NEW YORK STATE OF OPPORTUNITY. | Department of Public Service

Case 14-C-0370 - In the Matter of a Study on the State of Telecommunications in New York State

Staff Assessment of Telecommunications Services

Department of Public Service
Office of Telecommunications

June 23, 2015

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INTRODUCTION

This New York State Department of Public Service Staff (Staff) assessment provides a factual overview of the current landscape for communications in New York State, as well as a historical perspective of certain industry and consumer trends. It builds upon past efforts, and seeks to establish a foundation for further dialogue and for the State to determine whether there needs to be changes to regulation, policies and practices to ensure that the communications industry in New York is "future proofed" to meet the rapidly evolving consumer demands.

The last decade has produced radical change throughout the telecommunications industry. Previously, voice and video were distinct services, with different technology platforms, capabilities and benefits. This is no longer true. The Internet and broadband connections to the Internet have emerged as a powerful technology that has disrupted all of the conventional wisdom that governed the mechanisms, business models and regulatory construct for overseeing voice, cable and data communications throughout most of the 20th Century and until this year, the 21st Century.

Voice service provides the consumer with a telephone number that can be used by other parties to contact them, and enables real-time voice communications and the transmission of sound between two or more users; it also provides access to E911 services. Where telecommunication was previously a terrestrial service provided over copper cable, telecommunication today includes wireline and wireless services, broadband-based services that include over-the-top providers. In addition, along with traditional voice communications, the broadband and wireless networks have also created the emergence of voice and visual communications such as Skype and FaceTime, and has seen the emergence of texting and email as further mechanisms for real-time connections. While none of these latter vehicles fall within the traditional definitions of telecommunications, they are indicative of how the emergence of broadband and wireless technologies are radically altering the societal norms of interactive communication.

Video service typically provides content with multiple channels, each of which contain different programming and can be switched between at will. Most video services include the retransmission of local television broadcast signals. Where, previously, content services were the exclusive domain of cable companies and the broadcast system, broadband allows the emergence of over-the-top providers (those providing video service on broadband data connections). These allow the a la carte selection of programming, instead of being organized into pre-scheduled channels. Broadband service provides a high-speed, bidirectional connection to the Internet, allowing the user to transmit and receive information such as text, images, audio and video. Broadband services (commonly referred to as ISPs or Internet Service Providers) are commonly used by over-the-top providers to deliver voice and video service.

Voice, video and broadband have converged, and each are now available across all technology platforms and offered via copper, fiber, coaxial cable, satellite and mobile networks, as well as by so-called edge providers, such as Vonage and Netflix, which offer voice and video services through a consumer's broadband connection. In the past, consumers interacted with a phone or cable company regarding primarily video or telephone, respectively; convergence has

resulted in a given cable or traditional telephone or wireless company being able to provide video, broadband, and telephone services. As this convergence continues, consumers have at their disposal a wide array of services and service providers for their communications needs, albeit at varying technological capabilities and prices.

In short, the growth and increasingly important role of broadband has been the most influential trend to emerge from this convergence. Broadband service, which relies upon the same network as telephone, mobile, and cable television, facilitates competition in cable and telephone. Broadband allows consumers to download and stream video content through third-party providers such as Netflix, Hulu, and Apple TV, which compete directly with traditional cable video providers. As broadband download speeds increase, offerings like these, and many others, will become more robust and competitive. Additionally, voice over internet protocol (VoIP), the technology behind voice service offerings of cable companies and over-the-top providers like Vonage, Skype and MagicJack, rely on the same network as Internet services, and are increasingly replacing traditional landline telephone services in New York.[1] Over the course of the last decade, more than four million New York State residential and business consumers have adopted VoIP phone service. Since 2000, incumbent telephone company access line counts have fallen from more than 13 million to approximately 4 million. Millions of those incumbent telephone carrier access line losses have been customer migrations of their primary phone lines to VoIP phone and wireless voice service, as well as secondary line migrations from dial-up Internet services, to faster, more advanced cable modem, digital subscriber line (DSL) and optical carrier broadband now offered by most companies providing broadband service in New York State.

The rapid evolution of technology spurred by the development of the Internet is profoundly changing the fundamental concept of communication services throughout the world. The very essence of a world-class communications infrastructure in this State depends upon the strength of its evolving broadband networks. Much as telephone was an essential service for consumers in the second half of the 20th Century, so today is broadband. Broadband service, whether provided by wire, such as cable, digital subscriber line, and fiber optic technologies, or wirelessly via Wi-Fi and LTE cellular technologies, represents not only a communications platform (in the form of voice, text, e-mail, video conferencing, and other social media services), but a platform for social relationships, health information, news, entertainment, education, medical diagnosis, the payment of bills, navigation, shopping, government business, document storage, and job applications. Growing from a nascent industry fewer than 20 years ago, broadband has become a service relied upon by millions across the country. New York has experienced this evolution firsthand, as its media production industry, educational institutions, hospitals and healthcare industry, and financial institutions rely heavily on broadband connectivity to deliver services and aid to millions of New Yorkers.

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[1] VoIP, over-the-top, or nomadic VoIP services are known by these monikers because they are provisioned atop the network facilities of other providers, rather than traversing their own facilities-based networks. Companies negotiate agreements with the facilities-based companies for access onto the networks so as to deliver services to consumers.

This assessment is organized by major service offerings, namely voice, video and Internet broadband access. Although convergence is challenging the distinction between these services, laws, regulatory policies, and consumers still treat them differently. Given the growing importance of broadband, this assessment particularly focuses on high-speed broadband deployment in New York State and compares speeds to other states and countries.

For each of the three major service offerings (voice, video, broadband), the assessment reviews availability of networks and adoption trends, and market concentration levels. It next reviews the Commission's regulatory authority and policies applicable to each of the major services focusing on the following core interest areas: rates, service quality, consumer protections, universal service, emergency reporting and entry/exit.[2] Major regulatory transition issues/trends are also reviewed. The assessment then examines publicly available financial data and infrastructure investment trends for major national wireline, wireless and cable providers as well as similar data for smaller New York based traditional telephone carriers.

Brief History of Telecom Regulation in New York

The communications landscape in New York State and across the nation, continues its rapid transition to new, more powerful and diverse technologies. Today's networks are providing more advanced and more mobile services at faster speeds to consumers, and supplanting traditional forms of telephone and cable television services.

While the Public Service Commission (Commission, PSC) continues to have a primary and overarching interest in ensuring that telecommunications services are available at just and reasonable rates, and are provided in a reliable and adequate manner, the Commission has long supported competitive markets as the most effective approach to ensuring these core interests and consumers' evolving needs are maintained. In 1994, the Commission initiated its Competition II proceeding,[3] which articulated its four overarching "core" principles: (1) ensuring the provision of quality telecommunications services at reasonable rates, (2) where feasible, allowing competition to be the most efficient means to achieve that goal, (3) recognizing that regulation should reflect market conditions, and (4) acknowledging that providers in like circumstances should be subject to like regulations. The legislature has also amended the Public Service Law (PSL) to reflect market trends (e.g., PSL §5(6) was added in 1997 suspending application of the Public Service Law to cellular telephone; PSL §92-g was added in 2013 authorizing the de-tariffing of non-basic retail services). Throughout this transition to more competitive markets, the Commission has attempted to balance the needs of consumers for

[2] A matrix depicting the general applicability of the Public Service Law to various providers of voice services, as well as to various providers of video services and broadband services is included as Appendix A.

[3] Case 94-C-0095, Proceeding on Motion of the Commission to Examine Issues Related to the Continuing Provision of Universal Service and to Develop a Regulatory Framework for the Transition to Competition in the Local Exchange Market, Opinion No. 96-13 (issued May 22, 1996) (Competition II Order).

protection from business practices that might endanger their health, safety and welfare against the adequacy of market forces to provide those protections. Where markets do not protect core interests, the Commission continues to act and evolve its regulatory approach.

The last time the Commission embarked on a broad review of the telecommunications market in New York was in 2006 with its Competition III proceeding. Therein, the Commission determined that the significant and growing level of intermodal competition from digital cable networks, wireless networks and over-the-top providers reduced the incumbents' market power. The Commission found that a lightened regulatory approach for traditional incumbent telephone carriers was warranted and necessary in order to level the playing field and enable them to remain viable providers into the future. The Commission concluded that the residential market for non-basic service was effectively competitive, rejecting claims that for various reasons, such as the assertion that cellular service was not totally substitutable or that VoIP was not generally available, incumbent telephone companies still had market power. The Commission expected to reduce regulation and rely more heavily on market forces to achieve just and reasonable rates, and to maintain adequate service quality. In the wake of its Competition III proceeding, the Commission initiated several efforts to eliminate outdated regulations and provide for pricing flexibility where competition existed.

To maintain a basic level of regulatory protection, the Commission required incumbent telephone carriers to offer a "basic service"[4] subject to a regulated price cap.[5] For services other than basic services, with a few minor exceptions, the Commission granted Verizon New York Inc. (Verizon) and Frontier of Rochester, Inc. (Frontier) unlimited pricing flexibility for residential service, subject to service territory price uniformity to protect customers in non-competitive areas. The Commission also enforces service quality performance standards for areas that were not subject to adequate competition (i.e., "white spots") and for more vulnerable consumers (e.g., Lifeline, elderly and disabled).[6]

Subsequent to the Commission's Competition III proceeding, the Public Service Law was amended, in 2013, to authorize the de-tariffing of non-basic, retail residential as well as business

[4] Regulated basic services are defined in 16 NYCRR § 602.1(b) as the provision of access to: one party line service, local/toll calling, local usage, tone dialing, emergency services, assistance services, telecommunications relay services, directory listings, privacy protections and non-published service associated with the public switched network.

[5] See, Competition III Order; Case 07-C-0349, In the Matter of Examining a Framework for Regulatory Relief, Order Adopting Framework (issued March 4, 2008).

[6] See, Case 10-C-0202, Verizon Service Quality Improvement Plan, Order Adopting Verizon New York Inc.'s Revised Service Quality Improvement Plan with Modifications (issued December 17, 2010).

services (PSL § 92-g).[7] Previously, in 2006, the Legislature also authorized telephone corporations to offer promotional prices for non-basic services.[8]

In the cable television market, the Commission has fostered competition through facilitating competitive entry into the video market.[9] Where once there was only a single wireline cable provider operating in a particular franchise area, the competitive landscape has changed markedly over the last decade. For example, over the past ten years, Verizon has acquired 189 cable franchises and is now the third largest cable operator in the State. Over-the-top providers of video services such as Netflix have also emerged.

Regarding broadband Internet access, after years of classifying broadband service as an interstate information service, subject to limited regulation under Title I of the Telecommunications Act, the Federal Communications Commission (FCC) recently classified broadband as an interstate telecommunications service subject to common carrier regulation under Title II of the Federal Communications Act.[10] The FCC opted to forbear from many Title II regulations, most notably rate regulation and Universal Service Fund (USF) contributions. In doing so, the FCC also indicated that it would likely preempt states from imposing any requirements on broadband service providers that are inconsistent with its forbearance. The FCC's Report and Order is designed to promote an open Internet and establish net neutrality rules applicable to both wireline and wireless broadband service providers. Those rules ban blocking or throttling of Internet traffic (slowing down the delivery of certain types of internet traffic, like video, in favor of other types), prohibit paid prioritization (allowing a content producer to pay an internet service provider for its content to be delivered faster), and establishes a "no unreasonable interference/disadvantage standard" (no ISP may discriminate against a given class of users).

Thus, in the almost ten years since the Public Service Commission's Competition III proceeding was conducted, the technological evolution in the communications industry has continued. In fact, consumer interests have evolved dramatically. With the growth of high speed broadband services, wireless smart phones, and VoIP technology providing broadband and video in addition to communication services, competition and the convergence of voice, video and broadband has become more robust. The passage of time and changing industry trends, along

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[7] New York State, Laws of 2013, c. 389, § 1, eff. Jan. 19, 2014.

[8] New York State, Laws of 2006, c. 739, eff. Dec. 19, 2016.

[9] Case 05-M-0250, et al., Joint Petition of the Town of Babylon, the Cable Telecommunications Association of New York, Inc. and CSC Holdings, Inc. for a Declaratory Ruling Concerning Unfranchised Construction of Cable Systems in New York by Verizon Communications, Inc., Declaratory Ruling on Verizon Communications, Inc.'s Build-Out of it Fiber to the Premises Network (issued June 15, 2005).

[10] GN Docket No. 14-28, In the Matter of Protecting and Promoting the Open Internet, Report and Order on Remand, Declaratory Ruling, and Order in, (issued March 12, 2015).

with the near ubiquitous deployment of wireless and broadband technologies, has again brought the industry to an inflection point.

It is against this backdrop that Case 14-C-0370, In the Matter of a Study on the State of Telecommunications in New York State (the Telecom Study), was initiated. The Telecom Study is designed to help the Commission and the State Legislature better understand the dynamic nature of the state telecommunications landscape, to identify areas where there have been market successes, and other areas where there may be market failures or other regulatory opportunities to advance the public interest.

Data used in this assessment is derived from a variety of sources including, but not limited to: 1) telephone and cable company Annual Reports filed with the Public Service Commission; 2) Federal Communications Commission reports; 3) United States Census Bureau information; 4) digital map files available from Mosaik Solutions; 5) video, voice and broadband service provider websites; and 6) other Department Staff data sources.

VOICE COMMUNICATIONS

Providers and Service Types

Consumers in New York have multiple choices over voice communication, which continues to be provided by 40 incumbent local exchange carriers (incumbent telephone companies or ILEC) throughout New York State. Each company provides services in its own specific franchise territory. Verizon, a former Regional Bell Operating Company, is the largest of the incumbent telephone companies, followed by the aggregate subsidiaries of Frontier Communications, FairPoint Communications, Windstream Communications, and TDS Telecom. The remaining incumbent telephone companies are smaller providers operating in more rural areas of the state.

Many of the incumbent and competing telephone companies offer service over the traditional, copper-based telephone network, and others offer service over more advanced infrastructure, such as fiber optic and VoIP based platforms. Cable customers are also able to obtain telephone service from their cable suppliers. Twenty two of the State's twenty nine cable television companies offer VoIP as either part of a bundled package or a stand-alone service. Time Warner Cable is the largest incumbent cable provider, with a service footprint that covers most of upstate New York as well as the Metro New York City region. Cablevision Systems Corporation is the second largest cable company, with service primarily in Long Island, Metro New York City and portions of the Hudson Valley region.

The four national, facilities-based wireless companies, AT&T, Sprint Nextel, T-Mobile, and Verizon Wireless, also provide service in New York. In addition, smaller facilities-based companies such as Blue Wireless, and other resellers of wireless services, such as TracFone, Straight Talk, and Cricket Communications provide service in portions of the State.

In more recent years, other facility-based providers, along with service providers using the VoIP platforms, have become increasingly prominent in the State. These providers' networks interconnect with the incumbent competing telephone company networks, as well as cable television and wireless networks. Over-the-top VoIP providers such as Vonage, MagicJack, Ooma and Skype, are examples of companies that rely on the wired and wireless networks of other providers to deliver service to end-user customers.[11]

[11] In the early years of local telephone competition, companies such as AT&T and MCI WorldCom, as well as a number of other entrants who relied heavily on access to incumbent carriers' unbundled network elements, entered the local market. These providers were referred to as Competitive Local Exchange Carriers or CLECs. As competition from cable television companies and wireless carriers serving as the major competitors emerged, CLECs, many of which still operate as certified carriers in New York, are playing a smaller role in today's marketplace.

Availability and Adoption

According to the most recent (2014) data published by the FCC, 98.0% of occupied housing units in New York State have access to voice service (either wireless or wireline).[12] As indicated in the table below, wireline service by traditional incumbent local exchange carriers remains available throughout the state.

Voice Services	Availability	Adoption
LEC	>98%	>40%
Satellite	>95%	<1%
Wireless	>95%	>95%
Cable	>95%	>40%
Over-The-Top	>95%	>3%
Fiber	50%	>20%

Table 1: Voice Service Availability and Adoption[13]

Figure 1 depicts cable providers provide wireline voice service to 95% of the State. Specifically, 1,440 of the 1,544 incorporated municipalities in the State have wired cable networks capable of providing voice, video, and broadband (e.g., the "Triple Play") services. Nineteen municipalities have wired cable networks over which voice service is unavailable. These 19 municipalities represent approximately 16,300 households.[14] Eighty five, mostly rural,

[12] FCC, Universal Service Monitoring Report, December 2014, Table 6.6, Voice Penetration by State, September 2014 data. We note that the United States Census Bureau defines a housing unit as a "house, apartment, mobile home, group of rooms, or a single room that is occupied (or if vacant, is intended for occupancy) as separate living quarters. Separate living quarters are those in which the occupants live and eat separately from any other persons in the building and which have direct access from outside the building or through a common hall. The occupants may be a single family, one person living alone, two or more families living together, or any other group of related or unrelated persons who share living arrangements. U.S. Census Bureau, Household and Person Per Household, http://quickfacts.census.gov/qfd/meta/long_HSD310213.htm.

[13] This and other tables contained in this document, unless otherwise noted, are derived by Staff from a variety of sources. Availability refers to an estimate of the number of premises that can access the networks/technologies represented. Adoption refers to the subscriptions (residential and business) relative to total household premises (7.3 million) for Local Exchange Carrier (LEC), Satellite, Cable and Over-the-Top sectors, household premises passed (3.6 million) for Fiber, and total New York State population (19.4 million) for wireless. Premises includes households as reported by the FCC based on census data as of December 31, 2013. Adoption rates exceed 100% due to multiple household subscriptions.

[14] The majority of the households in the video-only cable networks are operated by Charter Communications in Rensselaer and Columbia counties.

municipalities do not have wired cable networks deployed.[15] In those communities, cable voice service is also unavailable.[16] Those 85 communities represent approximately 30,000 households. In total, approximately 46,300 households in these 104 municipalities lack access to a cable network capable of providing voice service. Additionally, in some municipalities that have cable franchises households that lie beyond the service area of the cable network do not have access to any of the cable services even though they reside in the franchise area.

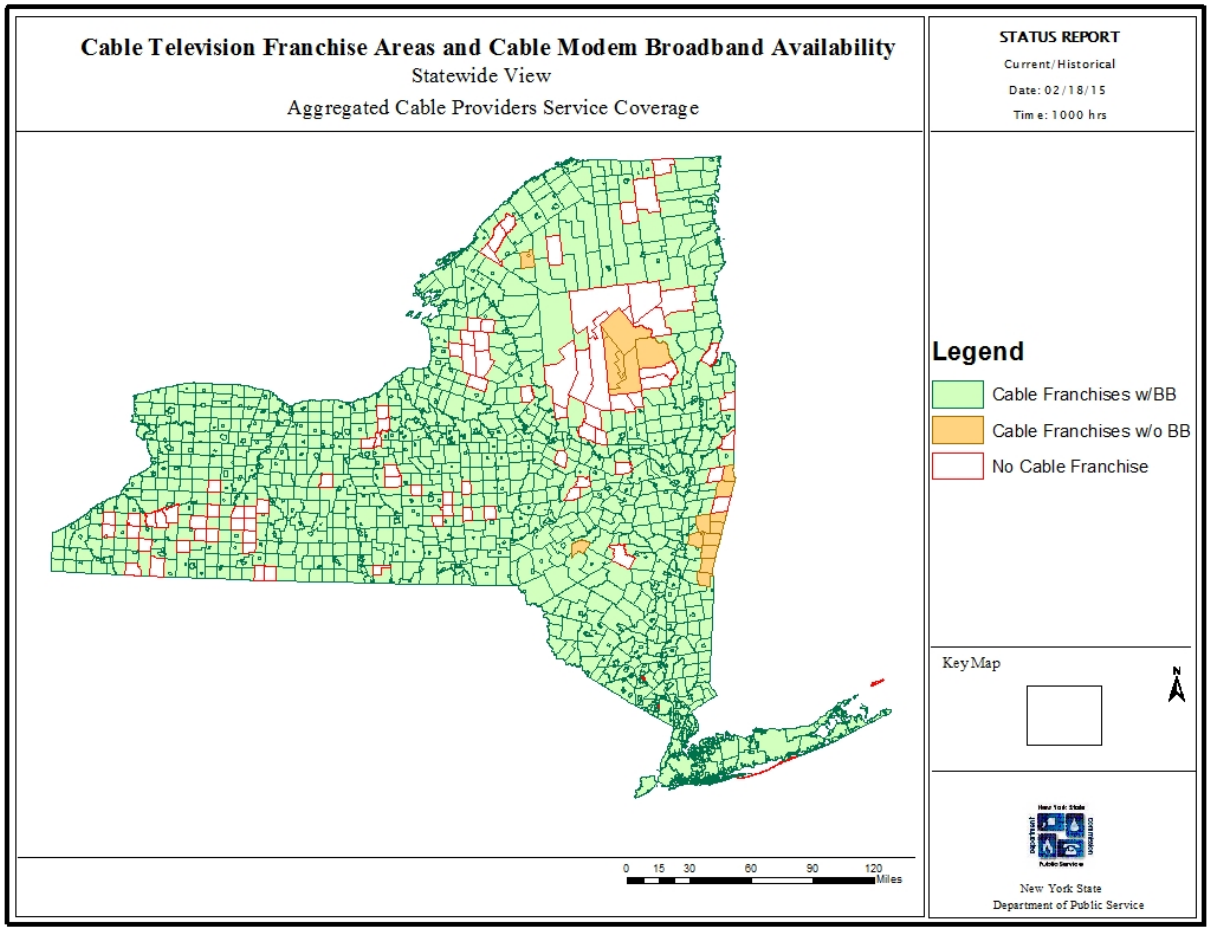

Figure 1: Cable Network Availability

[15] The communities of Fire Island, Suffolk County and Kiryas Joel, Orange County, have wired cable networks that provide voice and broadband service, but do not have cable television franchises, and therefore do not offer cable video service in those communities at this time.

[16] While there are municipalities in the State without cable television networks deployed, or locations with cable networks that are video-only, it is important to note that every municipality in the State has access to one or more wired or wireless network, capable of providing video, voice and data services to residents and businesses. Satellite video, voice and broadband services, as well as terrestrial wireless voice and data services are widely available throughout New York, as is wireline telephone and data services offered by incumbent local exchange carriers.

There are currently about 19.4 million residents of New York State, and essentially all have access to multiple wireless service providers. As of year-end 2012, approximately 20.7 million wireless voice customers in New York have adopted wireless service.

The Figure 2 map depicts the aggregate voice service coverage of the wireless companies serving the State.[17] We note that there are many areas with overlapping competitive service coverage from multiple wireless service providers; New Yorkers in these areas have anywhere from two to four providers or more for wireless service. The unshaded areas reveal where residents have limited or no wireless service coverage available (mostly forested and very rural areas).

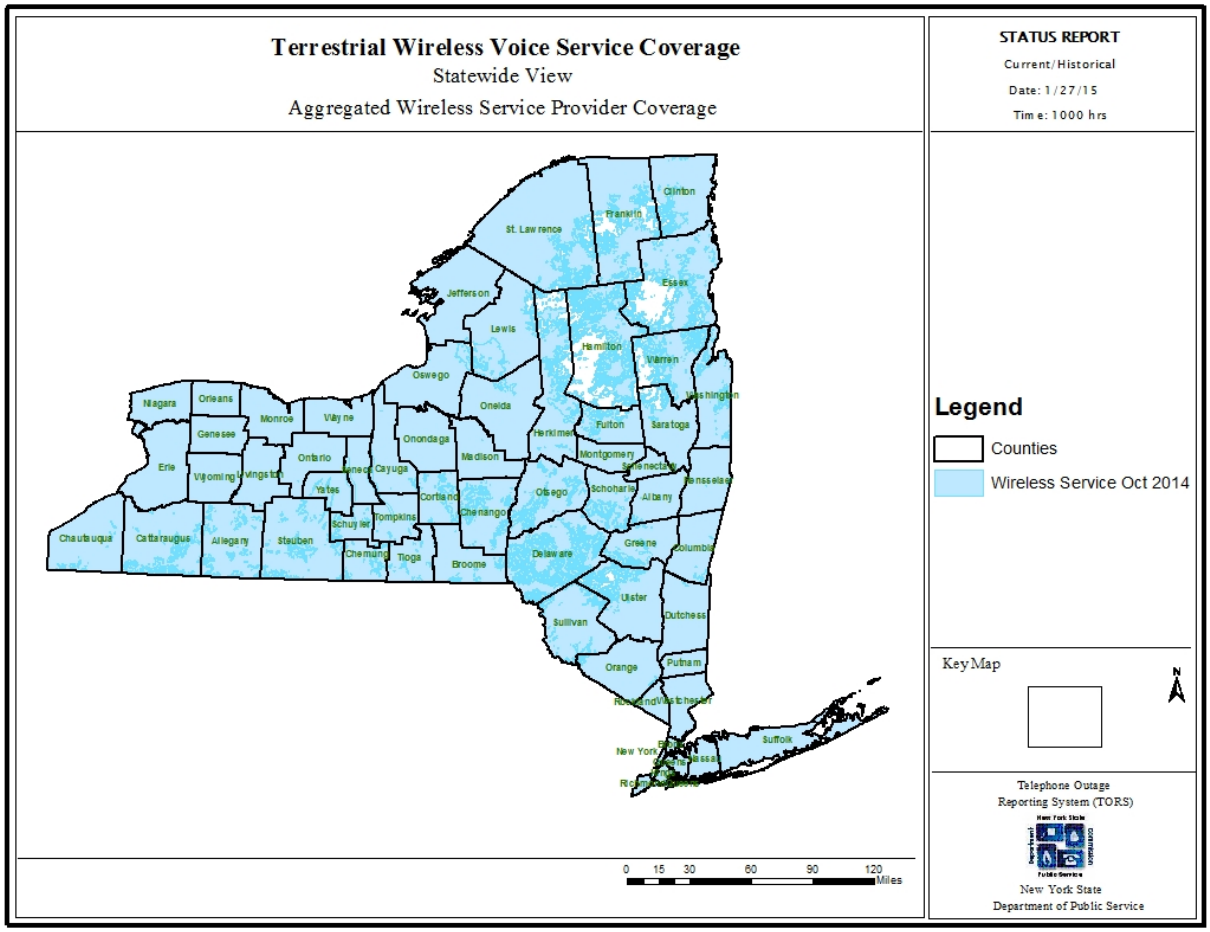

Figure 2: Wireless Voice Service Availability

[17] The aggregate voice service map is inclusive of all wireless services protocols and standards provided by each wireless company, and the aggregate LTE service map is inclusive of the four national wireless carriers.

Migration to wireless communications has been a major trend in voice services. Along with the proliferation of advanced personal electronics with improved features and functionality, and the emergence of Wi-Fi hotspots, wireless networks have led to a new era of voice communications. As these networks continue to deploy more advanced technologies, like LTE, consumers are expected to experience greater quality and reliability which could lead to additional future migrations as their primary voice platform. The move to wireless platforms is not limited to wireless cellular networks, however, as cable companies have also begun to offer wireless voice services over their expanded Wi-Fi networks.[18]

Over-the-top voice services are also generally available anywhere that broadband or Wi-Fi service (wired or wireless) is accessible to the consumer. Many over-the-top providers offer applications that consumers can download onto their smart phones, laptops, and other portable devices.

The emergence of wireless and cable wireline competition has changed consumer behavior with regard to voice services. In terms of adoption, consumers have migrated to competitive network platforms and providers in significant numbers. Traditional telephone companies have lost significant amounts of market share to competitors. Incumbent local exchange companies measure market penetration by access lines. The reduction in the number of incumbent telephone company customer access lines from the year 2000-2013 is contained in Figure 3. For context, the chart is overlaid with VoIP and wireless phone connections as well.

[18] For example, Cablevision and Time Warner Cable, the two largest cable operators in the state, both offer subscribers access to VoIP phone service using cable company Wi-Fi networks and applications, via Cablevision's "Freewheel" Wi-Fi voice service and Time Warner's "Phone 2 Go" Wi-Fi voice service.

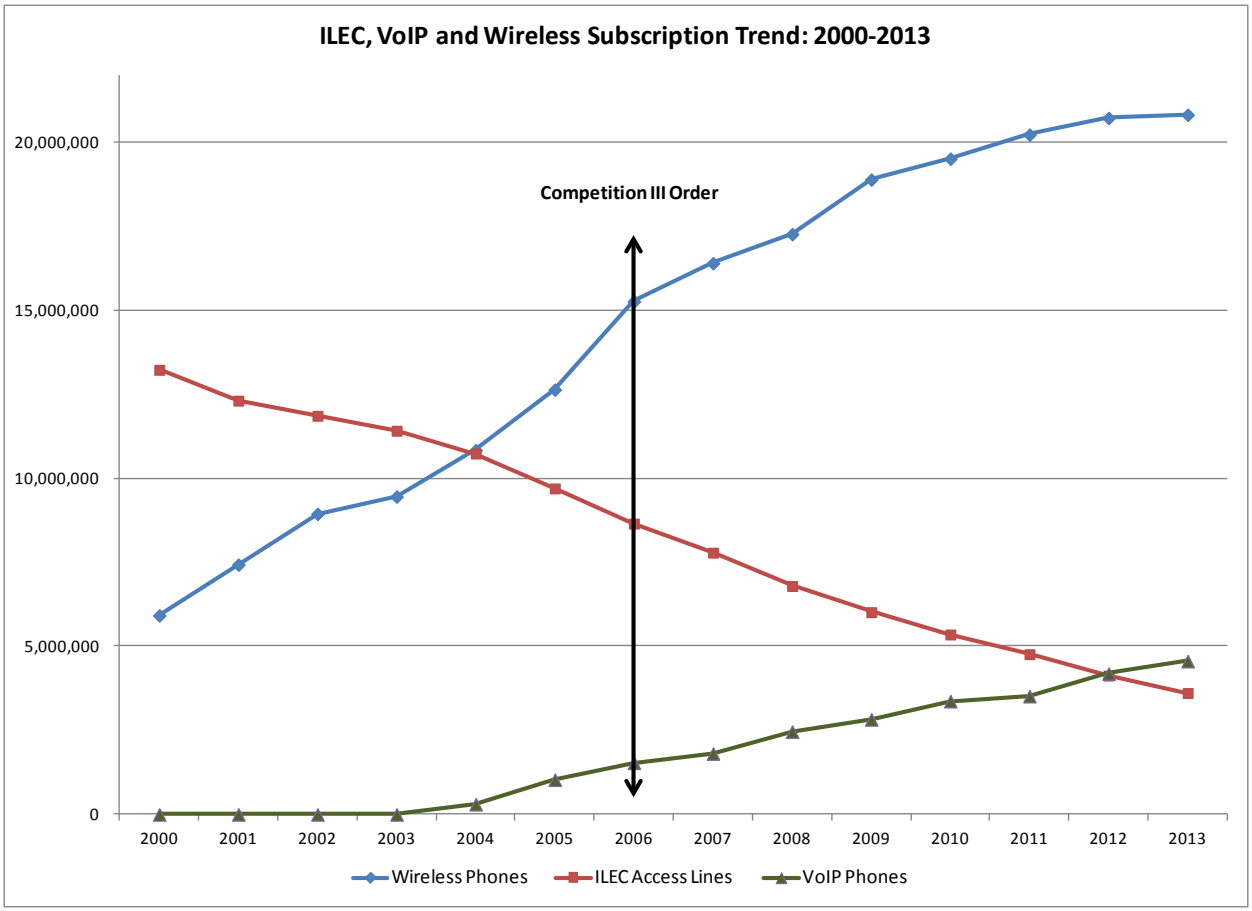

Figure 3: Voice Provider Connections in Service, 2000-2013

The trend lines indicate that adoption of both wireless and VoIP phone service has occurred rapidly over a relatively short period of time as consumers migrate away from more traditional telephone service. In 2004, the number of wireless phone connections reached the level of the incumbent phone service subscriptions and, from that time, wireless subscriptions escalated rapidly, surpassing the level of incumbent phone service subscriptions which peaked at about 13 million in 2000. Similarly, VoIP phone service, which began around 2004, and over the relatively short span of about a decade, has achieved subscription levels that have surpassed incumbent phone subscription levels.

