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STATE OF NEW YORK
DEPARTMENT OF PUBLIC SERVICE

March 27, 2014

TO: THE COMMISSION

FROM: OFFICE OF TELECOMMUNICATIONS

SUBJECT: CASE 13-M-0025 - In the Matter of Outages Caused by Superstorm Sandy. Report on Telecommunications Network Restoration Following Superstorm Sandy.

RECOMMENDTION: This memorandum is for informational purposes only. It provides the status of implementation of recommendations made in the Report on Telecommunications Network Restoration Following Superstorm Sandy. No Commission action is required.

SUMMARY

This memorandum reviews implementation progress on the post Superstorm Sandy¹ improvement recommendations for telephone, cable and wireless companies that were reviewed at the Commission's November 14, 2013 Session. The Department Staff report examined ways to improve the resiliency of telecommunications networks and to restore services as safely, efficiently and quickly as possible following emergency events.² Sixteen telephone, cable and wireless companies³ responded to Staff's report. Staff is generally satisfied with implementation progress. Going forward staff will give priority to (1) enhancing communication and coordination between the communications companies and electric utilities, (2) exploring

¹ Staff's recommendations are listed in Attachment 1. Of the 16 companies responding, only some currently fall under the Commission's jurisdiction. To the extent the Commission has not sought to assert jurisdiction over cable telephony and wireless services, those carriers are not currently under the Commission's authority.

² The report was issued publicly on November 19, 2013.

³ Report respondents are listed in Attachment 2.

the additional recommendations made by certain companies, including Time Warner Cable, that the Commission assist in facilitating arrangements that would allow utilities and service providers to share fuel supplies and discussions with the appropriate government entities regarding local and state rules that interfere with service providers' ability to handle and transport fuel; and (3) continuing its efforts with other state agencies, including the Disaster Preparedness Commission, to further improve telecommunications emergency response, including improved credentialing for technicians to expedite network restoration timeliness.

DISCUSSION

Emergency Plans

All of the companies responding to the report indicated that they maintain Emergency Plans which have been updated to incorporate lessons-learned following Superstorm Sandy. Verizon New York Inc. (Verizon), for instance, developed a "Metro Plan" that it utilizes in major metropolitan areas where it has multiple business units. That plan is designed to respond to catastrophic events that require extensive coordination of planning and logistical activities across multiple business units. An example of a situation that may trigger the activation of the Metro Plan is the identification of an imminent storm event that has the potential to disrupt Verizon's operations for an extended amount of time. Similarly, tw telecom updated its Emergency Plans to include expanding its mobile wireline recovery capabilities, establishing an executive team to continually review decisions associated with "site hardening," and steps to improve the company's customer notification systems. AT&T also enhances its emergency plans by conducting disaster recovery preparedness exercises several

times per year to test and strengthen its response and recovery processes. Staff attended and observed AT&T's East Coast readiness exercise, held in Hartford, CT, in May 2013.

Customer Credit Policies

All of the companies indicated that customer credit policies are contained in their tariffs, if applicable, and otherwise are generally available to customers through company websites, annual mailings and customer agreements.

For example, in the event of a natural disaster, Windstream Communications may elect to implement a Disaster Assistance Plan, available to residential and business customers whose premises have been damaged and considered unsafe, unsuitable or uninhabitable. Under its plan, the company may waive installation charges and up to three months of monthly recurring charges for certain services like call forwarding. Following Superstorm Sandy, Verizon Wireless reported that it waived domestic voice and text charges that its wireless customers incurred in storm-affected areas of the State, between October 29 and November 16, to help minimize the financial impact of the temporary loss of wireline services to its customers.

Customer Communications

Staff's report also included recommendations for how companies could improve their communication with customers through traditional means as well as through newer technologies. Overall, Staff observed that companies communicated effectively with their customers and the general public following Superstorm Sandy through traditional channels.

Many companies also utilized social and personal media, such as Facebook, Twitter, YouTube and text messaging. XO Communications posted restoration updates to its Twitter feed

one or more times daily as its recovery operations commenced. MegaPath launched a network status page on its website where service impacting events were viewable, including affected areas, estimated restoration times and the number of impacted users. Frontier Communications employed customized voicemail service alerts in its call centers to alert callers of the implications of outages along with the estimated times of restoration for its service in impacted areas. Comcast Corporation customers were able to use the company's website to get outage information for their particular account and could also sign up for free mobile text alert service to check for outages in their area.

