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June 30, 2008

Catrice C. Williams, Secretary  
Department of Telecommunications & Cable  
Commonwealth of Massachusetts  
Two South Station, 4<sup>th</sup> Floor  
Boston, Massachusetts 02110

Re: D.T.C./D.T.E. 06-6 — Town of Middlefield Petition

Dear Secretary Williams:

Enclosed for filing on behalf of Verizon New England, Inc., d/b/a Verizon Massachusetts “(Verizon MA”) is the Verizon MA Service-Quality and Infrastructure Analysis. Also enclosed is a Certificate of Service.

Thank you for your attention to this matter.

Sincerely,



Robert N. Werlin

Enclosures

cc: Service List

**COMMONWEALTH OF MASSACHUSETTS**  
**DEPARTMENT OF TELECOMMUNICATIONS AND CABLE**

\_\_\_\_\_)  
In re: Petition of Town of Middlefield )  
\_\_\_\_\_)

D.T.C./D.T.E. 06-6

**CERTIFICATE OF SERVICE**

I certify that I have this day served the foregoing document upon the Department of Telecommunications and Cable and parties of record in accordance with the requirements of the Department's Rules of Practice and Procedures.



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Dated: June 30, 2008

**D.T.C./D.T.E. 06-6**

**VERIZON MA SERVICE-QUALITY AND INFRASTRUCTURE ANALYSIS**

**I. INTRODUCTION**

In its Order of April 30, 2008 in D.T.C./D.T.E. 06-6, the Department of Telecommunications and Cable (“DTC” or the “Department”) ordered Verizon Massachusetts (“Verizon MA”) to undertake a comprehensive analysis of service quality and infrastructure issues in the Town of Middlefield (the “Town”). The Department noted that the analysis should include the nature and cause of the service quality problems identified by the Town, corrective action the company has taken or intends to take with a proposed timetable for such action, and a report on the age of the facilities and known trouble spots in the Town. Order at 18<sup>1</sup>

**II. ANALYSIS OF SERVICE-QUALITY AND INFRASTRUCTURE ISSUES**

**A. OVERVIEW**

Middlefield is a small community in Hampshire County that is served from the Becket central office. Verizon MA provides local exchange service to approximately 300 customers in the Town. That number fluctuates somewhat during the course of the year, particularly in the summer, because of seasonal customers. The central office serving the Town is a Nortel DMS-100 digital switching system installed in 1991. Verizon MA has evaluated the customer trouble reports for the Town and none relates to the Central Office switching system. In addition, the service quality issues raised by the Town in this proceeding generally related to conditions associated with Verizon MA’s outside plant and not the switching system. Accordingly, Verizon MA focused its detailed examination on the outside plant facilities within the Town.

To comply with the Department’s directive, Verizon MA conducted comprehensive field inspections of its entire outside plant serving Middlefield. The inspection was conducted by a team of Verizon MA technical personal specifically assigned to physically examine all aerial cables, terminals and other Verizon MA outside plant in the Town. The team’s objective was to identify and repair conditions that were causing, or could in the future cause, service or safety issues for Verizon MA customers in the Town. For example, the team rode along the company’s cable routes to visually inspect outside plant in the Town thereby enabling them to observe such conditions as the height of cables along public ways and open splice terminals. These two conditions were noted by the Town as principal service-quality issues allegedly affecting Verizon MA’s provision of services.

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<sup>1</sup> Verizon MA timely filed a Motion for Reconsideration and Reopening of the Record. Included in that Motion is a request for stay of this report. The Department has not ruled on the request for stay, and by filing this report Verizon MA is not waiving its rights.

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Attachment A is a report on the result of the field inspections. Verizon MA found a total of 44 conditions that could lead to service issues in the future. All of the 44 conditions were minor, and none was causing a specific customer service problem at the time. The conditions fall into three categories – open plant, lashing wire, and sheath damage.

### 1. Open Plant

Verizon MA has serving terminals and splice locations at numerous points along cable routes where different cable are joined together. These points are enclosed in cases of various size that protect the cables from weather and other damaging infiltrations while giving Verizon MA technicians ready access to the facilities. An open-plant condition occurs when the case's closure mechanism fails and leaves the conductors inside the cable potentially exposed to the elements or other infiltrations. This can be caused by many different outside influences including temperature extremes, heavy winds, ice, snow, rain, and wildlife.

