

PUBLIC VERSION

**REPORT OF
CONSULTANTS TO THE
DELAWARE PUBLIC
SERVICE COMMISSION
STAFF ON THE
ADEQUACY OF
VERIZON'S SERVICE**

PSC Docket No. 08-194

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PUBLIC VERSION

November 3, 2009

**State Of Delaware
The Public Service Commission
Dover, Delaware 19904**

In The Matter of the Investigation on the)
Motion of the Commission into the)
Adequacy of Basic Telecommunications) PSC Docket No. 08-194
Services Provided by Verizon Delaware)
LLC (Opened August 19, 2008))

**REPORT OF CONSULTANTS TO THE DELAWARE PUBLIC SERVICE
COMMISSION STAFF ON THE ADEQUACY OF VERIZON’S SERVICE**

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REPORT OF CONSULTANTS TO THE DELAWARE PUBLIC SERVICE COMMISSION STAFF ON THE ADEQUACY OF VERIZON'S SERVICE

1. KEY FINDINGS

- Verizon DE has significantly improved its performance on the Out-of-Service (“OOS”) troubles cleared in 24 Hours metric over the last 18 months. Even with that improvement, however, the Company has failed to meet the requirement on a statewide average basis in seven of the past twelve months (5.10.3).
- Verizon-DE consistently fails to meet the Commission’s service quality standard in the category of Business Office Answer Time (5.7.1.2).
- The Company’s performance in one additional area – Repeated Trouble Reports (5.10.4) – has generally met Commission objectives, but is trending in the wrong direction, missing the objective in four of the past twelve months.
- In addition to examining the Company’s performance data on a statewide basis, the examination of individual exchange data shows local inadequacies that are not reflected in statewide data. Even when the Company may be meeting the service quality objective on a statewide basis, there are exchanges and portions of exchanges that are receiving a reduced grade of service quality.
- Further disaggregation of the Company data helped to identify geographic locations within the state where there are unusually high trouble and repeat trouble reports. The disaggregation study also revealed that Verizon is unable to provide detailed address information (that is, a complete street address, with city, state and zip code) of its customers reporting troubles and repeat troubles. Verizon’s inability to provide this data prevented the consultants from providing the in-depth analysis that had been envisioned.
- Despite increasing construction expenditures in 2005 and 2006, Verizon-DE continues to experience challenges in restoring outages on its copper facilities in Delaware. The capital expenditures were largely directed at the provision of FIOS, which still reaches less than

(BEGIN PROPRIETARY) **(END PROPRIETARY)** percent of lines in Delaware. Over **(BEGIN PROPRIETARY)** **(END PROPRIETARY)** percent of customer lines in Delaware are served by copper rather than fiber.

- Staff has been provided with examples of extremely poor outside plant maintenance conditions, including exposed splice cases and pedestals, “rats-nest” cross-connect boxes, and drop wires strung across the ground and through trees. Some of these inadequate facility conditions were “bypasses” which should be temporary and should be corrected with new facilities.
- A limited examination of Verizon’s customer commitment and repair practices have revealed potential concerns regarding the Company’s internal processes that may affect the accuracy of the performance reported to the Commission. Such concerns warrant further examination of the Company’s internal processes to assure proper reporting of the Company’s performance.

REPORT OF CONSULTANTS TO THE DELAWARE PUBLIC SERVICE COMMISSION STAFF ON THE ADEQUACY OF VERIZON'S SERVICE

2. BACKGROUND

On August 19, 2009, the Delaware Public Service Commission opened, on its own motion, an investigation into the adequacy of basic telecommunications services provided by Verizon Delaware LLC ("Verizon-DE"). Specifically, PSC Order No. 7433 states:

1. That the Commission, finding such action to be in the public interest, hereby establishes this docket for an investigation into the efficiency, sufficiency, and adequacy of basic services provided by Verizon Delaware LLC over its copper facilities and to consider whether or not the Commission should, pursuant to 26 Del. C. § 308, upon a finding that such facilities or services are inefficient, insufficient, or inadequate, impose upon Verizon such penalty deemed necessary to restore such facilities and services to a state of efficiency, sufficiency, and adequacy.
2. That the Commission, as a part of the proceedings in this Docket, will also investigate the extent to which Verizon Delaware LLC has met, and will in the future comply with, the objectives and reporting requirements set forth in the Commission's Regulations Governing the Minimum Service Requirements for the Provision of Telephone Service for Public Use within the State of Delaware, including (but not limited to) a review of customer service practices utilized by call center customer service representatives and, in particular, how Verizon "closes out" customer complaints.

After requesting proposals, the Commission Staff selected the firm of Fox, Smolen & Associates ("FSA") of Austin, Texas to provide assistance with its investigation. FSA is undertaking this engagement in association with the firm of Rolka Loubé Saltzer Associates ("RLSA") of Harrisburg, Pennsylvania. The Project Coordinator for this project is Mr. Rowland Curry of FSA, assisted by Dr. Robert Loubé and Mr. Matt Saltzer of RLSA. Additional background on the consulting team is included in Attachment A of this report.

3. THE COMMISSION'S RULES

The Commission's current telephone service quality rules are found in Title 26 of the Delaware Administrative Code, Section 4003: Regulations Governing the Minimum Service Requirements for the Provision of Telephone Service for Public Use within the State of Delaware. These rules were adopted in 1991, and are wide-ranging, from customer billing protections to technical performance measures. The rules are organized into the following sections:

- 1.0 General Rules
- 2.0 Definition of Terms
- 3.0 Records and Reports
- 4.0 Customer Service and Protection
- 5.0 Quality of Service

As described in the title, the regulations in this section establish minimum service requirements for telecommunications utilities operating in the State of Delaware. The Commission's rules are similar to those found in many other states, in that they require the utility to meet certain standards, provide reports as specified, and the rules offer consumer protection in several areas.

As will be discussed in detail in this report, the service rules generally allow the utility to aggregate and report many of their performance measures on a statewide basis. Aggregation of performance results allows for a more concise examination of data, but frequently masks the specific performance experienced by groups of customers in exchanges and even portions of exchanges. Customers in one of the utility's exchanges may be experiencing service far below the objectives set forth in the rules, but the statewide performance may meet the objective because of the aggregation that takes place. The analysis in this report will highlight some of those disparities between statewide results and more granular performance.

4. SCOPE OF THE ANALYSIS

The Consultants initially proposed a multi-pronged examination of Verizon-DE's processes and performance data. The plan was to examine Verizon-DE data reported on its performance relative to the Commission's service standards over the past ten years, and provide analysis of performance and trends. Further, this project would review Verizon-DE's network modernization deployment trends and costs. The Consultants also proposed to provide graphic depictions of service quality performance measures, customer complaints, and network modernization trends. Finally, the analysis includes a more granular look at two of the performance measures, Trouble Reports per 100 Lines and Repeated Trouble Reports.

The Consultants have focused much of the analysis on the quality of local exchange service provided to customers served by copper wireline facilities. Verizon-DE has made a huge push, in Delaware and elsewhere, to provide services via their fiber-based FIOS (Fiber Optic Network) service.¹ Analysis of Verizon's FIOS system is not included in the scope of this project and will not be discussed except for this brief definition. To the extent that customer access lines are provided through the FIOS network, the service quality performance results will include those customer loops. Verizon does not separate performance by fiber versus copper.

The vast majority of customer lines, over **(BEGIN PROPRIETARY)** **(END PROPRIETARY)** percent, served by Verizon in Delaware are provided on copper wires. Only **(BEGIN PROPRIETARY)** **(END PROPRIETARY)** percent of lines providing basic local exchange service in Delaware are using the FIOS network.

During the initial phase of discovery, the Consultants learned that Verizon-DE had developed new service quality data and reporting systems such as vRepair and NORM, and that it would be exceedingly difficult and time consuming to gain access to older data sets in order to facilitate longitudinal analysis of specific exchanges on service quality performance over a ten-year period. For this report, then, detailed exchange analysis was limited to only a few recent years of data.

¹ Verizon FIOS is a bundled communications (Internet, telephone, and TV) service, operating over a fiber-optic network that is presently offered in some areas of Delaware by Verizon. Verizon FIOS products are delivered over the FTTP (Fiber To The Premises) network using passive optical network (PON) technology.

The focus of this evaluation is on the technical aspects of service – construction, maintenance, and repair services – particularly related to copper (non-fiber) loop facilities. The sub-parts of Section 4003 involved in the analysis include:

- 4.3 New Construction
 - 4.3.1 Standards of Construction
- 5.6 Installation of Service
 - 5.6.1 95% Primary Service Installed within 5 Working Days
 - 5.6.2 98% Non-Primary Service Installed within 20 Days
 - 5.6.7 90% of Installation Commitments Met
 - 5.6.9 Number of Held Orders over 90 Days
- 5.7 Operator Handled Calls
 - 5.7.1.1 90% Toll & Assistance within 10 Sec
 - 5.7.1.2 85% Repair & Business Office within 10 Sec
 - 5.7.1.3 80% DA within 10 Sec
- 5.10 Customer Trouble Reports
 - 5.10.1 Customer Trouble Reports not to exceed 5 per 100 Lines
 - 5.10.3 90% Out-of-Service Troubles Cleared within 24 Hours
 - 5.10.4 Repeated Trouble Reports not to exceed 20% of Total

5. PERFORMANCE MEASURES

5.1 Primary Service Order Installations

5.6.1 ninety-five percent of the local exchange carrier's service orders for installing primary service for order of less than 20 lines shall be completed within five working days, excluding those orders where a later date was specifically requested by the customer.

