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OF THE STATE OF CALIFORNIA



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Order Instituting Rulemaking To Evaluate
Telecommunications Corporations Service
Quality Performance and Consider
Modification to Service Quality Rules.

Rulemaking 11-12-001
(Filed December 1, 2011)

**COMMENTS OF THE OFFICE OF RATEPAYER ADVOCATES ON
COMMUNICATIONS DIVISION'S SEPTEMBER 2014 STAFF REPORT
ON CALIFORNIA WIRELINE TELEPHONE SERVICE QUALITY**

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I. INTRODUCTION

Pursuant to the September 24, 2014 *Assigned Commissioner's Amended Scoping Memo and Ruling* ("Amended Scoping Memo"), the Office of Ratepayer Advocates ("ORA")¹ submits the following comments in general support of the California Public Utilities Commission's ("CPUC or "Commission") Communications Division's ("CD") conclusions and recommendations set forth in its September 2014 Staff Report, *California Wireline Telephone Service Quality Pursuant to General Order 133-C Calendar Years 2010 through 2013* ("Staff Report"). These comments will focus on several key CD Staff recommendations that ORA supports because they would make the service quality rules more consistent, comprehensive, and effective. In addition, to better assist consumers, the Commission should consider publishing comparative information on carriers' service quality performances, and should order routine and independent audits of carriers' performances.

II. BACKGROUND

In D.09-07-019, the Commission adopted General Order ("G.O.") 133-C, which established uniform minimum standards of service for telephone corporations. Specifically, G.O. 133-C includes five measures of service quality and their respective standards,² which carriers are expected to meet:

- (1) telephone service installation intervals (five business days);
- (2) installation commitments (95%);
- (3) customer trouble reports (six reports per 100 lines for reporting units with 3,000 or more working lines; eight

¹ ORA was formerly known as the Division of Ratepayer Advocates.

² According to D.09-07-019, "[m]easures are the aspects or features of service subject to evaluation and reporting. Standards are the minimum acceptable values that measures must meet to be in compliance with the Commission's requirements. Existing measures include held primary service orders, installation-line energizing commitments, trouble reports, dial tone speed, dial service, toll operator answering time, directory assistance operator answering time, trouble report service answering time, and business office answering time." D.09-07-019, *mimeo*, at p. 2, n. 1.

reports per 100 working lines for reporting units with 1,001-2,999 working lines; and ten reports per 100 working lines for reporting units with 1,000 or fewer working lines);

- (4) out of service repair intervals (90% within 24 hours excluding Sundays and federal holidays, catastrophic events and widespread outages); and
- (5) answer time (80% within 60 seconds related to trouble reports and billing and non-billing issues) with the option to speak to a live agent, preferably in the first set of options (reporting units are limited to traffic offices with 10,000 or more lines).³

G.O. 133-C's five measures and standards became effective January 1, 2010.

The Staff Report discusses the service quality results for California wireline telecommunications carriers for calendar years 2010 through 2013, based on data submitted pursuant to the measures and standards established in G.O. 133-C.⁴

On September 24, 2014, the Assigned Commissioner issued the Amended Scoping Memo, requesting parties to "address the conclusions and recommendations made in the Staff Report," and further noting that "[t]he comments and reply comments will be used to develop a proposal for changes to the Commission's service quality rules, practices, and policies."⁵

In addition, in D.13-02-023, the Commission ordered the largest incumbent local exchange carriers to fund an evaluation of their telecommunications facilities.⁶ This evaluation is still pending, but the results of the evaluation should also be considered in any proposal for changes to General Order 133-C.

³ D.09-07-019, *mimeo*, Conclusion of Law 5 at 89.

⁴ California Wireline Telephone Service Quality Communications Division Staff Report, September 2014, R.11-12-001 [hereinafter "CD Staff Report"] at p. 1. In March 2011, CD staff issued a similar report that analyzed service quality results for 2010. See *ibid*.

⁵ Amended Scoping Memo at 3.

⁶ Amended Scoping Memo at 2.

III. MODIFICATIONS TO GENERAL ORDER 133-C

A. CD Staff's Recommendation to Use Unadjusted Raw Data Should Be Adopted

The CD Staff's recommendation to use unadjusted raw data results for calculating and reporting outage duration should be adopted.⁷ ORA also supports CD's recommendation that the Commission should not count customer-requested appointments as part of a service provider's outage duration.

Current rules governing exclusions of data have resulted in adjusted results that do not accurately portray what customers actually experience. For example, ORA conversations with carrier service repair employees and discovery earlier in this proceeding,⁸ show how adjusted results can be adjusted by excluding long repair intervals under the rubric of "occurring under circumstances beyond the carrier's control." This type of adjustment improved the Out-of-Service ("OOS") repair interval times in appearance, but gave an inaccurate picture of service quality performance. It also meant that the Commission was relying on data with inconsistent reporting methods across carriers.

It is not clear from Staff's Report whether the carriers have met the service quality standards on a monthly basis because the Staff Report only includes annual data.⁹ Carriers should not have discretion to adjust their data because such discretion provides an opportunity for data to be adjusted to appear to meet G.O. 133-C standards. The Commission and parties in this proceeding still await the study of AT&T and Verizon infrastructure, which is expected to provide more complete data regarding those carriers'

⁷ CD Staff Report at pp. 15, 26.