In Middlefield, the majority of the open-plant conditions (18) were open serving terminals. Serving terminals are access points to cables that directly serve a customer and are generally located at the utility pole where the cable on the street meets the drop wire serving the customer. An open serving terminal may leave conductors exposed to the elements and wildlife that could, over time, cause service interruptions. Depending on the location, an open serving terminal can exist many years without resulting in a service issue. Verizon MA took corrective action to remedy each of these conditions. The action taken and the date the work was completed are noted on Attachment 1.

A similar condition to the open terminal is an open splice closure. A splice closure is the junction point of two or more cables. Open splice closures also have the potential to leave conductors exposed to the elements and wildlife and could over time cause service interruptions. Verizon MA's field inspection found 11 instances of open splice closures in Middlefield. Also similar to open serving terminals, open splice closures can exist for years without resulting in a service issue. Verizon MA took corrective action to remedy each of these conditions. The action taken and the date the work was completed are noted on Attachment 1.

### 2. Lashing Wire

Lashing wire is used to hold aerial cable to its supporting strand. The lashing wire is a small gauge wire that is wrapped around Verizon MA's cable and also around the heavy-gauge metallic strand used to support the cable. If the lashing wire becomes loose or broken the cable can separate from the strand causing it to sag.

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Verizon MA's field inspection uncovered 13 locations where lashing wire was broken or loose. Typically, this condition does not affect telecommunications service, but could cause the cable to sag below minimum clearance levels creating a potential safety issue. Each instance uncovered by the filed inspections was repaired. The action taken and the date the work was completed are noted on Attachment 1.

Low-hanging cables was a major deficiency noted by the Department in its Order based on information provided by the Town. The Company's field inspections did not, however, identify any locations in the Town where Verizon MA's cables were below minimum height requirements. If the Town has specific locations where it believes Verizon MA cables fail to meet minimum height standards, the Company will review those sites with the Town to determine if there is a Verizon MA condition that should be remedied.

### 3. Sheath Damage

The final category of a potential service-affecting condition was damage to the protective sheath of the aerial cable. Extensive damage to the protective sheath can expose the conductors enclosed to the corrosive forces of the weather. Sheath damage is most often caused by cable rubbing against a tree, a tree or its limbs falling past but nicking the cable or by wildlife gnawing through the outside of the cable. In most cases this type of sheath damage does not result in immediate service interruptions. However, over time moisture from exposure to the elements can cause corrosion to the facilities inside the cable which will impact service. Two indications of sheath damage were found. Both of those instances were remedied.

A complete list of Open Plant, Lashing Wire and Sheath Damage conditions found as part of the comprehensive review of Verizon MA's outside plant facilities, including the location and the date the corrective actions were completed are identified in Attachment 1.

## **B. SCAN TEST**

In addition to the field inspections of cable facilities, Verizon MA also conducted electronic tests of its Digital Loop Carrier ("DLC") systems in Middlefield. These systems are a standard industry technology used throughout Verizon MA's serving areas to derive multiple channels from a single four-wire distribution cable running from a central office to a remote site. Typically the cable runs to a Remote Terminal where it is terminated in electronics.

Verizon MA conducted an electronic Scan Test of all the working lines served from the three DLC Systems providing service to the Town. The electronic Scan Test analyzes each pair of wires that leave the Remote Terminal to provide service to

customers. In conducting such a test, Verizon MA is able to identify specific potential facility issues before they actually become service effecting. The Scan Test results demonstrated that there was a potential of 31 future troubles in the facilities providing service in the Town. Upon further physical investigation and analysis only four lines were found to have potential problems that required remediation. Corrective action was taken during the week of May 26, 2008, to eliminate the potential for service problems at these locations.

### **C. REMOTE TERMINAL ROUTINE MAINTENANCE GUIDELINES**

The comprehensive service and infrastructure review also included the testing of all batteries that provide backup to commercial power at the three DLC System locations in the Town. These are located at Town Hill Road, Chipmam Road and Reservoir Road. As stated earlier, DLC systems consist of electronics that are necessary to provide dial tone services to Verizon MA customers in Middlefield. The electrical power for these systems is provided by the local commercial power company. To ensure uninterrupted service in the event of a commercial power failure, Verizon MA installs battery back up at the DLC system sites. Testing and replacement of these batteries as needed is a proactive step to avoid future Verizon MA service interruption when commercial power service is interrupted. Verizon MA completed testing of all batteries at the three locations and found all batteries to be in good working condition.

