Furthermore, the increased density and geographic reach of Wi-Fi could make it easier for Comcast to introduce a Wi-Fi-first wireless service that could potentially compete with current mobile wireless providers.⁹⁵

100. Comcast’s investment in CRANs provides another example of the benefits of geographic reach and agglomeration. CRANs are regional networks that connect Cable Modem Termination Systems (“CMTSes”), local routers, and regional routers by fiber to each other and to the

⁹³ This gives Comcast customers access to over 145,000 Wi-Fi hotspots outside the current Comcast footprint.

⁹⁴ Interview with Mike Hayashi (Executive Vice President of Architecture, Development and Engineering, Time Warner Cable).

⁹⁵ Comcast may be able to offer service that combines Wi-Fi access with wireless access through MVNO agreements with commercial mobile wireless operators.

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Internet backbone.⁹⁶ CRANs vary in size depending on the markets they serve, but generally connect geographically-proximate markets together in order to achieve geographic synergies. Comcast supports each CRAN with at least one regional data center.

101. In certain geographic areas such as New England and the Carolinas, the transaction will add TWC systems to nearby Comcast systems.⁹⁷ As Comcast adds TWC systems in regions near to its own systems, it may find it efficient to build out new CRANs and regional data centers to support those CRANs. Building out CRANs increases the efficiencies of the network by allowing investments to be scaled over more customers; delivering more scalable capacity for broadband and IP cable services, as well as business services like metro Ethernet and cell tower backhaul; reducing latency in delivering services to customers; making the network more reliable and resilient (building in redundancy); and potentially offering new options for regional interconnections (by building fiber to third-party interconnection facilities).⁹⁸ Comcast's regional data centers enable Comcast to offer new IP cable services, to better support the X1 platform, and to potentially offer another regional option for interconnection with Comcast's network.

102. Finally, the increased geographic reach from the transaction will allow Comcast to enhance the appeal and value to consumers of Comcast's new "Xfinity TV Store," Comcast's electronic sell-through ("EST") service that offers movies and TV shows for consumers to purchase electronically.⁹⁹ Unlike the traditional VOD model, in which the consumer pays to watch the content once, EST gives the consumer permanent access to the content.¹⁰⁰ Apple and Amazon are the largest providers of EST. Comcast's limited footprint inherently reduces the

⁹⁶ [[

]]. The CRAN includes all pieces of the network from the Regional Core network level and down.

⁹⁷ For example, in the Carolinas, Comcast serves customers primarily in South Carolina, while TWC serves customers in both North and South Carolina. In New England, Comcast serves customers primarily in parts of Connecticut, Massachusetts, and Vermont, while TWC serves customers primarily in New Hampshire and Maine.

⁹⁸ To the extent building out CRANs to regional data centers offer additional points of interconnection into Comcast's network, customers may see lower latency in their connections, which can improve some latency-sensitive services, for example, in gaming applications. Edge providers may also benefit from being near a regional interconnection point, because it can lead to space and power reductions as compared to other options, which can provide cost reductions of [[]]. Interview with Kevin McElearney (Senior Vice President, Network Engineering, Comcast).

⁹⁹ Comcast customers that purchase EST through Xfinity TV Store can then watch their purchases through their cable service on TVs and online at XfinityTV.com, or download their purchases to the device of their choice. See <http://www.xfinitypurchases.com/>.

¹⁰⁰ Although the consumer may own the content forever, it may become inaccessible due to changing technology or loss of support for certain platforms.

value of its EST product to consumers. Specifically, when a consumer purchases a movie or TV show from Comcast's EST store and moves out of the Comcast footprint and therefore terminates service with Comcast, that consumer will no longer be able to watch his/her EST purchases through his/her cable service and will only be able to access it online. The transaction, through the expansion of Comcast's and TWC's footprint, will allow the combined company's customers to move anywhere in the larger footprint and continue to be able to access their purchases on their TVs directly through their cable service as well. For example, currently if a Comcast customer moves from New Jersey to a location in New York City (or anywhere else) served by TWC, that customer cannot access Xfinity TV Store purchases on their cable TV service. However, after the transaction, that customer would be able to port purchases to the new location and access them easily on a television.

3. Sharing of Technologies and Services

103. Combining Comcast's and TWC's portfolios of technologies and services should improve quality and availability of services to residential customers. The transaction will extend the benefits of Comcast's all-digital network to TWC systems; it will extend Comcast's industry-leading VOD service to TWC systems; it will combine the two companies' specialized knowledge in IP cable and set-top box user interfaces; and it will increase the self-service and self-installation options for TWC customers.