Time Warner Cable customers were able to call customer service and billing telephone numbers to obtain timely recorded information updates regarding service outages and discuss concerns and problems directly with customer care agents. Customers who had temporarily relocated from their primary residences could also request that the company call them at their temporary location and inform the customer when service had been restored to their primary residence. Finally, Cablevision reported that it continues to expand its extensive WiFi network, and since Superstorm Sandy, has added more than 30,000 new hotspots throughout its tri-state service area, providing many additional communications channels for customers during storms and other emergency events.

Network Restoration

Staff's report included five recommendations with respect to network restoration. Some of the recommendations were industry segment specific and, thus, not applicable across the entire communications industry.

The first recommendation called for improved coordination between wireless companies and wireline providers,

to help prioritize and expedite critical service restoration during emergencies. Although Staff observed that wireless networks were restored relatively quickly following Superstorm Sandy, wireless resiliency remained a concern, as it is the primary means of communication for many consumers and emergency responders during these events. Staff witnessed that the loss of wireless communication to even a small geographic area can have devastating impacts and its resiliency depends on both powering and wired network survivability.

Companies stated that their emergency response activities included coordinated efforts among providers to restore services. Windstream, for example, provides wireless carriers utilizing its backhaul facilities with an escalation list to be used when service problems arise that identified critical personnel responsible for service restoration, and a process for expedited restoration. Frontier's Carrier Services team meets with all major customers, including wireless providers, on a regular basis to share escalation lists and discuss restoration protocols. This information is also posted on-line.

Finally, as stated in Staff's report, we continue to participate at the state and federal level in proceedings intended to improve wireless resiliency and redundancy and the reporting of outage information to better support emergency services and public communications during emergency events.

The second recommendation called for improved communications and coordination between telecommunications companies and electric utilities, which would mutually benefit restoration efforts, and help identify critical infrastructure for priority restoration. The industries have already made considerable progress in implementing this recommendation. Since our report, electric utilities, in collaboration with

telecommunications companies, filed updated emergency operations plans in December 2013 that incorporate critical telecommunications provider contact information and include methods to prioritize restoration of critical facilities. In the next phase of emergency plan updates, electric utilities are expected to further refine protocols to include, for example, interaction with telecommunications personnel stationed at utility emergency operations centers during events. Regarding this recommendation, Cablevision responded that it developed flexible arrangements to place personnel at utility operating centers during emergency events - establishing a means for the real-time information sharing that rapid disaster response requires. AT&T responded that it has contacted the electric utilities, identified liaisons, and will be ready to implement an outreach plan should circumstances warrant. AT&T also modified its Disaster Plan to include an electric utility liaison role, not just in New York State, but as a nationwide best practice.

The third recommendation identified the need for improved communications between contractors, utility tree trimming crews and municipal highway departments to minimize unnecessary damage to telecommunications facilities and prevent avoidable outages. Verizon believes that the added layer of contacts with power companies accomplished through the preceding recommendation will improve communications with utility tree-trimming crews. Staff concurs, and emphasizes that solid communications and coordination between and among the electric utility and telecommunications company personnel is key to the success among all service providers, and for their customers. Verizon also responded that local managers are typically in contact with municipalities as needed during emergency events. Through its contacts at local Emergency Operations Centers, and

its contacts with individual utilities in its service areas, tw telecom is working to establish greater recognition and understanding of the services it provides and discuss how to preserve its facilities during the electric and gas restoration processes.

The fourth recommendation suggested that wireless carriers consider establishing free roaming service agreements to assist their customers during emergency events and investigate other ways to help mitigate customer impact and network congestion related to significant events.⁴ AT&T and T-Mobile did establish a free-roaming service agreement for their customers during and after Superstorm Sandy. Thus, customers of either company could access whichever network was available to provide connectivity. Verizon and Sprint maintain a national roaming agreement, and provided roaming service during Superstorm Sandy at established terms and rates. Staff recommends that all wireless companies give additional thought and consideration to establishing free-roaming ability for their customers during and after catastrophic events. Aside from such roaming agreements, Verizon Wireless also set up mobile stores-on-wheels, stationed Wireless Emergency Communication Centers, and deployed Cells on Wheels to boost wireless coverage and capacity in affected areas. The company dispatched Mobile Satellite Command Centers to assist emergency workers and provided free domestic phone calls to all local residents, regardless of carrier.