Both residential and business customers are migrating away from the traditional telephone company providers, and adopting alternative service providers as detailed in Figure 4.

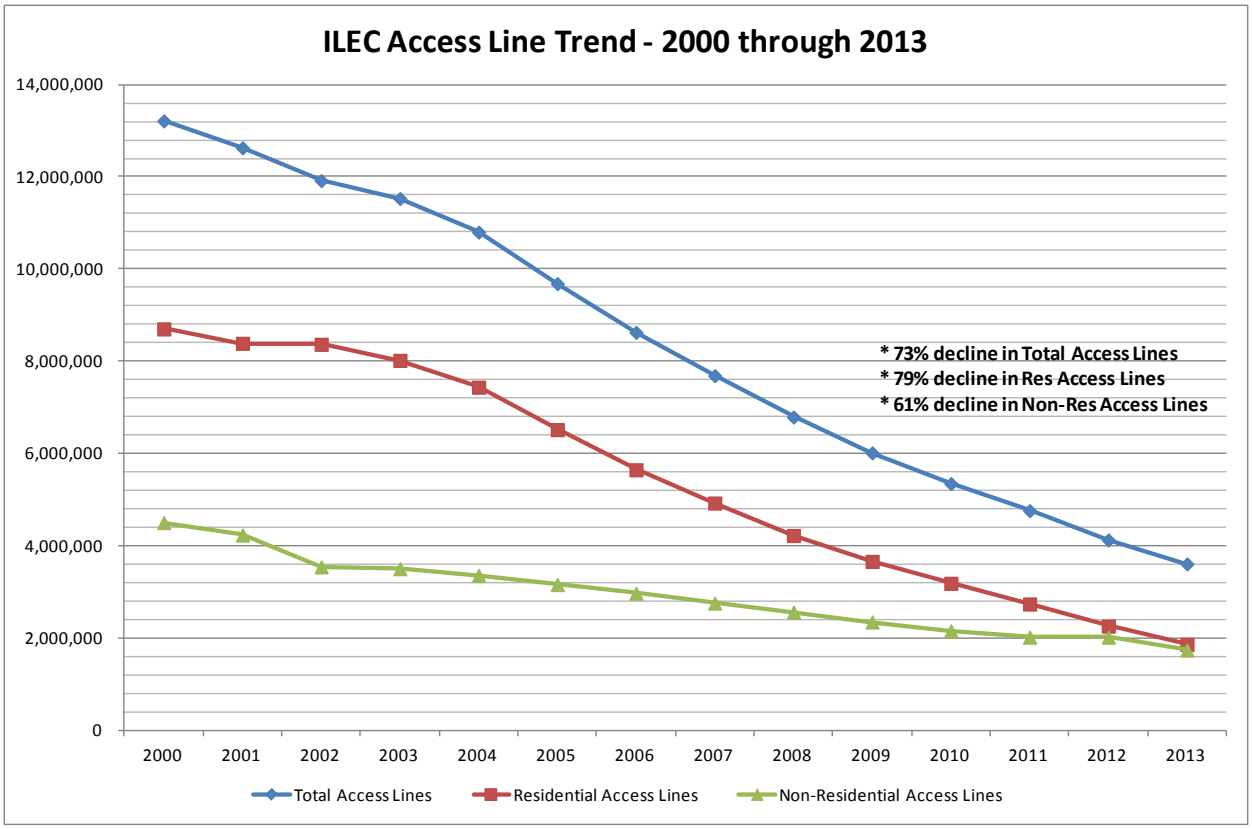

Figure 4: Incumbent Telephone Company Access Line Trends, 2000-2013

Consumers are also finding value in voice service provided by over-the-top providers. Broadband service is widely available to New Yorkers, allowing them to adopt over-the-top services that require very little bandwidth to provide voice service. Low-cost over-the-top voice service, combined with a basic broadband connection, makes for a competitively priced alternative to traditional basic telephone service.[19]

The trend away from traditional wireline services aligns with both National and State surveys of consumer preference. The most recent National Health Interview Survey on Wireless Substitution, commissioned by the Centers for Disease Control and Prevention, dated July 2014, found that, "the number of American homes with only wireless telephones continues to grow. Two in every five American homes (41.0%) had only wireless telephones." In the 2006 Competition III Order (Comp III Order), the Commission noted that 9.4% of U.S. wireless subscribers used a wireless phone as their primary phone.[20] In New York, a November 2014

[19] Satellite phone service is also an alternative for consumers who are interested in a supplementary service in remote areas or locations that may have spotty wireless voice service or in the instance where a wired voice service option may be unavailable. Cost, call quality, and reliability could be factors in the lower adoption rate for satellite phone service presently.

[20] Competition III Order, p. 35.

survey conducted by the Siena College Research Institute in New York for AT&T indicated that 28% of upstate households (21% statewide) rely only on mobile wireless for voice service.[21]

Market Concentration

Staff also analyzed the competitiveness of the New York State telecommunications markets using the methodology set out in the Department of Justice/Federal Trade Commission (DoJ/FTC) Horizontal Merger Guidelines.[22] Those guidelines stem from the premise that as the number of competitors in a market declines, the potential for anti-competitive behavior increases. The Herfindahl-Hirschman Indices (HHI) endorsed by the DoJ/FTC, measure market concentration and recognize the correlation between market concentration and the lack of market competitiveness. Concentration in a market is important because the level of concentration affects the behavior of firms in the marketplace. Greater market concentration is generally associated with behavior in which firms exercising market power seek to push prices above competitive levels. The HHI is calculated by summing the squared market shares of each company providing service in a given market. The DoJ/FTC generally classify the competitiveness of markets into three types:

- Unconcentrated Markets: HHI below 1500
- Moderately Concentrated Markets: HHI between 1500 and 2500
- Highly Concentrated Markets: HHI above 2500

Year 2013 customer counts shown above (Figure 3) were used to calculate HHIs for the voice market in New York. The tables below are reflective of statewide average HHIs. Although there are multiple incumbent and cable phone providers in the State, the service territories for these various incumbent telephone providers do not overlap. Similarly, the service territories for most of the cable providers (except mainly for Verizon FiOS and some smaller competitive cable companies) do not overlap. Thus, at any customer location, the analysis below reflects that customers in New York generally have the choice for phone service between an incumbent telephone carrier, a cable carrier, over-the-top VoIP and four primary wireless carriers. The national wireless shares from Table II.C.2 of the FCC's 17th annual wireless competition report were used as a proxy for New York State wireless company market shares. The lower bound estimate below does not treat Verizon wireline phone service and Verizon wireless phone as being provided from the same entity. The resultant HHI figure of 1,764 falls near the bottom of the DoJ/FTC Guidelines' moderately concentrated market range.

[21] See, Siena College, Cell Phones Used by 90 Percent of New Yorkers (issued March 4, 2015), https://www.siena.edu/news-events/article/cell-phones-used-by-90-percent-of-new-yorkers.

[22] See, U.S. Department of Justice, Horizontal Merger Guideline, available at http://www.justice.gov/atr/public/guidelines/hmg-2010.html.

Lower Bound Estimate

Voice Provider	Customers in 2013	Market Share	HHI
ilec	3,340,800	11.5%	132.7
clecs	259,200	0.9%	0.8
voip cable	4,140,000	14.3%	203.8
voip over the top	460,000	1.6%	2.5
wireless vz	7,592,000	26.2%	685.4
wireless at&t	6,760,000	23.3%	543.4
wireless t-mobile	2,267,200	7.8%	61.1
wireless sprint/nextel	3,224,000	11.1%	123.6
wireless all else	956,800	3.3%	10.9
total	29,000,000		1,764.2

Table 2: Voice HHI Lower Bound 2013

This analysis was re-done to combine the incumbent telephone wireline phone with affiliated wireless phone. In the great majority of the State, Verizon is the incumbent wireline phone provider and, thus, Verizon wireless is used as a proxy for the incumbent affiliated wireless phone provider. This upper bound HHI estimate of 2,367 falls close to the top of the DoJ/FTC Guidelines' moderately concentrated market range.

Upper Bound Estimate

Voice Provider	Customers in 2013	Market Share	HHI
ilec + affiliated wireless	10,932,800	37.7%	1,421.2
clecs	259,200	0.9%	0.8
voip cable	4,140,000	14.3%	203.8
voip over the top	460,000	1.6%	2.5
competitive wireless			
wireless at&t	6,760,000	23.3%	543.4
wireless t-mobile	2,267,200	7.8%	61.1
wireless sprint/nextel	3,224,000	11.1%	123.6
wireless all else	956,800	3.3%	10.9
total	29,000,000		2,367.3

Table 3: Voice HHI Upper Bound Estimate 2013

The range between the upper and lower bound is approximately 650, indicating that the actual HHI for voice service in the state likely falls somewhere within the moderately concentrated market range.

The overall HHI of the voice market has changed little from the time of the Comp III order. However, subscriptions have migrated from the incumbent platform to the other platforms, namely VOIP cable and wireless. At the time of Comp III, the incumbent carrier platform was used to provide voice service to well over 30% of the roughly 23 million voice customers in the state (including CLECs that resold voice service using the incumbent's network). Currently the incumbent carrier platform share of the voice service market (including CLECs reselling service) has fallen to roughly 10%. Moreover, the overall size of the voice market has grown to encompass over 29 million voice customers in the state. The tables below represent the lower and upper bound estimates using customer subscriptions in 2005.

Lower Bound Estimate

Voice Provider	Customers in 2005	Market Share	HHI
ilec	6,945,200	29.8%	887.5
clecs	2,754,800	11.8%	139.6
voip cable	900,000	3.9%	14.9
voip over the top	100,000	0.4%	0.2
wireless verizon	3,200,400	13.7%	188.5
wireless cingular	3,376,800	14.5%	209.8
wireless t-mobile	2,797,200	12.0%	144.0
wireless sprint/nextel	1,348,200	5.8%	33.4
wireless all else	1,890,000	8.1%	65.7
total	23,312,600		1,683.7

Table 4: Voice HHI Lower Bound 2005

Upper Bound Estimate

Voice Provider	Customers in 2005	Market Share	HHI
ilec + affiliated wireless	10,145,600	43.5%	1,894.0
clecs	2,754,800	11.8%	139.6
voip cable	900,000	3.9%	14.9
voip over the top	100,000	0.4%	0.2
competitive wireless			
wireless cingular	3,376,800	14.5%	209.8
wireless t-mobile	2,797,200	12.0%	144.0
wireless sprint/nextel	1,348,200	5.8%	33.4
wireless all else	1,890,000	8.1%	65.7
total	23,312,600		2,501.6

Table 5: Voice HHI Upper Bound Estimate 2005

Regulatory Oversight

The Commission's regulatory policies and practices over telecommunication providers have evolved with technological changes in the industry. In 1994, the Commission initiated its Competition II proceeding[23] which articulated its four overarching "core" principles: (1) ensuring the provision of quality telecommunications services at reasonable rates, (2) where feasible, allowing competition to be the most efficient means to achieve that goal, (3) recognizing that regulation should reflect market conditions, and (4) acknowledging that providers in like circumstances should be subject to like regulations. Throughout this transition to more competitive markets, the Commission has attempted to balance the needs of consumers for protection from business practices that might endanger their health, safety and welfare against the adequacy of market forces to provide those protections.

While the Commission's decisions rely on competition as a means to ensure that its core interests are maintained, there remain areas where the Commission continues to regulate and monitor the voice market outside of its competitive framework. These areas, discussed below, include pricing, service quality, consumer protections, universal service, emergency communications and entry/exit, as well as network transition and copper retirement.

Pricing

In April 2006, when the Commission issued its Comp III Order, it established a basic service offering rate cap of $23.00 for flat rate residential service, which at the time was comparable to the various measures of basic phone service market prices and was aligned with the forward-looking costs for providing the basic service, which ranged from $22 to $26. The Commission determined that the $23.00 benchmark reflected a just and reasonable price for basic phone service. Basic residential service remains capped at $23 (not including taxes and fees such as the federal Subscriber Line Charge).

The Comp III Order also reviewed national trends in telecommunications service prices, noting that, based on a Bureau of Labor Statistics index of wireline telecommunications service provider prices, national prices had decreased at an average annual rate of 1.8% over the period 1996 to 2006. Since the Comp III Order was issued, the national price trend for residential wired telecommunications prices have increased at an average annual rate of 2.9% per year.[24] Using

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[23] Case 94-C-0095, Proceeding on Motion of the Commission to Examine Issues Related to the Continuing Provision of Universal Service and to Develop a Regulatory Framework for the Transition to Competition in the Local Exchange Market, Opinion No. 96-13 (issued May 22, 1996) (Competition II Order).

[24] Based upon U.S. Bureau of Labor Statistics (BLS) data, residential wired telecommunications prices have gone up at an average annual rate of 2.9% per year since 2006. The BLS Producer Price Index for wired telecommunications carriers, residential local telephone service, has a value of 104.3 in December 2006 and 131.4 in December 2014. This implies a compound annual growth rate of 2.9%. BLS data indicate that the prices for business local telephone service have gone up by an average of 0.6% per year over the same time period.

the 2.9% rate of inflation as a guide, the $23.00 benchmark for basic phone service, established in 2006, would have increased to about $28.91 by 2014.[25]

In the Comp III Order, with a few minor exceptions, for residential services other than basic voice service, Verizon and Frontier were granted unlimited pricing flexibility, subject to service territory price uniformity to protect customers in non-competitive areas.

This assessment provides a high level review of pricing activity since Comp III. Appendix B shows the pricing trends since 2007 for Verizon's and Frontier's basic residential and residential packages and for basic business individual access line (with and without unlimited local and toll usage). These trends show steady Verizon price increases, especially for business services (roughly 6.0% per year for some services), but it should be noted these trends do not reflect promotional offerings.

The assessment also reviews other competitive phone service providers, both regulated and unregulated by the Commission, currently offering a variety of service choices to consumers. A sample of residential and small business phone prices being offered by cable providers, wireless providers and over-the-top providers as of May 11, 2015 is presented in Appendix B.[26] This sample is not intended to provide a comprehensive review of phone service pricing.

The examples in Appendix B reveal the challenge of making accurate pricing comparisons among the various competing providers. The phone service market has transitioned towards bundled packages of local, long distance calling, and various complimentary service features, including promotional pricing. Moreover, because phone service is no longer limited to physical service to the home or business, and includes much more than voice service (e.g., texting), it is difficult to compare pricing for these services to basic dial tone. Smart phones and other mobile communications devices bundle data communications with entertainment and other services. Similarly, as noted, cable companies and Verizon's FiOS offering bundle phone services with other network services, mainly video and broadband, often at discounted prices.

A sample of residential triple play bundled prices relative to lesser bundles and stand-alone prices is also provided in Appendix B. Many of the phone service options sampled are priced comparatively lower than the sampled Verizon offerings. Time Warner Cable, for example, offers a stand-alone Home Phone National product for $10 per month for 12 months. The price for that phone service post promotion, if not extended, may rise to $40. Many companies are now bundling phone service with a number of other network services and

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See, http://data.bls.gov/timeseries/PCU5171105171101, http://data.bls.gov/timeseries/PCU517110517110112, and http://www.bls.gov/ppi/naics517110.htm.

[25] The FCC's 2015 Urban Rate Survey for Fixed Voice, released April 16, 2015, determined that the reasonable comparability benchmark for voice services is $47.48.

[26] We note that there are literally dozens of competitive phone service providers in today's marketplace, offering potential customers various stand-alone or bundled service options.

enhanced features, resulting in reduced phone service pricing when combined with broadband or video offerings.

Time Warner Cable, like many others in the competitive market, also makes special offers to potential customers for lower pricing, generally for an introductory period of time. Another example: Cablevision, which provides service in the Long Island, metropolitan New York City and Lower Hudson Valley regions of the State, offers customers the option to add "Optimum Voice World Call" service to a package bundle for an additional $19.95 more per month. Comcast Corporation also offers XFINITY Voice Unlimited phone service to new customers for $29.99 for the first six months, with price increases thereafter.

Service Quality

The Commission's jurisdiction over incumbent and competitive telephone companies' service quality also varies depending on a variety of factors. For instance, all incumbent and certified competing telephone providers in New York are required to keep and retain performance records for each metric contained in the Commission's regulation at 16 NYCRR §603.3. In addition, these companies are expected to meet or exceed the Commission's performance thresholds. Carriers with fewer than 500,000 access lines are only required to report to the Department on their customer trouble report rate (CTRR) performance metrics. Conversely, carriers with more than 500,000 access lines are required to report to the Department on all the service quality metrics.

Currently, only Verizon and Time Warner Cable Information Services (TWCIS) have more than 500,000 access lines in New York.[27] However, both these companies have been afforded certain relief from the Commission's broader (i.e., non CTRR) reporting requirements as follows. In December 2010, based on competitive market conditions, the Commission adopted a revised Service Quality Improvement Plan (SQIP) directing Verizon to focus its reporting and performance efforts on what it considered to be the most important service quality metrics: out-of-service over 24 hours (OOS>24) and service affecting over 48 (SA>48) for only its "core" customers (i.e., residential and business customers without wireline alternatives, customers receiving Lifeline service, or customers having special needs, e.g., medical).[28] Verizon was allowed to cease reporting on the Commission's remaining service quality metrics favoring competitive market conditions to set acceptable levels of service quality where it exists.[29] TWCIS currently reports to the Department on all of the Commission's service quality

[27] Cablevision systems has more than 500,000 voice customers in New York State, but holds no CPCN for voice service and no ETC status for the provision of Lifeline phone service.

[28] Case 10-C-0202, Verizon Service Quality Improvement Plan, Order Adopting Verizon New York Inc.'s Revised Service Quality Improvement Plan with Modifications (issued December 17, 2010).

[29] Verizon continues to provide CTRR data, on a central office basis, for all of its phone service customers (core and non-core). It must also collect other data, but it does not report such data.

metrics.[30] However, upon the establishment of satisfactory baseline reporting, TWCIS would be allowed to report on only CTRR, OSS>24 and SA>48 metrics for core customers on a going forward basis. For all other over-the-top (such as MagicJack), non-regulated VoIP (such as Vonage) and wireless telephone carriers (such as T-Mobile), the Commission's service quality regulations do not apply.

Verizon and Frontier, the two largest incumbent telephone companies in New York, are subject to service quality incentive plans. A former Rochester of New York Telephone Open Market Plan[31] was subsequently terminated, but in its place, Frontier is now, among other things, subject to service quality incentives tied to rebates and dividend restrictions. Verizon, if it fails the Commission's OOS>24 and SA>48 performance metrics, is subject to a penalty action under PSL §25, under the SQIP.[32] At the time of the Commission Order adopting Verizon's revised SQIP, the company reported approximately 400,000 core customers and 4.96 million total access lines. As of December 2014, through customer migrations to other services and service providers (including Verizon wireless or other VoIP companies) or other circumstances, the number of core customers remaining on the Verizon's wireline network has declined to less than 200,000, a reduction of about 50%.

The following graph demonstrates an improving trend with regard to Verizon's OOS>24 metric for core customers. As can be seen, the trend with regard to this critical repair metric has been improving since the inception of the SQIP in January 2011 and, other than related to periods of inclement weather, the company generally performs better than the threshold for this metric. The trend with regard to the OOS>24 metric for non-core customers is similar.

[30] Case 13-C-0193, Petition of Time Warner Cable Information Services (New York), LLC for Waivers of Certain Commission Regulations Pertaining to Partial Payments, Directory Distribution, Timing for Suspension or Termination of Service, and a Partial Waiver of Service Quality Reporting Requirements, Order Granting in Part and Denying in Part Requests for Waivers or Rules (issued October 21, 2013).

[31] Cases 93-C-0103, Rochester Telephone Corporation - Restructuring Plan, and 93-C-0033, Rochester Telephone Corporation - Multiyear Rate Stability Agreement, Opinion No. 94-25, (issued November 10, 1994). The OMP was modified and extended in Opinion 00-04 (issued March 30, 2000).

[32] Case 10-C-0202, Supra.

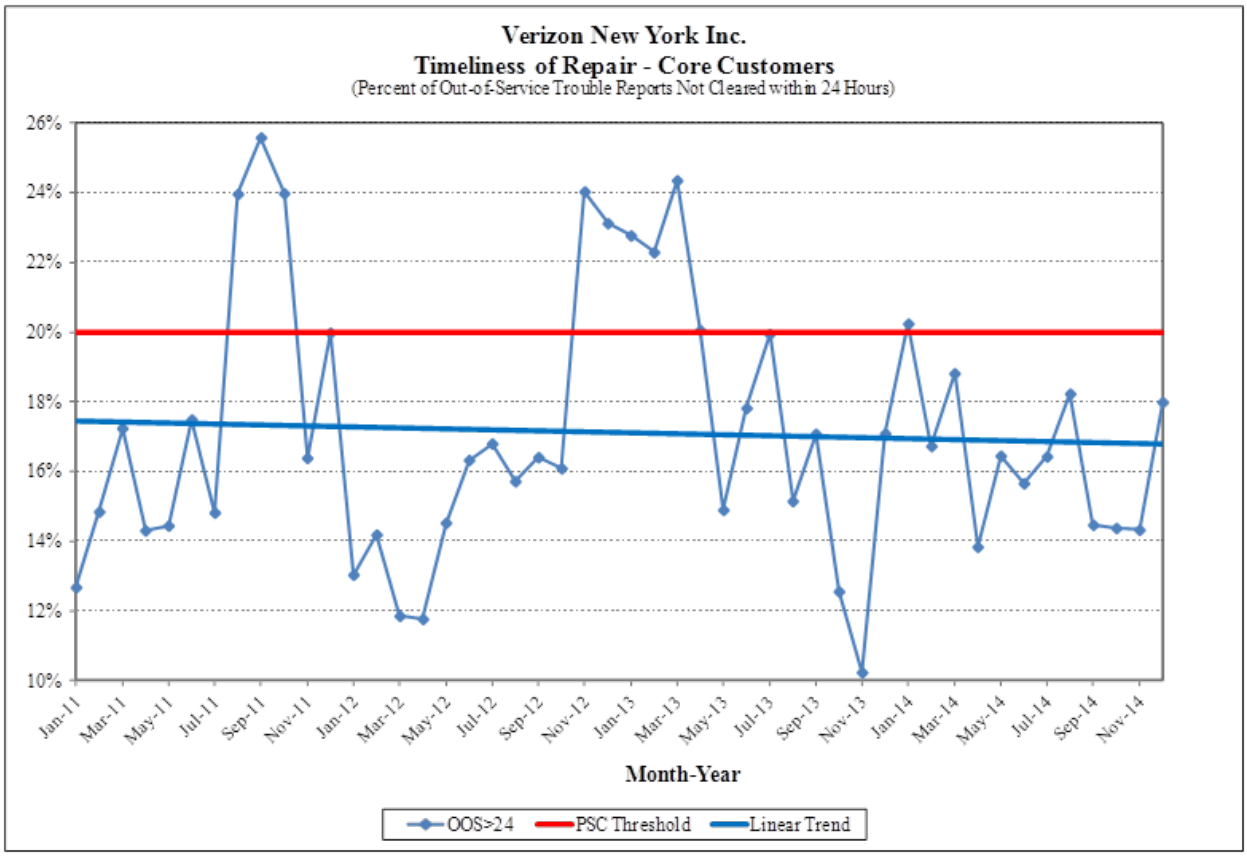

Figure 5: Verizon Repair Figures for Core Customers

But despite such improvements, in the third quarter of 2013, the Commission identified increasingly poor service quality performance related to Verizon central offices experiencing service inquiry report failures on the individual CTRR metrics for both core and non-core customers. In January 2014, Verizon initiated a Targeted CTRR Remediation Plan, which the Commission accepted.[33] Verizon projects that the work associated with its CTRR Plan will be complete by mid-2015.

The following chart depicts the average monthly CTRR (blue line) aggregated for all local exchange telephone companies providing service in New York State, as compared to the 3.3 CTRR service standard (red dashed line) pursuant to 16 NYCRR §603.

[33] Case 13-C-0161, In the Matter of Quality of Service provided by Local Exchange Companies in New York State, Order Regarding Mediation Plan (issued June 12, 2014).

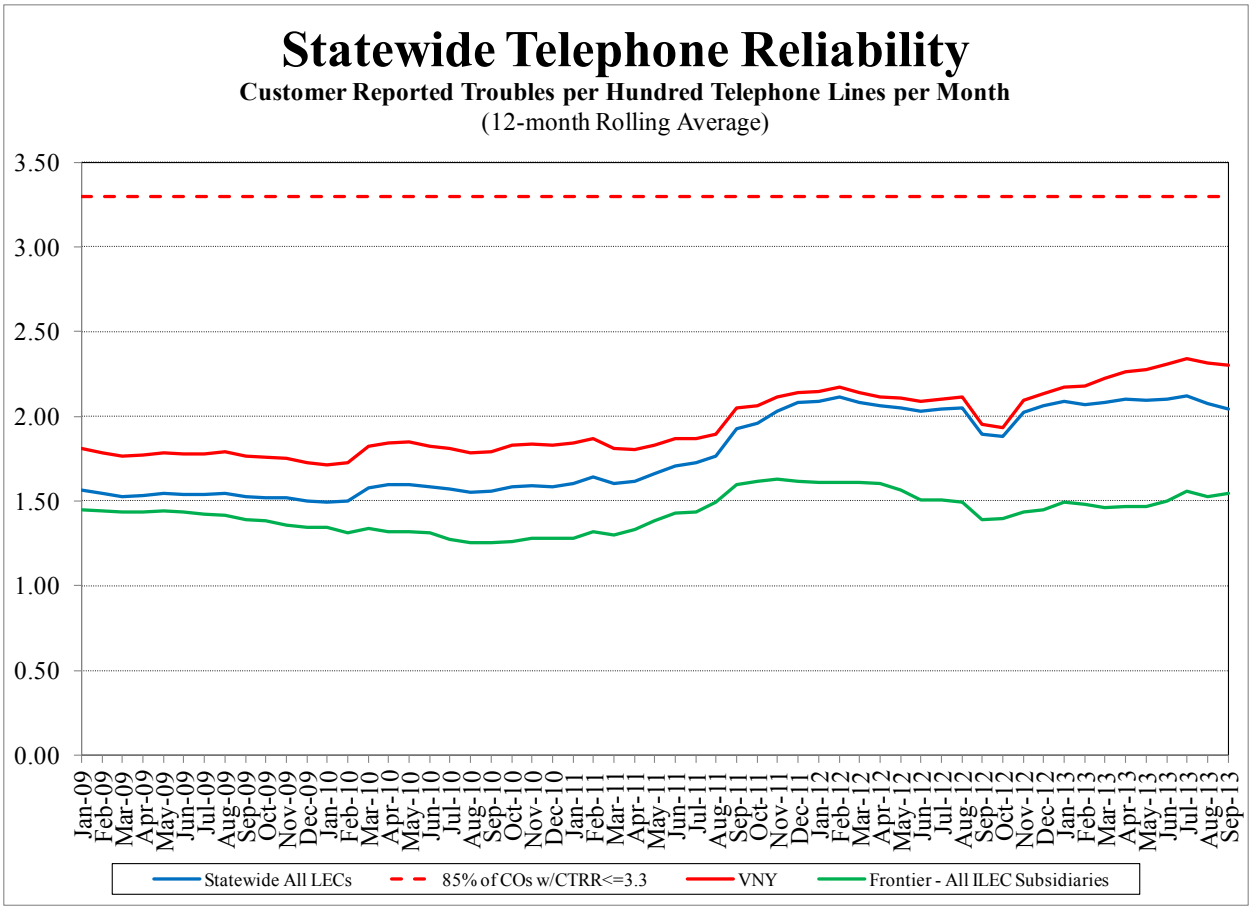

Figure 6: New York State Telephone Reliability Figures

The trend, from January 2009 through September 2013, indicates that the CTRR for service providers has been gradually worsening, and is still well below the Commission's service standard by which reliable service quality is measured. It should be noted that the statewide trend line is driven in large part by the larger incumbent phone companies as well as recent extreme weather events, including Hurricanes Irene and Lee and Superstorm Sandy.

Customer Protections

The Commission's Office of Consumer Services (OCS) has call centers and staff in Albany, Buffalo, Long Island, and New York City. OCS staff provides multi-lingual consumer assistance to help resolve consumer complaints for electric, natural gas, water, steam, telephone, and cable television throughout New York State. Consumers have several options by which they can lodge complaints regarding their voice and video services. They can use a toll-free Helpline or write or visit one of OCS' offices. In addition, consumers can also file electronic complaints through the Department website[34] at any time of any day. Key consumer protections include

[34] Electronic complaints can be lodged with the Department of Public Service through its website, http://www.dps.ny.gov.

termination notice and the availability of deferred payment arrangements on local voice charges, and the availability of a consumer complaint dispute resolution process.

While the Commission has regulatory oversight over some wireline telephone and cable companies, as stated above, many telecommunications service providers do not currently fall under the Commission's jurisdiction. For example, in 1997 the Legislature suspended the Commission's authority to regulate wireless carriers pursuant to Public Service Law §5(6) and nomadic VoIP has been classified by the FCC as interstate service. Similarly, cable modem broadband service has been classified as an interstate information service until March 2015, when the FCC reclassified it as an interstate telecommunications service.