### **D. VERIZON MA'S POLICIES, PRACTICES AND PROCEDURES FOR INSPECTING INFRASTRUCTURE AND EQUIPMENT**

Although Verizon MA's policies, practices and procedures regarding routine maintenance and inspection of infrastructure are voluminous and exist in several formats including internal databases, Verizon MA continually conducts analyses of its network. In addition, there are certain key processes and procedures that Verizon MA conducts on a daily and monthly basis to evaluate the status of its network. One such process is the Proactive Cable Maintenance Process ("PCM"). PCM is a maintenance process used to identify, track, monitor and measure the repair/replacement of defective outside plant facilities. It provides proactive outside plant analysis, targets defective outside plant facilities for repair or replacement, optimizes resources, reduces repeat reports and future customer trouble reports by repairing or replacing outside plant facilities. Another procedure is the Remote Terminal Routine Maintenance Guidelines. This procedure provides the process for scheduled inspections of Remote Terminals in order to evaluate trends that provide data that can be evaluated to provide proactive repair or replacement of a Remote Terminal. These processes and guidelines are applicable to all Verizon MA plant in Massachusetts, including plant within the Town.

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### **III. AGE OF FACILITIES AND KNOWN TROUBLE SPOTS**

The Department requested that Verizon MA include in its analysis a report on the age of its facilities in the Town. Attachment 2 provides information concerning the location, type and size of cable, length and year of placement for its facilities. As in every municipality across the state, the age of the cables varies. Verizon MA purchases cables from manufacturers that make cables specific to Verizon MA standards, and there are no specific life cycles or service lives for cable. As with many of the major components of the telecommunications network, cables do not physically deteriorate with use or because of passage of time.

As a result of the maintenance activities described above, there are no known trouble spots in Verizon MA's network in the Town.

### **IV. ADDITIONAL NETWORK INFRASTRUCTURE INFORMATION**

In February 2008, Verizon MA announced it was expanding High Speed Internet access to 23 communities in Western Massachusetts. Middlefield is one of those communities. As a result, Verizon MA is upgrading two of the Remote Terminals serving the town. In addition to the upgrade of the Remote Terminals, they will also be served by fiber optic cables enhancing service quality for all customers served by the Remote Terminals. The High Speed Internet expansion project also requires Verizon MA to perform additional work in the Becket central office which serves Middlefield. This expansion addresses the service quality concerns raised by Middlefield residents associated with their dial-up internet access service.