The final recommendation focused on the review of portable generator inventories, manpower levels, and refueling

⁴ Roaming agreements are established based on the network protocol deployed by each company. Therefore, AT&T and T-Mobile, which use a GSM platform, are compatible with each other to allow roaming, as are Verizon Wireless and Sprint which use CDMA technology.

contracts to determine whether additional resources are necessary to expedite service restorations and prioritize equipment deployment plans. Windstream responded that its central offices and transport buildings are already equipped with two backup power sources that are continually monitored and updated as needed. Fuel supply capacities are based on specific criteria at individual locations, such as power requirements, and equipment run time, as well as regulation and availability of local refueling resources. Company personnel test backup generators periodically to ensure good working order. tw telecom responded that it reviewed its portable generator inventories, manpower levels and refueling contracts and enhanced its contracts with national vendors to ensure the availability of generators at a local level. It also expanded its mobile wire center plan to include all ancillary equipment to ensure that it can restore a wire center more effectively during an emergency. Sprint responded that its detailed emergency plan includes provisions covering the transport of generators to support disaster recovery operations, staging of resources, activation of refueling vendors and contracts, or purchase of bulk fuel and preparations network facilities in the face of a threat (such as extensive sandbagging and weatherproofing).

A number of companies responded that fuel access was particularly difficult during and after Superstorm Sandy. In some instances, companies overcame potential problems due to pre-storm operational planning. For example, AT&T responded that it pre-staged thousands of generators before Superstorm Sandy's arrival, and deployed more than fifty tanker trucks of fuel to ensure that those generators and vehicles were adequately fueled in the weeks after the storm. The company

also supplied fuel to its employees so that the workforce could report where they were needed.

Time Warner Cable, however, noted that the lack of access to fuel was an impediment to its restoration. The company indicated that because it did not have access to the fuel supplies that electric utilities controlled through their own pre-existing contracts, Time Warner Cable had to find other, in some cases, more arduous alternatives, such as dispatching its tanker trucks to Delaware to purchase fuel. The company stated that it would be extremely helpful if the Commission could assist in facilitating arrangements that would allow utilities and service providers to gain temporary access to fuel under each other's pre-existing contracts during emergency situations. Time Warner Cable also suggested that the Commission facilitate discussions regarding local and state laws and regulations that may interfere with service providers' ability to handle and transport fuel, such regulations in place in New York City that prevent transferring fuel to and from certain types of containers and vehicles.

Based on Staff's observations, improved access to fuel supplies and enhancements to credentialing that could allow better access to impacted storm areas by restoration crews is needed and should be explored with the appropriate local, state and federal agencies. Staff intends to pursue such recommendations and we urge companies to continue pursuing solutions to both of these important issues as well. We will continue to monitor both of these important matters.

Outage Reporting

There were two recommendations related to outage reporting. The first was generally applicable to all companies for improved reporting compliance with established Department reporting guidelines; the second was specific to the wireless

industry, regarding the granularity of outage information provided to Staff, such as cell sites and facilities impaired, impairment cause(s), estimated customer impact(s), and specific location information.

In response to the first recommendation, most companies reiterated their commitment to prompt outage reporting in accordance with the Commission's requirements and the availability of its personnel to assist Staff and emergency responders during emergencies. tw telecom, however, recommends that Staff revise its reporting requirements to be more consistent with the Federal Communications Commission's (FCC) Network Outage Reporting System (NORS).⁵ It stated that during an outage situation there should be one common outage reporting system, using a single report format, which will allow companies to focus on the primary task of restoration. Staff appreciates this comment and has previously stated to companies and the FCC that NORS-type reporting, while informative, does not adequately address the need for real-time information to support the state's decision-making and emergency response activities.⁶ The FCC's NORS reporting criteria are narrower in scope than the Department's. Staff has found that the nature of events that necessitate emergency response at the local and state level may not require companies to file NORS reports with the FCC. Even in instances when a company is required to file a NORS report, that submission may be delayed or otherwise not specific enough for the Department's emergency response activities.

⁵ The FCC requires communications providers, including wireline, wireless, paging, cable, satellite and Signaling System 7 service providers, to electronically report information about significant disruptions or outages to their communications systems that meet specified thresholds set forth in 47 CFR, Part 4 rules.