In concert with Commission oversight, the FCC handles a wide range of telecommunications service and billing issues for consumers related to wireline, wireless and broadband services. The FCC's rules are intended to protect consumers no matter how they make their calls or access the Internet. The FCC's Consumer Inquiries and Complaints Division investigates complaints from consumers regarding unfair practices, or violations of its rules and requires service providers to rectify the issues when appropriate. Problems that consumers experience are tracked, prompting formal investigations as necessary, in order to serve as a deterrent to the companies the FCC regulates.

Given the differences between state and federal regulatory jurisdiction, the Commission has strived to adapt its policies to keep pace with the rapidly changing market place.

The rate of consumer complaints on intrastate telephone services for which the Commission has jurisdiction, as measured by total complaints per 100,000 lines for the five largest telephone companies in New York, has generally increased in recent years. Specifically, as shown in Figure 7, the complaint rate decreased from 2008 through 2010, and generally increased from 2010 through mid-year 2013. Aside from the complaints attributable to major storms, service-related complaints, including complaints regarding delays in installing and repairing telephone service, comprise the majority of consumer concerns.

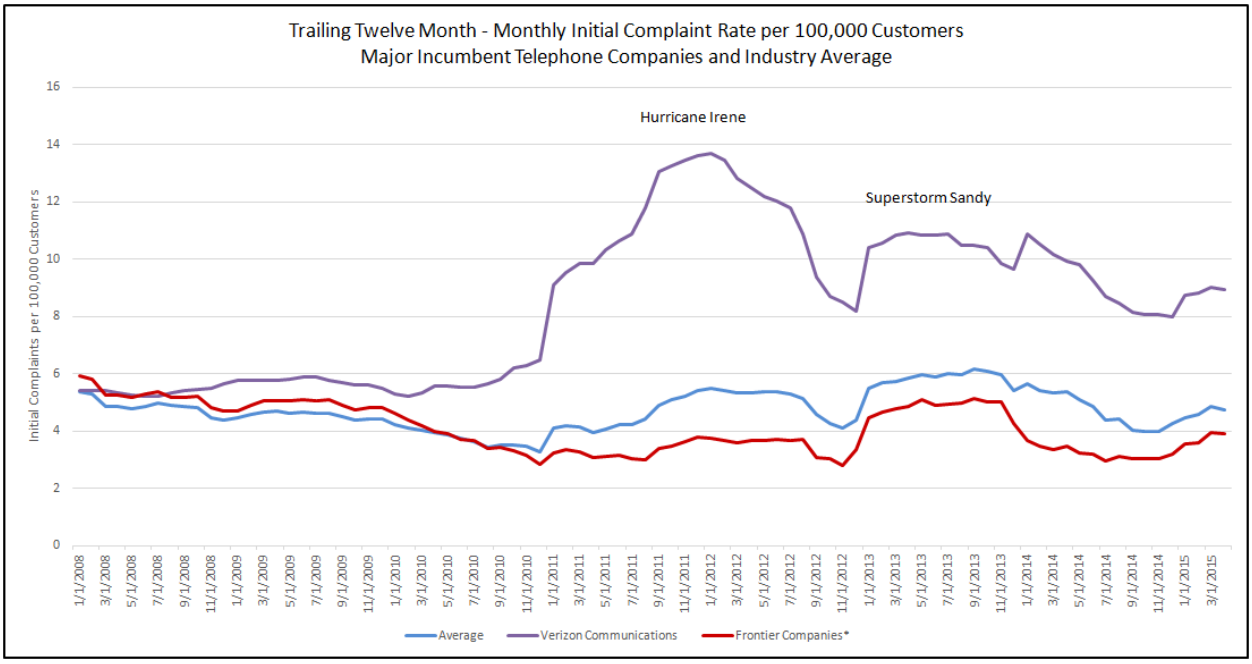

Figure 7: Telecommunications Complaint Rates 2008 - 2014

An alternative measure of how well telecommunications providers are meeting customer needs is through customer satisfaction surveys. J.D. Power conducts biennial U.S. Residential Telephone Service Provider Satisfaction studies for wireline service for each geographic region of the country.[35] In the latest study, conducted in 2013,[36] J.D. Power reports several key findings, including that performance and reliability are the most critical factors in driving overall satisfaction and meeting customer expectations. According to J.D. Power, the incidence of customers who indicate they plan to drop their current telephone service during the next year increases by 46 percent among those who have experienced a service outage compared to those who have not experienced an outage.

Table 6 depicts the 2011 and 2013 J.D. Power survey results (points, index ranking, and point change between the two survey years) for the major companies providing residential telephone service in the East Region. The table also depicts the average survey results for the four regions within the United States, for comparative purposes.

Overall, the surveys indicate that all seven major companies in the East Region improved their customer satisfaction point scores from 2011 to 2013. Verizon had the largest point score improvement in customer satisfaction levels year-to-year, at 89 points, and improved its ranking

[35] There are four regions included in the J.D. Power surveys: East, North Central, South and West. The East Region includes New York State and 12 other northeast states.

[36] J.D. Power, 2013 Residential Telephone Service Provider Satisfaction Study, http://www.jdpower.com/press-releases/2013-us-residential-telephone-service-provider-satisfaction-study (issued September 26, 2013).

from 3rd to 1st between 2011 and 2013, with a score of 729 out of a 1,000 point scale. Although this customer satisfaction data is aggregated for 13 states that make up the East Region, and does not provide specific New York State results,[37] it indicates that overall, in comparison to companies providing residential wireline phone service in other regions of the nation, customer satisfaction with East Region service providers has improved from 2011 to 2013, and all of the individual companies have improved their point scores over this time as well.

J.D. Power Residential Telephone Customer Satisfaction Index	Points 2011	Index Rank		Points 2013	Index Rank		Point Change 2011-2013
AT&T	635	4		707	4		72
Cox Communications	659	1		721	2		62
Frontier Communications	615	7		681	5		66
Optimum (Cablevision)	647	2		708	3		61
Time Warner Cable	626	6		672	6		46
Verizon	640	3		729	1		89
XFINITY (Comcast)	628	5		707	4		79
East Region Average	636	3		712	2		76
East Region Average	636	3		712	2		76
North Central Region Average	643	1		702	4		59
South Region Average	640	2		716	1		76
West Region Average	623	4		703	3		80

Table 6: U.S. Residential Telephone Service Provider Satisfaction Survey

DPS Staff does not maintain statistical data regarding consumer complaints for any of the unregulated services; however, Office of Consumer Services advises that wireless customers who do contact the Department most commonly report contractual obligations and billing errors as their primary complaints. Similarly, consumer contacts related to broadband Internet service generally have concerns with data speeds and intermittent or frequent out-of-service conditions. Consumer contacts related to satellite service commonly describe service quality and billing issues. A common theme is that consumers typically complain about the same types of service or billing issues, whether or not those issues are related to telecommunications services that are either regulated or not by the state.

Since 1988, the Commission has been publicly recognizing regulated local exchange carriers that provide excellent service quality by issuing annual service quality commendations to those carriers who achieve exemplary service quality performance. To receive a Commission service quality commendation, a company or operating division must meet the following performance criteria:

[37] According to J.D. Power, state level customer satisfaction scores of individual companies are not publicly available.

1. For the year, 95% or more of all monthly customer trouble report rate (CTRR) measurement opportunities must be less than or equal to 3.3 customer trouble reports per hundred access lines.[38]
2. For the year, an annual PSC complaint rate of 0.075 complaints per thousand access lines or less per month.[39]
3. Achievement of all applicable CTRR and PSC complaint rate targets associated with incentive plans, multi-year rate plans, mergers and asset transfers, and formal service quality proceedings.
4. Notwithstanding achievement of the above measures, no separate service quality Commission action must have been taken against the company or operating division during the year.

The following chart provides a historical view of the local exchange companies eligible for commendation, and those which have met the requisite criteria and received Commission commendations. The annual trend indicates that, first, the number of companies offering local exchange service has been on the rise since 1997, as more competitive carriers have entered the market. Second, the number of local exchange carriers receiving Commission commendations over the past 26 years has also been increasing.

[38] The Telephone Service Standards, 16 NYCRR Part 603, require that each central office perform at a CTRR of 5.5 or less. Thus, the commendation criteria significantly exceed the Commission standards.

[39] Commendations are also granted in cases where only one PSC complaint was charged against the company during the year under review, but the company's PSC complaint rate per 1,000 access lines exceeded 0.075 due to the company's small access line base.

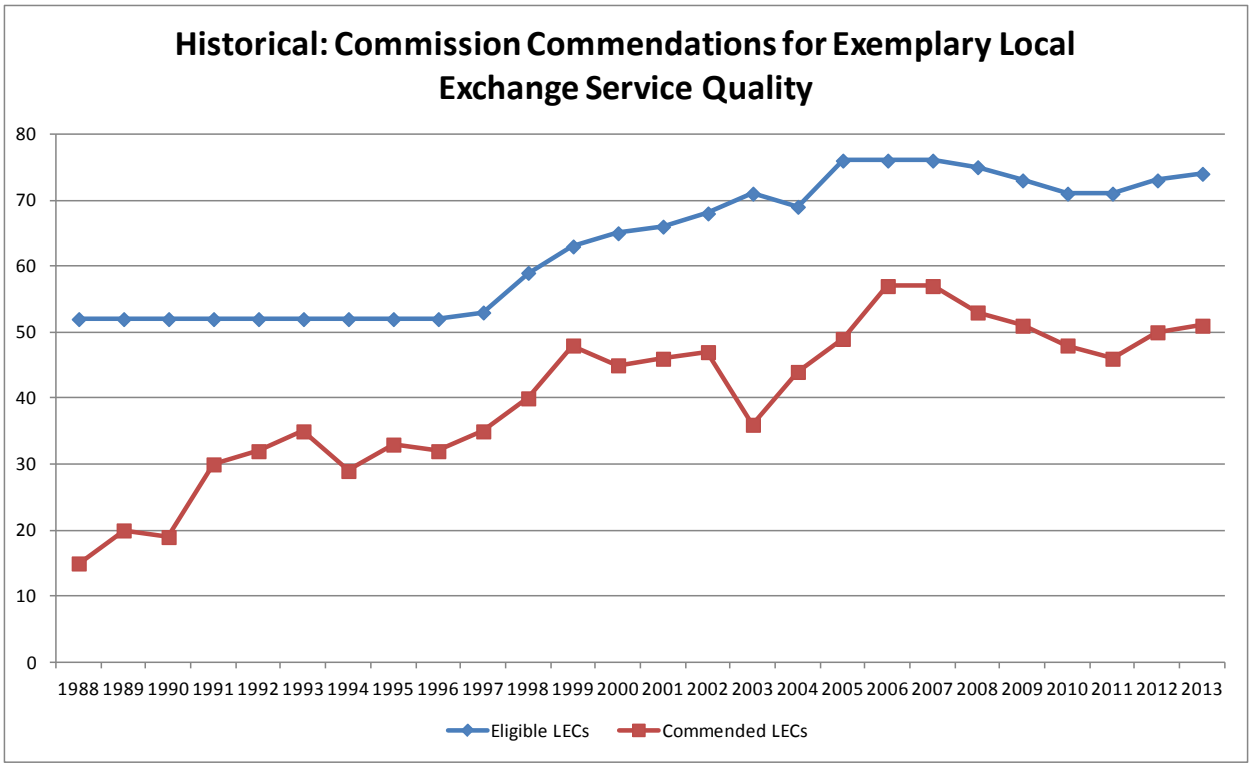

Figure 8: Commission Service Quality Commendations

State Universal Service Fund

The term "universal service" refers to the concept of making affordable basic telephone service available to everyone everywhere within the nation, state, or other governmental jurisdiction. To achieve this goal, local residential service was traditionally heavily subsidized by non-local, toll calling charges, and in later years via "access charges" that longer-distance, interexchange carriers pay to the local telephone companies for originating and terminating toll calls. As the communications marketplace became increasingly competitive, the Commission recognized the importance of pricing services at marginal costs and creating a "level playing field" where one service does not implicitly subsidize another. As part of that effort, the Commission has reduced intrastate access charges, which in turn reduced the amount of funding available to subsidize local exchange service. In response, the Commission established a State Universal Service Fund (SUSF) to provide additional revenues to the smaller incumbent local exchange companies so that they can continue to make basic service universally available to all customers at affordable rates. As noted earlier, 98% of occupied housing units in the state have voice service.

The SUSF was established by the Commission in Case 09-M-0527 for a term of four years, beginning January 1, 2013, with a sunset at the end of December 2016. As a result, incumbent phone carriers operating in New York, as well as Time Warner Cable Information Services and Cablevision Lightpath Inc., contribute to support the SUSF. All incumbent telephone companies, except for Verizon and Frontier Communications, are potentially eligible

to receive SUSF funding. Carriers that contribute to the SUSF are allowed to recover costs via a surcharge on consumer bills. The SUSF provides for a total of $17 million to be available, if needed, through 2016, with funding capped at $5 million in contributions for the first year and $4 million annually thereafter.

Through the end of 2014, disbursements from the SUSF have been significantly lower than the amount committed to the fund. In its first year, the SUSF collected only $1.25 million of the allotted $5 million, because that amount was sufficient to meet 2013 fund disbursements. Three companies, Oneida County Rural, Newport Telephone Company and Crown Point, received SUSF funds to supplement shortfall in revenue requirement due to basic rate cap. The remainder of the first year's commitment (approximately $3.75 million) was carried forward for potential use in subsequent years in addition to the $4 million maximum otherwise available for SUSF in years two through four. Through the first and second quarters of 2014, $2 million was collected and used for SUSF disbursements. In addition to the original three companies receiving funding, Oriskany Falls, Port Byron, Township and Vernon Telephone Corporation have also been approved for SUSF disbursements in 2014.

The estimated total disbursements expected for 2014 SUSF recipients was approximately $1.2 million, and 2015 SUSF disbursements are estimated at $2.0 million. Thus, almost halfway through the four-year term of the SUSF, only seven companies have been approved to receive funding, and the revenue draw has been lower than anticipated. Barring other rate case filings or unforeseen circumstances, the SUSF is likely to sustain itself over the four-year term without the need to collect or disburse funds at the full $17 million fund cap. Table 7 provides a historical view of the access line counts of the SUSF recipients from 2010-2013. The companies' line losses over this time range from approximately 9%-28%, mainly the result of consumer adoption of an alternative voice service from competitive providers.

SUSF Recipient Companies	Access Lines in Service				Percent Change
	2010	2011	2012	2013	2010-2013
Crown Point Telephone	819	780	818	748	-8.7%
Newport Telephone	2,987	2,812	2,687	2,528	-15.4%
Oneida County Rural Telephone	2,327	2,129	1,964	1,861	-20.0%
Oriskany Falls Telephone	436	409	366	343	-21.3%
Port Byron Telephone	2,349	2,225	2,137	1,976	-15.9%
Township Telephone	3,304	3,016	2,717	2,389	-27.7%
Vernon Telephone	1,939	1,807	1,717	1,610	-17.0%
Total Companies	14,161	13,178	12,406	11,455	-19.1%

Table 7: Access Line Losses of SUSF Recipients.

Sustaining network operations, reliability and financial stability may become more challenging as regulated service monthly revenues continue to decline. To this end, the SUSF Joint Proposal adopted by the Commission contemplates that a proceeding will be established to review the SUSF before it expires in 2016.

Lifeline Telephone Service

The Lifeline telephone service program was implemented by the FCC in 1985 in the wake of the 1984 divestiture of AT&T. Its initial purpose was to ensure that any increase in local rates that occurred following major changes in the marketplace would not make local phone service unaffordable for low-income households and result in service disconnection. There are mechanisms in place to ensure that carriers recover their cost of providing Lifeline service. Those carriers designated as Eligible Telecommunications Carriers (ETC) are eligible to receive Federal Universal Service Funding for Lifeline up to $9.25 per customer. New York carriers are also allowed recovery of their Lifeline costs, exclusive of any Federal Lifeline support, via procedures governed by the Targeted Accessibility Fund of New York, Inc.[40] In addition to Lifeline service being available to traditional and competitive wireline customers, Time Warner Cable also offers a VoIP-based Lifeline service.

Figure 9 depicts Lifeline service subscription for the period 2000-2013. As shown therein, the usage of Lifeline generally comports with consumer preference with telephone choice.

Subscribership to traditional wireline Lifeline services in New York peaked in 1996, at more than 768,000 lines. Since then, Lifeline enrollment has been declining and, as of year-end 2014, total wireline enrollment in New York amounted to only 137,000 lines.

Part of the recent decline in wireline Lifeline is due to an FCC initiative to eliminate duplicative subscriptions, including thousands in New York, where customers were enrolled and receiving both wireline and wireless Lifeline services. Those customers were given the choice of maintaining either a wireline or wireless Lifeline service, but not both. The net result of that reform was that many customers dropped their wireline enrollments for wireless Lifeline service, and the wireline figures for 2012 and 2013 declined further as duplicate enrollments were eliminated from the system.

The most significant growth in the Lifeline service category, however, is evident in the consumer adoption of wireless Lifeline service. Wireless companies, such as Cricket Communications, I-Wireless, Tracfone Wireless, and Virgin Mobile actively promote wireless Lifeline service. In the relatively short span of five years, wireless Lifeline subscriptions have ballooned from just a few thousand, to over 1 million. The level of wireless Lifeline subscriptions in 2013 has surpassed even the peak wireline subscriptions of the mid-1990s.

The subscription level of competitive phone companies' Lifeline service has remained relatively stable over the past decade.

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[40] The Targeted Accessibility Fund of New York, Incorporated (TAF) (http://www.tafny.org) was established by the Commission in 1998 as a mechanism to ensure the proper funding by the telecommunications carriers of various targeted programs as defined by the Commission. The programs identified were Lifeline, emergency services E911, Public Interest Pay Phones, and the Telecommunications Relay System.

Based on the historical data of the past decade, the availability of Lifeline services to New Yorkers has grown significantly, both in terms of the multi-platform providers, and in the overall subscription levels. This increase has been driven extensively by adoption of wireless Lifeline over landline Lifeline services. Lifeline continues to be a valuable program to ensure that residents have access to phone service, and assist New York in achieving its universal service goals.

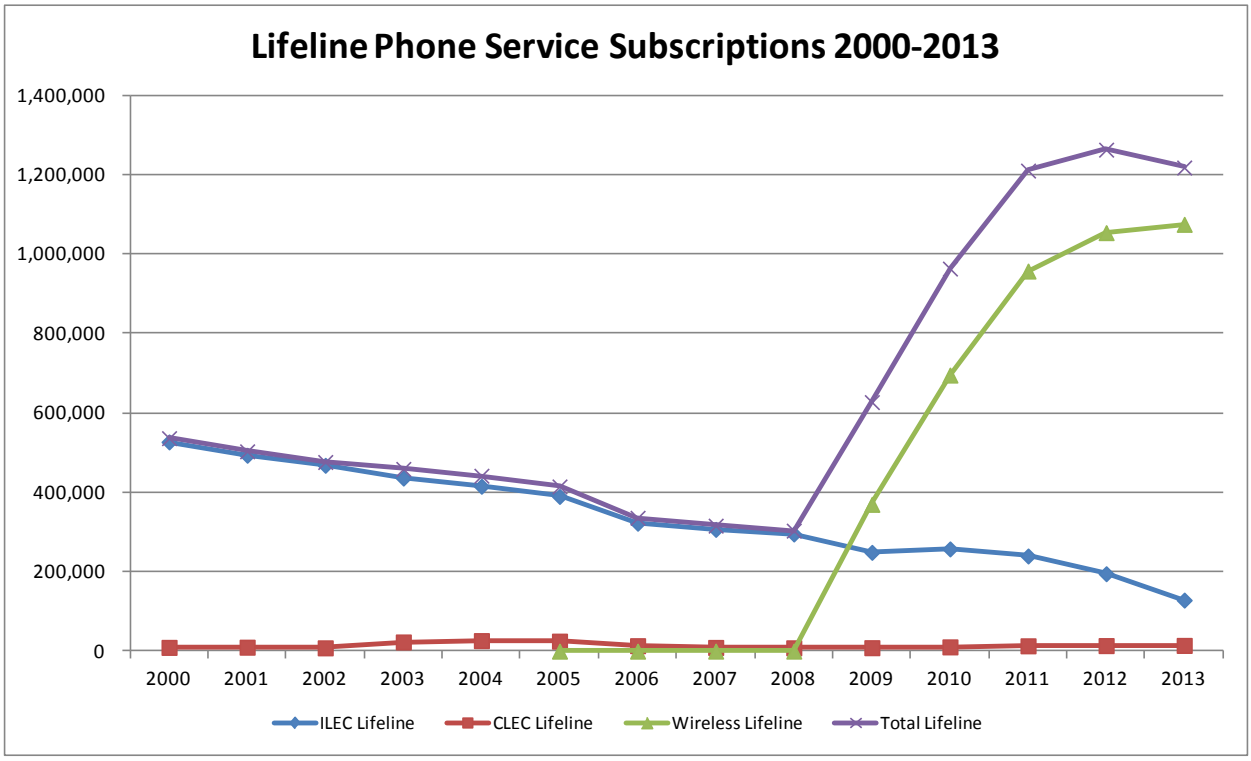

Figure 9: Lifeline Subscription by Industry Segment

Emergency Reporting

A critical function of the Commission is to ensure the integrity of the telecommunications infrastructure in New York State in order to protect the public's health, safety and welfare. A fundamental aspect of that function is the Department's Outage Reporting program which collects network outage information on a 24 x 7 basis and reports real-time network status in support of the Commission's emergency response activities as well as to external agencies, including the Office of the Governor, the Office of Emergency Management, the Division of Homeland Security and Emergency Services, and other entities in the State's emergency response community. For many years, facilities-based telephone service carriers and cable companies provided notification of network outages and other emergency events to the Department pursuant to 16 NYCRR Parts 603 and 890, respectively. In the Comp III Order, the Commission underscored the importance of maintaining robust and reliable telecommunications networks, and that accurate outage reporting on a near real-time basis for all intermodal services (voice, video and broadband) was necessary. Thus, in 2006, the Department expanded the program to

include cable (VoIP and data) and cellular carriers and all major entities (AT&T, T-Mobile, Sprint, Verizon Wireless, Time Warner Cable, and Cablevision) committed to participate. Each year Staff assesses its emergency operations plan and outage reporting expectations and notifies each carrier of modifications to the guidelines and requests companies to update critical contact information. In the wake of Superstorm Sandy in late 2012, the Department has and continues to emphasize coordination between the telecommunications and electric industries to improve emergency response efforts.[41]

Entry/Exit

Pursuant to PSL §99, before an incumbent or a competitive telephone provider can enter the telephone market, they must obtain a Certificate of Public Convenience and Necessity (CPCN), to provide local exchange (i.e., dial tone), intra-local access and transport service (i.e., long distance), alternative operator, and other types of telephone services - whether the company utilizes its own facilities or resells the services of another telephone company. If an incumbent or competitive telephone provider with a CPCN wants to transfer its franchise, assets, ownership or stock (i.e., to exit the market) it would need Commission approval under PSL §§99 and 100, respectively. With regard to VoIP telephone service, the Commission's regulations do apply to Time Warner Cable Information Services (TWCIS) based on its approved CPCN and eligible telecommunication carrier (ETC) status (to provide Lifeline service in its New York service area). Other telephone over-the-top, VoIP and wireless carriers, however, are not currently subject to these PSL regulations.[42]

Transitional Issues

Copper Retirement and Replacement

Although fiber technology has been used for decades in traditional telephone networks, for interoffice transport and to serve digital loop carrier systems, the deployment of fiber-to-the-premises (FTTP) is a relatively new development in the long history of telephony. Most all of the Frontier network in New York State remains copper-based. While Frontier's telephone (voice) service quality has not been an issue, the company's ability to provide modern high-speed Internet (data) service on a going-forward basis will become more and more limited without an assertive fiber build-out schedule.

The mass migration of customers to alternative communications modes over the last decade, and the resulting reduction of access lines and associated revenue, has strained the business case for narrow band legacy copper networks whose copper plant has contributed to

[41] Case 13-M-0025, In the Matter of Outages Caused by Hurricane Sandy, Staff Report (issued March 27, 2014).

[42] With regard to wireless, under PSL §5(6),(a), the application of the provisions of the PSL are suspended unless the Commission, after notice and hearing, determines that it is in the public interest to assert regulatory oversight.

declining service quality performance in some instances. Aging copper plant is an issue in both urban areas of New York, where Verizon's fiber technology may run parallel to copper, as well as rural areas, where fiber deployment is less prevalent.

Since the early 1990s, the Commission has observed the introduction of all-fiber loops and the impact of copper loop retirement and replacement from many perspectives: its potential to limit wholesale service offerings; the provision of quality retail service if copper is neglected; the relevance of copper-based services in the definition of basic telephone service; customer dependence on copper reliability, and the future viability of copper as telephone networks transform from circuit-switched (TDM) to multi-media IP based platforms.

Requirements for copper loop retirement were established by the FCC in the Triennial Review Order (2003) and Triennial Review Remand Order (2006). These proceedings focused mainly on competitor access to unbundled network elements, which did not mandate competitive access to an incumbent carrier's newly built all-fiber loops, and establishing notification requirements for incumbent carriers to follow when retiring copper loops. These requirements are still valid today, and provide the basis for the PSC guidelines and expectations for carriers to notify customers and competitors when copper loops are to be retired.[43]

The FCC currently has several open dockets on technology transitions and the impact of retiring and replacing copper technology, including the need for battery backup power at customer premises. In January 2014, the FCC authorized trials to explore the impact on consumers of technology transitions in communications networks. The trials,[44] which include actual migration of customers to wireless and IP networks, seek to gather data through cooperative research in urban, suburban and rural settings.

In a recent Notice of Proposed Rulemaking,[45] the FCC requested comments as it looks to establish reasonable expectations as providers transition from circuit switched, copper networks to IP-based multi-media wired and wireless networks. The Commission filed comments stressing, among other things, the importance of battery backup availability to support continued access to services during power interruptions as well as supplementing consumer education and notice requirements for those consumers affected by copper retirements.[46]

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[43] The Public Service Commission established Carrier Migration Guidelines in Case 00-C-0188 and requires notification of network changes to avoid service interruption, pursuant to tariff. See, e.g., Verizon Tariff PSC No. 15 – Communications, Section 1, Part C.1.c(3).

[44] AT&T has proposed the trials in Carbon Hill, Alabama, and in West Delray Beach, Florida.

[45] See, PS Docket No. 14-174, et al., Technology Transitions, Notice of Proposed Rulemaking and Declaratory Ruling (issued November 25, 2014).

[46] While FTTP networks are inherently more resilient than copper, they nevertheless require commercially provided power or back-up power supplies to operate. This point has been raised in various complaints and other Commission proceedings.

Except for the few areas where it has provided notification of copper facility retirement,[47] Verizon still maintains its copper network, even in areas where FiOS is broadly deployed. Pursuant to its franchise with New York City, Verizon committed to a complete build-out of FiOS for video service by June 2014. However, the Commission is aware that in some neighborhoods and many buildings in NYC, FiOS is not readily available to customers for various reasons. In many areas of New York City, the legacy copper infrastructure is in such poor condition that copper failures due to weather conditions can cause long delays for service restoration and Commission service quality standards are missed.[48] To keep customers connected, the company offers Voice Link as a permanent service or as an interim solution until copper can be repaired.[49] In many instances, the migration to FiOS may not be readily available so the company faces a difficult repair or lengthy replacement of the copper facility to serve a reduced customer base.

Staff also notes that in the wake of damage sustained in areas of Long Island, particularly in western Fire Island, Verizon sought to deploy its wireless-based Voice Link service and filed amendments to its tariff that would allow it to fulfill its obligation to provide service in that area. A condition of the temporary approval included a comprehensive evaluation of the performance of Voice Link, and the Commission sought comments from interested parties and stakeholders on the technology, service plans, and delivery. The majority of the comments received were negative toward Voice Link as a network solution, mostly criticizing inferior sound quality and limited functionality[50] (lack of support for FAX, alarm services, Internet, and other traditional copper-based telephone functions, such as operator service and long-distance provider choice). In the wake of concerns expressed by the Commission and consumers, Verizon ultimately decided to deploy its FiOS network.

The challenges of the NYC FiOS build and the Fire Island experience illustrates many of the difficulties faced by companies and communities related to the retirement and replacement of copper-based TDM networks and the transition to IP, FTTP and wireless networks. There is a general concern in areas solely served by copper networks that repairs are not unduly delayed as carriers transition to other technologies. The PSC must also ensure that copper retirements are not being accelerated as an artificial means to degrade competition, raise consumer prices or

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[47] Thus far, Verizon has notified the FCC and the Commission of retirements of copper facilities and switch equipment in certain areas of Manhattan, Queens, Long Island and Orchard Park. See, FCC, Section 251 Wireline Network Changes, http://www.fcc.gov/encyclopedia/section-251-wireline-network-changes.

[48] See, e.g., Case 14-C-0003, In the Matter of Quality of Service provided by Local Exchange Companies in New York State, Verizon New York Inc. 2014 Service Quality Report – Third Quarter (issued November 18, 2014).

[49] In all areas of the state Verizon offers permanent Voice Link as a non-tariffed service at $19.95 per month. When Verizon uses Voice Link as an interim service, it is offered free of charge.

otherwise reduce consumer protections. Thus, if copper retirements are conducted as part of a migration plan to new networks, such as FTTP, customers (including residential, business, and wholesale) should continue to have an equivalent service available at comparable cost, quality, reliability, and resiliency with equivalent consumer protections. Where Verizon is migrating customers to FiOS, it does so subject to Public Service Law obligations. The challenge of future regulatory oversight will be to accommodate new technologies, support industry investment and expansion of advanced networks, and incent competition where possible, while maintaining consumer protections as network transitions take place.

Network Impacts on Emergency Communications

The 911 system was developed to deliver calls and location information on the switched telephone network. Enhanced 911 (E911) systems were implemented over twenty years ago to connect callers to an emergency dispatcher or Public Safety Answering Point (PSAP), and simultaneously provide information on the location of the caller to emergency responders. Selective routing of a 911 call to the appropriate PSAP is accomplished in the E911 system by querying databases that match street addresses with the originating telephone numbers. As the call is delivered to the PSAP, a second query is made to the Automatic Location Information (ALI) database, again using the originating telephone number as a search key, and the customer's location record is then returned to the PSAP.

The emergence of VoIP and cellular networks presents challenges to the traditional E911 system because callers and devices on these networks may not be assigned to a fixed location; however, with some modifications they have adapted to utilizing the existing telephone network to deliver 911calls and location information to PSAPs. In fact, most PSAPs in New York currently receive more 911 calls that originate on wireless devices than from callers on wired telephones.

The FCC estimates that about 70 percent of 911 calls are placed from wireless phones, and that percentage is growing.[51] To accommodate the unique challenges to obtaining and transmitting location information for cellular 911 calling, the FCC has undertaken a phased-in approach to implement and improve location accuracy:

- **Phase I Enhanced 911 (E911) rules** require wireless service providers to provide the PSAP with the telephone number of the originator of a wireless 911 call and the location of the cell site or base station transmitting the call.