DESCRIPTION

The local exchange carrier is required to serve each qualified applicant for service within its certificated area as soon as is practical, but certainly not longer than five working days. This performance category evaluates the installation metric for primary service orders; i.e., where an applicant does not presently have telephone service at the current location and has requested service. The Commission rules define a primary service order as the initial provision of voice grade access between the customer's premises and the switched telecommunications network. This includes the initial connection to a new customer or the move of an existing customer to new premises. This does not include: complex service or auxiliary items such as gongs or buzzers; on premises stations or wiring beyond the subscriber interface or, if no interface, beyond the first jack; or added main local exchange lines to premises already having service. The installation interval measurements begin with either the date of application or the date on which the applicant qualifies for service, whichever is later. The installation interval requirements do not include service orders either to disconnect service or to make record changes on a customer's account.

According to Verizon, the following criteria were used to pull the numerator data for this metric: “% N (New) and T (Transfer) service orders less than 20 lines completed within 5 working days”: [Informal Request 2-1]

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FINDINGS

Verizon – DE had been very inconsistent in its attempts to meet this performance standard on a statewide composite basis prior to 2008. As shown in Figure 1, for the three-year period from 2005 through 2007, the Company failed to meet the objective on a statewide basis in 17 of the 36 months reported. However, the Company has shown improvement on a statewide basis as shown by its compliance each month since **(BEGIN PROPRIETARY)** **(END PROPRIETARY)**.

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5.2 Non-Primary Service Order Installations

5.6.2 ninety eight percent of the local exchange carrier's non-primary service orders shall be completed within twenty (20) days of receipt of an application, excluding those orders where a later date was specifically requested by the customer.

DESCRIPTION

“Non-primary” service orders include those orders for services beyond the initial provision of access to the customer's premises. This may include additional lines or features installed at the same premises, or changes in the type of service provided. As with the primary service order requirements, the interval measurement begins with either the date of application or the date on which the applicant qualifies for additional services, whichever is later. These installation interval requirements also do not include service orders either to disconnect service or to make record changes on a customer's account.

FINDINGS

Verizon – DE data demonstrates that they are maintaining performance levels that are consistently in compliance with this service objective on a statewide composite basis. In fact, Verizon – DE reports that they have met this objective with a score at or near **(BEGIN PROPRIETARY)** **(END PROPRIETARY)** in every month except August-September 2000, when a work stoppage occurred, and one other unexplained drop in October 2002.

Because of Verizon’s high compliance level with this standard, exchange specific data was not provided.

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5.3 Installation Commitments Met

- 5.6.6 the local exchange carrier shall provide to the customer a due date on which the requested installation or change shall be made. If a customer requests that the work be done on a regular working day later than that offered by the local exchange carrier, then the customer's requested date shall be the commitment date. If a customer's presence is required for access and the customer indicates that the premises is not normally occupied during the day, the local exchange carrier shall offer an appointment period with the customer for morning or afternoon, on the due date. Where an appointment cannot be kept by the local exchange carrier, the local exchange carrier shall attempt to notify the customer by a telephone call and schedule a new appointment. If unable to gain access to the customer's premises during the scheduled appointment period, the local exchange carrier representative shall leave a notice at the premises advising the customer how to reschedule the work.***
- 5.6.7 ninety percent of the local exchange carrier's commitments to customers as to the date of installation of service orders shall be met excepting those customer-caused delays.***

DESCRIPTION

As described in rule 5.6.6, the carrier is required to provide the customer with a date when the installation will be performed. A customer can request a different installation date after the date proposed by the utility, and that will become the commitment date. If the Company requires access to perform the installation and such access is not available, a missed appointment will not be counted. Rule 5.6.7 is the performance standard to which the Company should strive to meet.

Some state regulators expand this requirement to include morning and afternoon appointments for installations. That step has been taken to avoid having a homeowner take off a full day to wait for phone installation, and it is consistent with appointments made by many other service companies, such as appliance delivery and cable television companies.

FINDINGS

Verizon – DE data shows that they are maintaining performance levels that are consistently in compliance with the service objective for installation commitments on a statewide composite basis. Figure 3 shows the statewide performance for this measure.

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Repair Commitments

The Commission rules require the Company to provide appointments for repair visits when a trip to the premises is required, and in that case, morning and afternoon appointment periods are required.

5.10.2 The local exchange carrier shall provide to the customer a commitment time by which the trouble will be cleared. If a premises visit is required, the local exchange carrier shall establish an appointment period with the customer for the morning or afternoon. When an appointment cannot be kept by the local exchange carrier, the local exchange carrier shall attempt to notify the customer by a telephone call and schedule a new appointment. If unable to gain access to the customer's premises during a scheduled appointment period, the local exchange carrier representative shall leave a notice at the premises advising the customer how to reschedule the work.

Verizon does not provide results on the percentage of repair appointments completed at the time committed. There is no Commission standard for the percentage of repair commitments met by the Company.

Additional discussion of customer scheduling and complaint handling will be found in Section 6 of this Report.

5.4 Held Orders

- 4.4.1** *Applications for new telephone residential service requiring line extensions should be filled as quickly as possible and shall be filled within ninety (90) days unless unavailability of materials or other situations which are reasonably beyond the control of the utility cause unavoidable delays. Drop wire less than 300 feet in length which connects the utility distribution facility to the customer premises is not considered a line extension. For this rule, facility placement which requires a permit for a road or railroad crossing will be classed as a line extension.*
- 4.4.2** *If a line extension is required by other than a large business customer or if facilities are not available, the telecommunications utility shall inform the customer within ten (10) working days of receipt of the application, giving the customer an estimated completion date.*
- 4.4.3** *In the event that residential service is delayed in excess of ninety (90) days after an applicant has met credit requirements and made satisfactory arrangements for payment of any required construction charge, a report shall be made to the Commission listing the name, location and cause for delay. Unless such delays are due to causes which are reasonably beyond the control of the utility, delay in excess of ninety (90) days shall constitute refusal to serve, and consideration may be given to revoking the certificate of convenience and necessity or to granting a certificate to another utility to serve the applicant or refusal may be considered in arriving at a proper equity return or the Commission may take such further action as it deems appropriate.*
- 5.6.9** *a held regrade order is one not filled within 30 days after the customer has made application for a different grade of service except where the customer requests a later date. In the event of the local exchange carrier's inability to so fill such an order, the customer will be advised and furnished the date when it will be available. The number of held regrade orders shall not exceed 1.0% of the total number of customer access lines served.*

DESCRIPTION

The Commission's rules require local exchange carriers to provide service to each qualified applicant for service within its certificated area as rapidly as is practical. This collection of rules requires each utility to complete all residential service orders within 90 days, or provide a report to the Commission with the reason for the excessive delay.

A regrade order is an application for a different class and/or grade of service. Commission rule 5.6.9 requires the number of held regrade orders – those not completed within 30 days after proper application – to remain below 1 percent of the total number of access lines served on a statewide basis.

FINDINGS

Verizon – DE data demonstrates that they are maintaining performance levels that are consistently in compliance with this service objective on a statewide composite basis. The Company consistently reports that they have no held regrade orders under the definition in the rules. Because of the consistent performance levels of the Company, exchange basis data was not sought.

5.5 Toll and Assistance Operator, Directory Assistance Answer Time

5.7.1 Telecommunications utilities providing operator services shall maintain adequate personnel to provide an average operator answering performance as follows for each exchange on a monthly basis:

5.7.1.1 Ninety percent (90%) of toll and assistance operator calls answered within 10 seconds, or average answer time shall not exceed 4.0 seconds.

5.7.1.3 Eighty percent of directory assistance calls shall be answered within 10 seconds or the average answer time shall not exceed 8.0 seconds.

DESCRIPTION

These performance standards apply to local and long distance operator services, and to directory assistance service provided by the carrier. Historically, these services were provided by operators located within a local community. In order to take advantage of economies of scope and scale, today's operator services are provided through a large center that may be miles from the local community. For customers in Delaware, operator services are provided from a call center in Pennsylvania.

The rules require that telecommunications utilities providing operator services shall maintain adequate personnel to provide an average operator answering performance as follows for each exchange on a monthly basis. (5.7.1) An "answer" shall mean that the operator or representative is ready to render assistance and/or ready to accept the information necessary to process the call. An acknowledgment that the customer is waiting on the line shall not constitute an "answer". (5.7.2) Telecommunications utilities may measure answer time on a toll center or operating unit basis in lieu of measuring answer time in each exchange unless specifically requested by the Commission. (5.7.3)

Verizon states that the timing starts when the call leaves the VRU (Voice Response Unit) and drops into the agent queue to wait for a live answer. Timing ends when the call is answered. This leaves an unanswered question of the time that a customer may be in the VRU prior to going into the agent queue.

FINDINGS

With the exception of some difficult periods prior to 2005, Verizon – DE data show that the Company is maintaining performance levels that are consistently in compliance with both of these service objectives on a statewide composite basis. The data reported by Verizon for these categories are shown in Figure 4. Exchange-specific data is not shown for these measures because the nature of consolidated operator centers does not lend itself to exchange-based analysis. Note that Verizon has not missed the Toll answer time metric since January of 2000, and neither has it missed the DA answer time metric since December 2003. As a result, exchange specific data was not needed because of Verizon’s ability to consistently meet this standard in recent years.

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5.6 Business Office, Repair Access Answer Time

5.7.1.2 Eight-five percent (85%) of repair service calls, calls to business office, and other calls made during normal working hours shall be answered within 20 seconds (equivalent measurements may be used).

DESCRIPTION

This rule requires the carrier to have sufficient facilities and employees to respond to customers at the business office and repair center. This measure is limited to normal working hours.

Verizon states that the timing starts when the call leaves the VRU (Voice Response Unit) and drops into the agent queue to wait for a live answer. Timing ends when the call is answered. This leaves an unanswered question of the time that a customer may be in the VRU prior to going into the agent queue.