104. Comcast plans to convert TWC systems to all-digital more rapidly than TWC plans, which will benefit customers served by those systems through earlier and increased availability of advanced digital services and faster broadband speeds. Transitioning a network to all digital frees up bandwidth and allows a cable operator to increase the number of video channels it offers consumers as well as increase the bandwidth available for IP services (both cable and Internet).¹⁰¹ Transitioning to all-digital also results in increased video quality because it avoids conversions to analog signals, which can lead to reduced signal quality.¹⁰²

¹⁰¹ For example, a single 6 MHz QAM channel that was used to deliver a single analog TV channel can be converted to digital and then deliver 10–12 standard definition TV channels or 2–3 high definition TV channels. FCC 15th Video Competition Report, fn. 265. That same 6 MHz QAM channel can also deliver approximately 38 Mbps worth of IP traffic, and, utilizing DOCSIS 3.0 technology (described below), can be bonded with other 6 MHz QAM channels to create more capacity and increase speeds for IP traffic.

¹⁰² Interview with John Schanz (Executive Vice President and Chief Network Officer, Comcast Cable).

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105. Comcast's relatively large scale among cable operators gave it an incentive to be at the forefront of the all-digital transition.¹⁰³ TWC took a different approach to freeing up bandwidth by adopting "switched-digital video" (SDV), but it is now beginning to make the transition to an all-digital network to be able to deploy more advanced services. Currently only 17% of TWC's systems are all-digital and TWC plans to be all-digital in 75% of its footprint by the end of 2016.¹⁰⁴ Comcast has stated that the transition of TWC systems to all-digital will be an initial focus immediately after the transaction.¹⁰⁵ With the knowledge and experience Comcast brings from its own transition to all-digital, as well as the additional financial resources, it is likely that 100% of the acquired TWC systems will be transitioned to all-digital faster than they would be absent the transaction, which means customers will have access to more advanced services, including faster Internet speeds, sooner.

106. The transaction should also lead to more VOD content for customers in current TWC territory. As part of its array of video services, Comcast offers a large and growing VOD library, which includes almost 50,000 programming choices with 15,000 choices in high definition in select markets.¹⁰⁶ Comcast is widely acknowledged as leading the MVPD industry in offering VOD content and expects to bring its commitment to VOD to the TWC systems.¹⁰⁷ Customers in current TWC territories should benefit from getting access to this VOD content after the transaction, as soon as Comcast's contracts permit and the acquired systems have been integrated into Comcast's VOD content delivery network. Bringing TWC's VOD services up to Comcast's standards will require certain fixed cost investments (e.g., system upgrades in the TWC network), and the increased scale from the transaction will accelerate such investments.

107. The transaction should benefit customers of the combined company by also bringing Comcast's X1 platform and IP cable technologies to TWC's systems and bringing TWC's

¹⁰³ SNL Kagan, "The top 20 reasons why it makes sense today for cable MSOs to consolidate," 12/16/13: "Cable MSOs have achieved operating efficiencies via technological progress that make larger scale more efficient. ... Larger MSOs can better leverage the opportunities presented by this kind of environment. ... In addition, cable MSOs can now harvest investments in their platforms, for example going all-digital, a transition that was led by Comcast; Time Warner Cable is going much slower in this initiative, with only a few markets, including Manhattan, N.Y., all-digital currently." FCC 15th Video Competition Report, ¶ 87.

¹⁰⁴ SNL Kagan, "Charter, Time Warner Cable lag in all-digital push to convert CapEx into capacity," 1/17/14; TWC Operational and Financial Plan, 1/30/14, p. 11.

¹⁰⁵ Michael Farrell, "Smit: TWC Will Go All-Digital," *Multichannel News*, 3/10/14.

¹⁰⁶ MoffettNathanson Report, "Comcast Q4 2013 Earnings: Boardwalk Empire," 1/28/14, p. 2: "Their VOD service is the video industry's best library."

¹⁰⁷ MoffettResearch Report, "Cable and Satellite: The Next Ten Years," 6/4/13, p. 34.

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advances in IP cable to Comcast's systems. After the transaction, Comcast plans to roll out X1 to the acquired TWC systems rapidly, giving customers in TWC's current territory access to a technology that TWC had been unable to deploy on its own or obtain through licensing.

108. In addition, Comcast and TWC have taken different approaches in developing IP cable technologies and services, and the combined company will benefit from the sharing of best practices. Delivering cable services via IP, particularly with IP multicasting, offers multiple benefits to consumers relative to traditional QAM-based cable. In particular, IP cable offers better service at lower cost, while using less bandwidth and less energy, and enables customers to watch their cable services on a wide variety of IP-enabled devices such as computers, smartphones, and tablets.¹⁰⁸

109. Comcast's IP cable offerings include a live in-home TV streaming feature that allows customers to watch essentially their entire linear lineup, including all PEG and must-carry channels, on their computers and on smartphones and tablets.¹⁰⁹ TWC's IP service replicates the traditional linear lineup, but only includes local broadcast channels in some areas and PEG channels in New York and Kansas City.¹¹⁰ This transaction will allow Comcast's and TWC's customers to benefit from the best aspects of each company's approach to IP cable.