- **Phase II E911 rules** require wireless service providers to provide more precise location information to PSAPs; specifically, the latitude and longitude of the caller. This information must be accurate to within 50 to 300 meters depending upon the type of location technology used.

[51] See, FCC, Guide: 911 Wireless Service, http://www.fcc.gov/guides/wireless-911-services.

Recently, the FCC announced that it would modify its rules for cellular 911 calls to require all wireless carriers to meet the more stringent location accuracy standards, based on global position system (GPS) technology. The new rules are intended to help first responders better locate people in indoor locations, including tall structures during emergency events.

Still, most all 911 calls originating on wired and wireless devices, as well as the caller's location information, reach PSAPs via interconnection to the traditional telephone network and traverse existing trunks provided by the incumbent LEC. It is possible that E911 and next generation 911 systems (NG911, explained below) will be replaced entirely by IP-based systems due to their low-cost, dynamic routing and advanced information capabilities.

911 Oversight, Cost Recovery & Next Generation 911

Emergency communications and 911 calling are delivered and handled by PSAPs.[52] Oversight of the emergency communications and 911 calling systems in the state is the responsibility of the New York State Interoperable and Emergency Communication Board within the Division of Homeland Security and Emergency Services (DHSES).[53] Commission oversight of 911 calling is limited to requirements established for the reliability and redundancy of critical 911 circuits, network outage reporting, recovery of 911 costs incurred by carriers for call delivery and database access. Facilities-based carriers in New York are required to provide adequate trunks for 911 calls by their customers and associated ANI and ALI data to PSAPs in their operating territories.

These services must be provided over geographically redundant facilities to improve resiliency and provide a means for alternative delivery of services if the primary connection fails. In 1993, the Commission required that LECs provide at least two connections for 911 call delivery to counties at no cost, and established a rate for PSAPs to pay for accessing the ANI and ALI databases on a per use basis.[54] The Commission has also established the Targeted Accessibility Fund (TAF) of New York which allows contributing carriers monetary relief associated with costs incurred in providing 911 call and delivery functions.[55] TAF funding is calculated primarily on regulated intrastate revenue. As access lines and revenues continue their

[52] According to the FCC 9-1-1 Master Registry of PSAPs, there are approximately 192 primary and alternate PSAPs actively operating in New York.

[53] County Law § 326.

[54] Case 93-C-0396, Order Approving New York Telephone's Tariff (issued November 30, 1994).

[55] Case 94-C-0095, Proceeding on Motion of the Commission to Examine Issues Related to the Continuing Provision of Universal Service and to Develop a Regulatory Framework for the Transition to Competition in the Local Exchange Market, Opinion and Order Establishing Access Charges for New York Telephone Company and Instituting a Targeted Accessibility (issued June 2, 1998).

expected decline, a concern emerges as to how TAF recovery of 911 costs will be impacted as the demands on the existing 911 network will likely increase to accommodate NG911.

Over the past decade, public safety officials have talked extensively about the promises, possibilities and challenges associated with transitioning the 911 network from its mostly legacy copper-based, circuit-switched platform to an IP-based, software-intensive system capable of receiving and managing voice, data, image and video information. NG911 anticipates that emergency communication will not be limited to the 911 call, but also enable text, data, image and video transmissions. And while the need to upgrade the 911 system to an IP platform has become increasingly clear, exactly how to make the transition to the new platform continues to be a topic of debate.

A key piece to implementing NG911 effectively will depend on the development of standards designed to promote interoperability of emergency calling systems, and increase the level of competition among 911 service providers and equipment vendors, which public safety officials hope will increase choice and lower the cost of 911 solutions. To this end, the National Emergency Number Association (NENA) has been developing standards and guidelines over the past several years to provide PSAPs with a path to NG911; the i3 standard details the infrastructure and interfaces to provide the foundation of the next-generation architecture. Since the public switched telephone network and established database system will continue to be used for the foreseeable future, the i3 architecture will provide a gateway to interface between the legacy network and the next generation ESInet. The Department intends to work collaboratively with DHSES, the 911 Advisory Board and the Public Safety Broadband Working Group to further advance the implementation of NG911 in New York State, while maintaining our oversight of 911 system affordability and reliability as it pertains to providers of 911 services.

VIDEO COMMUNICATIONS

Providers and Service Types

Traditional cable video services entered the consumer market as an alternative for broadcast television service several decades ago. For many years, video was not considered an essential or critical service, but rather mainly as an entertainment service, and cable video was provided over monopoly providers' systems subject to the Commission's basic service rate and service quality regulations. The general policy goal at that time was to encourage the deployment of video service to as much of the State as possible, and that policy has mainly been met. The Commission, for the most part, no longer has basic service rate regulation because under the FCC's current rules for determining "effective competition," a cable operator may petition to be relieved of basic service rate regulation if, among other things, there is one or more unaffiliated competitors in a given franchise area offering comparable service to at least 50% of the franchise area's households and has achieved at least a 15% penetration level.[56] For most of the State the FCC has determined that "effective competition" exists.[57] Almost all of New York is considered to be effectively competitive as a result of satellite television availability and incumbent telephone providers that now provide video services as well.

Accordingly, the Commission's core interest in the video market has been to encourage wireline video network expansion and competition to the fullest extent possible Statewide. Today, the video service market has evolved such that consumers have near-ubiquitous video service availability from wired (Cable television and FiOS TV), broadcast television, and satellite providers, and can also purchase video programming from over-the-top service providers, like Netflix and Hulu, on a subscription basis using their existing wired and wireless broadband connections.[58] Many traditional cable television (CATV) and satellite providers also offer over-the-top video options as an additional service. Over 95% of New York now have available some form of video service, and in most places have at least two providers to choose from, but this was not always the case.

To support competitive entry, in June 2005, the Commission allowed Verizon to build out its FTTP network, capable of delivering video service, without first obtaining a video

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[56] See, 47 C.F.R. §§76.905 and 76.907.

[57] It should also be noted that in June 2015, the FCC adopted a new regime establishing a presumption of effective competition unless a franchising authority demonstrates the lack of competition. MB Docket No. 15-53, In the Matter of Amendment to the Commission's Rules Concerning Effective Competition, Report and Order (rel. June 3, 2015).

[58] For most customers, wireless broadband connections are not a viable option for household video needs because the speed of the broadband connection varies with the distance to cell towers, and most wireless plans have data limitations that would greatly increase the cost of relying on wireless broadband for video.

franchise from the affected local municipalities.[59] The Commission reasoned that because the PSL did not mandate that a cable franchise was required upon upgrading a wireline network capable of delivering multiple services (including video), until such time that a service provider actually decided to offer such video services, it would be unreasonable to require Verizon to prematurely obtain individual cable franchises. As a result, Verizon was allowed to upgrade its network consistent with pre-existing rights-of-way authorizations, but required to get municipal video franchises before it sought to install cable exclusive equipment or offer video service in those specific municipalities.

More recently, the Commission has allowed Verizon and other competitive wireline video providers to obtain geographically-limited video franchises in an effort to balance the desire for competitive choice to all customers with the risk of deterring entry and the concrete benefits of partial entry.[60] Over the last decade, twelve cable companies have acquired a total of 277 new cable franchises (189 by Verizon) in municipalities that were previously served by a single cable operator. However, anecdotal evidence suggests that obtaining initial local franchise approvals has, in some instances, taken a considerable amount of time. In response to this and other concerns regarding local franchising, Staff notes that the Legislature has in the past considered creating a statewide franchise system to regulate entry into the cable market in the hopes of expediting such approvals and promoting competitive entry.[61] Staff also notes that only wireline cable video providers in New York (as opposed to satellite and over-the-top providers) are required to obtain local franchises and Commission confirmation thereof. Broadband service in and of itself does not require a franchise.

Direct broadcast satellite (DBS) service from providers like DirecTV and Dish Network have captured about 15% of the state's consumer video market. DBS service offers a wide variety of high-definition programming, is easily installed, and includes various pricing and service bundle options. In addition, satellite video service is not confined to a wired network; thus, it is generally available to any location with a clear, unobstructed sky view.

Broadcast Television, while not a subscription service, nonetheless remains a significant market player for consumers. The New York State Broadcaster's Association estimates that about 1.25 million New York households, or roughly 17%, continue to rely exclusively on

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[59] Case 05-M-0250, et al., Joint Petition of the Town of Babylon, the Cable Telecommunications Association of New York, Inc. and CSC Holdings, Inc. for a Declaratory Ruling Concerning Unfranchised Construction of Cable Systems in New York by Verizon Communications, Declaratory Ruling on Verizon Communications, Inc.'s Build-Out of its Fiber to the Premises Network (issued June 15, 2005).

[60] See, e.g., Case 14-V-0089, Petition of Verizon New York Inc. for a Certificate of Confirmation for its Franchise with the City of Glen Cove, Nassau County, Order and Certificate of Conformation Approving Franchise Subject to Conditions (issued August 14, 2014).

[61] See, e.g., A5947-2013, Establishes statewide cable franchises for the purposes of competitive cable service (Brennan), http://open.nysenate.gov/legislation/bill/A5947-2013.

broadcast television for their video programming. As a wireless service, broadcast television programming is available to nearly all of the state's residential and business consumers.

More recently, over-the-top video providers like Netflix, Amazon and Hulu have achieved success in the video market through Internet-based services. Consumers with broadband connections have subscribed to over-the-top programming, either as a supplement to their cable, satellite or broadcast video service, or as a complete substitute for those other services. Attractive features of over-the-top video service include on-demand viewing options, robust content choices, picture quality, reliability, and affordability, especially if consumers choose to migrate away from traditional cable video packages.

Subscription to over-the-top video service is dependent upon the consumer having access to a broadband service connection. Over-the-top video service providers offer customers a variety of choices by which content may be downloaded and streamed onto viewing devices. Netflix, for example, provides streaming video content in standard definition, high definition or ultra-high definition, which customers can select based upon their individual broadband connection speeds.[62] This flexibility allows customers to manage their viewing experience depending on the particular device (television, tablet, phone, etc.) and broadband connection used for viewing. Low-cost over-the-top video services, combined with a basic broadband connection, gives consumers competitively priced alternatives to cable and satellite, and free broadcast television service. Staff expects that consumer demand for video services will remain vibrant in New York.

Availability & Adoption

Video service choices are available across New York from cable, broadcast, satellite, over-the-top and fiber network service providers. The following table depicts general availability and adoption percentages for each of the service provider types.

[62] See, Netflix Help Center, Internet Connection Speed Recommendations, https://help.netflix.com/en/node/306.

Netflix, states that the following broadband speeds can stream its content:

0.5 Megabits per second - Required broadband connection speed

1.5 Megabits per second - Recommended broadband connection speed

3.0 Megabits per second - Recommended for Standard Definition quality

5.0 Megabits per second - Recommended for High Definition quality

25 Megabits per second - Recommended for Ultra High Definition quality

Video Services	Availability	Adoption
Satellite	>95%	>15%
Broadcast	>95%	>15%
Cable	>95%	>50%
Over-The-Top	>95%	>40%
Fiber	50%	>20%

Table 8: Video Service Availability and Adoption[63]

Similar to voice-only service, consumer trends in the video marketplace have changed considerably over the last decade or so. Incumbent cable operators still retain a sizeable portion of the video market, but consumers have migrated to satellite, over-the-top video programming and competitive wireline providers in significant numbers in recent years. For example, FTTP networks, which began deployment in the state only about a decade ago, currently offer competitive video service to roughly 50% of the state's consumers, and have captured sizeable market share in that relatively short time span.[64]

Wireless carriers do not currently offer a full channel lineup of video programming similar to cable and over-the-top providers, but subscribers to mobile wireless broadband service do have the flexibility to access over-the-top video content just as wired broadband subscribers do. Video streaming over cellular wireless broadband can be affected by speed variations based on proximity to cellular towers, and can be a costly application since most cellular plans have data limitations. Thus, wireless broadband subscribers can experience video content on their mobile phones, laptops, or other wireless smart devices, but at potentially high cost.

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[63] This and other tables contained in this document, unless otherwise noted, are derived by Staff from a variety of sources. Availability refers to an estimate of the number of premises that can access the networks/technologies represented. Adoption refers to subscriptions (residential and non-residential) relative to total household premises for Satellite, Broadcast and Cable sectors, and households passed (3.6 million) for Fiber. Over-the-top adoption is based on national estimates of subscriptions to the top three over-the-top providers (Netflix, Amazon and Hulu). Video service adoption rates exceed 100% due to multiple household subscriptions, such as a cable video subscription, over-the-top subscription, and broadcast television available as well.

[64] FTTP networks are capable of providing video, voice and broadband services. An FTTP network provider, if interested in providing video service within a municipality, must first negotiate a cable franchise with a municipality prior to offering video service over its network. In some areas where Verizon has deployed FTTP network, for example, the company offers only voice and broadband service; in other areas, the company offers voice, broadband and video service. In addition to Verizon, other companies operating in the state, such as New Visions Communications, SLIC Networks, Time Warner Cable, State Telephone, Cogent Communications, provide FTTP service, though some provide FTTP principally or only to businesses.

The two largest DBS companies providing video service in both New York State and nationally are Dish Network and DirecTV. DBS providers use geostationary satellites to deliver all digital video programming to subscribers through the installation of a small satellite dish antenna mounted in the vicinity of the customer's home or business, which is then connected to one or more set-top receivers. DBS systems have the advantage of providing service over a nationwide footprint and as such, Dish Network and DirecTV are well positioned to provide service to areas with low population densities. They are also able to add subscribers virtually anywhere in the United States with minimal incremental infrastructure cost. DBS providers offer a wide range of entertainment, sports, news and music programming, as well as high definition quality content. Figure 10 shows the growth of satellite video subscribers nationally, from 2007 through 2013.

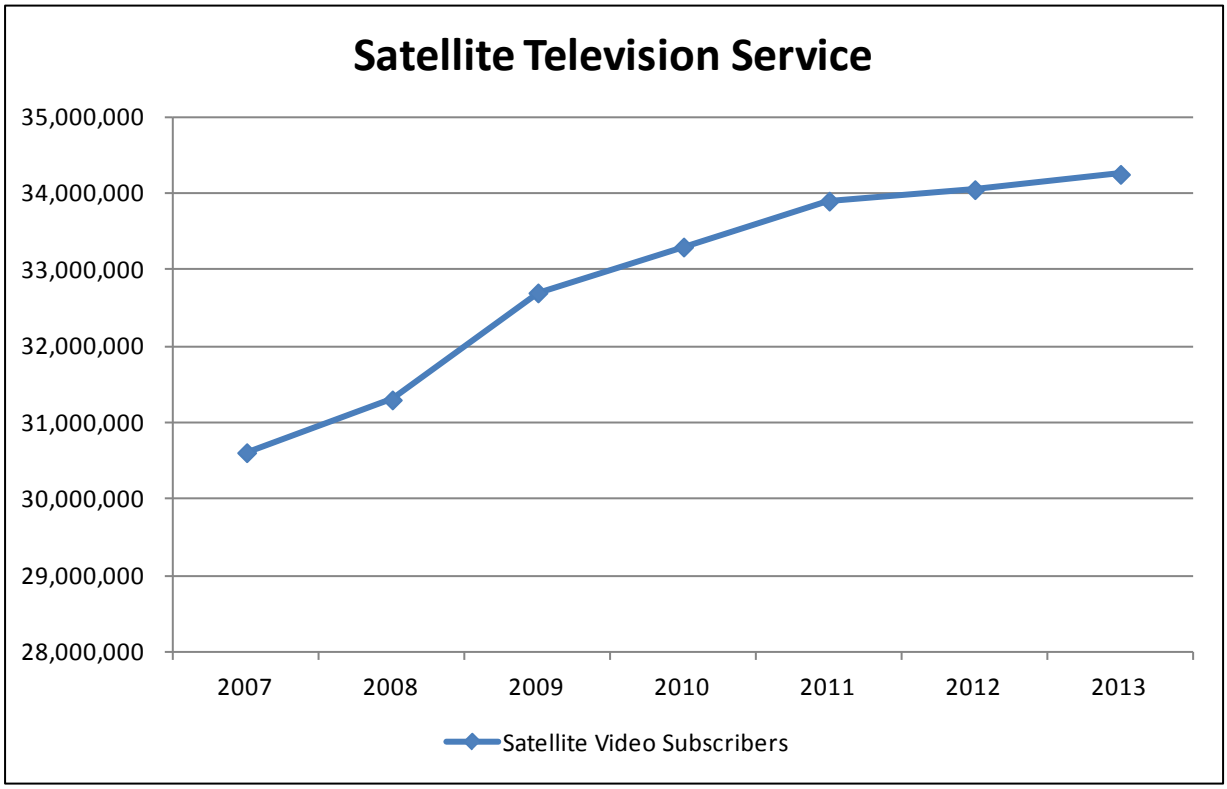

Figure 10: Satellite Video Subscriptions in U.S.

Collectively, it is estimated that Dish Network and DirecTV serve a million or more residential and business customers in New York State. According to a recent news article focused on the City of Syracuse, NY, "DirecTV has 800,000 subscribers in New York. Dish was

cited as having more than 350,000 New York subscribers, and employing more than 800 New Yorkers throughout the state.[65]

Competition

Since 1993, the FCC has presumed that cable systems within municipal franchise areas are not subject to effective video competition unless the cable operator makes a demonstration to the contrary. In June 2015, the FCC voted to adopt a new regime that establishes a presumption of effective competition unless a franchising authority demonstrates a lack of competition.[66] Local franchising authorities without effective competition in their franchise areas retained the authority to regulate the video basic service tier rates for a given cable provider. Under the prior regime, a cable operator was permitted to file a petition with the FCC demonstrating that it was subject to effective competition under one of the following FCC-designated criteria tests: 1) The LEC Test, [67] 2) The Competing Provider Test, [68] 3) The Low Penetration Test,[69] or 4) The Municipal Provider Test.[70]

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[65] Queens Gazette, Officials Tour DISH Network's Customer Service Center, http://www.qgazette.com/news/2013-03-06/Front_Page/Officials_Tour_DISH_Networks_Customer_Service_Cent.html.

[66] MB Docket No. 15-53, In the Matter of Amendment to the Commission's Rules Concerning Effective Competition, Report and Order (rel. June 3, 2015).

[67] The FCC identifies local exchange carriers (LEC), or their affiliates, offering video programming services directly to subscribers by any means (other than direct-to-home satellite services) in the franchise area of an unaffiliated cable operator as a competing LEC provider. The cable operator must demonstrate that the LEC or affiliate offers comparable programming, consisting of at least 12 channels of video programming, including at least one channel of non-broadcast service programming, supported with copies of channel lineups for the LEC or affiliate competitors.

[68] Direct Broadcast Satellite (DBS) providers, such as DirecTV and Dish Network, are recognized by the FCC as competing multichannel video programming distributors (MVPDs), with national service footprints capable of serving essentially all households. A cable franchise area must be served by at least two unaffiliated MVPDs, each of which offers comparable video programming to at least 50 percent of the households in the franchise area, and the number of households subscribing to programming services offered by the MVPDs other than the largest MVPD, must exceed 15 percent of the households in the franchise area.

[69] The FCC recognizes that a cable operator is subject to effective competition if the cable company serves fewer than 30 percent of the households in the franchise area, demonstrated through the provision of cable subscription and comparative census household data that confirms the under 30 percent serving rate.

[70] A cable operator is subject to effective competition if the local franchising authority for a franchise area operates its own multichannel video programming distributor system, and offers video programming to at least 50 percent of the households in that franchise area.

For more than a decade, cable companies operating in New York State have been petitioning the FCC for special relief from basic service tier rate regulation. At this time, the majority of cable television franchises in the state have been recognized by the FCC as subject to "effective competition" under one or more of the four designated FCC tests. The "Competing Provider Test," - which is focused on satellite television competition - has been the primary means demonstrated by cable operators, and acknowledged by the FCC, far and above the other three tests, for granting basic service tier rate deregulation. The Figure 11 map shows cable franchise areas across the state, shaded in green, that have been granted basic service tier rate relief by the FCC. [71]

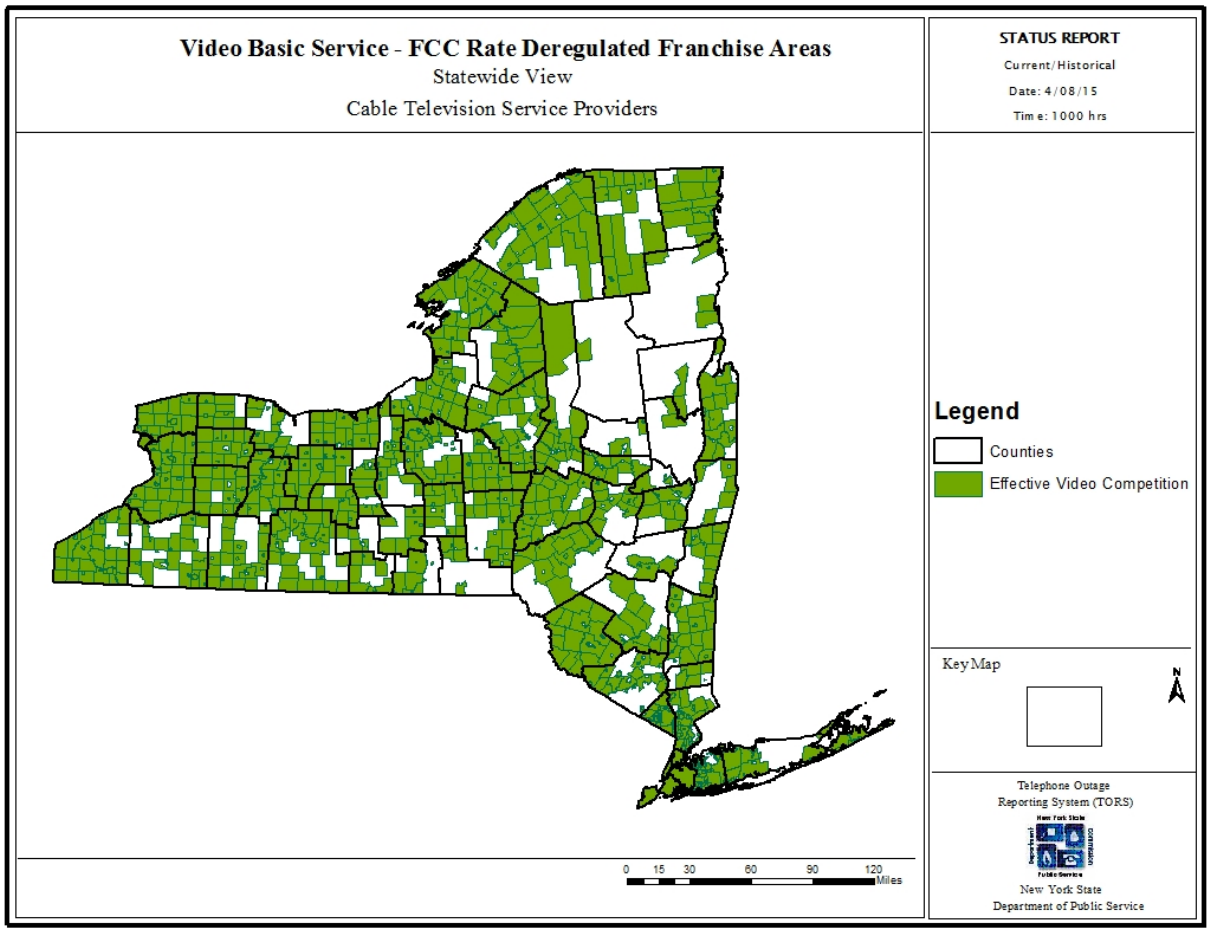

Figure 11: Municipal Franchise Areas Deemed Effectively Competitive for Video Service

[71] The aggregate number of rate-deregulated franchise areas displayed on the map is 969. We note that cable petitions for rate-deregulation in more than 150 additional franchises are pending before the FCC; they are not displayed on the map. Consumers in those areas of the map that are unshaded may have competitive choices for video services.

Staff did not perform an HHI analysis for the New York video market because we did not have sufficient market data.

Pricing

Video pricing typically delineates price points for different programming packages, with package tiers ranging from basic to premium packages. Basic packages typically offer local broadcast television stations and local public, educational and governmental channels; Standard packages are offered with various programming line ups; and Premium packages typically include a premium services such Home Box Office, Show Time, and Cinemax. Pricing is often discounted with promotional offerings and when included in triple or double play bundling options with video and video services.

A sampling of stand-alone and bundled prices are contained in Appendix B, Table 3. In general, the samples were selected where the component parts (i.e., video package, broadband speed, voice) were also available on a stand-alone basis. The selection of prices contained in Appendix B also attempts to make the overall total package reasonably comparable from company to company.

A sample of the pricing information as of May 11, 2015 for standalone broadband services, in comparison with bundled prices from Appendix B is in Table 9 below. A more complete set of pricing information can be found in Appendix B.

Bundle	Triple Bundle Price	(Video+Data) Bundle	Incremental Charge for Phone Triple Bundle less Video+Data Bundle	Standalone Prices		
				Phone	Video	Data
Verizon Triple Bundle *2 Channel Packs* *25Mbps Data* *Unlimited Domestic and Canadian Calling, Promo (24 months)*	$74.99	$59.99	$15.00	$61.99	$54.99	$54.99
Time Warner Cable Triple Bundle *200+ Channels* *30Mbps* *Unlimited Calls in the U.S., Canada, Puerto Rico, Mexico, Hong Kong, Promo (12 months)*	$89.99	$89.99	$0.00	$10.00	$49.99	$54.99
Cablevision Triple Play *245+ Channels* *50Mbps* *Unlimited Domestic Calling, Puerto Rico, U.S. Virgin Islands, and Canada*	$84.95	$79.95	$5.00	$34.95	$64.95	$64.90
Comcast Starter Triple Bundle *140+ Channels* *25 Mbps* *Unlimited Nationwide Talk and Text, Promo (12 months)*	$89.99	$79.99	$10.00	$29.99	$49.99	$49.95
Frontier Triple Bundle DISH Top 250 *6Mbps* *Unlimited Domestic Calling*	$85.97	$69.98	$15.99	$30.99	$34.99	$29.99

Table 9: Examples of Bundle and Standalone Pricing

Regulatory Oversight

Rates

States have no rate authority regarding rate tiers above the basic level, and neither does the FCC. The PSC, for the most part, no longer has basic service rate regulation authority because, as noted earlier, under the FCC's current rules for determining "effective competition," a cable operator may petition to be relieved of basic service rate regulation if, among other things, there is one or more unaffiliated competitors in a given franchise area offering comparable service to at least 50% of the franchise area's households and the competitor has achieved at least a 15% penetration level.[72] For most of the State, the FCC has determined that "effective competition" exists.[73] Almost all of New York is considered to be effectively competitive as a result of satellite television availability and incumbent telephone providers that now provide video services as well.

Service Quality and Consumer Protections

With regard to video customer service and system reliability regulations pursuant to 16 NYCRR Parts 890 and 896, regulated wireline video providers in New York must adhere to those standards (e.g., timeliness of installations and repairs, out-of-service conditions and call center answer time) and the Commission has not relieved any operator of those requirements. However, satellite, over-the-top, OVS and DBS video providers, who are not subject to the Commission's jurisdiction under Article 11 of the PSL, are not required to adhere to these regulations.

Staff notes that according to the American Customer Satisfaction Index's (ACSI) Telecommunications and Information Report 2014, there continues to be a high level of customer dissatisfaction with cable television service providers.[74] The 2014 ACSI score is 65, which is lower than last year's score of 68. According to the ACSI, customer satisfaction with their subscription TV provider is significantly lower than with other types of household services such as energy utilities (ACSI score of 76) and fixed-line telephone service (73). Of note is that the greatest level of dissatisfaction is with customer facing interactions such as with call centers and company websites. There is a greater level of satisfaction registered for picture quality, ease of using remotes and on-screen guides, reliability and range of channels available. There was also a greater level of satisfaction with fiber optic/satellite providers than with traditional cable providers. ACSI also notes that customer dissatisfaction with video providers, and the

[72] 47 C.F.R. §§76.905 and 76.907.

[73] As noted above, in June, 2015, the FCC adopted a new regime establishing a presumption of effective competition unless a franchising authority demonstrates a lack of competition.

[74] ACSI, Telecommunications and Information Report 2014, http://www.theacsi.org/news-and-resources/customer-satisfaction-reports/reports-2014/acsi-telecommunications-and-information-report-2014.

emergence of over-the-top video, has led to the first ever net loss of cable video subscribers for a full year (2013).[75]

Entry/Exit

With regard to market entry and exit, all regulated wireline cable providers ,(e.g., Time Warner Cable, Cablevision Systems, Inc., and Verizon) in New York must obtain not only local approval to provide video service, but also Commission approval pursuant to PSL §221.[76] Moreover, any transfer of a regulated wireline video system or franchise needs the Commission's approval pursuant to PSL §222 and no regulated video provider may abandon its system without Commission approval (PSL §226). These laws, however, do not apply to satellite, over-the-top and DBS video providers, who are not subject to the Commission's jurisdiction under PSL Article 11.

In June 2005, the Commission allowed Verizon to build out its FTTP network, capable of delivering video service, without first obtaining a video franchise from the affected local municipalities.[77] The Commission reasoned that because the PSL did not precisely mandate when a cable franchise was required for upgrading a network capable of delivering multiple services (including video), it would be unreasonable to require Verizon to obtain individual cable franchises. As a result, Verizon was allowed to upgrade its network consistent with pre-existing rights-of-way authorizations, but was required to get municipal video franchises before it sought to install cable exclusive equipment or offer video service in those specific municipalities. The presence of facilities-based competitive providers in the video market has, in more densely populated areas, resulted in new entrants needing to access multi-tenant dwellings. Department Staff notes that in attempting to complete its competitive build-outs, Verizon, for example, has requested numerous authorizations to enter these premises.

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[75] Id.

[76] Wireline video providers such as RCN, which operates an Open Video System (OVS) in NYC under FCC rules, are not required to seek or obtain a Certificate of Confirmation from the Commission to provide video service to customers.

[77] Case 05-M-0250, et al., Joint Petition of the Town of Babylon, the Cable Telecommunications Association of New York, Inc. and CSC Holdings, Inc. for a Declaratory Ruling Concerning Unfranchised Construction of Cable Systems in New York by Verizon Communications, Declaratory Ruling on Verizon Communications, Inc.'s Build-Out of its Fiber to the Premises Network (issued June 15, 2005).