According to the Commission's rules, an "answer" shall mean that the operator or representative is ready to render assistance and/or ready to accept the information necessary to process the call. An acknowledgment that the customer is waiting on the line shall not constitute an "answer". (5.7.2) Telecommunications utilities may measure answer time on a toll center or operating unit basis in lieu of measuring answer time in each exchange unless specifically requested by the Commission. (5.7.3)

FINDINGS – BUSINESS OFFICE ANSWER TIME

With respect to customer access to the business office, Verizon DE data show that the Company is consistently in violation of the Commission rule for this performance measure. The performance results for this measure are shown for the past ten years in Figure 5. Verizon-DE has met the 85 percent objective only once in the past 30 months, and their performance has dropped as low as **(BEGIN PROPRIETARY)** **(END PROPRIETARY)**

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FINDINGS – REPAIR SERVICE ANSWER TIME

With respect to customer access to the repair center where 85% of repair center calls must be answered within 20 seconds, Verizon DE data indicate that the Company is consistently performing in compliance with the Commission rule. The performance results for Verizon DE in the category of Repair Center Answer Time for 2000 – 2009 is shown in Figure 6.

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5.7 Customer Trouble Reports

5.10 Customer trouble reports.

5.10.1 The local exchange carrier shall maintain its network service in such a manner that the average monthly rate of customer trouble reports, excluding customer premises equipment (CPE) reports, shall not exceed five (5) reports per 100 customer access line in each exchange.

DESCRIPTION

The Commission's rules define a customer trouble report as any oral or written report from a customer or user of telecommunications services received by any telecommunications utility relating to a physical defect, difficulty or dissatisfaction with the regulated service provided by the telecommunications utility's facilities. A separate report shall be written for each telephone line reported in trouble even when several items are reported by one customer at the same time, unless the group of troubles so reported is clearly related to a common cause. One report shall be counted for each oral or written report received by any telecommunications utility even though it may duplicate a previous report or merely involve an inquiry concerning progress on a previous report.

Verizon indicates that the following criteria were used to pull the numerator data for this metric: "customer trouble report rate per 100 access lines": [Informal Request 2-5]

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The following table was provided to Staff in response to Informal Request 3-4, and provides clarification on what is included and excluded from “official” customer trouble reports. For example, if a customer’s telephone set (Customer Provided Equipment) is the cause of trouble on the line, it is not counted against Verizon.

Figure 7. What is Included and Excluded from Trouble Reports?

INCLUDES		
CENTRAL OFFICE Any problem with central office equipment or wiring	OUTSIDE PLANT Any problem with cables, intermediate or serving terminals	STATION WIRING Any problem with the wiring from the serving terminal to the customer’s location including the ONT or Network Interface Device
TEST OK Troubles that have been tested OK by a Verizon employee ²	FOUND OK Troubles that have been found OK by a Verizon employee ³	SUBSEQUENT REPORTS (on initial reports) Customer reports input while a trouble ticket remains open on that circuit ID
EXCLUDES		
STATION EQUIPMENT Verizon owned telephone sets	STATION EQUIPMENT – OTHER Verizon owned telephone equipment other than telephone sets	CPE Any Customer Provided Equipment
CUSTOMER ACTION Customer caused problems	REFERRED OUT TO OTHER DEPT Reports received by Verizon maintenance centers that should have gone to other departments. Example: Business Office to negotiate a service order.	SUBSEQUENT REPORTS (on repeat reports) Customer reports input while a repeated trouble ticket remains open on that circuit ID

² Test OK can also occur when an automated line testing unit shows no trouble on the line.

³ If a technician is dispatched to the customer premises and finds nothing wrong, the report is closed as “found OK”.

FINDINGS

Verizon-DE data show that it has consistently met this performance objective on a statewide basis, keeping its score below 5.0 Trouble Reports per 100 Lines in all of the months reviewed, as shown in Figure 8.

Analysis of this performance measure on an exchange-specific basis shows that while most exchanges are staying beneath the 5.0 statewide objective thus far in 2009, the following exchanges have exceeded the metric (the number reported is in parentheses after the month):

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Additional analysis on customer trouble reports is provided in the section of this report entitled “Disaggregation Study”. The special study evaluates 2008 data on a census block group (CBG) basis to determine whether certain areas in the state have a much higher trouble report rate than

is reflected in the aggregated statewide data reported by the Company, or even by the aggregated wire center data.

5.8 Out-of-Service Trouble Clearing Time

5.10.3 At least 90% of out-of-service trouble reports on service provided by the local exchange carrier shall be cleared within 24 hours of notification.

DESCRIPTION

The Out-of-Service (“OOS”) Trouble Clearing Time performance measure is at the core of service quality for telecommunications companies. A customer is out of service if they have no dial tone, they can’t call out, and they can’t receive calls. The carrier is required to repair the outage within 24 hours.

Out-of-Service restoral time can be indicative of inadequate plant construction or maintenance, insufficient workforce or training, defective administrative procedures, or a combination of multiple factors.

Verizon indicates that the following criteria were used to pull the numerator data for the metric “% OOS trouble reports cleared within 24 hours”: [Informal Request 2-7]

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Verizon provides rebates to customers who experience outages on their lines that are not cleared within 24 hours. Verizon provided the following description of their automatic rebate program in response to Staff RFI 5-6:

All customers will receive automatic rebates for the period of time they have experienced out of service difficulties, providing they meet certain criteria. The trouble reported must be an Out-Of-Service condition:

- Can't Call Out
- Can't Be Called
- No Dial Tone
- The trouble must be closed with a disposition code beginning with 01, 02, 03, 04, or 05, which are codes that signify that the problem occurred on company-owned or maintained equipment or facilities. There will be no out of service adjustment for any type of CPE-related troubles (customer premises equipment) or no trouble found; codes 12 and 09.

Verizon will automatically credit customers the correct amount of their monthly basic rate for each day a trouble report remains open in excess of 24 hours from the time the trouble was reported. The total time from receipt of the trouble to the final status must be at least 24 hours and 1 minute in duration. The customer shall be credited at the rate of 1/30 of the monthly charges for the facility or service for each period of 24 hour interruption or major fraction therefore. However, the minimum rebate is 2 days even if the out-of-service condition was only 24 hours and 1 minute. The customer receives credit for only the basic service charge.

The basic residential local exchange rate in Delaware is \$9.40, so a residential customer who is out of service for two days would receive a credit of approximately **63 cents** under the automatic rebate program.

FINDINGS

Verizon DE has significantly improved its performance on the Out-of-Service ("OOS") troubles cleared in 24 Hours metric over the last 18 months. Even with that improvement, however, the Company has failed to meet the requirement on a statewide average basis in 7 of the past 12 months.

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During August 2009, only **(BEGIN PROPRIETARY)** **(END PROPRIETARY)** of 33 Verizon exchanges performed at or above the 90 percent standard. Figure 10 shows the number of exchanges (out of 33 in Delaware) that meet the 90% objective for the period from September 2008 to August 2009.

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The following table shows, for the period from September 2008 to August 2009, the number of months that each exchange met the OOS Clearing Time objective of 90%

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5.9 Repeated Trouble Reports

5.10.4 Each local exchange carrier shall establish procedures to ensure the prompt investigation and correction of trouble reports so that the percentage of repeated trouble reports on residence and single line business lines does not exceed 20% of the total customer trouble reports on those lines.

DESCRIPTION

A repeated trouble report is a report regarding a specific line or circuit occurring within thirty (30) calendar days of a previously cleared trouble report on the same line or circuit. Such reports generally indicate that the case of trouble was not properly corrected on the first attempt, or was otherwise closed prematurely. Closer analysis can reveal whether a carrier's repair techniques and training are effective, and whether trouble reports are being closed out without actually finding the root cause of the problem. Repeated reports can also indicate inadequate loop facilities or deteriorating plant conditions that are difficult to keep operational.

Verizon states that the following criteria were used to pull the numerator data for this metric: "% Network repeat reports on residence and single line business": [Informal Request 2-9]

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FINDINGS

Prior to late 2007, Verizon-DE consistently met this performance measure. More recently, the Company has failed to meet the standard on a statewide, aggregated basis, in six of the past 24 months. The trend for this measure for the last several years has been upward, toward the 20 percent requirement, and above.

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Additional discussion of the repeated report category is included in the following section describing the disaggregation study.

5.10 Disaggregation Study

A disaggregation study of the customer trouble and repeated trouble reports was undertaken to determine whether service quality performance in specific neighborhoods was substantially below state-wide averages or below Commission performance standards, and thereby may indicate that in those neighborhoods service is not safe, adequate or reliable. As noted above, a customer trouble report is any oral or written report from a customer or user of telecommunications relating to a physical defect, difficulty or dissatisfaction with the regulated service provided by the telecommunications utility's facilities, and a repeated trouble report is a report regarding a specific line or circuit within thirty (30) days of a previously cleared trouble report on the same line or circuit.

To perform the disaggregation study, Staff requested that Verizon provide the following information in a database format: 1) customer locations; 2) customer trouble reports for the year 2008; 3) repeated trouble reports. Based on experience with Verizon's legacy systems, the consultants presumed that complete address information (street, city and zip code) would be available. These data would be sufficient to allow staff and its consultants to place each customer location, trouble and repeated trouble on a state map using geographic information systems techniques. Because Verizon had previously agreed to provide wire center data for certain metrics, and was of the belief that the wire center data should be sufficient to evaluate the Company's service quality, the Company objected to providing these data. Staff then filed with the Hearing Examiner a Motion to Compel Verizon to provide the requested data. After extended discussions, the Hearing Examiner ultimately ruled that Verizon would provide the information sought by Staff's consultants for only those individual wire centers where the customer trouble report exceeded 2.0 per 100 lines for the 2008 calendar year. Using the wire center data provided by Verizon, Staff identified twenty-six of the thirty-three exchanges that met the Hearing Examiner's threshold. Due to the consultants' desire to reduce the cost of the study for Verizon and to not request multi-year customer location data, the disaggregation study was designed to compare data for a discrete period of time – calendar year 2008 – rather than to compare trouble and repeated trouble reports over a longer time period. The data for the year

2008 included, (BEGIN PROPRIETARY) (END PROPRIETARY) trouble reports, and (BEGIN PROPRIETARY) (END PROPRIETARY) repeated trouble reports. The data also included (BEGIN PROPRIETARY) (END PROPRIETARY) customer location records as of March 2009. The customer location records are for an instance in time, rather than for an entire year. While it might have been desirable that the instant in time would have been the mid-point of the 2008, the consultants were advised that the customer location data were not archived and that data as of March 2009 were available.