110. In addition, customers in current TWC territory will benefit from getting access to Comcast's innovative self-installation and self-service options. As part of Comcast's efforts to provide efficient customer service and following its conversion to digital, Comcast introduced self-service products, including self-install kits and online self-service.¹¹¹ Self-install kits allow

¹⁰⁸ Comcast's next-generation set-top box, with the internal name Xi3, will be an all-IP set-top box. That is, all content to the Xi3 will be delivered using IP, removing the need for a QAM tuner and enabling the delivery of the X1 platform experience over a customer's in-home Wi-Fi network, without needing to run coaxial cable to the set-top box. Mari Silbey, "Comcast plans the X3, its first all-IP HD set-top," *Fierce Cable*, 4/5/12, available at <http://www.fiercecable.com/story/comcast-plans-x3-its-first-all-ip-hd-set-top/2012-04-05>.

¹⁰⁹ Comcast Press Release, "Comcast Launches X1 DVR with Cloud Technology and Live In-Home Streaming in Boston," 2/4/14, available at <http://corporate.comcast.com/news-information/news-feed/comcast-launches-x1-dvr-with-cloud-technology-and-live-in-home-streaming-in-boston>.

¹¹⁰ SNL Kagan, "Cable's managed IP video poised for progress in 2013," 12/21/12; Interview with Marcien Jenckes (Executive Vice President, Consumer Services, Comcast Cable). TWC's IP cable product does not cover all traditional Title VI functions, including PEG and must-carry channels as well as accessibility features, in all areas.

¹¹¹ Todd Spangler, "Comcast Self-Install Kits Let Subs Connect Without Truck Roll," *Multichannel News*, 5/9/11, available at <http://www.multichannel.com/marketing/comcast-self-install-kits-let-subs-connect-without-truck-roll/138092>; John Williamson, "Improving Online Self Service," *Comcast Voices*, 5/9/12, available at <http://corporate.comcast.com/comcast-voices/improving-online-self-service>; Gene Marks, "How Comcast Succeeds by Providing Less Customer Service," *Forbes*, 8/5/13, available at

customers to hook up video, broadband, or voice service without an on-site cable technician. Self-install kits are cheaper for consumers than a traditional technician installation: \$9.95 shipping and handling compared to a \$50–60 technician installation fee.¹¹² By investing millions of dollars in developing and designing the self-install kits, Comcast was able to reduce the marginal cost of adding new customers.¹¹³ While TWC has been able to invest in some self-installation options for existing customers, it does not yet offer a self-install option for new customers.¹¹⁴

4. Contracting as an Alternative

111. As discussed above, a potential alternative to achieve the benefits of scale, geographic reach, and sharing of technologies and services could be through partnerships or licensing arrangements among cable companies operating in different geographic regions. Cable operators have in the past attempted to partner in providing services to residential customers, but in many cases, these partnerships were not pursued or were not successful. Three specific examples illustrate the difficulties in contracting to obtain the benefits discussed above: the costs and difficulties associated with licensing the X1 platform, the inability to create a cross-provider partnership for a common “front door” for TV Everywhere services, and the lack of success of Comcast and TWC collaborating to offer a “Download To Go” feature across their combined footprint.

112. First, Comcast’s discussions with TWC about licensing the X1 platform {{

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<http://www.forbes.com/sites/quickerbetteertech/2013/08/05/how-comcast-succeeds-by-providing-less-customer-service/>.

¹¹² Todd Spangler, “Comcast Self-Install Kits Let Subs Connect Without Truck Roll,” *Multichannel News*, 5/9/11, available at <http://www.multichannel.com/marketing/comcast-self-install-kits-let-subs-connect-without-truck-roll/138092>.

¹¹³ Interview with John Schanz (Executive Vice President and Chief Network Officer, Comcast Cable). In the second quarter of 2013 alone, Comcast reduced its number of truck rolls by nearly 1 million. Comcast Q2 2013 Earnings Call Transcript.

¹¹⁴ TWC Q4 2013 Earnings Call Transcript; TWC offers self-installation in some instances for existing customers adding new service. Timewarnercable.com, Account and Billing FAQs, “What criteria do I have to meet to be able to do a self-installation?” available at <http://www.timewarnercable.com/en/residential-home/support/faqs/faqs-account-and-billing/new-service/what-criteria-do-i-have-to-meet-to-be-able-to-do-a-self-installation.html>.