BROADBAND COMMUNICATIONS

Introduction

Broadband service provides a bidirectional connection, typically to the Internet, that allows the user to transmit and receive information such as text, images, audio and video. The growth and increasingly important role of broadband has been a key trend to emerge in the telecommunications landscape. Voice, video and broadband have converged and each are now available across all technology platforms. Broadband service, which relies upon the same network as telephone, mobile, and cable television, facilitates access to over-the-top voice and video providers, and thereby promotes competition. Broadband allows consumers to download and stream video content through third-party providers such as Netflix, Hulu, and Apple TV, which compete directly with traditional cable video providers. As broadband download speeds increase, offerings like these and many others will become more robust and competitive. Additionally, VoIP, the technology behind voice service offerings of cable companies and so called "over-the-top" (OTT) providers like Vonage, Skype and MagicJack, rely on the same network as Internet services, and are increasingly replacing traditional landline telephone services in New York.

Much as telephone was an essential service for consumers in the second half of the 20th Century, so today is broadband. Broadband service, whether provided by wire, such as hybrid coaxial/fiber cable, copper-based digital subscriber line, and/or fiber optic technologies, or wirelessly via Wi-Fi and LTE cellular technologies or fixed point-to-point wireless,[78] or satellite, represents not only a communications platform (in the form of voice, text, e-mail, video conferencing, and other social media services), but a platform for social relationships, health information, news, entertainment, education, medical diagnosis, the payment of bills, navigation, shopping, government business, document storage, and job applications. Bidirectional

[78] References to "Mobile Wireless" and "Wireless Broadband" in the Telecom Study generally relate to "Terrestrial Mobile Wireless" services provided by the four large national wireless (cellular) companies (AT&T, Sprint, T-Mobile and Verizon Wireless). Staff recognizes that Terrestrial Fixed Wireless broadband service is an important segment of the wireless industry as well; at the present time, fixed wireless broadband service comprises a very small portion of the overall market share in New York State. Fixed wireless service connects two locations (e.g., building to building or tower to customer location) via radio or other wireless communications link. In certain locations where it may be too costly or difficult to install wired network infrastructure, fixed wireless networks can provide a viable service alternative, for example, by providing Internet access to rural customers. Mobile wireless service, on the other hand, typically connects an individual to the wireless network through connectivity to a stationary cell tower. The vast majority of wireless connections in New York State, and the United States, are via terrestrial mobile wireless networks. Mobile wireless broadband service speed is dynamic, meaning that the broadband speed varies based on the distance of the end user device (such as a Smart Phone) to the nearest cell tower connection. Generally, the closer the end user device is to the cell tower, the faster broadband speed available to the user. Mobile wireless broadband customers cannot select a specific speed for their service like fixed wireline broadband customers.

connections are also increasingly critical to the development of other utility networks to promote demand responsiveness and improved network efficiency. The very essence of a world-class communications infrastructure in this State depends upon the strength of its evolving broadband networks.

Consumer demands for broadband speed vary and are evolving at a rapid pace. There are varying definitions and opinions as to what should be considered "broadband." A 200 kbps internet connection is far more limited in the types of applications it can support than a 100 Mbps connection. For the purposes of this Study, Department Staff presents broadband data and analysis for four download speed levels: 200 kbps, 3 Mbps, 25 Mbps and 100 Mbps. The FCC collects broadband data at a number of different download and upload speed tiers. In order to broadly survey broadband availability and adoption rates, this Study uses download speeds of 200 Kbps and above, and 3 Mbps and above, which are the broadest (only) speed tiers publicly reported by the FCC with data by state and by industry sector. While Staff recognizes that consumers are increasingly seeking faster broadband service, the FCC does not publicly report on speed tiers faster than 3 Mbps by industry segment, by state. Approximately 4 million New Yorkers subscribed to broadband service between 200 Kbps and 3 Mbps as December 2013. Staff also describes current availability at the FCC's current benchmark of 25 Mbps download/3 Mbps upload and the state goal of improving broadband speeds to 100 Mbps in most places based on our review of what providers are currently advertising.

FCC and New York State Developments

After years of classifying broadband service as an interstate information service, subject to limited regulation under Title I of the Telecommunications Act, the FCC recently classified broadband as an interstate telecommunications service subject to common carrier regulation under Title II of the Federal Communications Act.[79] The FCC opted to forbear from many Title II regulations, most notably rate regulation and Universal Service Fund (USF) contributions.

As required by section 706 of the Telecommunications Act of 1996, the FCC periodically conducts an inquiry regarding the availability of "advanced telecommunications capability" (i.e., broadband) to all Americans to determine whether such capability is being deployed in a reasonable and timely fashion. Beginning in 1999, the FCC set this benchmark as 200 kilobits per second (both upload and download). This benchmark was subsequently updated. In 2010, the FCC benchmark for advanced broadband speeds was revised to 4 Mbps download and 1 Mbps upload.

Those benchmark speeds were again raised by the FCC in January 2015 to 25 Mbps download/3 Mbps upload. The FCC found that the previous standards for upload and download speed were, "dated and inadequate for evaluating whether advanced broadband is being deployed

[79] GN Docket No. 14-28, In the Matter of Protecting and Promoting the Open Internet, Report and Order on Remand, Declaratory Ruling, and Order (March 12, 2015).

to all Americans in a timely way,"[80] and established the 25/3 standard to better reflect advances in technology, market offerings by broadband providers and consumer demand. The revised FCC benchmark was described by the FCC as a practical forward-looking vision of high quality service.[81] New York, however, has often taken the lead on development of policies and programs that exceed federal benchmark. The New York goal – that residents have high-speed Internet access with speeds of up to 100 Mbps in most places by the end of 2018 – recognizes that modern networks are capable of such speeds and that today's investment must accommodate the fact that broadband speeds are evolving at a rapid pace.[82] To that end, Governor Andrew Cuomo proposed, and the New York State Legislature approved, $500 million in the most recent New York State Budget to assist in the further expansion of broadband networks to unserved and underserved areas of the state.[83]

Provider and Service Types

Broadband in New York is provided by telephone operators, cable operators, wireless companies, satellite providers, wireless internet service providers (WISP), and wireline companies. For example, all 40 incumbent local exchange carriers (ILECs) and dozens of competitive local exchange carriers (CLECs) provide broadband service over traditional copper networks and/or fiber-based networks. Cable operators provide broadband service over hybrid fiber-coaxial (HFC) networks. The four national wireless companies utilize the networks of the wireline companies, in addition to their towers and wireless spectrum, to provide broadband service. Satellite service providers offer broadband over their satellite and associated networks.

As illustrated below, the different technologies used by providers are capable of providing various data speeds ranging from 50 Kbps to 1 Gbps. DSL in advanced technological forms may reach service speeds up to 50 Mbps, depending on a customer's distance from certain field equipment. On the other hand, fiber currently provides consumers the fastest available speeds. Staff notes that the diagram below does not contain any data regarding satellite providers, that the figures contained in the diagram were from 2013, and that faster speeds are continually being offered by providers.

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[80] FCC, 2015 Broadband Progress Report, http://www.fcc.gov/reports/2015-broadband-progress-report.

[81] In December 2014, the FCC adopted 10 Mbps/1 Mbps as the minimum standard for access to Connect America Fund support which supports universal service in a cost efficient manner under 47 USC § 254, where there is no broadband service at 3 Mbps/768 kbps.

[82] See, Moving the *New* New York Forward, Governor Andrew M. Cuomo 2014, Chapter 9. See also, New York Broadband Program Office, New NY Broadband Program Presentation, http://www.nysac.org/policy-research/documents/BroadbandMay52015.pdf (May 5, 2015) (New NY Broadband Presentation).

[83] Chapter 54 of the Laws of 2015, pp. 745-46; See also, New NY Broadband Presentation.

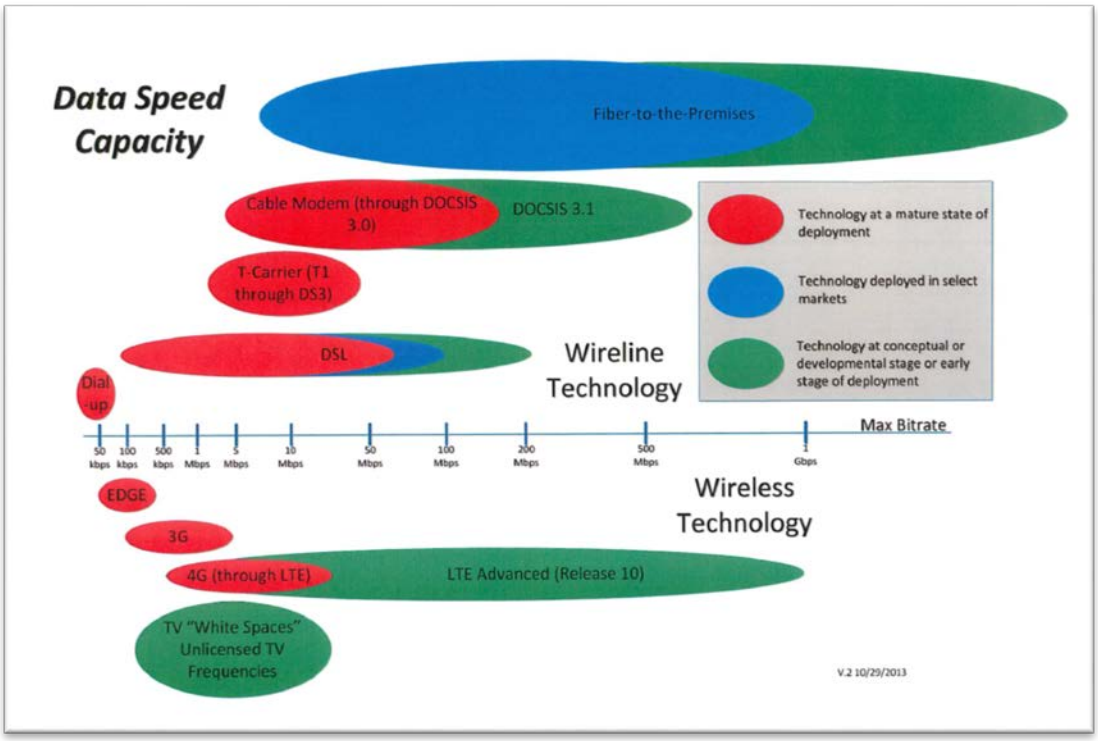

Figure 12: Speed Capacity of Various Broadband Technologies

Availability and Adoption

While approximately 5% of municipalities in the State are without deployed cable television networks, or have cable networks that are video-only, it is noted that every municipality in the State has access to one or more wired or wireless networks, capable of providing video, voice and data services to residents and businesses. Satellite video, voice and broadband services, as well as terrestrial wireless voice and data services are also widely available throughout New York, as demonstrated in the chart below.

Broadband Services	Availability	Adoption
Satellite	>95%	<1%
Wireless	>95%	>60%
Cable	>95%	>60%
LEC	>90%	>10%
Fiber	50%	>25%

Table 10 a: Approximate Broadband Service Availability and Adoption Rates, By Technology in 2013 at ≥ 200 kbps.[84]

[84] This and other tables contained in this document, unless otherwise noted, are derived by Staff from a variety of sources. Availability refers to an estimate of the number of premises that can access the networks/technologies represented. Adoption refers to the subscriptions (residential and non-residential) relative to total premises (7.3 million) for Satellite, Cable and LEC sectors, or premises passed (3.6 million for Fiber, and population (19.4 million) for

Broadband Services	Availability	Adoption
Satellite	>95%	<1%
Wireless	>95%	>40%
Cable	>95%	>55%
LEC	>90%	<10%
Fiber	50%	>25%

Table 10 b: Approximate Broadband Service Availability and Adoption Rates, By Technology in 2013 at ≥ 3 Mbps.

Today, approximately 5% of the State's municipalities in the state do not have wired cable operator networks providing broadband service, which seems to be the preferred method of broadband service where choice is available; there remain 104 rural municipalities that do not have wired cable networks offering broadband service. In total, approximately 46,300 households in these 104 municipalities lack access to a cable network capable of providing voice or broadband service.[85] Additionally, in some municipalities that have cable franchises, households that lie beyond the primary service area of the cable network (and therefore typically face line extension charges) do not have access to any of the cable services even though they reside in the franchise area.

For the communities not served by cable broadband, traditional telephone company Digital Subscriber Line (DSL) service, as well as terrestrial wireless and satellite broadband services, may be available. Terrestrial wireless broadband, provided by LTE depending on location, provides service to consumers in excess of 25 Mbps, but at prices that typically cost more than other options per Gigabyte.

At the current FCC "advanced telecommunications capability" benchmark speeds of 25 Mbps download/3Mpbs upload, Staff estimates that 95% of the state now has access.[86] These speeds are generally only available from cable operators and fiber networks. Copper-based digital subscriber line, mobile wireless and satellite service is generally available at speeds below 25 Mbps.

Only half of the State's consumers have access to service at 100 Mbps or above now. Broadband speeds and competitive alternatives are more robust in the downstate market and in

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wireless. Aggregate broadband service adoption rates exceed 100% due to multiple household subscriptions, such as a cable subscription and wireless subscription.

[85] As previously referenced in the *Voice* section (Figure 1 supra), 19 municipalities have wired cable networks over which voice and broadband service is unavailable. These 19 municipalities represent approximately 16,300 households. Eighty five, mostly rural, municipalities do not have wired cable networks deployed. In those communities, cable voice and broadband service is also unavailable. Those 85 communities represent approximately 30,000 households.

[86] Staff estimates that 95% of the state also has access to 50 Mbps.

some major upstate cities. Cablevision and Verizon FiOS, for example, advertise 100 Mbps or faster data service availability throughout their service footprints.[87] Time Warner Cable offers broadband service up to 300 Mbps in its New York City market, 50 Mbps in the remainder of its service footprint, and is expanding broadband speed in other market areas to 100 Mbps, but it has not yet announced firm plans to increase broadband speeds in upstate New York.[88] Cable modem network upgrades to enable faster speeds appear to be driven by population density and by the presence of competitive markets.

Staff performed a statistical analysis of the drivers of broadband deployment in New York State (detailed in Appendix C). The econometric results laid out in Appendix C indicate that a significant portion of the variation in broadband deployments are associated with variations in income and population density across the State. In general, areas with higher levels of income and areas with higher population densities, both of which tend to be urban and suburban areas, also tend to have greater broadband deployment. The results indicate that population density is a significant driver for cable television network availability and, to a lesser extent, for fiber overbuild network availability. This is consistent with the existence of state codified build-out requirements for cable television networks.[89] In contrast, competitive fiber network deployment is associated with income more than other wired network types. Higher levels of population density are generally related to the availability of wireless connectivity. This is consistent with carriers deploying networks by initially placing cell towers in areas with more potential customers.[90] Higher levels of income are also somewhat associated with the availability of mobile wireless connections. This could be expected given certain wireless data plans costs, but again, it is noted that wireless broadband subscription levels in New York State continue to grow faster than any other broadband industry segment, indicating that price may no longer be as significant a driver as it was in years past.

Competition

Wireline broadband competition is available to the vast majority of State residents at varying speeds. Competition is generally more robust at lower speed levels. Generally,

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[87] See, e.g., Cablevision, Optimum Online, http://www.optimum.com/home-internet-service/ultra101.jsp; Comcast, Comcast Internet Service, http://www.comcast.com/internet-service.html; Verizon, FiOS Fastest Internet, http://www.verizon.com/home/fios-fastest-internet.

[88] Time Warner Cable, TWC Announces Internet Speed Upgrades, http://www.timewarnercable.com/en/about-us/press/twc_announces_internet_speed_upgrades.html.

[89] 16 NYCRR 895.5 which defines the primary service area that must be served as 35 homes per linear mile, unless a lower number of homes is provided as part of a local franchise agreement.

[90] However, as noted elsewhere in the Telecom Study, at the present time, cellular networks have expanded well beyond the most densely populated areas of the state, and now provide service coverage to 95% of the state's geography, including low density population areas.

competition, as evidenced in the maps below, is more robust in urban areas. The blue shaded areas on the maps below have cable modem download service generally available at 25 Mbps or above and 100 Mbps or above respectively. The burgundy cross-hatch depicts areas where competitive providers (generally fiber based providers) also offer broadband service at these speeds or above. The unshaded areas depict portions of the state where wireline broadband service is generally not available at download speeds at or above 25 Mbps or 100 Mbps respectively.

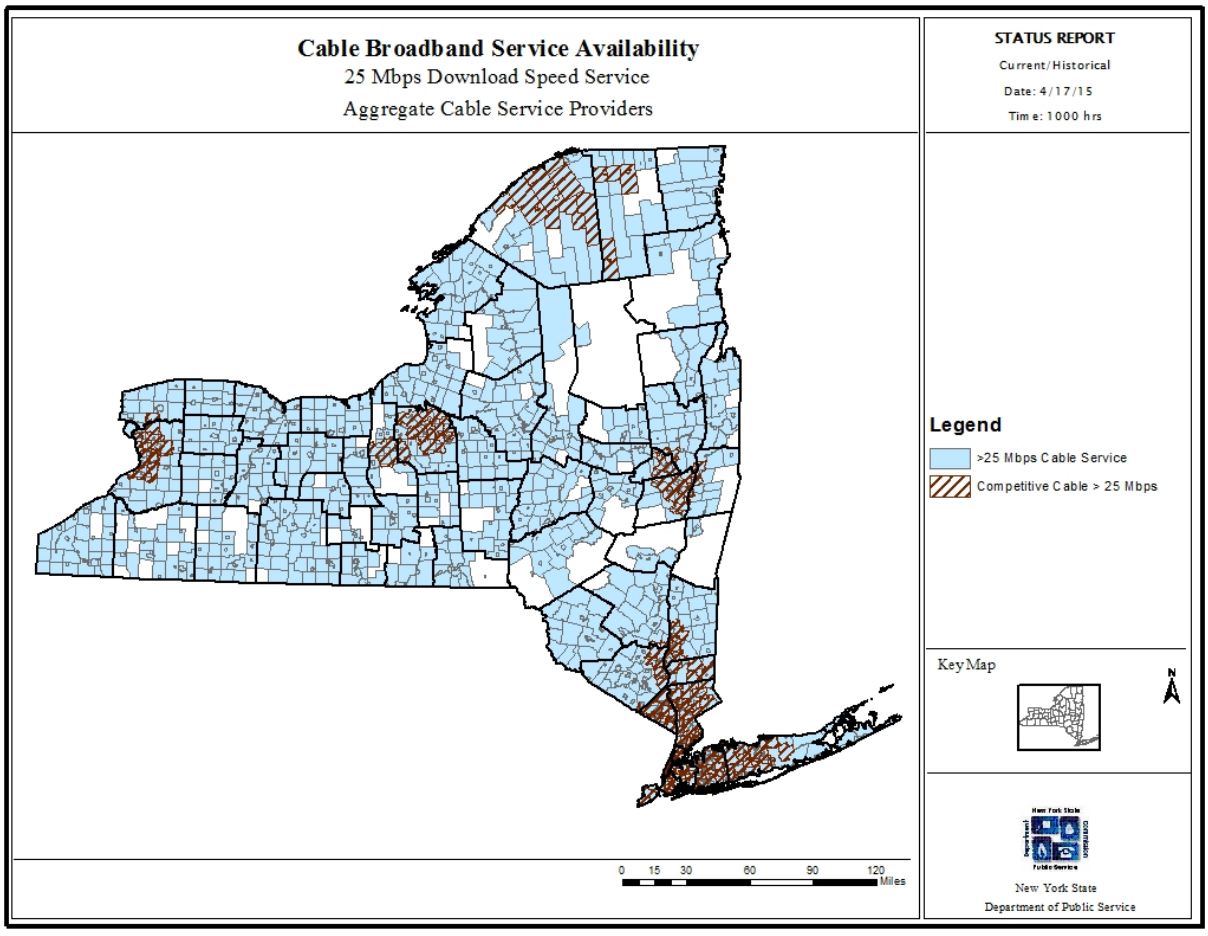

Figure 13 a: Cable Broadband Availability ≥25 Mbps

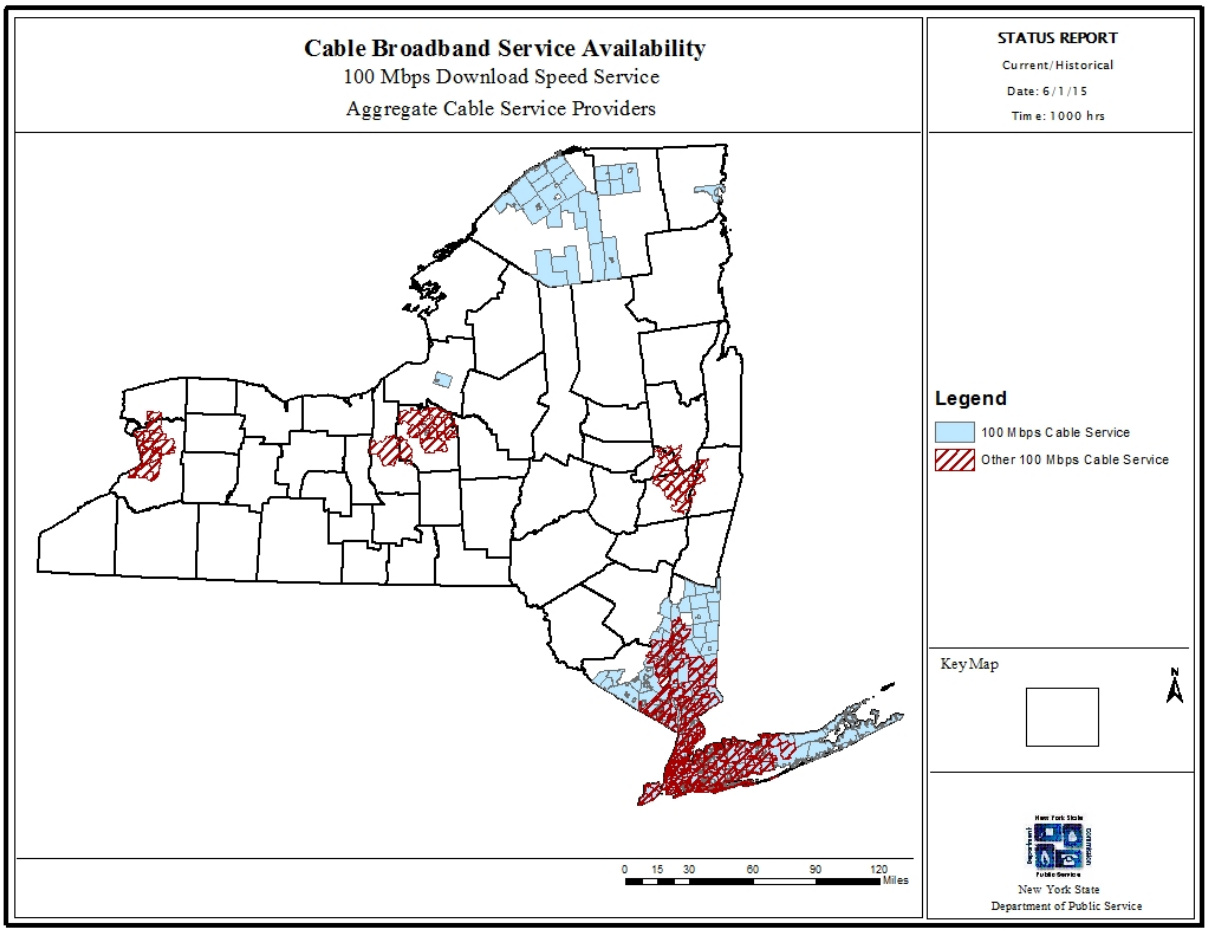

Figure 13 b: Cable Broadband Availability ≥100 Mbps

Staff's analysis (Appendix C) indicates that most broadband consumers in the State have some level of local intermodal broadband competition at varying speeds. Seven (7%) of households have only a single wireline broadband provider. The 7% is comprised as follows: DSL serves fewer than 2% of households and cable modem serves about 5% of households. Fiber-to-the-premises is almost never the sole broadband option, being a relatively newer technology and network architecture, and, as a result, primarily exists as a competitive alternative to other established network types. Mobile wireless broadband, while not necessarily a full substitute for wired broadband, is available to nearly all households, whether or not a wired broadband service is available. Fixed point-to-point wireless is a nascent service beginning to be offered to some rural customers and according to Appendix C reaches approximately 12% of the New York State census blocks.

Staff did not perform an HHI analysis for the New York broadband market because it did not have adequate market share information.

By way of background, there has been increased competition and significant network growth in New York State's cable and broadband markets in recent years. The result is wider availability of cable broadband services to the residential and businesses community. In the years leading up to 2005, cable companies had obtained more than 1,470 municipal franchises. Since 2005, 12 cable companies have obtained a total of 277 new cable franchises (189 by Verizon), constructing and deploying networks in municipalities that were previously unserved or underserved; or overbuilding new cable networks in previously incumbent-only cable franchise areas. These additional franchises provide broadband service, in addition to video and voice services. Table 11 depicts the aggregate number of cable plant miles in the state from 2011 through 2013, indicating overall expansion of more than 6,000 miles of network.

Year	Plant Mileage
2011	92,263
2012	95,775
2013	98,726

Table 11: Total Cable Plant Mileage in New York.

As shown in Table 12, between 2009 and 2013, nearly 640,000 additional households have subscribed to cable modem broadband services (not including Verizon FiOS). Additional subscription growth is due, in part, to the cable network extensions and deployments, as well as technology developments, in response to consumer demand.

Year	Cable Modem Connections	Premises Passed	% Penetration
2009	3,886,000	7,971,269	48.8%
2010	4,013,000	8,111,234	49.5%
2011	4,116,000	8,458,135	48.7%
2012	4,457,000	8,550,088	52.1%
2013	4,525,000	8,754,255	51.7%

Table 12: Cable Modem Subscriptions 2009-2013.[91]

A large part of the new franchises and recent build outs is the result of Verizon's entry into the cable market, which began in 2004 and has had a rapid, measurable effect on cable broadband competition and availability. The company has invested billions of dollars in FTTP network overbuild, competing directly with Cablevision and Time Warner for customers. Over just a few years, consumer adoption of Verizon FiOS cable services, where available, has been strong, advancing Verizon to the position as the third largest cable operator in the state, with more than 180 cable franchises. The company continues to make significant financial investments in its FTTP networks, filling in service within existing market areas. It appears, however, that Verizon is not expanding FTTP networks into new market areas of the state. Verizon has stated publicly that it does not plan to expand its current FiOS footprint and has

[91] Cable Modem Connections referenced in FCC Internet Access Services Report, Status as of December 31, 2013. Premises passed (residential and non-residential) aggregated from DPS cable filing data.

suggested that it will eventually serve rural areas with LTE technology and discontinue copper-based services.[92]

The state's mobile (cellular) wireless broadband system has expanded tremendously in the last few years, and consumers are subscribing to wireless broadband faster than any other mode available to them. The deployment of Long Term Evolution (LTE, or 4G) service throughout most of the state by companies like AT&T and Verizon Wireless, has raised the broadband bar. Consumers can now subscribe to mobile (cellular) wireless data plans from a variety of providers with download speeds in excess of 50 Mbps with the additional ability to take this service with them, just as with mobile voice service. Additional wireless spectrum, recently auctioned by the FCC to 15 winning bidders providing service in New York, should significantly add to existing capacity and allow further expansion of wireless broadband services and enhanced competition.[93] Nationally, the FCC's AWS-3 auction raised nearly $45 billion, of which $6.8 billion, or 15.1% of the total bid revenues, were for wireless spectrum licenses in New York State market areas.

As more consumers adopt wireless services for their voice, data, and video needs, companies are expanding their service coverage and broadband speeds to meet consumer demand (as noted in the video section of this report, while functionally capable of providing video services, wireless broadband connections are not currently a viable option for most households' video needs and may include significant data caps at present). Table 13 depicts the aggregate number of wireless broadband connections in service between 2009 and 2013. The accompanying Figure 14 map shows the LTE broadband service coverage of the four national wireless carriers as of April 2014. Over the last two years, LTE broadband coverage has expanded significantly, providing subscribers with access to faster data speeds from more providers than ever before. The significant growth of wireless broadband connections over the past few years is reflective of the expanded service coverage of wireless broadband networks over that same time period.

Mobile Wireless	Broadband Connections
2009	3,643,000
2010	5,455,000
2011	9,301,000
2012	11,084,000
2013	12,725,000

Table 13: Mobile Wireless Broadband Connections[94]

[92] Edited Transcript, Verizon at Goldman Sachs Communacopia Conference, p. 13 (September 20, 2012), http://www.verizon.com/idc/groups/public/documents/adacct/goldman_vz_transcript_092012.pdf.

[93] AU Docket 14-78, Auction of Advanced Wireless Services Scheduled for November 13, 2014, Public Notice, (January 30, 2015).

[94] These figures were taken from the FCC's Internet Access Services Reports and consider all connections at speeds greater than 200 kbps in at least one direction.