Dated: June 30, 2008

Town	Location	Pole Number	Classification	Condition Found	Corrective Action	Date Completed
Middlefield	Chester Rd	P 5	Lashing Wire	Lashing Wire Broken	Relash	5/19/2008
Middlefield	Alderman Rd	P 23-24	Lashing Wire	Lashing Wire Broken	Relash	5/19/2008
Middlefield	Main Rd	P 17	Lashing Wire	Lashing Wire Broken	Relash	5/19/2008
Middlefield	Main Rd	P 13-14	Lashing Wire	Lashing Wire Broken	Relash	5/20/2208
Middlefield	Town Hill Rd	P 124 1/2 -126	Lashing Wire	Lashing Wire Broken	Relash	5/20/2208
Middlefield	Town Hill Rd	P 19-20	Lashing Wire	Lashing Wire Broken	Relash	5/20/2208
Middlefield	Town Hill Rd	P 40=42	Lashing Wire	Lashing Wire Broken	Relash	5/20/2208
Middlefield	Town Hill Rd	P 44- 47	Lashing Wire	Lashing Wire Broken	Relash	5/20/2208
Middlefield	Bell Rd	P 1-2	Lashing Wire	Lashing Wire Broken	Relash	5/21/2008
Middlefield	Bell Rd	P 9-10	Lashing Wire	Lashing Wire Broken	Relash	5/21/2008
Middlefield	Chipman	P 291/2-3	Lashing Wire	Lashing Wire Broken	Relash	5/21/2008
Middlefield	Chipman	P 9-11	Lashing Wire	Lashing Wire Broken	Relash	5/21/2008
Middlefield	E River Rd	P 292/85	Lashing Wire	Lashing Wire Broken	Relash	5/21/2008
Middlefield	Main Rd	P 12	Open Plant - splice closure	Splice Open	Place 3M closure. Make over deteriorated conductors.	6/4/2008
Middlefield	Main Rd	P 24	Open Plant - splice closure	Splice Open	Place 3M closure. Make over deteriorated conductors.	6/2/2008
Middlefield	Main Rd	P 47-48	Open Plant - splice closure	Splice Open	Place 3M closure. Make over deteriorated conductors.	5/30/2008
Middlefield	Town Hill Rd	P125	Open Plant - splice closure	Splice Open	Place 3M closure. Make over deteriorated conductors.	5/30/2008
Middlefield	Town Hill Rd	P 2/120	Open Plant - splice closure	Splice Open	Place 3M closure. Make over deteriorated conductors.	5/29/2008
Middlefield	Town Hill Rd	P 111	Open Plant - splice closure	Splice Open	Place 3M closure. Make over deteriorated conductors.	5/29/2008
Middlefield	Town Hill Rd	P 107	Open Plant - splice closure	Splice Open	Place 3M closure. Make over deteriorated conductors.	5/27/2008
Middlefield	Town Hill Rd	P 43	Open Plant - splice closure	Splice Open	Place 3M closure. Make over deteriorated conductors.	5/26/2008
Middlefield	Town Hill Rd	P 62-63	Open Plant - splice closure	Splice Open	Place 3M closure. Make over deteriorated conductors.	5/26/2008
Middlefield	Reservoir Rd	P 100	Open Plant - splice closure	Splice Open Closure to small	Place 3M closure. Make over deteriorated conductors.	5/22/2008
Middlefield	Reservoir Rd	P 58	Open Plant - splice closure	Splice Open Closure to small	Place 3M closure. Make over deteriorated conductors.	5/22/2008
Middlefield	Chester Rd	P 3	Open Plant - serving terminal	105 Terminal End Cap Open	Close. Place tie wraps.	5/20/2008
Middlefield	Alderman Rd	P 281/12	Open Plant - serving terminal	Ready Access Terminal Wire Hanging Out	8 Step, make over deteriorated conductors & Close	5/29/2008
Middlefield	Alderman Rd	P 25	Open Plant - serving terminal	Ready Access Terminal Open	8 Step, make over deteriorated conductors & Close	5/22/2008
Middlefield	Main Rd	P 28/54	Open Plant - serving terminal	Ready Access Terminal Open	8 Step, make over deteriorated conductors & Close	5/27/2008
Middlefield	Main Rd	P 22	Open Plant - serving terminal	Ready Access Terminal Open	8 Step, make over deteriorated conductors & Close	6/6/2008
Middlefield	Main Rd	P 16	Open Plant - serving terminal	Strand Mounted Terminal open	Close. Place tie wraps.	6/3/2008
Middlefield	Main Rd	P 27/1	Open Plant - serving terminal	Ready Access Terminal Open	8 Step, make over deteriorated conductors & Close	6/5/2008
Middlefield	Main Rd	P 6	Open Plant - serving terminal	Ready Access Terminal Pulled Apart	Place 3M ITC (Intergrated terminal closure). Make over conductors. Recon drops. 3M extension may be needed.	6/5/2208

Town	Location	Pole Number	Classification	Condition Found	Corrective Action	Date Completed
Middlefield	Main Rd	P7	Open Plant - serving terminal	Ready Access Terminal Pulled Apart	Place 3M ITC (Intergrated terminal closure). Make over conductors. Recon drops. 3M extension may be needed.	6/6/2008
Middlefield	Main Rd	P 8-9	Open Plant - serving terminal	Ready Access Terminal Open	8 Step, make over deteriorated conductors & Close	6/3/2008
Middlefield	Main Rd	P 16	Open Plant - serving terminal	Ready Access Terminal Open	8 Step, make over deteriorated conductors & Close	6/3/2008
Middlefield	Main Rd	P 42	Open Plant - serving terminal	Ready Access Terminal Open	8 Step, make over deteriorated conductors & Close	6/2/2008
Middlefield	Town Hill Rd	P 25/8	Open Plant - serving terminal	Ready Access Terminal Open	8 Step, make over deteriorated conductors & Close	5/27/2008
Middlefield	Town Hill Rd	P 59	Open Plant - serving terminal	Ready Access Terminal Open	8 Step, make over deteriorated conductors & Close	5/26/2008
Middlefield	Town Hill Rd	P 78	Open Plant - serving terminal	Pole Mounted Terminalinal Open	Close	5/22/2008
Middlefield	Bell Rd	P 4	Open Plant - serving terminal	Ready Access Terminal Open	8 Step, make over deteriorated conductors & Close	5/21/2008
Middlefield	Arthur Pease Rd	P 19-20	Open Plant - serving terminal	Pole Mounted Terminalinal Open	Close	5/21/2008
Middlefield	Chipman	P 25	Open Plant - serving terminal	Pole Mounted Terminalinal Open	Close	5/20/2008
Middlefield	Chipman	P 291/ 2-3	Sheath Damage	Sheath Damaged	Place 3M closure. Make over deteriorated conductors.	5/21/2008
Middlefield	Clarke Wright Rd	P 8/15-16	Sheath Damage	Cable Hiting Tree	Inspect for sheath / conductor damage. Place Tree Guard	5/20/2008