⁶ PSC Comments to the FCC in ET Docket 04-35, dated March 4, 2010.

Several years ago, Staff took steps to streamline the outage reporting process for all companies, including the establishment of a single phone number and email address which provides companies direct access to Staff on a 24/7/365 basis. The information to be provided to Staff, once contacted by the company representative, is minimal, requiring no more than a few minutes of time. Periodic company updates during extended duration outage events are likewise intended to be brief informational exchanges. The Department's outage reporting process is designed to be quick, simple and efficient, thus facilitating expedited transfer of outage information and allowing company representatives more time to focus on other restoration activities. We expect companies to provide Staff with timely outage reports and updates in accordance with the Department's outage reporting guidelines.

In its response to the recommendation on outage reporting, Verizon Wireless stated that it remains committed to providing relevant information concerning service outages in order to facilitate collaborative efforts during such events. The company provided the New York State Department of Homeland Security (NYSDHS) daily updates on network status during and after the Superstorm Sandy (which included cell site performance information by county for the affected areas and quantified cell sites on backup power and out-of-service) and noted that the Disaster Information Reporting System (DIRS) data it filed with the FCC was made available to the NYSDHS and Staff. Sprint-Nextel responded that its Disaster Recovery Management System is an event-management tool that provides real-time network status. The system is used to view service impacting alarm conditions, diagnose root-cause and track and fix actions across multiple Field Operations organizations. When requested, the company supports and works closely with state and local officials to

provide additional information during disasters or network events.

AT&T responded that it is participating in a proceeding before the FCC to address the transparency of wireless companies' network conditions during emergency events.⁷ The company cites the importance and priority in restoring service to customers and its belief that limited carrier resources should not be diverted from those efforts to attempt to address regulatory reporting obligations. As reported previously, that information, while useful, does not completely support the need for real-time granular information on a municipality basis which Staff is often expected to provide immediately when requested during an emergency.

State and local agencies rely on the Department to provide immediate network status information to assess communications capability in support of their emergency response. Staff found the outreach and repeated discussion with some companies necessary to obtain substantive and timely outage information on Sandy's impact frustrated our ability to assist the state emergency operation. While Staff was eventually satisfied with the daily information provided by wireless providers several days after Sandy's passing, the consistency and timeliness of reporting differed among providers, especially in the immediate aftermath of Superstorm Sandy's passing.

⁷ In September 2013, the FCC initiated a Notice of Proposed Rulemaking (NPRM), FCC 13-125, that recommends new cell site outage reporting requirements for Commercial Mobile Radio Service providers. Specifically, the FCC proposes that during and immediately after major disasters, facilities-based mobile wireless providers be required to submit data on the percentage of cell sites within their networks that are operational within a designated disaster area. The FCC proposes the disclosures be made public. As a general matter, Staff concurs with the FCC's proposal.

System Reliability and Resiliency

The report also included two recommendations related to system reliability and resiliency. The first recommendation stated that all companies review their network architecture plans to determine whether battery backup enhancements are necessary to improve network resiliency. The second recommended that all companies review their facilities, especially those located in areas known for heavy rainfall and/or flooding, to determine whether targeted network enhancements, in the form of cable or equipment replacements or facilities additions, would help diminish repetitive, large scale outages.

In response to the first recommendation, XO Communications stated that upon review of its direct current (DC) power plants, it determined that many of them were served by only a single power riser. To enhance power delivery to those units, XO split its delivery systems into separate power risers to create redundant delivery systems. Staff recommends that other companies conduct the same type of survey, and if practicable, consider making similar redundancy enhancements to its power systems. Verizon stated that its current battery backup arrangements are adequate and that those arrangements are among the issues taken into account in reviewing and updating its emergency response plans, and fall in line with the company's practice of conducting periodic maintenance routines on battery backup equipment.

With respect to the second recommendation, Verizon responded that network resiliency considerations led the company to implement a program of deployment of fiber optic outside plant in lower Manhattan, as well as smaller-scale fiber migration programs in other service areas. In addition, the company has taken measures to either relocate facilities affected by flooding to higher ground, or to reinforce the

waterproofing of such facilities. Cablevision responded that it has invested in a centralized network diagnostic tool that provides the company with better visibility into network interruptions and helps facilitate restoration more efficiently and quickly.