113. TWC has been interested in developing its own advanced video platform, but with its current scale it has yet to deploy the required technology.¹¹⁵ As a workaround to developing the technology itself, {{

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114. Second, Comcast's and TWC's efforts to develop a common "front door" by which cable customers nationwide could access TV Everywhere content from their local cable operator met with frustration. This front door was conceived as a single application and user interface for customers to access their respective cable providers' TV Everywhere content on third-party consumer-owned devices, such as tablets, phones, computers, and gaming consoles.¹¹⁸ This effort was unsuccessful because, among other things, conforming to a common approach given the realities of differing legacy and planned technologies, priorities, and business models became overly complex for both parties.¹¹⁹ As a result, Comcast and TWC were unwilling to make the necessary investments. The transaction makes the agreement unnecessary.

115. As a third example, Comcast and TWC were not able to collaborate to offer a "Download To Go" feature across their combined footprint. Comcast offers its customers the ability to download content to mobile devices and tablets via the Xfinity TV Go app, which allows

¹¹⁵ Interview with Mike Angus (Senior Vice President and General Manager, Video, Time Warner Cable). TWC employs roughly 300 developers, compared to Comcast's 1,000. Interview with Kevin Leddy (Executive Vice President, Technology Policy and Product Management, Time Warner Cable).

¹¹⁶ Interview with Mike Hayashi (Executive Vice President of Architecture, Development and Engineering, Time Warner Cable).

¹¹⁷ {{

}}. Interview with Mike Angus (Senior Vice President and General Manager, Video, Time Warner Cable). We understand that Comcast has been pursuing an X1 licensing arrangement with another cable operator, and has come close to reaching initial terms for a trial, but there are still several outstanding issues that the parties will have to explore to determine whether the arrangement makes technical and economic sense for both companies.

¹¹⁸ See Declaration of Michael J. Angelakis, ¶ 17.

¹¹⁹ See Declaration of Michael J. Angelakis, ¶ 17.

customers to watch content on those devices when not connected to the Internet.¹²⁰ Comcast and TWC put time and effort into a technical collaboration to make this technology available to TWC customers. However, they ultimately found that the difficulties and costs associated with supporting two different technology roadmaps were prohibitive and they were not able to proceed with the partnership.¹²¹ While Comcast offer such a feature, TWC, despite trying to work with Comcast to implement a common solution, does not. After the transaction, the companies will have a combined roadmap and aligned priorities, making the broader adoption of the Download To Go feature more likely.

C. Benefits to Business Customers

116. In recent years, Comcast and TWC began to provide communication services to businesses, a segment that has long been dominated by large incumbent telephone companies such as AT&T, Verizon, and CenturyLink. Competing ILECs are many times the size of TWC and Comcast in business services.¹²² In this section, we discuss how the transaction will bring benefits to business customers across the footprint of the combined company.¹²³

117. Comcast first entered the small business segment (generally less than 20 employees) in 2006; this required investment in network infrastructure, business systems, and sales and support organizations.¹²⁴ Small business customers typically require Internet service, video, and voice.¹²⁵

¹²⁰ See Comcast.com, "XFINITY TV Go App with Download Feature Frequently Asked Questions," available at <http://customer.comcast.com/help-and-support/xfinity-apps/xtv-go-app-download-feature-faqs>.

¹²¹ Interview with Sam Schwartz (Chief Business Development Officer, Comcast).

¹²² In 2013, Comcast and TWC reported business services revenues of \$3.2 billion and \$2.3 billion, respectively. Verizon reported \$14.7 billion in sales to "medium and large" business customers, and CenturyLink reported \$11.1 billion in business, wholesale, and data hosting revenues. AT&T reported \$8.8 billion in worldwide business customer revenue in one quarter of 2013 – an annualized revenue stream of approximately \$35 billion – and reported that worldwide revenue from "strategic business services", which include VPN, Ethernet, cloud, hosting, and other advanced IP services, were \$9 billion on an annualized basis. See Comcast 2013 Form 10-K, p. 53; TWC 2013 Form 10-K, p. 32; Verizon 2013 Form 10-K, March 7, 2014, p. 19; CenturyLink 2013 Form 10-K, p. 50; and AT&T Investor Briefing No. 283, January 28, 2014, available at http://www.att.com/Investor/Earnings/4q13/ib_final_4q13.pdf.

¹²³ Dr. Israel's declaration also discusses the benefits of the transaction to current and potential business customers.

¹²⁴ See "Our History", Comcast Business: "2006: Comcast formed Business Services and launched Internet and voice services for small businesses with less than 20 employees. Annual revenue for 2006 was \$265 million, available at <http://business.comcast.com/about-us/our-history>. We adopt Comcast's categorization of small, mid-sized, and large business customers. See, e.g., Comcast 2013 Form 10-K, p. 5. While others, including TWC, may use different definitions of the boundaries between market segments, these differences have no material impact on our conclusions.

¹²⁵ Interview with Kevin O'Toole (Senior Vice President and General Manager, New Business Solutions, Comcast Cable).