The Unit of Analysis

The basic unit of analysis is the Census Block Group (“CBG”). A CBG is a collection of Census Blocks. The population range for a CBG is between 600 and 3,000 individuals, with an optimum size of 1,500 individuals. There are 506 CBGs in Delaware. 394 CBGs were identified within the 26 study exchanges.

Two other census geographic units could have been used. These are Census Blocks and Census Tracts. A Census Block is an area bounded on all sides by visible features such as streets, rivers or creeks, and by political boundaries such as city, county or state lines. In urban areas, Census Blocks are generally small in area and are bounded by streets. In rural areas, a Census Block may contain many square miles. In Delaware, there are 21,807 Census Blocks. Due to the size and number of Census Blocks and the difficulty of accurately geo-coding a customer location to a block, it was decided not to use Census Blocks as the basis of the study. Census tracts, on the other hand, are more limited in number. A tract boundary will never cross a county line. The population range for tracts is between 1,500 and 8,000 individuals, with an optimum size of 4,000 individuals. A tract is a combination of CBGs. There are 197 Census tracts in Delaware.

The decision to use CBGs as the unit of analysis is based on a desire to show as much variance as possible while at the same time keeping the analysis manageable. The study also could have been performed using Census Tracts as the unit of analysis.

Method of Analysis

The method of analysis used in this disaggregation study was to determine the number of troubles per hundred lines and the repeated troubles as a percentage of troubles at the CBG level. This work was performed from data supplied by Verizon for 26 of the 33 exchanges in Delaware. The data were the street address customer location information for residential and business customers, for trouble reports and for repeated troubles. Each street address was transformed into a specific latitude and longitude. Those specific geo-coded addresses were entered into the MapInfo mapping software, similar to the Commission's own ArcGIS mapping software, along with the boundaries of the CBGs, street information, and wire center boundaries. Queries were run on the MapInfo data base requesting the number of customers, the number of trouble reports and the number of repeated trouble reports by CBG. An analysis of those queries is discussed in the findings section below.

Data Analysis

The Disaggregation Study is based on three primary sets of data; the customer location data base, the trouble report data base, and the repeated trouble data base. Due to problems with all three data bases it was not possible to use all of the information provided by Verizon. The reduction in the total amount of data would only bias the results if the problems with the data were heavily weighted toward one particular area in the state or related to one particular item in the analysis. However, such a bias did not appear to be the case. Thus, while it would have been desirable to use all of the data, the basic purpose of the analysis, to identify neighborhoods in the state that are reporting relatively high or low numbers of trouble reports or repeated troubles, was not affected by the missing data. The problems encountered with the data bases are discussed in detail below.

Customer Location Data Base

Verizon prepared the customer location data base in response to Staff Data Request 2.2. The original data request asked for address information including the street address, city and zip code

for residential, business, DSL and special access customers.⁴ The request also asked for information regarding the “type of structure” used to support the cable, where type of structure refers to whether the cables are on poles, buried directly into the ground or placed in underground conduits.

Under a compromise agreement, Verizon provided address and structure information for residential and business customers in 26 exchanges; however, due to Verizon’s strong objection to providing any data related to DSL and special access service, Staff agreed to limit the data request to information regarding basic local service.

The information regarding customer address included data fields for the street (house) number, the street name, city, and zip code. Verizon also included its latitude and longitude data (geo-coding information which provides a more precise location) for many of its customers. The information initially appeared to be complete. With regard to the structure type, Verizon made a best effort to secure this information but was not able to obtain the information for approximately **(BEGIN PROPRIETARY)** **(END PROPRIETARY)** percent of its customers. The Company was unable to provide a single database of customer locations, and instead included three data sets: 1) Proprietary_Lead_TermMatch, for customers served by copper distribution cable that was constructed by matching geo-coded distribution terminals with customer information; 2) Proprietary_Lead_NoTermMatch, for customers served by copper distribution cable when it was not possible for Verizon to match a distribution terminal with customer information; and 3) Proprietary_IVAPP_FTTTP for customers served by fiber distribution cable. The following table provides a summary of the data for all three data bases.

⁴ Digital Subscriber Line (“DSL”) service is used predominantly by residential customers as a high speed data conduit to the Internet. Special access services are sold predominantly to business customers. Special access services provide high speed connections to the Internet, direct connections to long distance carriers and transport wireless messages between cellular towers. The same facilities (cables, remote terminals, poles, and conduits) that provide basic local exchange service also provide DSL and special access services. Because the services are provided using the same facilities, Staff wished to investigate whether the provision of DSL and special access services affected Verizon’s ability to provide safe and reliable basic local exchange service.

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The count is a sum of rows of data provided as of March 2009. Verizon also provided the number of lines at each location. The total number of lines was **(BEGIN PROPRIETARY)** **(END PROPRIETARY)** which is reasonably close to the **(BEGIN PROPRIETARY)** **(END PROPRIETARY)** line count filed for December 2008 for the 26 studied exchanges. Thus, it appeared that data bases were reasonably accurate. Even though the goal of this investigation is to determine the adequacy of the copper facilities, customers served by the fiber-to-the-premise (“FTTP”) network are included here in the customer location data base and in the trouble and repeated trouble reports data bases discussed below because the Commission does not have a separate metric for customers served by FTTP network. Also, Verizon’s service quality performance reports do not separate trouble and repeated trouble reports according to whether the customer is served by the copper or the FTTP network. Inclusion of the FTTP-served customers in this analysis matches Verizon’s standard reporting procedures and allows the Commission to understand where there is adequate service and where there are service problems throughout the state.

When the geo-coded customer locations were combined with the geo-coded trouble reports, a number of anomalies began to appear. For example, in one CBG, there were 96 trouble reports in 2008, but only one line, or the equivalent of 800 troubles per hundred lines. An examination of the customer data showed that there were actually multiple lines in that CBG. A sample of the customer locations were geo-coded using the Delorme's XMAP 5.2 GIS Editor software. This software uses the street address and the zip code to determine the location. It determines its ability to locate an address and reports the level of confidence it has for each geo-location ('not located', 'zip code centroid,' 'street' or address").

Map 2 provides a comparison of the Verizon geo-coded information and the results of using the Delorme software. The green houses represent the sample records which the Delorme software could locate to the "street" or "address" provided by Verizon. The red Xs are locations of the sample records that contained a street that was not located within the zip-code provided by Verizon and therefore are placed at the zip-code centroids. The blue stars are the customer locations based on the latitude and longitude data provided by Verizon in the customer records. In only one case was a blue star relatively close to the correct address. In most instances, the blue stars were many blocks away from the addresses. The blue stars were located in CBGs that did not contain the customers' locations. Thus, using the Verizon specified latitude and longitude data was causing the observed anomaly.

To correct this error and to ensure that similar errors did not occur, every customer location record was re-geo-coded using the Delorme software. Of the (BEGIN PROPRIETARY) (END PROPRIETARY) customer locations records, the Delorme software was able to successfully geo-code (BEGIN PROPRIETARY) (END PROPRIETARY) records to the "street" or "address" level of accuracy. These records were used in the study. The remaining (BEGIN PROPRIETARY) (END PROPRIETARY) records were not used due to one of three reasons. First, (BEGIN PROPRIETARY) (END PROPRIETARY) records could only be geo-coded to a zip-code centroid. For these addresses, the street provided by Verizon did not exist in the zip-code area that Verizon had provided. Second, (BEGIN PROPRIETARY) (END PROPRIETARY) records did not include a city. An additional (BEGIN PROPRIETARY) (END PROPRIETARY) records did not include a street

address. Finally, **(BEGIN PROPRIETARY)** **(END PROPRIETARY)** records were excluded because the geo-coded location fell within an exchange that was excluded from the study.

In a further comparison of the Verizon-provided wire center information and the wire centers into which the Delorme software located the customers, we found that numerous customer locations records did not geo-code into the wire center that Verizon had assigned to the record. Therefore, we further reduced the number of records in this study to **(BEGIN PROPRIETARY)** **(END PROPRIETARY)** by limiting the records to those records where the Delorme software placed the customer into the specified Verizon wire center. Some of the excluded records included records where the street crossed a wire center or state boundary.

Trouble Report Data Base

Verizon provided two different data bases that reportedly contained address data associated with 2008 trouble reports. The first data base, provided on May 4, 2009 was constructed using information from the Loop Engineering Assignment Data (“LEAD”) data base for copper-fed circuits and from the IVAPP data base for fiber-fed circuits.⁵ The LEAD address information rarely shows a city and never provides a zip code. The IVAPP data base provides the name of the franchising authority rather than a city name but does include the zip code. After spending many hours attempting to utilize the data provided by Verizon on May 4, 2009, Staff and its consultants met with Verizon on June 5, 2009 to discuss problems associated with using those data bases and to further understand Verizon’s procedures associated with solving trouble issues. During the course of that meeting, Verizon’s subject matter experts realized that it was possible to obtain a better trouble and repeated trouble data base directly for Verizon’s NORM system. Thus, the work related to the first data response was rendered useless and the consultants were required to begin again with their analysis of the data.