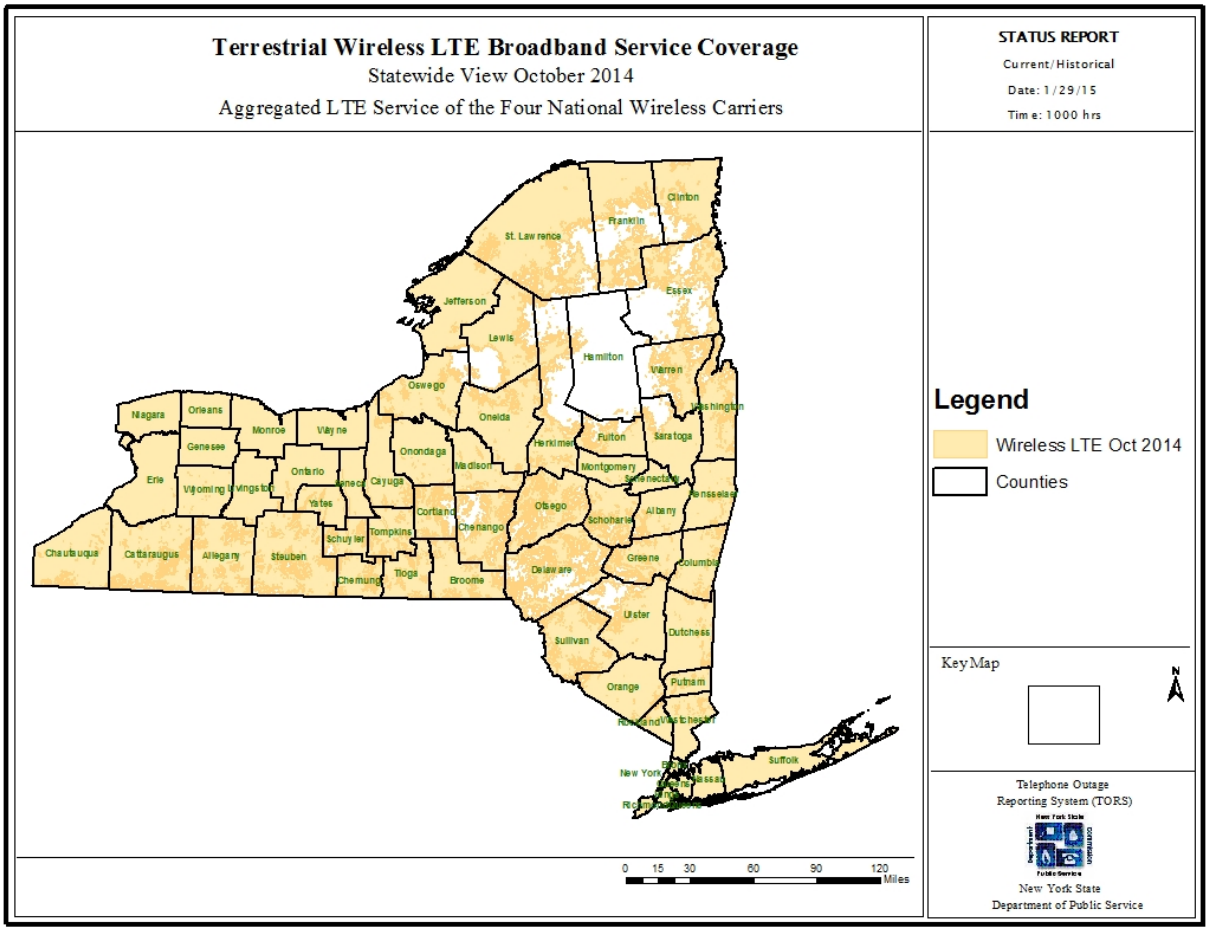

Figure 14: Wireless LTE Broadband Service Coverage

Direct Broadcast Satellite provides yet another consumer option for broadband service. DBS technologies historically had limitations, including the existence of data caps, high latency, the need for line of sight, rooftop space for equipment, and geographic coverage issues. DBS broadband subscription levels in the state are growing however, in part, because of technological advances designed to correct these historic limitations. Technological advances resulting in higher speeds, better performance and lower costs are reflected in satellite service adoption and subscription growth. In recent years, satellite companies have invested significant capital to upgrade their broadband services. For example, in January 2012, following the launch of its ViaSat-1 satellite, ViaSat began providing its Exede high-speed Internet service at 12 Mbps download and 3 Mbps upload on all of its broadband service plans. ViaSat has announced plans to launch another satellite for mid-2016.[95]

[95] ViaSat, ViaSat Announces Next Generation Broadband Satellite, https://www.viasat.com/news/viasat-announces-next-generation-broadband-satellite

Digital Subscriber Line (DSL) service, which is provided over telephone company networks, is the only broadband service in New York State that has shown a marked decline in consumer subscriptions over the past several years. DSL service is provided over twisted-pair copper lines and is generally not as fast as cable or fiber broadband service. The provision of DSL service is dependent upon some technical requirements, such as end user distance from the central office and condition of the copper line over which the service is provided, both of which can limit DSL's speed, availability and reliability. In general, DSL speeds vary from under 1 Mbps to over 25 Mbps depending on these factors. The majority of active DSL connections in the state are under 6 Mbps. Consumers have shown a growing tendency to migrate from DSL to some other broadband service platform when other choices are available.

As indicated in Figure 15, incumbent telephone company DSL subscribership in New York peaked in 2007, with about 1.15 million customers. Since then, while still significant in numbers, the annual subscribership to DSL service has been on the decline, partly due to expanded availability of cable and wireless networks. As of 2013, about 687,000 customers subscribed to DSL.

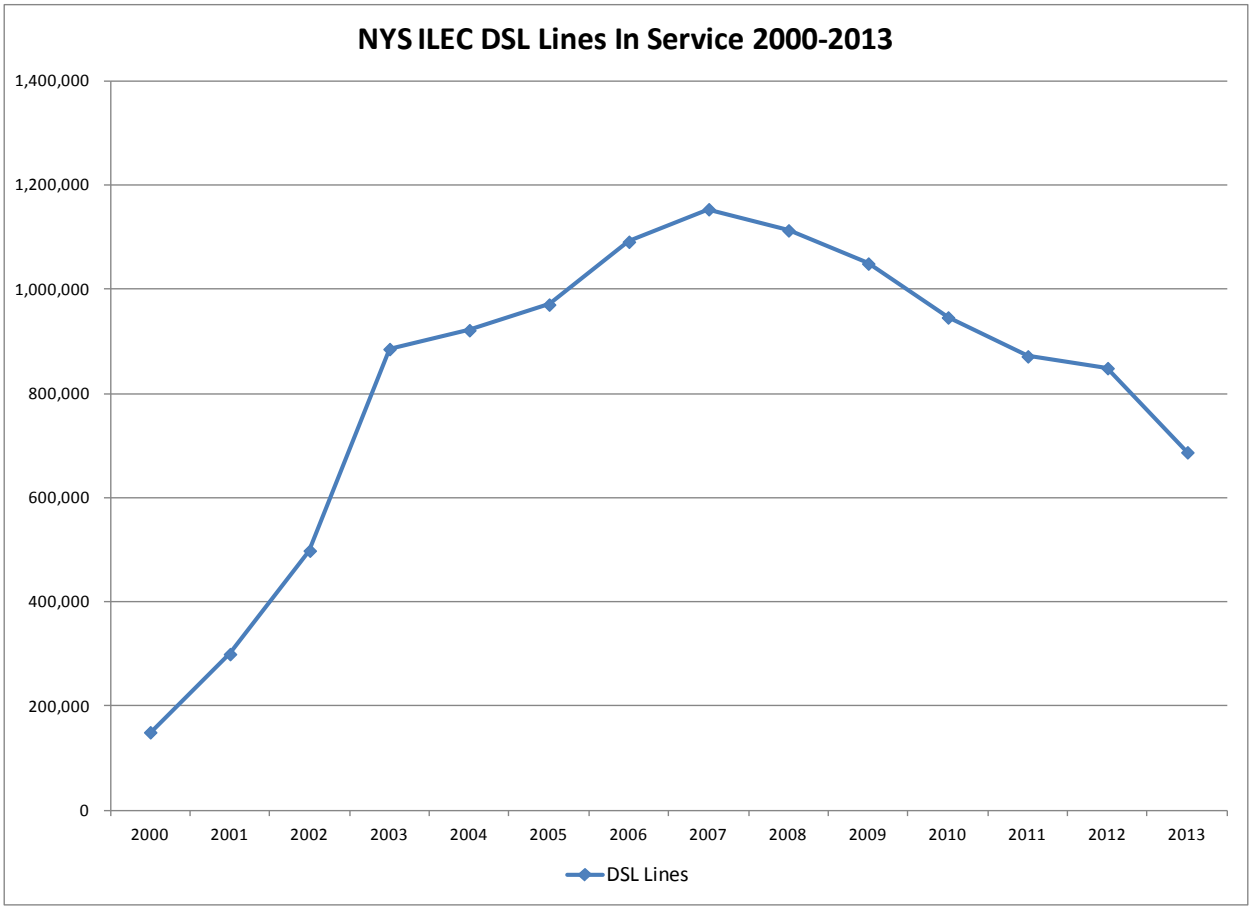

Figure 15: ILEC DSL Lines in Service

Digital Divide

Access to the Internet is essential to participation in modern society. New Yorkers have adopted broadband services roughly 10 percentage points above the national average and New York is ranked near the top among states in terms of adoption by the FCC. The FCC recently observed in its 2015 Broadband Progress Report that consumer decisions about adoption included factors such as price and quality.[96] The FCC also observed that adoption lags behind deployment to a significant degree, at all speeds. The FCC cited a 2014 National Telecommunications and Information Administration Digital National Report for the finding that the top reason given for non-adoption was consumers not wanting broadband; the second most cited reason was because it was too expensive.

While one of the great potential benefits of the Internet is to facilitate the acquisition and dissemination of information to all individuals at low costs, physical ability to connect to the Internet using either the current or modernized network does not provide any benefit to customers who cannot afford it. Communications services have historically been, and continue to be, beyond the reach of some lower-income residents of New York State. According to a 2011 survey in New York, the adoption rate of all broadband services (including mobile) was only 67% as of 2011.[97]

Of particular concern to the Department is that, according to the Broadband Service Adoption Study, it is low- and middle-income New Yorkers who are most likely to not have broadband service. In 2011, of those households with incomes under $20,000, only 36.9% had adopted broadband service and compared with 59.6% of those with incomes between $20,000 and $35,000, with cost being the most frequently cited barrier to adoption.[98] This digital divide was recognized by numerous parties to the Commission's review of the Comcast and Time Warner Cable merger. Numerous commenters encouraged the Commission to take concrete steps to ensure that more low-income New Yorkers have access to broadband services; the City of New York commented that 36 percent of City households below the poverty line do not have Internet access at home.

New York State has recognized this particular challenge and established programs to support low-income adoption of broadband service. For example, Governor Cuomo's Smart

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[96] GN Docket No. 14-126, 2015 Broadband Progress Report, Notice of Inquiry on Immediate Action to Accelerate Deployment, ¶ 7 (issued February 4, 2015).

[97] See, Center for Technology in Government, Broadband Internet Service Adoption and Use in New York State Households, p. 1 (May 2011) (Broadband Service Adoption Study), http://broadbandmap.ny.gov/documents/adoption-study/NYS-Broadband-Adoption-Study-Color.pdf. We recognize that since the publication of this study, mobile (cellular) broadband subscription rates have more than doubled, with 5.455 million in 2010 growing to 12.725 million in 2013, based on the FCC December 31, 2013 Internet Access Report, this 67% figure is likely understated today.

[98] Id., pp. 11, 18.

Schools Bond Act, which provides $2 billion to school districts to upgrade technology and ensure that they have access to high-speed broadband.[99] The Broadband Program Office has funded multiple projects to provide low-cost broadband service.[100]

Pricing

Broadband service speed (primarily download speed) typically delineates price points for broadband service, with prices increasing with faster speeds. Various speed and price points are offered. Broadband service offerings are generally provided on a stand-alone basis. As noted earlier, with regard to voice services, pricing is often discounted with promotional offerings and when included in triple or double play bundling options with video and video services.

A sampling of stand-alone and bundled prices is contained in Appendix B, Table 3. In general, the samples were selected where the component parts (i.e., video line up, broadband speed, voice) were also available on a stand-alone basis. Not all varieties of video line-ups or broadband speeds are available on a stand-alone basis. For example, Time Warner Cable's Everyday Low Price broadband offering ($14.99 with 1-3 Mbps download speed depending on location) is not available in bundles. The selection of prices contained in Appendix B also attempts to make the overall total package reasonably comparable form company to company.

A sample of the pricing information as of May 11, 2015 for standalone broadband services, in comparison with bundled prices from Appendix B is set forth in Table 14 below. Additional samples of pricing information can be found in Appendix B.

[99] See, 2015 Opportunity Agenda: Restoring Economic Opportunity, Re: Statewide Broadband Access for Every New Yorker, (January 16, 2015), https://www.governor.ny.gov/news/2015-opportunity-agenda-restoring-economic-opportunity-1.

[100] See, Broadband Program Office, State Funding, http://nysbroadband.ny.gov/state-funding.

Bundle	Triple Bundle Price	(Video+Data) Bundle	Incremental Charge for Phone Triple Bundle less Video+Data Bundle	Standalone Prices		
				Phone	Video	Data
Verizon Triple Bundle *2 Channel Packs 25Mbps Data Unlimited Domestic and Canadian Calling, Promo (24 months)*	$74.99	$59.99	$15.00	$61.99	$54.99	$54.99
Time Warner Cable Triple Bundle *200+ Channels 30Mbps Unlimited Calls in the U.S., Canada, Puerto Rico, Mexico, Hong Kong, Promo (12 months)*	$89.99	$89.99	$0.00	$10.00	$49.99	$54.99
Cablevision Triple Play *245+ Channels 50Mbps Unlimited Domestic Calling, Puerto Rico, U.S. Virgin Islands, and Canada*	$84.95	$79.95	$5.00	$34.95	$64.95	$64.90
Comcast Starter Triple Bundle *140+ Channels 25 Mbps Unlimited Nationwide Talk and Text, Promo (12 months)*	$89.99	$79.99	$10.00	$29.99	$49.99	$49.95
Frontier Triple Bundle DISH Top 250 *6Mbps Unlimited Domestic Calling*	$85.97	$69.98	$15.99	$30.99	$34.99	$29.99

Table 14: Example Bundled and Standalone Pricing

Global Speed Comparisons

As of mid-2013, New York State had nearly 100 providers of broadband service over wireline, wireless, and satellite networks, and ranked 13th in the nation with respect to that total.[101] As consumer demand for voice, data, video, and other needs and applications increases, companies have responded by expanding service coverage, functionality and speed. The wireline broadband outlook for New York, as compared to other states in the nation, and internationally, is good, and on an improving annual trajectory. Figures 16 and 17 depict average wireline broadband upload and download speed trends of New York State broadband networks, based upon millions of actual speed tests[102] performed by New York State consumers. With respect to wireline broadband download and upload speeds, subscribers of New York State networks have significantly faster service than the national average, and far faster than the

[101] FCC Internet Access Service Report, June 30, 2013, available at http://www.fcc.gov/document/fcc-releases-new-data-internet-access-services-1.

[102] New York State, US, EU, and global data speed tests are analyzed and presented on a monthly basis by Net Index, "The Global Standard in Internet Metrics." EU data prior to December 2013 was unavailable for comparative trending purposes. See, Net Index, http://www.netindex.com/. Staff notes that these data are averages and that certain factors, like the existence of a large city with fast speeds, or a largely rural geography with slower speeds, may alter a given state or national average.

European Union (EU) and global averages.[103] The trend over the past 3 years has also shown a general increase in wireline broadband speeds.

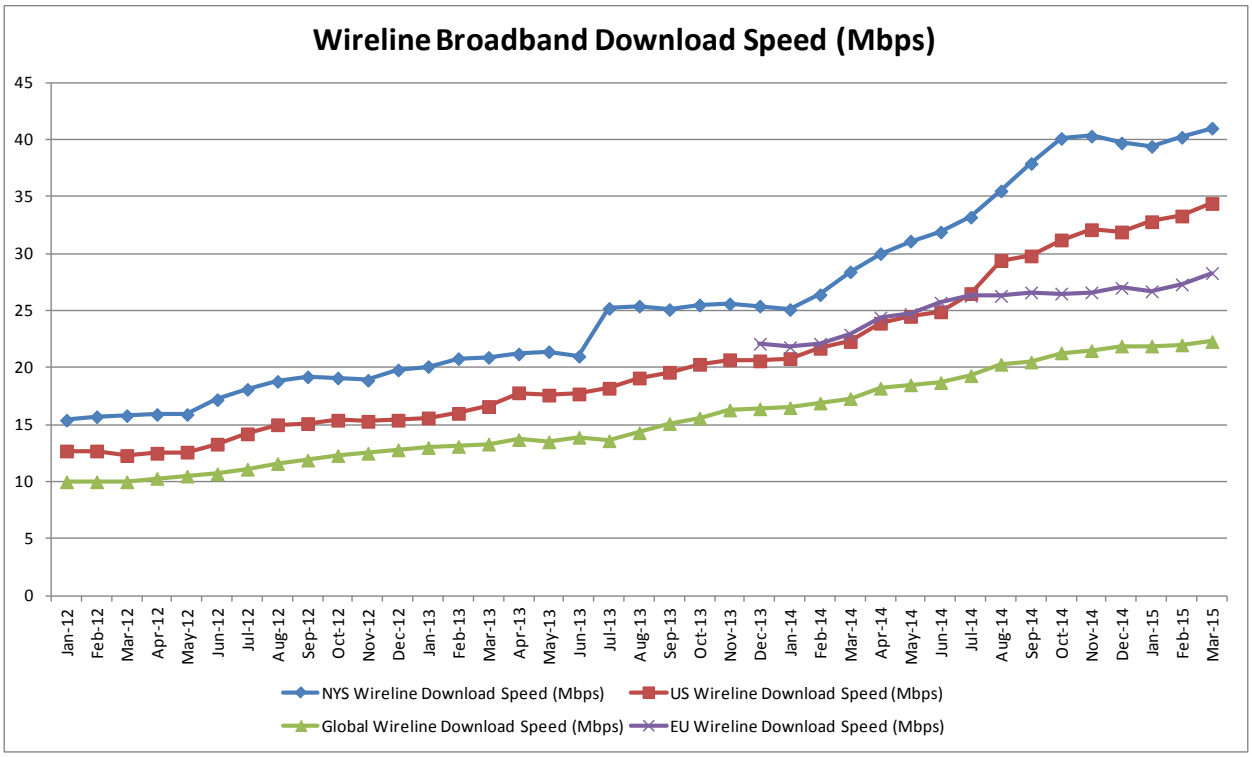

Figure 16: NYS, US, EU and Global Wireline Broadband Download Speeds.

[103] The EU is comprised of 28 countries in northern, central, eastern and Western Europe. The global average is based upon aggregated data from over 180 countries around the world.

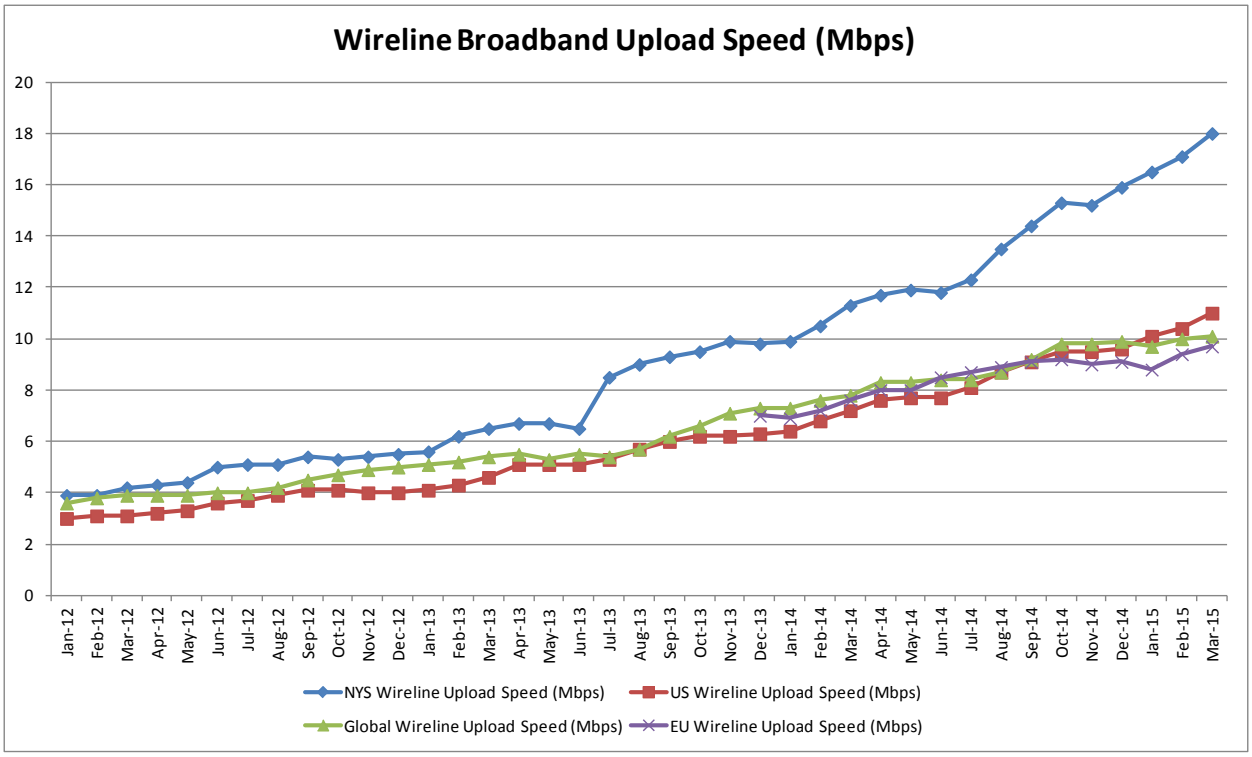

Figure 17: NYS, US, EU and Global Wireline Broadband Upload Speeds.

Wireless broadband service availability has expanded significantly throughout the State, with faster broadband speeds. Increased speed allows consumers faster access to their services and applications. As shown in Figures 18 and 19, based upon millions of actual mobile speed tests performed by consumers, wireless broadband speeds (download and upload) on New York networks are on par or better than the national average, and far exceed the global averages. Similar to the wireline industry, the wireless speed trend over the past 3 years has shown an incremental increase in wireless broadband speeds, again indicating that network providers are making capital investments to enhance wireless infrastructure to meet growing consumer demand.

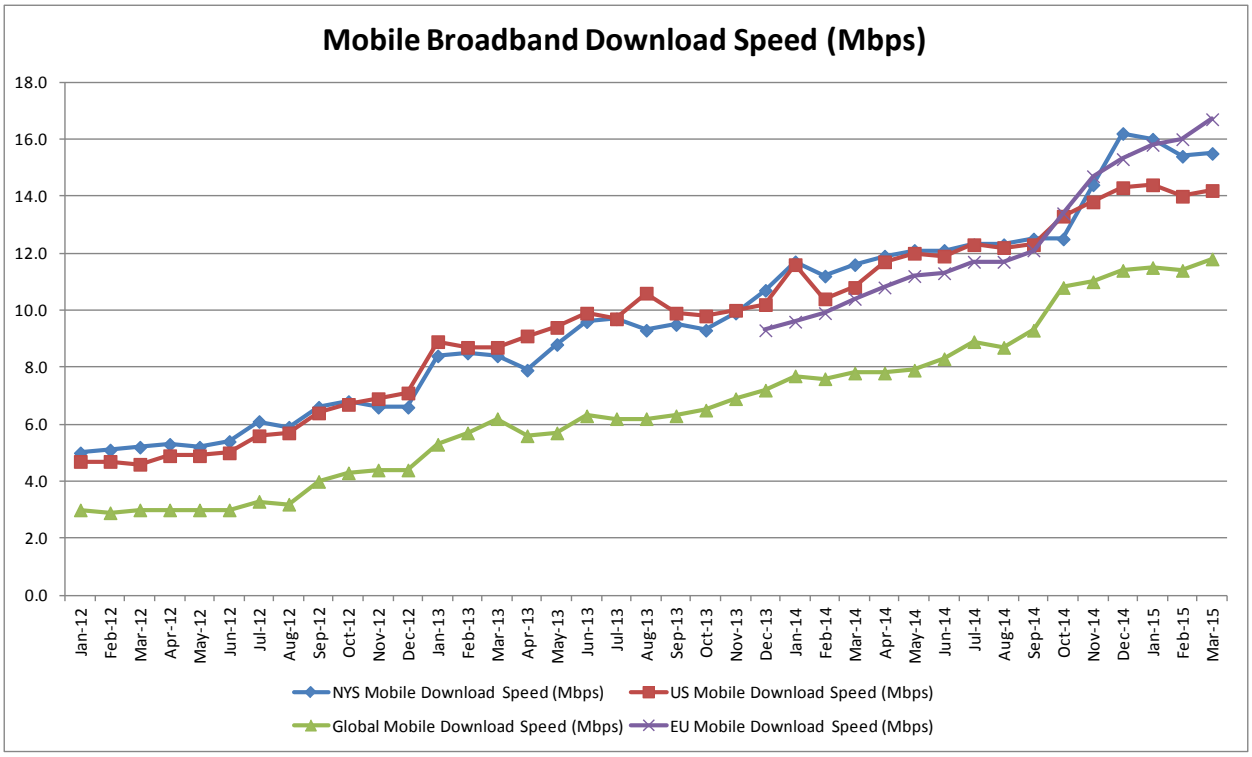

Figure 18: NYS, US, EU and Global Mobile Broadband Download Speeds.

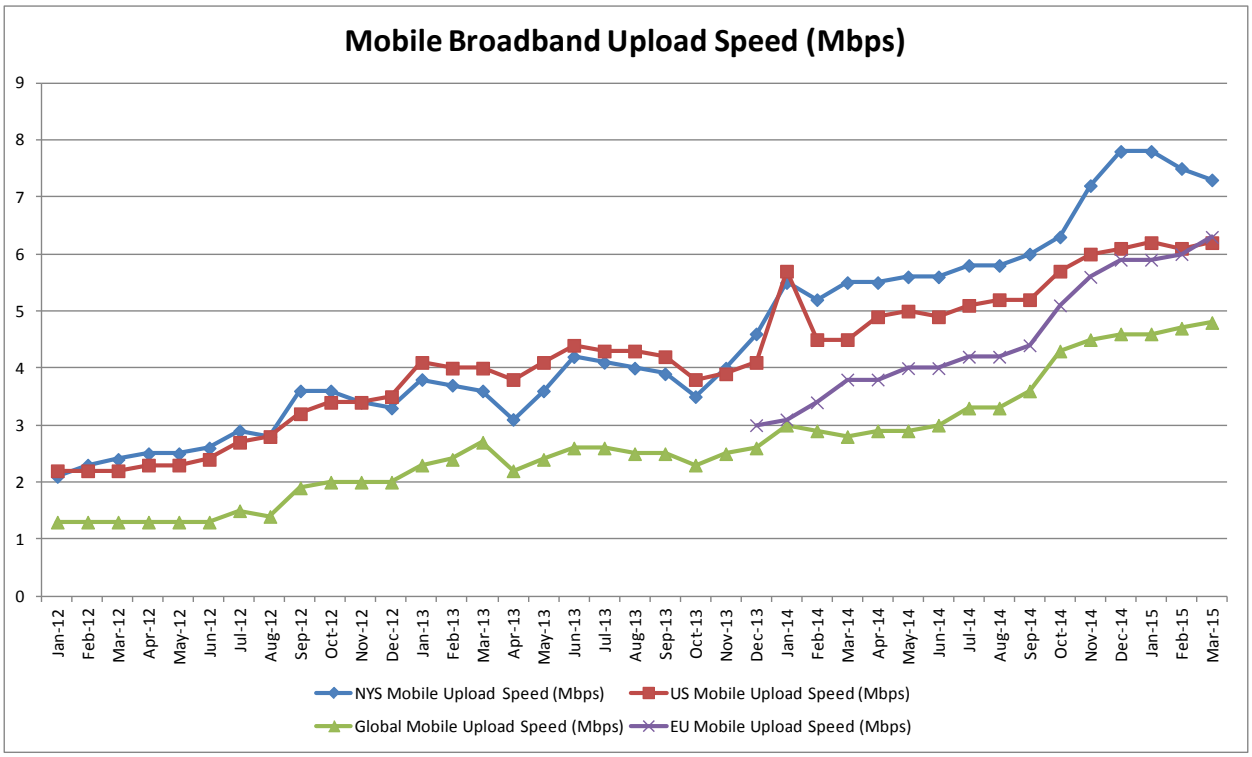

Figure 19: NYS, US, EU and Global Mobile Broadband Upload Speeds.

Regulatory Oversight

As noted, after years of classifying broadband service as an interstate information service, subject to limited regulation under Title I of the Telecommunications Act, the FCC recently classified broadband as an interstate telecommunications service subject to common carrier regulation under Title II of the Federal Communications Act.[104] The FCC opted to forbear from many Title II regulations most notably rate regulation and Universal Service Fund (USF) contributions. In doing so, the FCC also indicated that it would likely preempt states, including New York State, from imposing any requirements on broadband service providers that are inconsistent with its forbearance.

As reflected in Appendix A, the extent of the Commission's authority or jurisdiction over broadband services is limited and at present, not fully defined. While the Commission has a duty under the Federal law to encourage the deployment of advanced telecommunications infrastructure,[105] it cannot price regulate or restrict entry of broadband networks.[106] At the same time, however, the Commission does have some authority over the networks that provide broadband through its authority over telephone and cable providers: most notably, in 2014, the Commission's authority over cable mergers and transfers was strengthened to require that an applicant make a showing that a given transaction is in the public interest. In its comments to the Commission in Case 14-M-0183, related to the Comcast Merger, Staff recognized that the Commission has a core interest in ensuring broadband access and affordability for all New Yorkers and stated that any review of a cable merger must include an analysis of a transaction's impacts on broadband service.

Staff advocated that, among other things, the Commission should examine customer service,[107] and, consistent with the statewide push toward universal 100 Mbps service, Staff argued that faster broadband service should be made available to a larger segment of New

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[104] GN Docket No. 14-28, In the Matter of Protecting and Promoting the Open Internet, Report and Order on Remand, Declaratory Ruling, and Order (issued March 12, 2015) (Open Internet Order).

[105] 47 U.S.C. §1302(a) states in relevant part that "each State commission with regulatory jurisdiction over telecommunications services shall encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans (including, in particular, elementary and secondary schools and classrooms) by utilizing, in a manner consistent with the public interest, convenience, and necessity, price cap regulation, regulatory forbearance, measures that promote competition in the local telecommunications market, or other regulating methods that remove barriers to infrastructure investment."

[106] Open Internet Order, supra.

[107] The ACSI report detailed in the Video section above also measured customer satisfaction with Internet Service Providers (ISP). The 2014 survey of customer satisfaction gives ISPs a score of 63, which is the lowest ranking among the 43 household consumer industries measured in the ACSI survey. High prices, unreliable service, and slow broadband speeds are the factors attributed to the low customer satisfaction scores.

York's consumers as the result of any cable merger through investments in the system to address physical access limitations and through commitments to address the digital divide.

INVESTMENT & FINANCIAL TRENDS

As part of its assessment of telecommunications services and carriers, Department Staff examined a variety of publicly available financial data of the major national carriers, including wireline and wireless phone, cable television (CATV), and satellite (SATV) providers. In addition, Staff reviewed similar data for the small New York independent local exchange carriers (ILECs), and reviewed data concerning key indicators, such as: shareholder returns, credit ratings, cash flow metrics, and investment levels (capital expenditures). For each of these areas, Staff reviewed trending data over time (i.e., over the last 5 years or longer), relatively among carriers in the same sector (telecommunications and CATV), and also in comparison to other large ILECs. The data trends and comparisons provide further context to the overall assessment of the state of telecommunications in New York State.

The financial data is presented in two sections. First, data is presented for major telecommunications, CATV, and SATV entities on a national basis (the major carriers) and then in the second section, data is presented for New York State financial data for the State's large and small ILECs. The national data section is important because the major wireless, SATV, and CATV carriers operate and finance their businesses on a national basis and this financial data is readily available at that level. The national level data provides important context for the New York markets in which many of these same companies also provide service. In the New York section, we provide more granular key financial data for New York ILECs as reported to the Commission in the PSC Annual Report.