<b>CABLES IN MIDDLEFIELD</b>			
<u>Street Name</u>	<u>Cable</u>	<u>Length</u>	<u>Year Placed</u>
	<u>Type/Size</u>		
Becket Rd	BKMA-25	195	1988
	ANAW-100	1490	2002
	ANAW-100	3630	2002
	ANAW-100	3640	2002
	48 FBR CA	8955	2002
West Hill Rd	ANAW-100	3640	2002
	48 FBR CA	3640	2002
	ANAW-100	730	2002
	BKMA-25	4422	1981
	BHBS-16	1756	1971
Reservoir Rd	48 FBR CA	3643	2002
	ANAW-400	2245	2002
	BHAA-200	1998	1987
	KHAH-54	600	1990
Off P 104	12 FBR CA	100	2002
Off P 104	AFTY-600	75	1990
Town Hill Rd	KHAH-54	4246	1990
	BHAA-100	3830	1971
	BHAA-100	4000	1971
	BHBA-50	3877	1971
	BHBA-50	523	1983
	BHBA-50	4163	1971
	BHBA-50	215	1971
	BHAA-75	4397	1962
	BHBA-50	4331	1958
	BHAA-200	543	1981
	BKMA-300	543	1990
Off P 126	BHAA-200	50	1988
Off P 126	BHAA-200	50	1983
West Hill Farm Rd	BHAA-25	2120	1981
Harry Pease Rd	BHAA-25	3782	1978
Main Rd	BKMA-300	312	1990
	BHAA-200	296	1981
	BKMA-100	6195	1990
	BHBA-50	654	1959
	BHAA-50	1496	1962
	BHAA-25	3251	1964
	BHAA-25	428	1981

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Attachment 2

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	BHAA-25	2272	1964
	BHBA-16	4239	1964
	BKMA-100	6380	1990
	BHBA-25	3115	1978
	BHAA-50	2525	1967
	BKMA-100	2510	1989
	BHAA-50	1965	1967
	BHAA-50	620	1981
	BHAA-50	1582	1967
	BKMA-100	4167	1990
	BHAA-100	225	2002
	BHAA-100	125	2002
	BHAA-25	192	1980
	BHAA-25	1873	1970
	BKMA-50	1767	1992
	BKMA-100	25	1992
	BHAA-25	1302	1981
	BHAA-25	1217	1990
	BHAS-25	1884	1970
Bell Rd	BHBA-50	416	1967
	BHBA-50	4570	1967
	BKMA-100	4986	1992
	BHBA-50	4986	1987
Off P 9	BKMS-25	240	1992
Arthur Pease Rd	BHBA-25	4081	1979
	BHBA-25	1048	1990
	BHBA-50	745	1967
	BHBA-50	2655	1967
	BKMA-100	984	1992
	BKMA-50	1470	1990
	BKMA-50	1860	1992
	BHBS-25	1861	1965
Root Rd	BHBA-50	796	1967
	BHBA-50	864	1992
	BHBA-50	1494	1967
	BKMA-100	2500	1992
	BKMA-100	864	1992
Off P 26	BHAA-50	1170	2000
Chipman Rd	BHBS-25	3676	1966
	BKMA-100	2756	1992
	BHBA-50	1952	1989
	BKMA-200	600	2003
	BKMA-100	1090	1992
	BKMA-100	4780	1992
Off P 16	AFTY-600	65	1992

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Clark Wright Rd	BKMA-50	2540	1997
	BKMA-50	3130	1998
	BHBS-11	2510	1971
	BHBS-11	1760	1972
East River Rd	BHBA-50	960	1992
	BHBA-16	4935	1975
Chester Rd	BHAA-50	1410	1998
	BHAA-100	1255	1998
	BHBA-100	859	1989
	BHBA-100	427	1995
	BHBA-50	2541	1994
Off P 6	BHAA-50	50	1998
Alderman Rd	BHBS-11	770	1971
	BHBA-25	4044	1973
	BHBA-50	188	1973
Berkshire Inn Rd	BHAA-25	1965	1982