On June 8, 2009, Verizon provide staff and its consultants with two new data bases, one for troubles and the other for repeated troubles. The trouble data base contained fields for wire

⁵ A copper-fed circuit is a circuit that is entirely or in-part served by copper cable. A fiber-fed circuit is a circuit that is entirely served by fiber-optic cable. Fiber-fed circuits are part of Verizon’s Fiber-To-The-Premise (“FTTP”) network that delivers Verizon’s FiOS services.

center, circuit ID, city, zip code and trouble address. However, the city and zip fields had been filled in for only **(BEGIN PROPRIETARY)** **(END PROPRIETARY)** of the **(BEGIN PROPRIETARY)** **(END PROPRIETARY)** records. In addition, the information in the trouble address field had been inconsistently entered and differed by row. In some rows, the information included city, state and zip. In other rows, the name of the sub-division was used in place of the city. In most rows the information was incomplete. When Staff made the request to Verizon to re-organize the data into a consistent format, Verizon was unwilling to do so and suggested that the consultants should perform that task.

Given that response, the first attempt to geo-code the trouble addresses with the new data base using the automated Delorme software did not result in obtaining a substantial number of usable geo-coded addresses. To overcome these problems, the addresses were manually entered by the consultants into Internet-based geo-coding services such as Terra Server, Yahoo Map and Google Earth. The result of that process was that **(BEGIN PROPRIETARY)** **(END PROPRIETARY)** unique addresses associated with **(BEGIN PROPRIETARY)** **(END PROPRIETARY)** trouble records were successfully geo-coded. However, the geo-codes of **(BEGIN PROPRIETARY)** **(END PROPRIETARY)** records were associated with addresses outside of the exchange that Verizon claimed that the trouble occurred. Thus, those records were eliminated from the study, leaving **(BEGIN PROPRIETARY)** **(END PROPRIETARY)** trouble report records to be included in the study.

Repeated Trouble Data Base

Verizon also provided two repeated trouble data bases. These data bases were constructed using the same sources as the May 5 and June 8 trouble data bases. The repeated trouble data base and the trouble data base had two fields that allowed RLSA to assign geo-codes developed for the trouble data base to records in the repeated trouble data base. These records were the circuit ID and the first ten characters in the address. The repeated trouble data base had **(BEGIN PROPRIETARY)** **(END PROPRIETARY)** records. However, due to problems associated with determining geo-codes for trouble reports as discussed above, **(BEGIN PROPRIETARY)** **(END PROPRIETARY)** repeated trouble records could not be geo-

coded. Thus, **(BEGIN PROPRIETARY)** **(END PROPRIETARY)** repeated troubles were used in the study.

Findings

- Trouble Reports

The number of trouble reports per hundred lines varies considerably by CBG. **(BEGIN PROPRIETARY)** **(END PROPRIETARY)**.

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Map 3 and Map 4 show the range of trouble across the state. Map 3 features the state road network while Map 4 features Verizon's exchange boundaries. The number of troubles per hundred are grouped into five categories, with each category having the same number of CBGs. The white areas on the map are associated with the seven exchanges excluded from the study.

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(END PROPRIETARY) A closer view of New Castle County is provided in Map 5. In that map, a high level road network overlays the CBG information. The same detailed view of the troubles for Kent and Sussex counties is provided in Map 6.

Regression analysis was performed in an attempt to determine the factors that might lead to higher or lower troubles per hundred lines. In particular, the relationship between the number of troubles per hundred lines as a function of the percent of lines served via aerial cable and as function of the percent of lines served via buried cable were evaluated. The results of the

regression shown below are inconsistent with an initial hypothesis that troubles would increase with the percent of lines served by aerial structure and decrease with the percent of lines served by buried structure. However, given that the coefficient in the aerial was not significant, and the R-squared associated with each equation was so low, very little confidence can be put in the results. A major factor contributing to the low quality of the results is the fact that there was no data associated with the type of structure for over half of the lines. If that data could have been secured, it is possible that more meaningful results could have been obtained.

Regression Results

Number of troubles = $8.01 + 2.907 * \text{percent aerial structure}$
(0.65) t-statistic; R-square = 0.001

Number of troubles = $9.21 - 4.16 * \text{percent of buried structure}$
(-2.18) t-statistic; R-square = 0.011

- Repeated troubles

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Map 7 and Map 8 show the range of trouble across the state. Map 7 features the state road network while Map 8 features Verizon's exchange boundaries. The repeated troubles percentage CBGs are grouped into five categories, with each category having the same number of CBGs. The white areas on the map are associated with the seven exchanges excluded from the study.

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(END PROPRIETARY) A closer view of New Castle County is provided in Map 9. In that map, a high level road network overlays the CBG information. The same detailed view of the troubles for Kent and Sussex counties is provided in Map 10.

Troubles and Repeated Troubles

High occurrences of trouble and repeated trouble reports are compared in Maps 11 and 12. Those maps depict instances where there are both high trouble reports and high repeated trouble reports. CBGs that are reporting high trouble reports and high repeated trouble reports should receive special attention in order to ensure that customers living in those areas are receiving safe and reliable service.

Application of the Disaggregation Study Analysis to Verizon's Service Quality Performance

The Disaggregation Study clearly indicates that service quality varies by CBG. That is, there are some CBGs (neighborhoods) that report very good service quality and other CBGs that report service quality that is not acceptable. Combining Census information and telecommunications data is an innovative tool of analysis. The FCC generates analyses of wireless coverage at the Census Block level.⁶ The NTIA and the FCC are using Census Block analysis to determine where there are sections of the nation that do not have broadband service or are underserved with regard to broadband service.⁷ In addition, the FCC requires all broadband carriers to file information regarding broadband service at the Census Tract level.⁸

While the usefulness of the disaggregation of service quality data is undeniable, current Verizon practices and reporting procedures make it difficult to proceed with an ongoing CBG analysis. As pointed out above, Verizon's data are not recorded in a manner that allows for an easy translation of the data into the CBG analysis. Moreover, comparisons between the results of the study and Verizon's engineering practices may be difficult. Therefore, the consultants recommend that as part of Verizon's action plan that Verizon develop a methodology that would systematically evaluate service quality at a level of analysis below the wire center, and use that methodology to determine those areas where there is need for action to improve service quality.

⁶ In the Matter of Implementation of Section 6002 (b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services, Thirteenth Report, WT Docket No. 08-27, released January 16, 2009. Appendix B.

⁷ National Telecommunications and Information Administration, State Broadband Data and Development Grant Program, Docket No. 0660-ZA29, Notice of Funds Availability.
http://www.ntia.doc.gov/frnotices/2009/FR_BBNOFA_090709.pdf

⁸ FCC Form 477, <http://www.fcc.gov/formpage.html>

6. Customer Commitment and Scheduling Process

As a part of its Order in establishing the current proceeding, the Commission asked for an investigation including (but not limited to) a review of customer service practices utilized by call center customer service representatives and, in particular, how Verizon “closes out” customer complaints. (*see PSC Order No. 7433, Ordering Para. No. 2*)

The Staff’s consultant has reviewed certain documents and responses with respect to the Commission’s request on this portion of the investigation. However, the scope of this review has not included a full-scale analysis of the Company’s procedures and management systems. In reviewing the customer service practices, we have focused on four items that have been discussed by the Commission, the Staff, or in public comment meetings held in this docket, or that would be routine questions in an investigation such as this one.

Prompting the Customer to Agree to a Change in the Commitment Time

At the second public comment session (3/10/09), Mr. Jim Hummel, representing the Communications Workers of America, expressed concern over the issue of “moving jobs” or contacting the customers to change commitment times. He indicated that the Company calls customers to determine if they will agree to changing the commitment, e.g., from the morning to the afternoon.

In order to further investigate Mr. Hummel’s concerns, Staff propounded the following data request to Verizon.

Data Request 4-2:

Please indicate and explain whether Verizon is aware of any company procedures, processes, or programs wherein a customer may be contacted to revise a commitment date or time for installation or repair services. If the customer agrees to accept a change in commitment or schedule at the request of Verizon, indicate whether the performance indication is then based on the revised schedule or commitment.

Verizon Response:

Verizon does have “Methods and Procedures” governing the customer contact process to revise a commitment date or time for installation or repair services. These proprietary documents are attached ...

It is important to note that Verizon DE’s service metric is calculated using the original commitment date and time, unless a change in commitment is initiated by the customer.

Staff consultants have reviewed the documentation provided in response to this request for information, and have also met with Verizon subject matter experts to discuss these processes. Verizon has established a process for contacting the customer in the event of either a potential missed commitment or an actual missed commitment. In either case, the Verizon employee clearly attempts to re-negotiate the appointment with the customer. If the customer agrees, a new commitment date/time is entered in the system (handle code REG); if the customer refuses, a different (PRI) code is entered in the system. Verizon asserts that their performance is measured against their ability to make the originally scheduled commitment. It is Verizon’s position that their practice of proactive customer contact and rescheduling appointments has no affect on its performance results reported to the Commission regarding commitments.

Restoral Time

A practice either observed or suspected in investigating performance measures is the possibility of prompts to the technician that a trouble restoral time may be outside of the standard parameters. As a result, Staff requested a response from Verizon as follows:

Data Request 4-3:

Please indicate and explain whether Verizon is aware of any company procedures, processes, or programs wherein a repair technician, upon providing close-out information for a repair ticket, will be “prompted” by the system in any way, for example, that the date/time they have entered is outside of any acceptable range for close-outs for purposes of performance tracking.

Verizon Response:

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Verizon explained on several occasions when discussing the issue that the prompt is there because a technician may actually restore service and then perform other activities before closing out the ticket; nonetheless, the prompt is of concern to Staff's consultants.

The Scrubber/vScrub Process

Another issue raised by Mr. Hummel at the public comment session (3/11/09) deals with Verizon's practice of "scrubbing" a trouble ticket prior to dispatching a service technician. Mr. Hummel described a mechanized system that tests the line prior to dispatch, and the trouble report may be closed out in error.