Other Comments and Recommendations

AT&T stated that attempts to grade and score post-emergency utility performance without taking into account the design and potential interdependencies of the carriers' networks could have unintended consequence of favoring restoration efforts over the provision of humanitarian aid or governmental assistance, and favoring competitive advantage over mutual aid to other carriers.

However, as the FCC has noted, there has been significant concern with respect to service providers keeping customers properly informed during and after significant events affecting wireless networks.⁸ This consumer information void is precisely the reason why the FCC recently opened its proceeding to review that information dissemination problem, and efforts to improve upon it. Staff concurs in the FCC's observations.

AT&T recommends that Staff work with other agencies to review credentialing issues for service provider employees and also to assist with physical access difficulties encountered by

⁸ As stated in the FCC NPRM, 13-125, page 3, "In the months following Superstorm Sandy, the Commission held field hearings in New York and New Jersey to further explore the communications impacts of Superstorm Sandy and consider lessons learned. It then held a follow-up field hearing in California to look, in part, at emerging technological solutions for improving communications during such emergencies. Among the concerns raised at these hearings was the lack of information made publicly available during Superstorm Sandy about the operational status of communications networks and the progress being made to rectify service outages."

refueling contractors who attempt to enter Manhattan via bridges and tunnels after Superstorm Sandy struck, but were delayed or denied access by a variety of local authorities. Similar comments were made by other service providers and Staff intends to take up these matters through collaboration with the Disaster Preparedness Commission.⁹

MegaPath noted that, as of January 31, 2014, Verizon had not yet lifted its force majeure related to Superstorm Sandy and recommends that it be required to do so. MegaPath states that this will enable competing providers to accurately assess Verizon's network performance since the time it declared the network operations to be back to normal, which the company did on May 1, 2013, allowing them to create a basis upon which they are to be compensated, if appropriate, according to performance metrics. MegaPath also suggested that specific rules should be established for the evaluation of force majeure situations by an unbiased third-party. MegaPath believes that incumbent carriers should be relieved from unilaterally determining when such a force majeure event can be lifted such that competitors, who are wholesale customers, are not placed at a disadvantage. Staff again raised this matter with Verizon and was informed that the company had terminated the force majeure event effective January 31, 2014. Finally, MegaPath also recommends that regulatory rules should be established that increase staffing criteria for the utilities during force majeure situations and stipulate a

⁹ The Disaster Preparedness Commission (DPC) is comprised of the commissioners, directors or chairpersons of 28 State agencies, including the PSC, and one volunteer organization, the American Red Cross. DPC responsibilities include: the preparation of State disaster plans; the direction of State disaster operations and coordinating those with local government operations; and the coordination of federal, State and private recovery efforts. More information on DPC can be found online, at: <http://www.dhSES.ny.gov/oem/disaster-prep/>

higher level of responsiveness to align with service level agreements between companies until such time that the force majeure event is lifted. Department of Telecommunications Staff assigned to the Carrier Working Group, Case 97-C-0139, intends to look into this issue.

Comments were also received from the Public Utility Law Project (PULP) which urges the Commission, in complying with the new regulations regarding gas and electric customer complaints, to take the initiative to ensure similar reforms are made to the Department's Office of Consumer Services (OCS) procedures and complaint forms. Given the devastation of Superstorm Sandy and the possibility of future events, PULP recommends an external Commission review of complaint outreach and the recording of post storm complaints and decisions by OCS.

We agree with PULP that consumer complaints regarding lack of service and timely restoration are very important to ensure service quality both during and after storm events. Telecom complaints received by OCS as a result of Superstorm Sandy were carefully evaluated. OCS received and responded to more than 6,200 consumer complaints related to service disruptions, including complaints of extended service restoration delays.

PULP cites the recent amendment to PSL § 71 which requires the Department to accept complaints via its website for groups of customers or local officials for gas or electric service. Consumers have been able to file complaints with OCS via the internet for several years. The form has been modified to ensure that any groups of utility customers (including telecommunications) or local officials are able to file complaints via the web. Groups will continue to be able to file complaints by phone or letter, regarding any regulated utility service in the state. In addition, OCS has, and will continue

to, accept individual consumer complaints regarding any regulated utility service by phone or letter, including complaints regarding disruption or extended delays of service.