Since the early 2000's, the Commission has relied upon the presence of vibrant competition, rather than cost of service regulation to promote innovation and investment and constrain prices and ensure quality service of its regulated carriers. To put New York in perspective, according to the National Regulatory Research Institute (NRRI) "by the end of 2013, 30 states had reduced or eliminated retail telecommunications regulation. Two additional states, Colorado and Iowa, were added to the map in 2014, bringing that total to 32."[108] In examining the adequacy of state regulation, a review of the financial data of the carriers was undertaken in three key areas: reasonableness of shareholder returns, ability to access capital on reasonable terms, and adequacy of investment.

This assessment presents available data that could reveal excessive shareholder returns,[109] which might be an indicator that carriers' prices were too high (i.e., competition

[108] Lichtenberg, Sherry, Ph.D., Telecommunications Legislation 2014: Completing the Process, National Regulatory Research Institute, Report 14-07, June 2014.

[109] Excessive returns are returns consistently well above the expected market return.

wasn't constraining prices). To determine whether shareholder returns were excessive for major carriers in the space, Staff relied upon: share price data, dividend history and growth rates.

Another way to gauge the financial strength of the carriers was through an analysis of their credit ratings and key cash flow metrics. Credit ratings provide an independent assessment of the financial strength of the carriers (i.e., the carrier's ability to repay debt capital). A credit rating considers the carrier's scale and business model, its technological positioning, overall operating environment, and its financial policy. If the sector had inferior credit ratings, that could indicate an inability to raise capital if needed to fund critical telecommunications infrastructure.

Credit metrics are a critical component of the credit analysis. Moody's gauges financial strength by assessing a company's leverage (debt to equity ratio), cash flow generated and interest coverage. Cash flow is used for investment in existing businesses or new opportunities as well as for servicing debt or paying dividends.

Finally, Staff considered the level of infrastructure investments of the carriers by reviewing capital expenditures as a percentage of cash flow. A lack of reinvestment could signal future service deterioration or lack of commitment to the business.

National Key Financial Data

Shareholder Returns

In order to measure shareholder returns Staff relied upon an examination of the carriers stock price appreciation over time compared to Standard & Poor's 500 (S&P 500). Staff also looked at the carrier's dividend history. The S&P 500 is an index of 500 stocks chosen for market size, liquidity and industry grouping, among other factors. The S&P 500 is designed to be a leading indicator of domestic equities and is meant to reflect the risk/return characteristics of the large cap universe, and often the market as a whole. The return on the S&P 500 indicates a typical competitive return. Generally, half the companies in the index will achieve a higher return and half lower.

Next, a company's ability to pay steady dividends over time - and its power to increase them - provides good insights about its fundamentals. Dividends are promises of cash disbursements to investors. Typically, mature, profitable companies pay dividends. Generally growth companies do not pay dividends because they think the cash is better spent on reinvestment in their business.

The charts below present stock price performance for the major carriers as a group and of large ILECs vs. the S&P 500 and Dow Utilities.

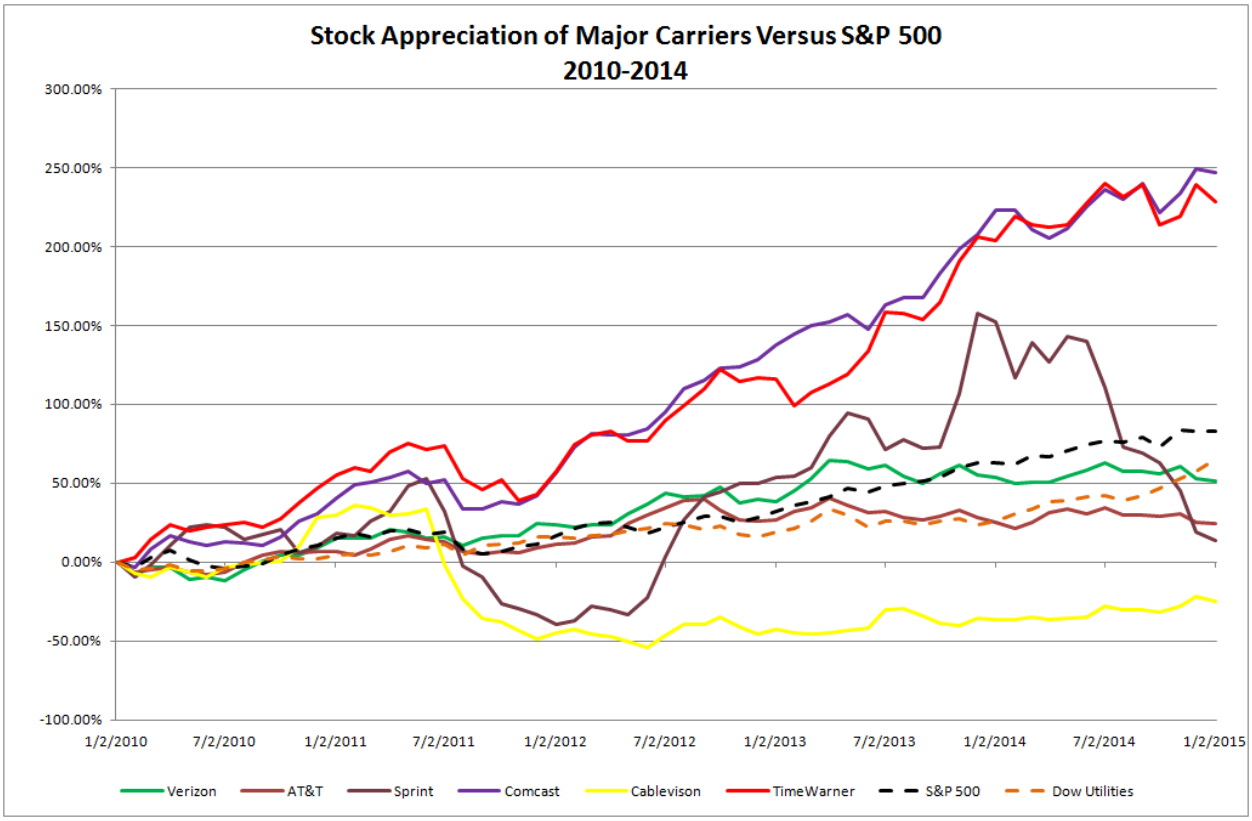

Figure 20: Stock Appreciation of Major Carriers vs. S&P 500
2010 Through 2014

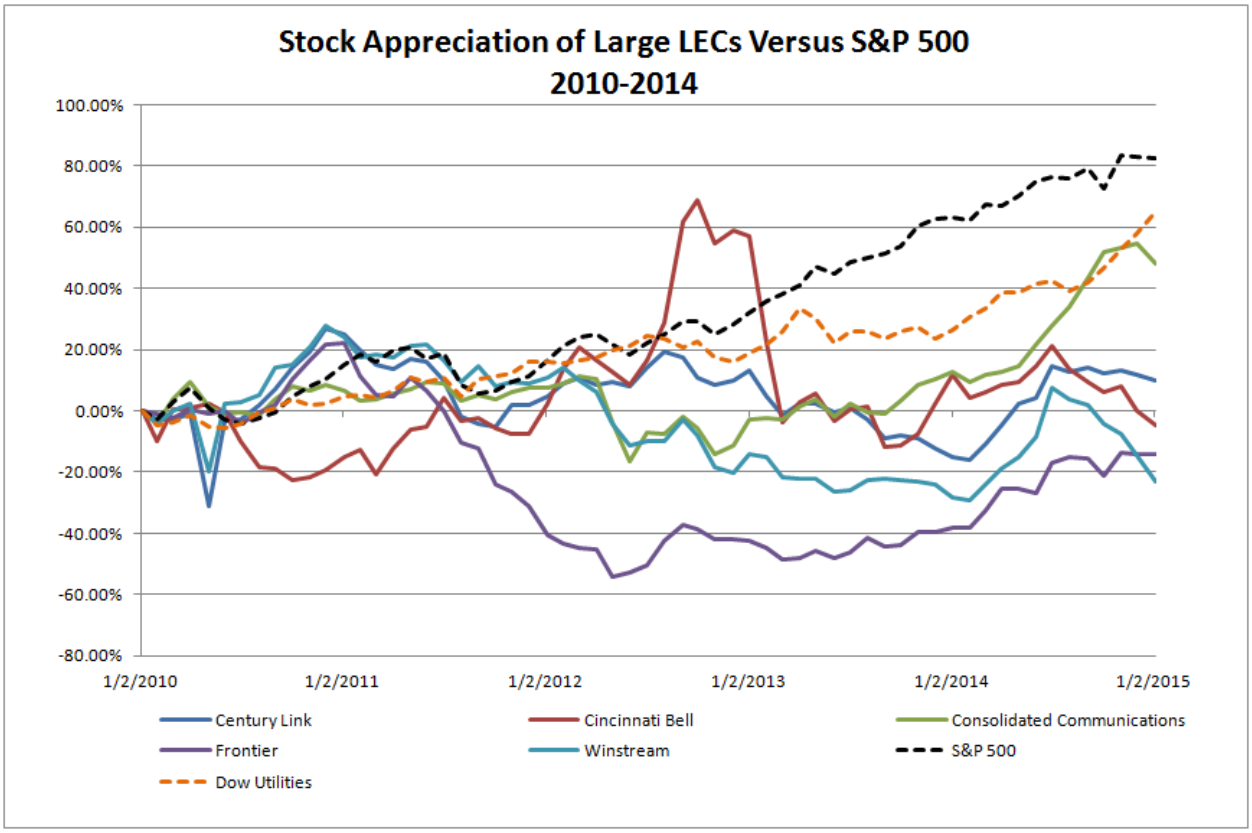

Figure 21: Stock Appreciation of Large ILECs vs. S&P 500
2010 Through 2014

Table 15 below presents the dividends paid and the cumulative growth rates between 2010-2014 for the major carriers.

Table 15: Dividend Per Share
History of Major Carriers 2010 through 2014

	2010	2011	2012	2013	2014	Growth Rate 2010-14
Wireless and Diversified						
AT&T Inc.	$1.68	$1.72	$1.76	$1.80	$1.84	2.30%
Sprint Corp.	$0.00	$0.00	$0.00	$0.00	$0.00	0.00%
Telephone & Data Systems	$0.41	$0.43	$0.49	$0.51	$0.54	7.13%
Verizon Communications	$1.93	$1.96	$2.02	$2.08	$2.16	2.85%
Large ILECS						
CenturyLink, Inc.	$2.90	$2.90	$2.90	$2.16	$2.16	-7.10%
Cincinnati Bell	$0.00	$0.00	$0.00	$0.00	$0.00	0.00%
Consolidated Communications	$1.55	$1.55	$1.55	$1.55	$1.55	0.00%
Frontier Communications	$0.88	$0.75	$0.40	$0.40	$0.40	-17.89%
Windstream Corp	$1.00	$1.00	$1.00	$1.00	$1.00	0.00%
CATV						
Cablevision	$0.48	$0.58	$0.60	$0.60	$0.60	0.85%
Comcast	$0.38	$0.45	$0.60	$0.78	$0.90	24.06%
Time Warner	$1.60	$1.92	$2.24	$2.60	$3.00	16.04%
SATV						
Direct TV	$0.00	$0.00	$0.00	$0.00	$0.00	0.00%
Dish	$0.00	$0.00	$0.00	$0.00	$0.00	0.00%

The first chart shows the price appreciation of the major carriers versus the appreciation of the S&P 500 index. This demonstrates that only two of the carriers (Comcast and Time Warner) achieved higher stock appreciation than the growth in the S&P 500.[110] The other companies all achieved returns less than the return achieved by the S&P 500. Similarly, the second chart which graphs the price appreciation of several large ILECs versus the changes in the S&P 500 index and the Dow utilities index indicates that the large ILECs all underperformed both indices. The CATV companies' higher stock appreciation has been driven by services other

[110] T-Mobile US was formed through the business combination between T-Mobile USA and MetroPCS which closed on April 30, 2013. The accounting treatment of the deal made post transaction stock prices incomparable with the prices pre-transaction. Thus T-Mobile was removed from the analysis.

than pure telephone service such as the higher penetration of bundled residential and increasingly business services (led by high-speed data); and in the case of Comcast, via gains in TV subscriptions and content licensing for NBCU's cable and broadcast divisions. Together, these graphs are indicative of vibrant competition in the telephone industry, and other than investors in the CATV companies, investors achieved less stock price appreciation than might have been achieved by an investment in the market as a whole.

In terms of dividends and dividend growth, through dividends CATV operators are signaling to investors that they anticipate that their operations will be successful over the foreseeable future. It should be noted that the high growth rate achieved by the CATV companies will not be sustainable since it came off a relatively low dividend level in 2009 and will level off. In fact over the last two years, Cablevision has held its dividend constant. The dividend growth rates of Verizon and AT&T are indicative of both a mature company, and a company that is making capital expenditures. The lack of a dividend on the part of Sprint indicates that it is investing its cash toward the effort of garnering greater market share from Verizon and AT&T. The dividend growth rate in the ILEC sector has generally stayed the same or decreased.

Credit Ratings

The current Moody's credit rating for companies in the wireline, wireless, CATV, and SATV segments are shown below and compared with the credit ratings of the companies in 2006. A credit rating considers the company's scale and business model, the company's technological positioning; the company's overall operating environment; and the financial policy of the company. Moody's has an alphabetical scale that measures the credit risk of a company's securities with Aa-rated securities having high quality and very low risk of default. This rating system moves in a continuum and, when a company is in default, Moody's assigns it a D rating. Moody's also adds numbers 1 through 3 on its ratings in the Aa to the Ca category where the number 1 indicates that the obligation ranks in the higher end of its alphabetical rating category; the number 2 indicates a mid-range ranking; and the number 3 indicates a ranking in the lower end of that alphabetical rating category.

Table 16: Moody's Credit Ratings
Major Carriers Over Time

	Moody's Senior Unsecured Rating 2006	Moody's Senior Unsecured Rating 2014	Credit Trend 2006-2014
Wireless and Diversified			
AT&T Inc.	A2	A3	Downgrade
Sprint Corp.	Baa3	Ba2	Downgrade
Telephone & Data Systems	N/A	Ba1	N/A
Verizon Communications	A3	Baa1	Downgrade
Large ILECS			
CenturyLink, Inc.	Ba1 (2013)	Ba1	Stable
Cincinnati Bell	B2	Ba3	Upgrade
Consolidated Communications	B1 (2012)	B1	Stable
Frontier Communications	Ba3	Ba3	Stable
Windstream Corp	Ba2	Ba3	Downgrade
CATV			
Cablevision	B1	Ba2	Upgrade
Comcast	Baa1 (2011)	A3	Upgrade
Time Warner	Baa2	Baa2	Stable
SATV			
Direct TV	Ba2	Baa2	Upgrade
Dish	Ba3	Ba3	Stable

As can be seen from the above table, the Moody's credit ratings since 2006 have remained generally stable for large ILECs but have deteriorated for wireless/diversified carriers. Overall, in the sector, four companies have seen their credit ratings improve; four have seen a decline; and five have had their credit ratings remain the same. Five of the companies have investment grade ratings (i.e.; Baa and above) and can attract capital at lower costs. The other companies have speculative grade ratings, meaning that they have access to capital; however, capital is acquired on terms that are more expensive than those companies with investment grade ratings.

Moody's opines that the outlook for the wireless industry is "positive" and that the outlook for the wireline industry is "stable."[111] Standard and Poors (S&P) "project[s] a stable outlook for telecom and CATV companies over the coming 12 months, in spite of [pricing and capital outlays]…industry risks."[112] However, S&P strikes a more pessimistic tone for the wireline industry by noting that "the credit outlook for wireline providers remains unfavorable due to the erosion of core residential phone customers in their consumer businesses (ibid.)"

The credit ratings are indicative that the companies have, for the most part, maintained their financial strength.

Financial Strength Metrics

Financial strength is the lynchpin of a Moody's credit rating, afforded nearly half of the weighting in its assessments. Financial strength can mitigate other risks and provides greater operational flexibility to allow a company to better compete with other companies in the industry. Moody's gauges financial strength by assessing a company's leverage (proportion of debt to total capital), cash flow (funds generated from operations), and interest coverage (cash available to pay interest).

[111] Moody's Investor Survey Outlook, US Wireless Outlook Is Positive, While Fixed-Line Telecom Is Stable (issued December 3, 2014).

[112] Ratings Direct, Top 10 Global Investor Questions For 2015: Telecommunications And Cable Sector (issued, November 17, 2014).

Table 17: Moody's Metrics Concerning Financial Strength
Major Carriers Projected 12-18 Months

		Rating Implied by Metrics (Projected)				
Wireless and Diversified	Moody's Senior Unsecured Rating 2014	Debt/EBITDA	FCF/Debt	RCF/Debt	FFO Coverage	EBITDA - CapEX Coverage
AT&T Inc.	A3	Baa	Caa	Ba	A	Ba
Sprint Corp.	Ba2	B	Caa	B	B	Caa
Telephone & Data Systems	Ba1	Baa	Caa	Baa	Baa	Caa
Verizon Communications	Baa1	Baa	Caa	B	Baa	Baa
Large ILECS						
CenturyLink, Inc.	Ba1	Ba	B	B	Ba	Ba
Cincinnati Bell	Ba3	B	Caa	Caa	B	B
Consolidated Communications	B1	N/A	N/A	N/A	N/A	N/A
Frontier Communications	Ba3	B	Caa	Caa	B	B
Windstream Corp	Ba3	B	Caa	B	Ba	B
CATV						
Cablevision	Ba2	B	Caa	N/R	N/R	B
Comcast	A3	A	N/R	N/R	N/R	Baa
Time Warner	Baa2	Baa	N/R	N/R	N/R	Baa
SATV						
Direct TV	Baa2	Baa	Baa	N/R	N/R	A
Dish	Ba3	N/A	N/A	N/A	N/A	N/A

As can be seen in the chart above, the credit ratings of the entities exceed the credit assessment of the financial metrics of the companies in the telecommunication industry as shown in the left column and on the prior page. This is because of the scale of these entities, particularly the wireless companies, and the business model support higher credit ratings. The relatively weaker financial metrics are directly or indirectly the result of competition in the telecommunications industry. Competition in the industry squeezes profit margins and reduces coverage ratios and cash flow metrics. Indirectly, some telecommunication companies have leveraged themselves by using debt to acquire new technologies or reduce competitors. The weakness of the financial metrics suggests existence of competition and the lack of sterling benchmarks indicates that no entity is achieving excess profits in the industry.

Infrastructure Investment

S&P "expect[s] capital expenditures in the U.S. to remain elevated, especially in wireless."[113] Moody's on the other hand expects "relatively flat to down capex spending in 2015." A good measure of the adequacy of investment is the amount of capital expenditures as a percentage of cash flow. Table 18 below presents this metric for major carriers in the industry.

Table 18: Capital Expenditures as % of Cash Flow
Major Carriers 2010-2014

	2010	2011	2012	2013	2014
Wireless and Diversified					
AT&T Inc.	53.9%	63.8%	61.2%	65.7%	67.7%
Sprint Corp.	86.0%	165.2%	200.0%	231.3%	186.7%
Telephone & Data Systems	83.4%	100.4%	111.1%	76.2%	113.9%%
Verizon Communications	72.6%	72.0%	72.1%	59.1%	61.0%
Large ILECS					
CenturyLink, Inc.	35.1%	52.4%	52.6%	55.1%	51.4%
Cincinnati Bell	75.5%	122.6%	167.6%	140.3%	84.5%
Consolidated Communications	36.2%	37.1%	60.7%	63.5%	66.1%
Frontier Communications	55.2%	50.3%	56.7%	45.4%	43.3%
Windstream Corp	41.2%	58.3%	69.5%	53.4%	59.5%
CATV					
Cablevision	62.0%	65.0%	96.7%	91.7%	83.7%
Comcast	48.5%	44.1%	40.8%	44.9%	45.1%
Time Warner	66.0%	64.2%	58.4%	62.6%	61.5%
SATV					
Direct TV	51.6%	64.0%	65.2%	66.6%	57.7%
Dish	56.5%	31.9%	58.9%	65.7%	51.6%

As can be seen from the above data, all the companies are reinvesting large percentages of their cash flows back into their businesses. This is indicative of investment opportunities, and also the need to keep up with their competitors.

Overall, the metrics presented demonstrate that nationally, the major players in the telecommunication industry are involved in vibrant competition with each other. Companies are reinvesting in their businesses at strong rates and the stock appreciation in the competitors shares suggest that there is no evidence of any company achieving excess shareholder returns.

[113] Id.

Nationally, it appears that these competitors have the financial wherewithal to carry out the capital expenditures needed for them to push competition. The wireless segment has completed the majority of their upgrade to being a 4G network, but will need to purchase and deploy spectrum purchased in the upcoming AWS-3 spectrum and broadcast incentive auctions. In addition, AT&T has committed to expand its broadband coverage as part of its pledge to federal regulators in receiving approval for its DIRECTV acquisition. Wireline companies will need to fund projects that will improve top-line performance, including market expansions and the deployment of fiber to support broadband speed upgrades. The CATV companies will expend monies for cloud-based set-top boxes, Wi-Fi gateways, and commercial services. S&P expects that most of these companies will fund investments through operating cash flow; however, successes by wireless companies in the upcoming spectrum auctions could prompt new debt issuances.

New York State Key Financial Information

In this section, Staff presents the key financial data of the 37 small Class B, small NY ILECs, together with the large Class A companies, Frontier, Citizens and Verizon New York. New York State companies are either not publicly traded or are subsidiaries of holding companies, thus they have no stand-alone stock price dividend data, or credit rating. As a result, they must be evaluated on other metrics. Staff reviewed the following data in examining the financial health of the NY ILECs: Pre-Tax Coverage of Interest Expense, dividend payout ratio, and the total company New York State return on equity.

The Pre-Tax Coverage of Interest Expense is a ratio used to determine a company's ability to pay interest on its debt. The interest coverage ratio is calculated by dividing a company's pre-tax earnings by its interest expense. The lower the ratio, the more the company is burdened by debt expense. When a company's interest coverage ratio is 1.5 or lower, its ability to meet interest expenses may be questionable. An interest coverage ratio below 1 indicates the company is not generating sufficient revenues to satisfy interest expenses.

The dividend payout ratio is the amount of dividends paid out by a company expressed as a percentage of its earnings. The payout ratio is a useful financial metric used to assess the sustainability of a company's dividend payments. A ratio greater than 100% indicates the company is paying out more in dividends than it makes in net income.[114] The return on equity metric measures an entity's profitability by calculating how much profit a company generates with the money shareholders have invested. The calculation is simply the amount of net income generated by an entity expressed as a percentage of shareholders equity. Return on equity is useful for comparing the profitability of a company to that of other firms in the same industry.

[114] The adequacy of a payout ratio depends very much on the sector. Companies in industries such as utilities have stable and predictable earnings and cash flows, and thus can support higher payouts than cyclical or technology companies.

Table 19: Selected Financial Metrics
NY ILECs-2009-2013[115]

	2009	2010	2011	2012	2013
Pretax Coverage of Interest Expense					
Verizon New York	-3.3	-6.2	-7.9	-8.4	3.7
Frontier of Rochester	7.2	2.3	0.8	1.9	1.6
Citizens	NMF[116]	NMF	NMF	NMF	NMF
Class B Companies	18.9	13.6	10.6	9.8	12.6
Dividends Payout Ratio					
Verizon New York	0.0%	0.0%	0.0%	0.0%	0.0%
Frontier of Rochester	0.0%	0.00%	31530.0%	0.00%	455.8%
Citizens	271.0%	668.62%	768.2%	0.00%	0.00%
Class B Companies	39.1%	55.7%	321.2%	29.9%	24.9%
Return on Common Equity					
Verizon New York	NMF[117]	NMF	NMF	NMF	NMF
Frontier of Rochester	4.6%	1.2%	-0.0%	1.0%	0.9%
Citizens	18.9%	30.6%	-34.9%	-15.3%	-11.3%
Class B Companies	5.7%	4.5%	3.6%	3.8%	4.1%

The pre-tax interest coverage ratios of the Class B companies and Citizens Telephone Company are very large because these companies have taken note of their business position and financed themselves very conservatively. Citizens and many Class B companies have capital structures that contain little if any long-term debt, and, therefore, have very little interest expense. With a small number in the denominator, the calculation will produce a large number. Frontier of Rochester has debt and its coverage ratio is reasonable, but has been shrinking

[115] Data presented for 2009-2013. 2014 data not yet available.

[116] NMF is used because Citizen has very little interest expense and the number calculated is extremely large. It would not be informative. The useful information to take away is that Citizens has very little interest to cover.

[117] NMF indicates the calculation is not informative. In this instance Verizon New York's reported equity balance is negative. There is no balance to compute a return on. Although mathematically an answer can be produced, it provides no useful information.

because of continued pressure on margins. Verizon New York exhibits negative coverage ratios, which means the company has been reporting large losses in New York State.[118]

Verizon New York has not paid a dividend to its parent during the period 2009 through 2013. Frontier and Citizens had years where they did not pay dividends to their parent, but had years where they paid very large dividends to their parents while achieving relatively small earnings. Because each is owned by a sole shareholder, its parent, many of the insights in paying a dividend are not applicable with these companies. It seems that dividends for Frontier and Citizens are provided to its parents on an as needed basis, while Verizon New York, with reported losses, has chosen to reinvest all cash generated within its business. With the exception of the Frontier, TDS, and FairPoint subsidiaries, the Class B Companies are privately held companies with a small amount of shareholders. These small companies, with the exception of an outlier year, in the aggregate, pay out about one third of their earnings on average. This indicates that these companies are relatively financial healthy since they are able to disperse a dividend to their investors.

As stated earlier, Verizon New York wireline has been reporting financial losses. These losses, combined with a book value that is now negative, means that a return on equity calculation is not meaningful to them. The recent low total company return on equity achieved by the Class B Companies, Frontier, and Citizens is indicative that their operating environment is difficult and that they are facing strong competition as a whole. On an intrastate basis, in 2013 the New York ILECs perform even worse. Verizon's results are still not meaningful, but their total company net income shifts to an intrastate company loss. Frontier of Rochester loses 4.8% on equity; Citizen loses 9.1%, and the Class B Companies lose 7.8%. The discrepancy between total company and intrastate return on equity is due, in part, because these company's investments in non-regulated operations such as DSL have been performing better than their intrastate regulated telephone business, and in some cases, earning a profit. All of these New York companies, like all ILECs in general, have experienced significant loss of access lines and associated voice revenues. These companies have also experienced diminishing inter-carrier compensation revenues.

Infrastructure Investment

The capital expenditure as a percentage of operating cash flow is a good measure of the adequacy of investment in a company's infrastructure. Table 20 below presents this metric for NY ILECs.

[118] Verizon New York earned a large profit in 2013 due primarily to a change in its accounting for its pension expense. It should not be considered a long-term turnaround in its operations.

Table 20: Capital Expenditures as % of Operating Cash Flow
NY ILECs 2009-2013

	2009	2010	2011	2012	2013
Verizon	149.2%	97.2%	376.7%	NMF[119]	90.04%
Frontier	18.3%	11.5%	11.6%	5.1%	NMF
Citizens	14.2%	15.3%	12.7%	5.4%	NMF
Class B Companies	37.0%	41.0%	36.2%	28.9%	95.6%

This data demonstrates that Verizon and some of the Class B Companies, though facing significant challenges in New York, continue to reinvest heavily in New York State infrastructure. Frontier of Rochester and Citizens have been reinvesting at a lower rate. However, their service has remained strong and they continue to earn commendations from the Commission for their service.

Generally, these companies are facing challenges. Several have expanded their product offerings to meet this challenge, but a financial rebound has been limited because competitors generally can offer superior products. Particularly for the Class B Companies, the greatest financing challenge wireline companies in the State face is the ability to finance large scale broadband build outs or upgrades. Verizon New York, Citizens and Frontier of Rochester have the luxury of relying on a stronger parent, but could also see their budgets strained if the parents are reluctant to invest in projects that have a low expected return.

Cable and Telephone Network Capital Investments in New York State

Cable and telephone companies have invested significant dollars, historically, on network deployments. In particular, cable television companies have invested in modern network infrastructure, including head-end equipment, coaxial and fiber optic outside plant cabling; subscriber devices, such as energy efficient set-top boxes; and advanced software to provide consumers with the latest in technology and services. Over the last five years, the cable industry has invested over $3.2 billion to help make cable television, VoIP voice and cable broadband service available to more than 95% of New York State residences and businesses. Telephone companies have invested in central office equipment upgrades, copper and fiber optic cabling, and other hardware and software, to provide customers with voice, DSL and optical carrier broadband and video services. In particular, Verizon has deployed its competitive fiber optic network (FiOS) to more than 3.6 million New York households and businesses. This advanced network competes directly with cable operators such as Cablevision and Time Warner Cable. Cumulatively, the incumbent telephone industry has invested over $6.4 billion from 2009 through 2013, averaging $1.2 to $1.4 billion annually. Combined, the cable and telephone

[119] NMF in this instance occurs because cash flow was negative and the calculation produces results that are not meaningful.

industries are investing, on average, over $1.8 billion dollars per year in enhancements to New York State telecommunications networks.[120] Figures 22 and 23 and Table 21 depict cable industry and telephone industry aggregate capital expenditures over a 5-year period.