In response to Mr. Hummel's concerns, Staff included a question for Verizon to determine the source of his concern.

Data Request 4-4:

Please describe in detail any company procedures, processes, or programs where there may be "automatic" close-out of a customer trouble report if the customer's line is tested electronically and there is no apparent fault found on the line.

Verizon Response:

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It is reasonable in many instances to use automated testing as a filter for determining whether to dispatch a technician to the customer's premises. Noise and crosstalk frequently do not present clear indications to testing equipment as to whether a line is in trouble or not. Many of the troubles in Delaware appear to be related to noisy lines, particularly during wet weather. Staff's

consultants believe further study of Verizon's vScrub process may be needed to determine if that system is closing trouble reports prematurely.

Approach to Handling Out-of-Service Trouble Reports

Staff requested information from Verizon regarding its handling of out-of-service trouble reports, and the potential for delaying action on a trouble ticket which had already failed to meet the out-of-service in twenty-four hours metric:

Data Request 4-5:

Please indicate and explain whether Verizon is aware of any company procedures, processes, or programs wherein a repair or maintenance manager, supervisor, or administrator may advise repair technicians to delay repairing a customer outage that has already exceeded 24 hours in order to repair other outages that may have been out of service for less than 24 hours.

Verizon Response:

Verizon does not advise its employees to delay the repair of a customer outage that has already exceeded 24 hours in order to repair other outages that are out of service for less than 24 hours.

Verizon's response indicates that such a practice is not the policy of the Company.

7. FACILITY CONSTRUCTION

The Commission's service rules contain the following with reference to standards of construction:

4.3 New Construction

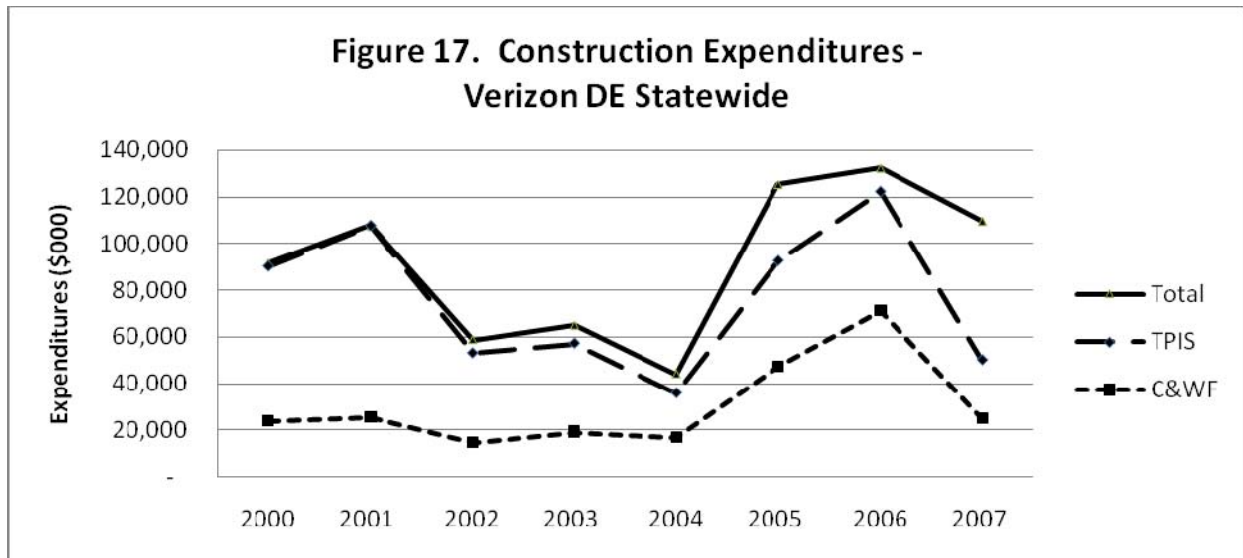
4.3.1 Standards of construction. In determining standard practice, the Commission will be guided by the provisions of the American National Standards Institute, Incorporated, the National Electrical Safety Code, and such other codes and standards that are generally accepted by the industry, except as modified by this Commission. Each utility shall construct, install, operate, and maintain its plant, structures, equipment, and lines in accordance with these standards, and in such a manner to best accommodate the public, and to prevent interference with service furnished by other public utilities insofar as practical.

In this section, we evaluate Verizon's construction expenditures over the past several years, their use of "bypass" configurations, and transmission loss and noise.

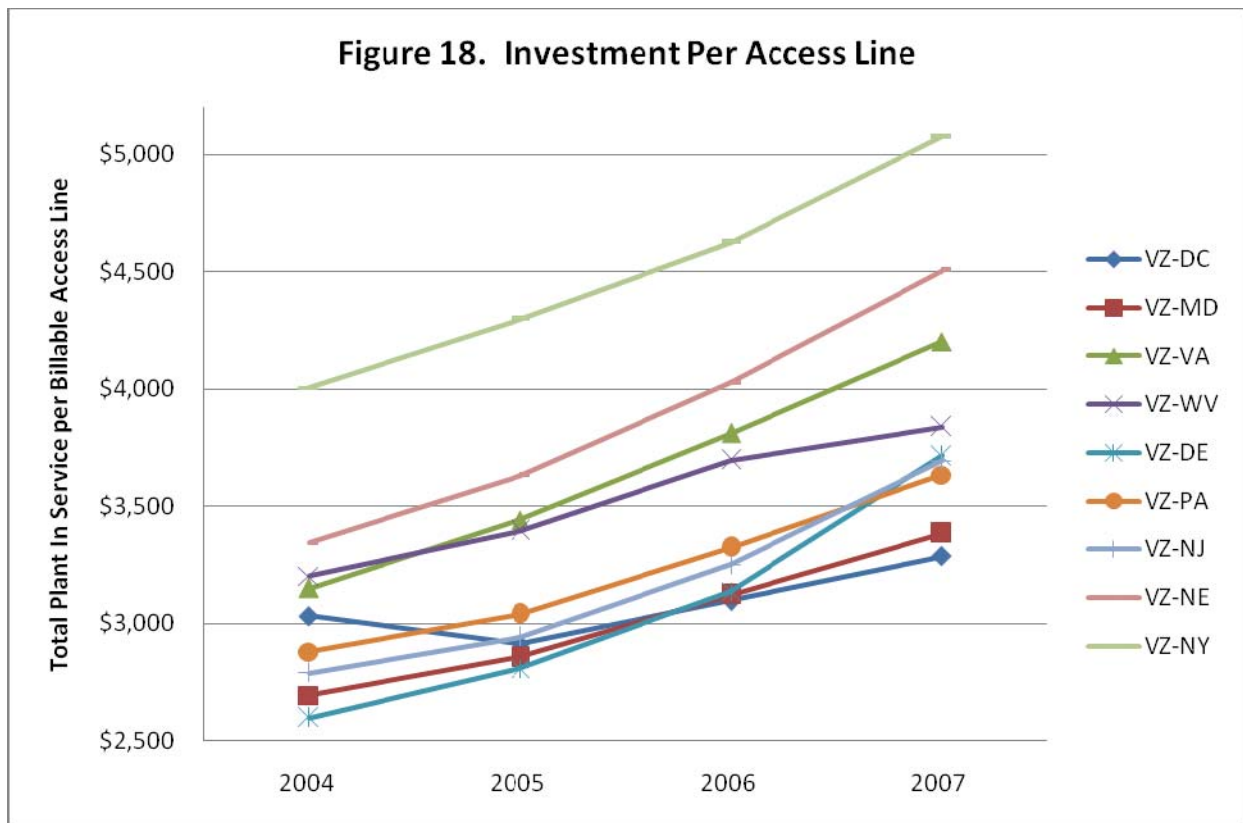
7.1 Construction Expenditures

Operating data, including construction expenditures, have been reported by Verizon-DE and other large carriers to the Federal Communications Commission (FCC), and is accessible through the Automated Reporting Management Information System (ARMIS). ARMIS was initiated in 1987 for collecting financial and operational data from the largest carriers. ARMIS filing requirements for Verizon and other carriers were reduced significantly for 2008 data by Commission forbearance orders. So the most recent information that can be compared to the other states and carriers is data from 2007.

Figure 17 shows Verizon-DE's construction expenditures in Delaware for the period from 2000 to 2007, as reported through ARMIS. The line marked "Total" includes TPUC, or Telephone Plant Under Construction, that is not yet classified as being in service. The dashed line marked "TPIS" is Telephone Plant In Service, as collected in the FCC's accounting system. The dashed line marked "C&WF" is the amount recorded under the Cable & Wire Facilities accounts.



An alternative method of reviewing Verizon’s plant facility investment is to compare it to other Verizon states in the region. Looking at the Total Plant in Service (TPIS) per billable access line (Figure 18), it appears that Verizon-DE was lagging behind the other states in 2004 and 2005, and with increased construction expenditures in 2006 and 2007, pulled closer to the “middle of the pack”, but still behind several states in that analysis.



	2004	2005	2006	2007
Verizon Washington D.C.	\$3,031	\$2,912	\$3,097	\$3,285
Verizon Maryland	\$2,693	\$2,856	\$3,123	\$3,386
Verizon Virginia	\$3,150	\$3,443	\$3,810	\$4,202
Verizon West Virginia	\$3,203	\$3,395	\$3,695	\$3,837
Verizon Delaware LLC	\$2,598	\$2,809	\$3,137	\$3,714
Verizon Pennsylvania	\$2,879	\$3,041	\$3,324	\$3,633
Verizon New Jersey	\$2,788	\$2,941	\$3,251	\$3,694
Verizon NE	\$3,345	\$3,631	\$4,026	\$4,505
Verizon New York Telephone	\$4,006	\$4,298	\$4,625	\$5,074

Verizon provided a separate analysis of capital expenditures in response to Staff RFI 1-6, and is summarized in Figure 19 below. It is clear that the increased level of construction expenditures in 2005 and 2006 were directed toward growth, specifically for the FIOS upgrades, and the amount expended for service improvement and asset restoration dropped significantly.