PULP points out that OCS posts a monthly complaint report on its website. This transparent report includes energy, gas, water, telecommunications and cable complaints as well as escalated complaints. This process allows consumers to see what utilities have complaints filed against them. We find that complaints and comments provide important information regarding the quality of consumer service and protections provided by utilities. The importance of complaints as the result of network-affecting events, such as storms, is evidenced by complaints being a metric in the utility scorecard recently approved by the Commission. Based on the foregoing, Staff does not believe that PULP's recommendation for an external Commission review of complaint outreach and the recording of post storm complaints and decisions by OCS is warranted.

CONCLUSION

Company responses indicate general acceptance and implementation of all applicable recommendations to improve future restoration and response efforts during and following storms and other emergencies. Staff will continue to participate in proceedings that seek to enhance communication and coordination between the communications companies and electric utilities. Staff also intends to explore the additional recommendations made by certain companies, including Time Warner Cable's suggestion that the Commission assist in facilitating arrangements that would allow utilities and service providers to share fuel supplies and discussions with the appropriate government entities regarding local and state rules that interfere with service providers' ability to handle and

transport fuel; and, continue its efforts with other state agencies, including the Disaster Preparedness Commission, to further improve telecommunications emergency response, including improved credentialing for technicians to expedite network restoration timeliness. We urge companies to stay engaged and continue pursuing solutions to these important matters as well.

Respectfully submitted,

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ATTACHMENT 1: Telecommunications Network Restoration Following Superstorm Sandy - Summary of Recommendations

Emergency Plans

1. Companies should ensure that their Emergency Plans are updated to reflect operational changes and improvements resulting from lessons learned from Superstorm Sandy.

Customer Credit Policies

2. Wireless and other phone service providers should ensure that their customer credit policies are clearly defined and readily available to customers, and companies should maintain records of credits issued to New York State customers for major weather, or other large scale events.

Customer Communication

3. During and following a major storm, disaster, or other emergency, all telecommunications providers should strive to update website information and/or issue press releases on a regular (daily) basis and provide accurate estimates of the number of customers affected, areas impacted, and reasonable restoration time estimates.
4. Companies should investigate ways to continue to expand the use of newer technologies to communicate with customers during outages (i.e., email, text messaging, and social media) and report their findings to staff.

Network Restoration

5. Because wireless communications services are critical during emergency events, better coordination is needed between wireless and wireline providers of backhaul facilities to prioritize and expedite critical service restoration during emergencies.
6. Telecommunications companies should explore protocols to improve communications and coordination with electric utilities that would mutually benefit telecommunications and electric network restoration, including the identification of critical infrastructure for priority restoration and the sharing of outage information among industries.
7. Companies should investigate ways to improve communications between contractors, utility tree trimming crews and municipal highway departments to minimize unnecessary damage to telecommunications cables and prevent avoidable outages.

8. All wireless carriers should consider establishing free-roaming service agreements to assist their customers during emergency events, and investigate other ways to help mitigate customer impact and network congestion, during and immediately after, significant network-affecting events.
9. All companies should review their portable generator inventories, manpower levels, and refueling contracts to determine whether additional resources are necessary to expedite service restorations and prioritize equipment deployment plans. Emergency Plans should be updated accordingly.

Outage Reporting

10. All companies should work with staff on steps necessary to improve compliance with established outage reporting guidelines; review their internal policies to ensure that outage information is reported in a timely and accurate manner; and, confirm that company representatives responsible for outage reporting are familiar with those guidelines and relevant staff contacts.
11. Outage information from wireless carriers should be granular, to include cell sites and facilities impaired, impairment cause(s), estimated customer impact, and specific locations (municipality and/or county basis).

System Reliability and Resiliency

12. All companies should review their network architecture plans to determine whether battery backup enhancements are necessary to improve network resiliency.
13. All companies should review their facilities, especially those located in areas known for heavy rainfall and/or flooding, to determine whether targeted network enhancements, in the form of cable or equipment replacements or facilities additions, would help diminish repetitive, large scale outages.

ATTACHMENT 2: Respondents to Staff Report Recommendations

AT&T

Broadview Networks

Cablevision Systems

CenturyLink

Comcast Cable

Frontier Communications

Level 3 Communications

MegaPath Corporation

Public Utility Law Project

Sprint Communications

Time Warner Cable

T-Mobile

tw telecom

Verizon New York

Verizon Wireless

Windstream Communications

XO Communications