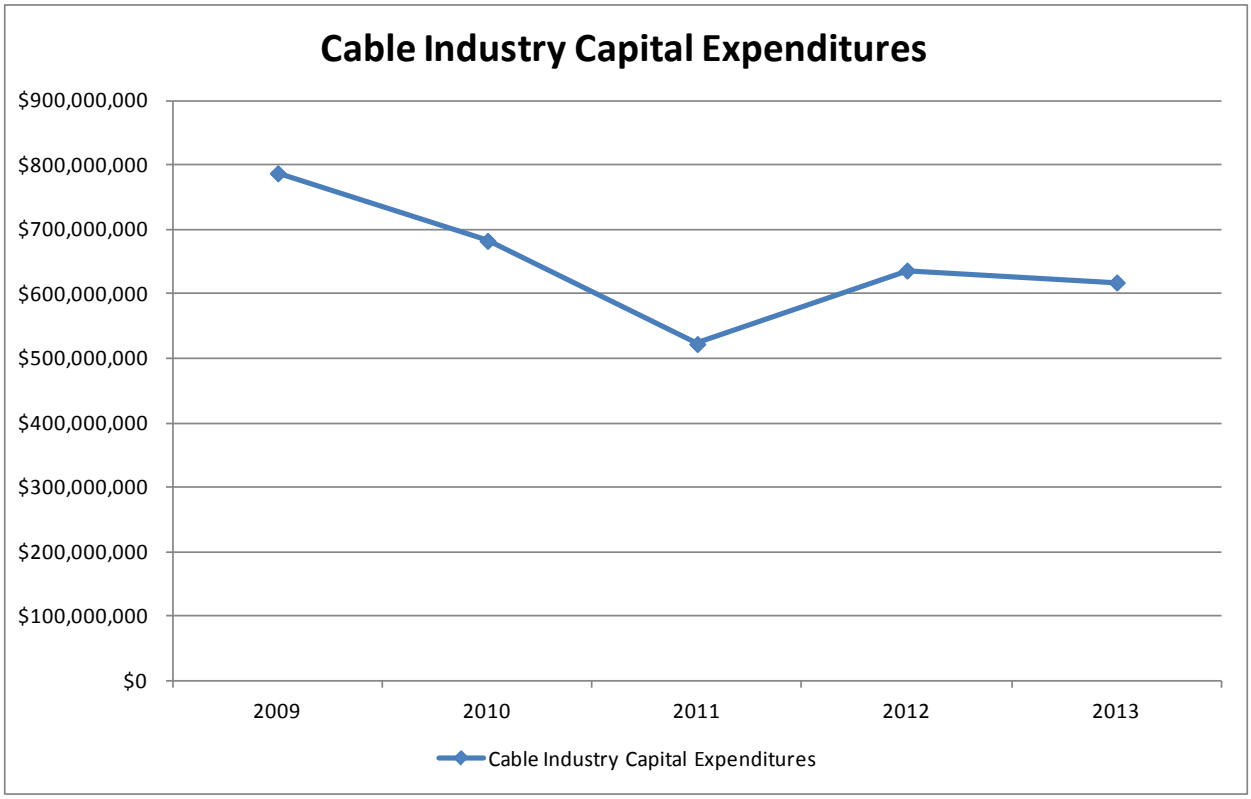

Figure 22: Cable Industry Capital Expenditures 2009-2013

[120] Annual and aggregate capital investments described should be considered conservative estimates because the inclusive data is for only a subset of the total cable and television industry operating in New York State. Capital investment dollars for smaller cable television companies, as well as facilities-based competitive local exchange companies, are excluded from the annual figures. Staff estimates that investments from excluded companies in both these categories are conservatively in the tens of millions of dollars.

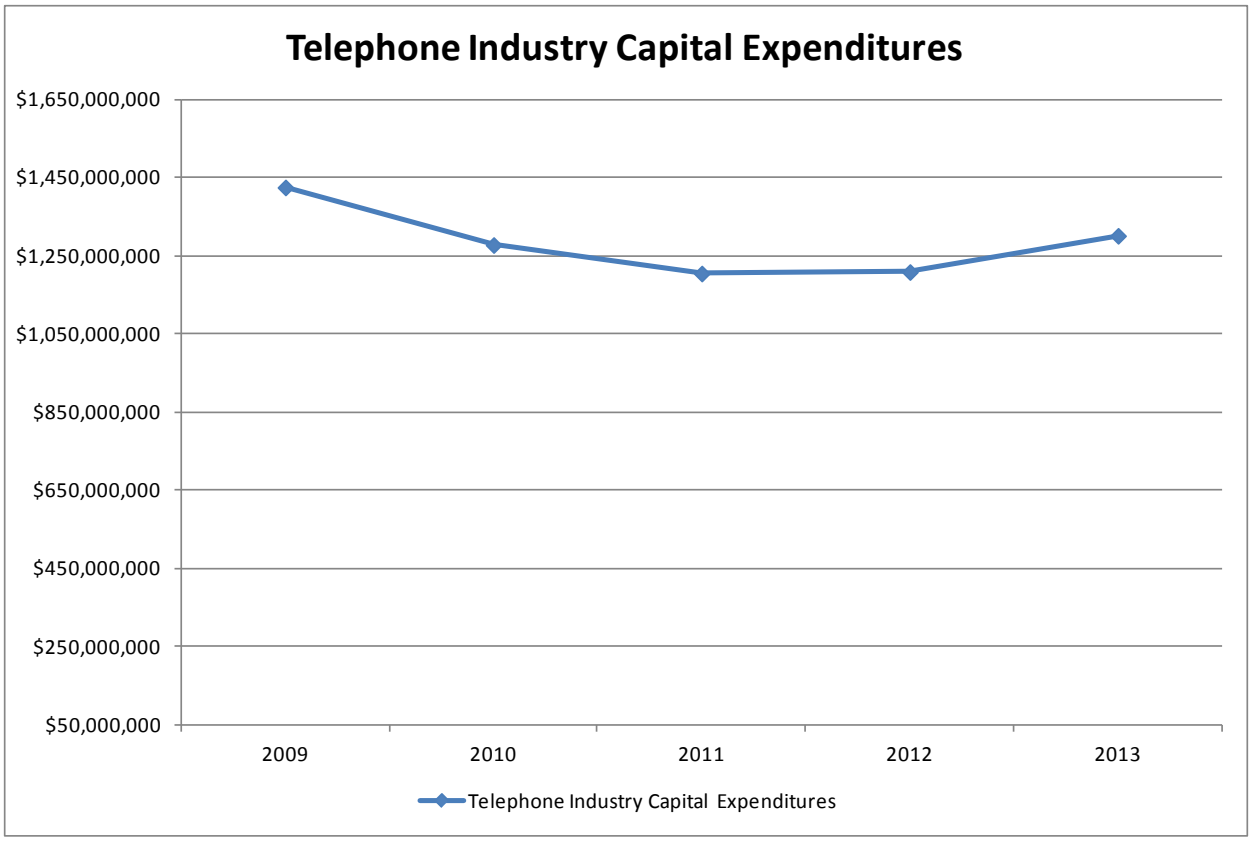

Figure 23: Telephone Industry Capital Expenditures 2009-2013

Capital Expenditures	2009	2010	2011	2012	2013
Telephone Industry	$1,425,094,648	$1,277,873,582	$1,204,996,757	$1,208,845,038	$1,301,474,660
Cable Industry	$787,426,968	$682,649,055	$522,707,397	$636,616,285	$618,096,961
Total	$2,212,521,616	$1,960,522,637	$1,727,704,154	$1,845,461,323	$1,919,571,621

Table 21: Combined Telephone and Cable Capital Expenditures 2009-2013

Financial Summary Analyses

Staff's review of external financial data of the national and New York carriers reveals that the carriers' financial performance is consistent with a competitive market and that they continue to have the ability to attract capital on reasonable terms. New York telecommunications companies generally have maintained their financial wherewithal over the last decade while competing in a technologically fast paced, intermodal telecommunications environment. These companies have balanced the need to provide returns on shareholder investment, maintained their financial viability investment grade ratings, and continued to reinvest in infrastructure.

APPENDICES

APPENDIX A: High Level Overview of Public Service Law Jurisdiction & Commission Core Interests

	Rates	Consumer Protection	Service Quality	Universal Service	Emergency Reporting	Entry/Exit
Voice						
Incumbent LEC	Yes	Yes	Yes	Yes	Yes	Yes
Competitive LEC	Yes	Yes	Yes	N/A	Yes	Yes
Cable VoIP[1]	Not Exercising	Not Exercising[2]	Not Exercising	Not Exercising	Not Exercising	Not Exercising
over-the-top VoIP	No	No	No	No	No	No
Wireless	Preempted[5]	Not Exercising	Not Exercising	Not Exercising	Not Exercising[3]	Preempted[5]
Video						
Wireline	No	Yes	Yes	No	Yes	Yes
Satellite	No	No	No	No	No	No
Broadband[4]	Preempted[5]	Not Exercising	Not Exercising	Preempted[5]	Not Exercising	Indirectly

[1] Time Warner currently holds a Commission issued Certificate of Public Convenience and Necessity and has Eligible Telecommunications status with respect to its voice service.

[2] The Commission handles complaints regarding services provided by video providers regardless of whether they are voice or video services.

[3] Cable VoIP and wireless providers voluntarily provide outage and other emergency information to the Commission.

[4] To the extent that broadband service is provided by voice and video providers otherwise subject to Commission regulation, the Commission has an indirect role with respect to broadband service via the regulated company networks that broadband service is provided over.

[5] Federal Law, including portions of the Telecommunications Law and FCC rules and regulations preempt the Commission from regulating these areas.

APPENDIX B: Pricing Information

The following tables contain pricing information from a sample of the available standalone voice and bundle packages offered in New York State. Included in this sample are both retail rates and time-limited promotional pricing to new customers, where noted. Due to the speed at which prices change in this market, the following tables represent a snapshot of the market as of May 11, 2015. For example, this appendix does not take into account Verizon's new "Custom TV" pricing, which may reduce the price of FiOS bundles some consumers.

Table 1 contains prices for residential voice service offerings. Table 2 provides similar information for business voice service offerings. Tables 1 and 2 are organized by the technologies used to deliver voice service, starting with traditional landline-based technologies and ending with mobile voice services. Table 3 contains pricing information for residential triple play bundles (packages containing voice, video, and data service). Table 3 also calculates the incremental cost to consumers of adding voice service if they are already planning to purchase video and data packages.

The broad sample of pricing information on residential voice services contained in Table 1 includes prices for voice services offered by traditional ILECs, CLECs, and cable companies which utilize coaxial or fiber to transmit voice and sound. Also included are prices on newer residential options from over-the-top VOIP providers, which use consumers' data connections to deliver voice service. Finally, Table 1 includes prices on residential voice services offered by mobile providers, which use the same technology as cellular phones.

Table 2 contains a broad sample of voice service prices available to businesses in the State. The various technologies used to provide voice services to business customers tends to be similar to those used to provide voice service to residential consumers. However, the business service offerings included enhanced reliability guarantees and other ancillary features that are valuable to small businesses.

Table 3 contains pricing information on a broad sample of the bundle packages offered to residential consumers. These packages contain voice, video, and data services. By comparing the price of these triple play packages with the prices of packages that contain only video and data service, the incremental cost of voice service (within a package) can be calculated. In general, the incremental cost of voice service when consumers already intend to purchase video and data service is quite low, and is typically lower than most standalone voice services.

Finally, Tables 4 and 5 show changes in Verizon and Frontier of Rochester prices over the time period since the Competition III proceeding order was issued in 2006.

Table 1: Sample of Standalone Phone Pricing - Comparison - Residential[1]

Landline Phone	Price (monthly)	Wireless Home Phone [2]	
Verizon Basic	$31.45	Verizon Wireless Home Phone[3]	$20.00
Verizon Non-Basic[4]	$43.55	AT&T Home Phone [5]	$20.00
Verizon Non-Basic[6]	$66.49	Sprint Home Phone [7]	$10.00
Frontier Basic	$32.74	StraightTalk Home Phone	$15.00
Frontier Non-Basic[8]	$35.74	Mobile Wireless[9]	
AT&T Basic	$34.95	Sprint Prepaid[10]	$35.00
AT&T Unlimited Plus	$32.99	T-Mobile Prepaid[11]	$35.00
Alteva Voice[12]	$36.45	At&t Prepaid Gophone [13]	$30.00
CrownPoint Telephone Basic Service[14]	$29.50	StraighTalk Prepaid[15]	$30.00
Cable Phone (Standalone)[16]		Verizon Prepaid[17]	$35.00
Time Warner Cable Home Phone National[18]	$10.00	Tracfone Prepaid[19]	$9.99
Comcast XFINITY Voice Local with More[20]	$34.95	Tracfone Prepaid[21]	$16.67
Comcast XFINITY Voice Unlimited[22]	$29.99	MetroPCS Prepaid [23]	$30.00
Comcast XFINITY Voice Unlimited[24]	$44.95	Verizon Nationwide 450[25]	$39.99
RCN Unlimited Nationwide [26]	$19.99	Verizon Nationwide 900[27]	$59.99
Cablevision Home Phone Not Available as a Standalone Product		Verizon Nationwide Unlimited[28]	$69.99
Over the Top VOIP[29]			
Vonage Unlimited [30]	$9.99		
Vonage Unlimited	$25.99		
MagicJack	$35/year		

Prices as of 5-11-15

[1] Prices do not include fees or taxes except the FCC Subscriber Line Charge (SLC). The SLC is not applicable to cable and over-the-top VOIP.
[2] Allows you to plug your existing home phone into the wireless home phone device, keep the same phone number.
[3] Unlimited long-distance in the U.S. **Wireless device free with 2 year contract.**
[4] Regional Value (Downstate), Unlimited home region calling.
[5] Unlimited nationwide calling.
[6] Freedom Value, Unlimited local, regional, and long-distance to U.S., Canada, and Puerto Rico.
[7] Unlimited domestic minutes.
[8] Unlimited local and nationwide long-distance.
[9] Mobile telephones can act as substitutes for the traditional fixed-line telephone system.
[10] Unlimited domestic talk and text and 1 GB of data.
[11] Unlimited domestic talk and text.
[12] Unlimited calling in the U.S, Canada, Puerto Rico, and Guam.
[13] Unlimited domestic talk and text.
[14] Unlimited local service.
[15] 1500 domestic minutes and unlimited domestic text.
[16] Phone service provided by traditional cable operators.
[17] Unlimited domestic talk and text.
[18] Unlimited local, regional, and long-distance to U.S., Canada, Mexico, Hong Kong, and U.S. territories, **Promotional price for 12 months.**
[19] 50 domestic minutes.
[20] Unlimited local calling.
[21] 1500 domestic minutes, **Requires 12 month plan.**
[22] Unlimited nationwide calling, **Promotional price for 6 months.**

Table 2: Sample of Phone Pricing - Comparison – Business[1]

Landline Phone[2]	Monthly Price	Over the Top VOIP[3]	Monthly Price
Verizon Single Line Business (1MB)[11,12]	$32.96	Vonage Low-Cost Business Phone	$14.99
Verizon Single Line Business (1MB)[12,14]	$24.97	Nextiva Office Pro[6,11]	$34.95
Verizon 1MB+ Unlimited Local Usage[11]	$66.46	Nextiva Office Pro[6]	$32.95
Verizon 1MB+ Unlimited Local Usage[13]	$62.11	RingCentral(500 local minutes)	$34.99
Verizon 1MB+ Unlimited Local and Toll Usage[11]	$72.96	RingCentral[8,13]	$24.99
Verizon 1MB+ Unlimited Local and Toll Usage[13]	$68.96	MegaPath Unlimited Local	$19.95
Frontier Business Voice	$44.73	MegaPath Unlimited National	$24.95
AT&T Local Service (500 local minutes)	$27.60		
Cable Phone		**Mobile Wireless**	
Time Warner Cable Business Class	$45.79	Sprint Unlimited Domestic Talk and Text Business	$15.00
Cablevision Optimum Online[10]	$29.95	AT&T Pooled Nation[9]	$44.99
Comcast Business Phone	$29.95		

Prices as of 5-11-15

1. Prices do not include fees or taxes except the FCC Subscriber Line Charge (SLC). The SLC is not applicable to cable and over-the-top VOIP.
2. Delivered via traditional landline network, either as an incumbent or as a CLEC using the incumbent's network.
3. Voice-over IP offerings utilize a consumer's existing internet connection to transmit voice.
4. Includes $6.50 SLC. The SLC is not applicable to cable and over-the-top VOIP.
5. No contract, $0.03/min domestic calls.
6. Toll-free number included.
7. 500 domestic minutes.
8. Unlimited nationwide calling, **3 year price lock.**
9. 450 minutes, unlimited weekend and night minutes.
10. Must be bundled with internet service.
11. Month-to-Month term.
12. $0.0825/min for the first three minutes, $0.0176/min each additional minute.
13. 1 Year term agreement required.
14. 2 Year term agreement required.

Table 3: Sample Residential Bundle Comparison

Prices as of 5-11-15

Bundle	Triple Bundle Price	(Video+Data) Bundle	Incremental Charge for Phone Triple Bundle less Video+Data Bundle	Standalone Prices		
				Phone	Video	Data
Verizon Triple Bundle *2 Channel Packs* *25Mbps Data* *Unlimited Domestic and Canadian Calling, Promo (24 months)*	$74.99	$59.99	$15.00	$61.99	$54.99	$54.99
Time Warner Cable Triple Bundle *200+ Channels* *30Mbps* *Unlimited Calls in the U.S., Canada, Puerto Rico, Mexico, Hong Kong, Promo (12 months)*	$89.99	$89.99	$0.00	$10.00	$49.99	$54.99
Cablevision Triple Play *245+ Channels* *50Mbps* *Unlimited Domestic Calling, Puerto Rico, U.S. Virgin Islands, and Canada*	$84.95	$79.95	$5.00	$34.95	$64.95	$64.90
Comcast Starter Triple Bundle *140+ Channels* *25 Mbps* *Unlimited Nationwide Talk and Text, Promo (12 months)*	$89.99	$79.99	$10.00	$29.99	$49.99	$49.95
Frontier Triple Bundle DISH Top *250* *6Mbps* *Unlimited Domestic Calling*	$85.97	$69.98	$15.99	$30.99	$34.99	$29.99
Charter Triple Play *125+ Channels* *60 Mbps* *Unlimited Nationwide Calling + Canada, Puerto Rico, Guam, and Virgin Islands, Promo (12 months)*	$89.97	$89.98	-$0.01	x	$59.99	$39.99
Citizens Cablevision *104 Channels* *1 Mbps* *Unlimited Local ~ 300 long-distance minutes*	$133.25	$143.20	-$9.95	$15.85	$85.25	$57.95
Fairpoint *171 Channels* *5 Mbps* *600 long-distance minutes*	$120.39	$92.95	$27.44	$39.13	$61.45	$44.95
CastleTV *242 Channels* *1 Mbps* *Unlimited Local, Long-distance in the Continental U.S. and Canada*	$116.99	$92.90	$24.09	x	$55.95	$36.95
DISH *55+ Channels* *Up to 20Mbps* *Nationwide Calling*	$69.98	$59.98	$10.00	$35.00	$19.99	$49.99
Haefele TV *125 Channels* *7 Mbps* *5,000 minutes local/long-distance*	$99.95	$102.40	-$2.45	$44.99	$57.45	$54.95

Table 4: Selected Verizon Rate Changes Since Comp III *			Average Annual Change
BASIC RESIDENTIAL	**2007**	**2014**	**2007 - 2014**
Single Line Flate Rate:	$19.05	$23.00	**2.59%**
Single Line Message Rate:	$11.85	$15.80	**4.17%**
BASIC BUSINESS	**2007**	**2014**	**2007 - 2014**
Single Line Message Rate:	$19.95	$26.46	**4.08%**
Individual Trunk Rates:	$9.98	$13.23	**4.07%**
Business Unlimited Local Usage & Unlimited Local and Toll Usage (Month-To-Month)	**2007**	**2014**	**2007 - 2014**
Exchange Access Line			
Unlimited Local Usage (M-T-M):	$20.50	$33.50	**7.93%**
Unlimited Local and Toll Usage (M-T-M):	$27.00	$40.00	**6.02%**
Digital Centrex Plus Access Line			
Unlimited Local Usage (M-T-M):	$20.50	$33.50	**7.93%**
Unlimited Local and Toll Usage (M-T-M):	$27.00	$40.00	**6.02%**
Business Unlimited Local Usage & Unlimited Local and Toll Usage (1 Year Term)	**2007**	**2014**	**2007 - 2014**
Exchange Access Line			
Unlimited Local Usage (1 year):	$16.50	$29.15	**9.58%**
Unlimited Local and Toll Usage (1 year):	$22.73	$36.00	**7.30%**
Digital Centrex Plus Access Line			
Unlimited Local Usage (1 year):	$16.50	$29.15	**9.58%**
Unlimited Local and Toll Usage (1 year):	$22.73	$36.00	**7.30%**
Business Access Line plus Usage **	**2007**	**2014**	**2007 - 2014**
Business Single Line Message Rate + Unlimited Local Usage	$40.45	$59.96	**6.03%**
Business Single Line Message Rate + Unlimited Local and Toll Usage	$46.95	$66.46	**5.19%**
RESIDENTIAL PACKAGES			
	2007	**2014**	**2007 - 2014**
Regional Package Unlimited:	$35.00	$35.00	**0.00%**
Regional Value:	**2007**	**2014**	**2007 - 2014**
NY Metro LATA -	$22.04	$35.04	**7.37%**
Non Metro LATA -	$27.04	$40.04	**6.01%**
Regional Essentials:	**2007**	**2014**	**2007 - 2014**
NY Metro LATA -	$27.04	$37.04	**4.62%**
Non Metro LATA -	$32.04	$42.04	**3.90%**
Freedom Value:	**2007**	**2014**	**2007 - 2014**
NY Metro LATA -	$34.99	$42.99	**2.86%**
Non Metro LATA -	$39.99	$47.99	**2.50%**
Freedom Essentials:	**2007**	**2014**	**2007 - 2014**
NY Metro LATA -	$39.99	$49.99	**3.13%**
Non Metro LATA -	$44.99	$54.99	**2.78%**
	2007	**2014**	**2007 - 2014**
Local Package:	$38.99	$50.99	**3.85%**
	2007	**2014**	**2007 - 2014**
Local Package Extra:	$41.99	$53.99	**3.57%**
	2007	**2014**	**2007 - 2014**
Local Package Unlimited:	$54.99	$66.99	**2.73%**
	2007	**2014**	**2007 - 2014**
Regional Package:	$46.95	$57.95	**2.93%**
Regional Package Extra:	**2007**	**2014**	**2007 - 2014**
NY Metro LATA -	$56.95	$67.95	**2.41%**
Non Metro LATA -	$49.95	$60.95	**2.75%**

*** Prices do not include the Subscriber Line Charge. Verizon's SLC was $6.50 per month in 2014.**

**** Historically, Verizon's Single Line Business (1MB), by itself and combined with Unlimited Local and/or Toll Usage, have been the company's most popular small business services.**

Table 5: Selected Frontier Rochester Rate Changes Since Comp III *

BASIC RESIDENTIAL	2007	2014	Average Annual Change 2007 - 2014
Single Line Flate Rate:			
Rate Group 2:	$10.23	$16.23	7.33%
Rate Group 3:	$10.71	$16.71	7.00%
Rate Group 4:	$11.19	$17.19	6.70%
Rate Group 5:	$11.91	$17.91	6.30%
Rate Group 6:	$12.80	$18.80	5.86%
Rate Group 7:	$13.74	$19.74	5.46%
Rate Group 8:	$14.63	$20.63	5.13%
Rate Group 9:	$15.71	$21.71	4.77%
Single Line Message Rate:			
MR - 0 (RG1-9):	$8.53	$14.53	8.79%
MR - 50 (RG9):	$11.82	$17.82	6.35%
MR - 80 (RG9):	$13.61	$19.61	5.51%

BASIC BUSINESS	2007	2014	
Single Line Message Rate (RG2-9):	$11.72	$14.53	3.00%

RESIDENTIAL PACKAGES			
	2007	2014	2007 - 2014
Frontier Freedom Pack - I:	$15.95	$15.95	0.00%
	2007	2014	2007 - 2014
Frontier Freedom Pack - II:	$15.50	$15.50	0.00%
	2007	2014	2007 - 2014
Frontier Freedom Family Pack:	$21.45	$21.45	0.00%
	2007	2014	2007 - 2014
Frontier Freedom Plus Pack:	$19.55	$19.55	0.00%
	2007	2014	2007 - 2014
In-Touch Pack:	$9.25	$9.25	0.00%
	2007	2014	2007 - 2014
Family Max Pack:	$16.95	$16.95	0.00%
	2007	2014	2007 - 2014
Max Pack Plus:	$16.50	$16.50	0.00%
	2007	2014	2007 - 2014
Max Pack:	$14.95	$14.95	0.00%
	2007	2014	2007 - 2014
Frontier Choices:	$14.95	$14.95	0.00%

*** Prices do not include the Subscriber Line Charge. Frontier Rochester's SLC was $4.75 in 2014.**

Table 5: Selected Frontier Rochester Rate Changes Since Comp III * (Continued)

BUSINESS PACKAGES	2007	2014	2007 - 2014
Basic Max Pack:	$18.95	$18.95	0.00%
Max Pack:	$19.95	$19.95	0.00%
Max Pack Plus:	$21.50	$21.50	0.00%
In-Touch Pack:	$12.45	$12.45	0.00%
Frontier Choices:	$14.95	$14.95	0.00%

RESIDENTIAL BUNDLES		
Frontier Digital Phone Silver:	**2007**	**2014**
Month to Month:	N/A	$26.00
One Year Term:	N/A	$26.00
Two Year Term:	N/A	$26.00
Frontier Digital Phone Service:	**2007**	**2014**
Month to Month:	N/A	$29.99
One Year Term:	N/A	$29.99
Two Year Term:	N/A	$29.99
	2007	**2014**
Frontier Digital Phone Bronze:	N/A	$19.99
Frontier Digital Phone Plus Service:	**2007**	**2014**
Month to Month:	N/A	$29.99
One Year Term:	N/A	$29.99
Two Year Term:	N/A	$29.99
	2007	**2014**
Frontier Digital Phone Bronze:	N/A	$19.99
	2007	**2014**
Frontier Digital Phone 100:	N/A	$18.99
	2007	**2014**
Frontier Unlimited State:	N/A	$18.99
	2007	**2014**
Frontier Digital Phone Essentials 4:	N/A	$19.99
	2007	**2014**
Frontier Digital Phone Essentials:	N/A	$21.99
	2007	**2014**
Frontier Digital Phone Unlimited:	N/A	$21.99
	2007	**2014**
Frontier Digital Phone Unlimited Plus:	N/A	$21.99

*** Prices do not include the Subscriber Line Charge. Frontier Rochester's SLC was $4.75 in 2014.**

APPENDIX C: Demographic Drivers of Broadband Availability

This appendix describes the demographic drivers of residential broadband availability. A household's access to broadband depends upon whether a wired network physically passes the household, or whether a wireless tower is located near that household.

Similar to the methodology used in the Case 07-C-0349 small telephone company framework proceeding, mapping data was relied upon to identify broadband coverage areas. The Department of Public Service's Geographic Information Service (GIS) unit overlaid GIS versions of mobile wireless, DSL, cable, fiber and fixed wireless coverage maps with GIS maps showing census block boundaries. This enabled DPS staff to estimate the proportion of the population in each census block that had mobile wireless, DSL, cable, fiber and fixed wireless broadband service available to them.

Mosaik Solutions is the source of the wireless cellular coverage mapping data. The Mosaik Solutions data includes the four major wireless carriers AT&T, Verizon, T-Mobile, and Sprint, as well as a few smaller wireless carriers with limited coverage in the state, and is current as of May 2014. The cable, DSL, fiber and fixed wireless mapping coverage data comes from the New York State Broadband Mapping Unit of the NYS Office of Information Technology Services, GIS Program Office. This mapping information was created in affiliation with the National Telecommunications Information Administration and is current as of April 2014. This broadband coverage is then matched to census blocks within the state using census block shape files obtained from the Census Bureau's ACS 2011 5-yr estimate GIS shapefile.

General Analysis of Telecommunication Availability at the Household Level

NYS residents generally have access to multiple telecommunication systems. At the household level, the Broadband Program Office's data indicate that almost 93% of households have access to a cable network, 91% have access to a DSL network, 46% have access to fiber, and greater than 98% have access to at least one mobile wireless service provider. Matching up the Census Bureau's public use micro-data with the wireless coverage maps indicates there is an average of five cell providers available to households in the state.

This statistical analysis relies upon broadband availability data aggregated at the census block level. If a broadband technology is available to 90% of a census block or greater, that broadband technology is considered available to households in that census block. Descriptive results of this aggregation can be found in Table 1. Of particular interest is the fact that approximately 5.0% of those living in blocks with a broadband cable network have no alternative broadband network available (excluding mobile wireless), and 4.5% of those living in blocks with fixed wireless have no alternative broadband network options(again excluding mobile wireless). It should also be noted that greater than 85% of the population has access to at least two broadband networks, and over 40% have access to three or greater.

Statistical Analysis of the Availability of Wired Broadband Networks

A regression model is estimated to analyze the variation in network availability at the census block level. The models specify that the likelihood of a wired or wireless broadband network being located near a residential location is a function of the population density in that household area and of the income level in that household area.[1] The estimated coefficients (reported as odds ratios) of the regression model can be found in Table 2. In a logistic model such as the one estimated here, the odds ratio describes the increase in odds per unit change of an explanatory variable, with a value greater than one associated with greater odds, and a value less than one associated with smaller odds.

The regression results indicate that for DSL, Cable, Fiber, and mobile wireless, both higher levels of population density and higher incomes are associated with greater broadband network availability. While this is not surprising, more interesting are the relative effects these factors have on the probability of broadband network connection availability across connection types. Population density drives cable network availability more than it does fiber network availability, which is consistent with the existence of NYS codified build-out requirements for cable and no such requirements for fiber. In contrast, fiber deployment appears to be driven by income more than other wired network types, perhaps due to the premium services fiber enables. Higher levels of population density are most related to the availability of wireless connectivity. This is consistent with wireless firms building out their networks by initially placing cell towers in areas with more potential customers. Higher levels of income are also associated with the availability of mobile wireless connections. This could be expected given the high cost of wireless data plans. Finally, the results indicate that population density and median income are negatively related to the availability of fixed wireless connections. This is not surprising given that fixed wireless networks tend to be constructed in more rural, lower income areas.

[1] Specifically, a logic model that relates the likelihood of connection type availability to population density and median income is estimated. For the purposes of this analysis, the dependent variable availability takes the value of one if the connection type is available in 90% or more households on a block. The results converted to odds ratios are reported in Table 1. An odds ratio above 1 indicates that increases in the associated explanatory variable increases the likelihood of a particular service being available, while an odds ratio below 1 indicates that increases in the explanatory variable decreases the likelihood of that particular service being available.

Table 1

Overall Availability of Broadband Connection Types (% of population in census block IDs)

Connection Type	Availability
DSL	81.38%
Cable	89.37%
Fiber	37.93%
Fixed Wireless	12.88%
Mobile Wireless	98.83%

% of population where noted network type is only available broadband connection (excluding Mobile Wireless)

Connection Type	Availability
DSL	1.430%
Cable	4.470%
Fiber	0.020%
Fixed Wireless	0.530%

# of available wired connection types available (excluding mobile wireless)

# of Connection Types	Availability
0	8.53%
1	6.45%
2	42.36%
3	40.24%
4	2.42%

Table 2

Broadband Availability					
Model	(1)	(2)	(3)	(4)	(5)
Dependent Variable					
Connection Type	DSL	Cable	Fiber	Mobile Wireless	Fixed Wireless
Population Density	1.22483***	1.163401***	1.003314***	2.12e24***	0.9954463***
	(0.007893)	(0.0076975)	(0.0003952)	(9.20e24)	(0.000635)
Median Income	1.006397***	1.014452	1.01744***	1.023105***	0.9893343***
	(0.0006902)	(0.0010001)	(0.0005494)	(0.007521)	(0.0008168)
Number of Observations	15085	15085	15085	15085	15085
Pseudo R-Square	0.281	0.217	0.06 1	0.613	0.019

Robust Standard Errors in parentheses
*** Significant at the 99% confidence level
** Significant at the 95% confidence level
* Significant at the 90% confidence level

Average Variable Values:
Population Density 28.968 (1000s/sq meter)
Median Income 64.550 ($1000s)