Figure 19. Delaware Outside Plant Expenditures 2003-2008 (\$000)

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7.2 Inadequate Plant Conditions – “Bypass”

During the March 11, 2009 public comment meeting in this proceeding, photographs were submitted by Mr. Hummel of the CWA that showed various inadequate plant conditions. There were a number of examples of extremely poor outside plant maintenance conditions, including exposed splice cases and pedestals, “rats-nest” cross-connect boxes, and drop wires strung across the ground and through trees. In addition, the Commission heard individual customer complaints in the public comment meetings about lines strung on the ground and other poor plant conditions.

The typical experience of telephone companies is that when faults are discovered in cable plant, temporary fixes or “bypasses” are used to provide continuous customer service until the span of cable can be properly repaired or replaced. Such temporary solutions should be the exception and not the rule, and should be properly corrected within a reasonable amount of time. The bypasses, as well as the poor splice and pedestal condition shown in the photographs, are temporary “fixes” that are not weatherproof and allow the exposed wires to deteriorate and will lead to service problems including noisy lines and outages.

When queried, Verizon-DE provided a listing of bypass conditions that is summarized in Figure 20. In some instances, the Company indicated when the inadequate plant condition is scheduled for proper repair. What was surprising was that Verizon-DE could not tell Staff when the bypass was put in place. In other words, it is not clear whether these inadequacies date back to the

beginning of 2009 or to the beginning of 2003. The column in Figure 20 marked “Repaired” shows the number of work orders that have been completed by the end of September 2009 to repair the bypass conditions reported.

Figure 20. Bypass Conditions Reported by Verizon-DE

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In response to Staff’s RFI 5-8, Verizon provided the following description of their Proactive Cable Maintenance program:

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Despite Verizon's use of the PCM program, Staff has concerns that the Company's programs to improve their outside plant distribution system do not appear to be keeping up with the deterioration of their aging local infrastructure.

7.3 Subscriber Transmission Loss & Noise

5.3 Inspections and tests

5.3.1 Each telecommunications utility shall adopt a program of periodic tests, inspections, and preventive maintenance aimed at achieving efficient operation of its system and rendition of safe, adequate, and continuous service.

5.3.2 Each telecommunications utility shall maintain or have access to test facilities enabling it to determine the operating and transmission capabilities of all equipment and facilities. The actual transmission performance of the network shall be monitored in order to determine if the service objectives in this chapter are met. This monitoring function shall include, but not be limited to, circuit order tests prior to placing trunks in service, routine periodic trunk maintenance tests, test of actual switched trunk connections, periodic noise tests of a sample of customer loops in each exchange, and special transmission surveys of the network.

5.11 Transmission requirements.

5.11.2 Subscriber lines. All newly constructed and rebuilt subscriber lines shall be designed for a transmission loss of no more than eight decibels from the serving central office to the customer premises network interface. All subscriber lines shall be maintained so that transmission loss does not exceed 10 decibels. Subscriber lines shall in addition be constructed and maintained so that metallic noise does not exceed 30 decibels above reference noise level ("C" message weighing) on 90% of the lines. Metallic noise shall not exceed 35 decibels above reference noise level ("C" message weighing) on any subscriber line.

Discussion

Transmission loss and noise are important elements in constructing and maintaining a telephone network. Transmission loss generally refers to the ability of one party to hear the other party to a conversation, and could be most easily viewed as “volume.” Transmission loss is measured in decibels (dB) at a particular frequency, normally around 1,000 Hertz (Hz). If there is no more than eight dB of transmission loss in a subscriber line, the parties should be able to hear each other satisfactorily, based on objective customer testing.

Noise is fairly self-explanatory, although there are many different types of noise in the telephone network. Some noise can sound like a light, consistent hiss, and other noise conditions can be loud crackling and popping. The crackling and popping is referred to as impulse noise. Metallic noise, aka circuit noise, is an electrical signal that is steady-state or consistent; it is not impulse noise. Noise can be measured with specialized test equipment, and its unit of measurement is “dBrnC” or decibels above reference noise with C-message weighting.

Transmission loss and noise standards provide an objective metric to evaluate a customer line that may be the source of complaints. If a customer complains that they can’t hear well, or that there is noise on the line, these measures and objectives will determine whether the facilities need repair.

Findings

In order to determine what steps were being taken by Verizon to assure the loss and noise requirements of this regulation, Staff requested the following information from Verizon:

Data Request 1-3:

Please describe the methods and procedures used by Verizon in assuring the quality of subscriber line loss and noise in keeping with [DAC § 4000.5.11.2]. If periodic reports are compiled with respect to periodic testing in exchanges, please provide such documentation and reports for each month for each wire center or exchange tested.

Verizon Response:

Verizon’s Engineering Network Planning and Design group follows an industry standard resistance design criteria. The basic design rules state that loops less than 1300 ohms and 18kft in total loop length do not require any type of loading to prevent transmission loss above the specified standards and satisfy the metallic noise requirements. ...

Pursuant to the requirements set forth in Docket 20 - - Transmission Requirements, Verizon DE runs a Line Test Survey (Bulk Test) on a random sample of customer loops in Delaware for selected central offices once a month. December is an exempt month, and no report is required. See the attached spreadsheet, “Survey of Customer Loops for Periodic Noise by Exchange Response DR 1-3.xls,” which provides the results of these tests from January 2000 through December 2008.

A summary of Verizon’s spreadsheet is shown in Figure 21.

Figure 21. Verizon Metallic Noise Test Results

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After Staff, its consultants, and the DPA reviewed Verizon's response to this data request, it was apparent that there was an irregularity, as the most recent four years of data (2005-2008) reflected absolutely zero instances of customer loops that did not meet the 30 dBrnC noise objective, out of thousands of measurements. During discussions with Verizon, the Company was asked to explain the anomaly which it had apparently not taken notice of in four years.

In a Supplemental Response to this data request dated February 16, 2009, Verizon advised Staff that, beginning in approximately **2004**, Verizon developed and implemented its own service assurance maintenance platform - vRepair. Verizon determined that during the transition to vRepair, the testing procedures for measuring metallic noise on subscriber lines in Delaware had changed. Verizon identified two problems with the metallic noise testing and reporting procedures. First, it had "become apparent" that there was a misunderstanding of the testing process by the testers at the time that vRepair was deployed in Delaware. Rather than randomly testing customer lines and recording how many of them failed to meet the objective, the Delaware testers would test the lines in the random sample for the selected central office until they had tested 90 lines in the wire center that returned a "test OK" response. As a result of this procedure, the initial response to this data request showed all zeros for the number of lines exceeding 30dbrnC for the period from 2005 through 2008. The second difficulty identified by Verizon on this issue was that it was unable to update the original spread sheet.

After further investigation, Verizon responded to Staff that the testing method it currently employs ensures compliance with the requirements of the rule in that it is only required to conduct "periodic noise tests of a sample of customer loops in each exchange." Verizon asserts in its May 15, 2009 Supplemental Response that while it has submitted monthly metallic noise reports with its service quality metrics until the above-referenced flaw was discovered in its

random testing methods, the rule does not require that periodic noise tests be “random” rather than targeted based on the likelihood that a noise problem may exist. Verizon states that it investigated whether there was an alternative automated testing method available for metallic noise that would allow for random sampling, and none exists. Verizon states that it is and has been conducting *targeted* metallic noise testing of its subscriber lines in the ordinary course of business. Further, technicians are not permitted to close a trouble report ticket for a copper loop until the metallic noise level is at or below 30 dBrnC, thus ensuring compliance with the metallic noise standard.

Accordingly, Verizon has determined that “the methods and procedures that it is using ensure the quality of subscriber line loss and noise in keeping with the Commission's rules and regulations.”

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8. EMPLOYEES IN DELAWARE

The Verizon-DE workforce in Delaware steadily declined from 2001 through 2004, as can be seen in Figure 21. The workforce generally rebounded from 2005 through mid-2007 due to increases in outside plant workers. The number has steadily declined again since mid-2007. This table shows the number of employees assigned to outside plant, central office, other, and total.

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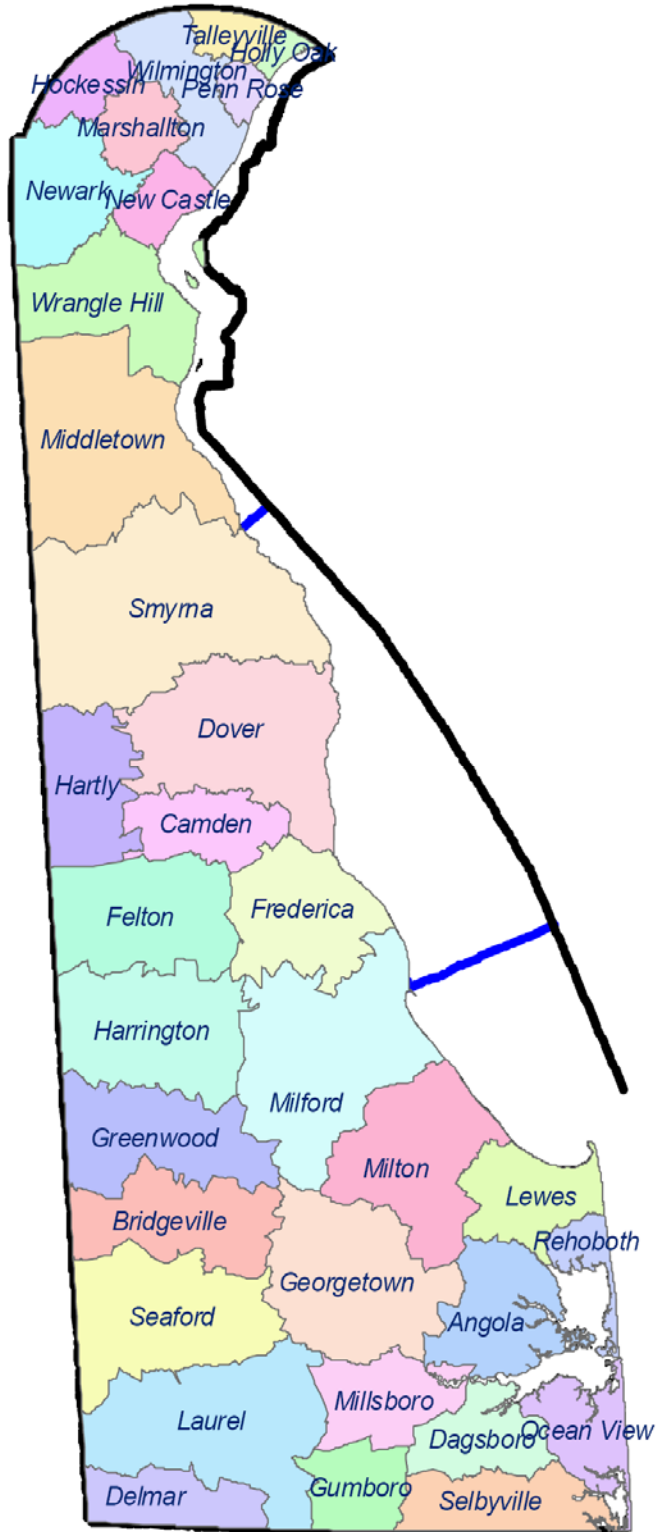
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Verizon responds that while the absolute number of employees in Delaware has varied throughout the years (e.g., decreasing from 2002-2004 and increasing in 2004-2006), overall any

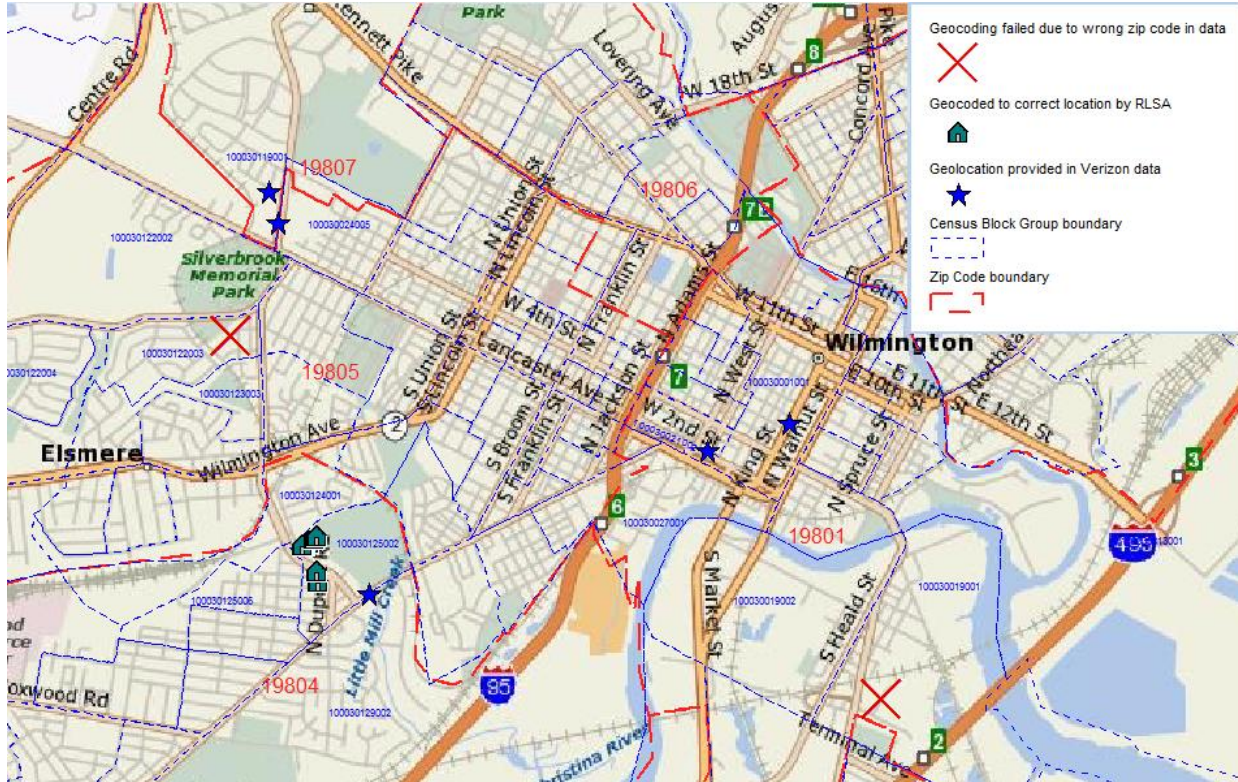
reduction in force has been consistent with the decline in Verizon's access lines so that Verizon's force levels have remained stable or improved.

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Map 1
Exchange Boundaries in Delaware



Map 2 Illustration of Disparity in GIS Positioning



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Map 3
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Map 4
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Map 5
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Map 10
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Map 11
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Map 12
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Attachment A – Staff Consultants

Rowland L. Curry has over 35 years experience in the regulated utility industry, predominantly focusing on state and federal telecommunications policy and technological issues. He has provided contract consulting services to public-sector governmental and individual clients in ten states. Mr. Curry's projects have ranged widely from Universal Service Fund ("USF") administration to service quality evaluations, and have included proceedings related to competitive interconnection agreements, the FCC's Triennial Review processes, and 9-1-1 service rates and tariffs.

Prior to beginning his consulting career in 2001, Mr. Curry served on the staff of the Public Utility Commission of Texas (Texas PUC) for almost 25 years. During his tenure at the Texas PUC, Mr. Curry was the Director of the Telephone Division, and also held the position of Chief Engineer. He has extensive experience and expertise in a wide variety of technical and policy issues as a result of his long tenure with the Texas PUC.

Mr. Curry has been closely involved in telephone service quality analysis since 1976, establishing an effective program of TSQ analysis at the Texas PUC that combined operational report analysis with on-site field testing of all local exchange carriers. He has written service quality rules for the Texas PUC and was instrumental in preparing a Handbook of Telephone Service Quality Rules for the National Association of Regulatory Utility Commissioners (NARUC). He has participated as a consultant in projects on behalf of the Pennsylvania Office of Consumer Advocate and the New Hampshire Public Utilities Commission regarding telephone service quality service rules and issues (involving Verizon companies).

Mr. Curry served terms as Chairman of the Staff Subcommittee on Telecommunications and the Staff Subcommittee on Telephone Service Quality of the NARUC. He was an appointed staff member of the Federal-State Joint Board on Universal Service, and was the state staff Chair from 1998 until 2001. He also worked on two other Joint Boards, on jurisdictional separations and Alaska rate integration. Mr. Curry is intimately familiar with telecommunications carriers' costs and pricing, revenue streams, network operations, maintenance, technologies, service performance metrics, and competitive policy and interconnection issues.

From 2001 to 2006, Mr. Curry provided consulting services through his own firm, Curry & Associates, with engagements on telecommunications issues in ten states. Mr. Curry joined Fox, Smolen & Associates in September 2006, and has participated with them in both electric utility and telecommunications projects since that time.

Mr. Curry is an electrical engineering graduate of Texas Tech University, and is a Registered Professional Engineer in Texas. He is a member of the Texas Society of Professional Engineers, the National Society of Professional Engineers, and the Association of Energy Engineers.

Dr. Robert Loube has testified on behalf of consumer advocates and state attorney generals in cases that focus on rate design, broadband deployment, revenue forecasts, market power and regulatory structure, and the impact of Fiber-to-the-premise networks on service quality. Currently he is engaged by the Maine Office of the Public Advocate in a number of rural exemptions cases and the Pennsylvania Office of Consumer Advocate in a proceeding that is reviewing the Pennsylvania Universal Service Fund. In the Verizon-FairPoint Merger proceeding, he developed the Maine Public Advocate's broadband deployment plan and compared that proposal to FairPoint's broadband deployment plan with regard to cost and consumer coverage.

Previously, Dr. Loube was an industry economist at the Federal Communications Commission, the Director of the Office of Economics of the Public Service Commission of the District of Columbia (DCPSC), and the econometrician of the Indiana Utility Regulatory Commission (IURC). Dr. Loube has served on the Federal-State Joint Boards for Universal Service and Separations.

At the FCC, Dr. Loube helped develop the FCC's forward-looking universal service cost model. He was responsible for evaluating the impact of universal service rule changes on incumbent and competitive carriers and on consumers. He was a member of the team that drafted the universal service orders, and he reviewed and commented on the draft orders from other divisions and bureaus for the Telecommunications Access Policy Division.

At the DCPSC, Dr. Loube testified on issues related to class revenue responsibility, rate structure, low income rates, demand side management programs, and least cost planning principles. He chaired the Commission's workshop that reviewed the District's telephone service quality rules.

Matthew Saltzer has assisted in the development of complex databases suitable for use for each of the RLSA administrative clients, including Arkansas, Maine, Vermont, D.C. state commissions and USAC. He is responsible for mapping customer location data to support client line-count filings with USAC. He has prepared maps depicting the deployment of FiOS in Maryland, and he has integrated the maps of telephone companies and cable companies to illustrate service territory overlaps.

Mr. Saltzer has worked in the fields of Information Technology and management of information systems (MIS) since 1991. Initially he provided accounting and computer support to private law firms. His duties included the implementation of appropriate computer networks and the training of the firm's employees. He was instrumental in the development of various data-handling and office efficiency improvement software solutions.