⁸ See Reply Comments of the Division of Ratepayer Advocates on Order Instituting Rulemaking to Evaluate Telecommunications Corporations Service Quality Performance and Consider Modification to Service Quality Rules, R.11-12-011 (March 1, 2012) at pp. 21-22.

⁹ Note that G.O. 133-C's standards are set on a monthly basis but reported quarterly, with the exception of the standard regarding answer time for trouble reports and billing and non-billing inquiries, which is compiled quarterly and reported annually.

redirection of investments from basic telephone services to higher end services.¹⁰ ORA, therefore, agrees with Staff's recommendation for using unadjusted data.¹¹

In addition, the Commission should, as part of its consideration of incentive methodologies, adopt a new service quality rule that would require carriers to compensate customers for OOS repairs that exceed the Commission repair interval standard by a prescribed amount. This is needed because there appears to be, at least for AT&T and Verizon, consistent geographic concentration of the longest repair intervals in particular wire centers.¹² Specifically, ORA's Geographic Information Systems mapping of raw repair interval data by wire center revealed the persistence of extremely long repair times in particular mountain and desert wire centers.¹³ Small LECs in similar geographies consistently met the standards, indicating that the problem is unlikely to be simply one of distance and topography.¹⁴ The Commission should adopt some type of compensation to customers as an incentive for non-compliant carriers to improve their repair times, while at the same time reimbursing affected consumers for the harm of unreasonably long service interruptions.

B. CD Staff's Recommendation Related to the Reporting of 9-1-1 and Catastrophic Events Should Be Adopted

The Commission should adopt CD Staff's recommendation to establish a standard to determine how long the duration of catastrophic events and widespread service outages need to be in order to allow such events or outages to be used to exempt carriers from reporting standards.¹⁵ Because states of emergency and/or catastrophic events are currently exempted from reporting standards, service providers are able to adjust data to

¹⁰ D.13-02-023 at pp. 2-3.

¹¹ CD Staff Report at p. 15.

¹² See R.02-12-004, Joint Comments of the Division of Ratepayer Advocates and The Utility Reform On Commissioner Chong's Proposed Decision Adopting General Order 133-C and Addressing Other Telecommunications Service Quality Reporting Requirements, May 11, 2009, at 9-12 and Attachment 2.

¹³ *Id.* at 11.

¹⁴ *Id.* at 12.

¹⁵ CD Staff Report at pp. 24-25, 27.

avoid reporting outages purportedly related to a catastrophic event or emergency. CD Staff's recommendation would provide clarity as to when a state of emergency and/or catastrophic event actually begins and ends, thus limiting the ability of service providers to inappropriately exclude reporting certain outages.¹⁶

As discussed in the Staff Report, the Commission has no established standards to measure or report 9-1-1 outages.¹⁷ Instead, the only requirement for carriers is to provide copies of the Federal Communications Commission's ("FCC's") Network Outage Reporting System ("NORS") reports to the Commission.¹⁸ However, these reports are currently produced to the Commission in email format and present the outage data in a manner that is of limited value. Therefore, ORA recommends that the Commission consider refining this requirement so that the NORS reports are produced in a more useful format, such as in an excel file.

The Commission has also had a Petition pending before the FCC for the last four years seeking direct access to the FCC's NORS database. Direct access to the NORS database would eliminate the current issues with the NORS reports the CPUC receives. However, unless and until that Petition is granted, the CPUC should consider adopting requirements for reporting outages, as recommended in the Staff Report.¹⁹ A more specific discussion of the reporting outage requirements that the Commission should adopt is included below.

C. Additional Recommendations on Reporting of Outages including 9-1-1 and Catastrophic Events

In addition to CD Staff's recommendations, the Commission should establish: (a) service quality standards for 9-1-1 outages, as well as catastrophic and widespread outages; and (b) reporting requirements on those outages. The Commission should apply these standards and requirements to all service providers regardless of the technology

¹⁶ *Id.* at p. 25.

¹⁷ *Id.* at p. 24.

¹⁸ *Ibid.*

¹⁹ *See id.* at p. 26.

used, including wireline and wireless voice (including interconnected and over-the-top VoIP) and broadband internet access:

1. **Definition of “outage”:** The CPUC should adopt the FCC’s “outage” definition because it addresses various technology platforms.²⁰
2. **State-level standards for reporting outages:** The CPUC should adopt threshold criteria for outage reporting that are meaningful for California. For instance, the FCC’s outage reporting threshold criteria for interconnected VoIP service providers applies when an outage of at least 30 minutes in duration potentially affects at least 900,000 user minutes of interconnected VoIP service. While this particular threshold might be too high to determine impacts to California consumers, it provides a starting point to develop recommendations for performance improvement.
3. **Service Quality standards for 9-1-1 and catastrophic/widespread outages:** The Commission should establish service quality standards for 9-1-1 and catastrophic/widespread outages. Those standards should apply to all service providers including wireline, wireless voice (including interconnected and over-the-top VoIP), and broadband internet access services, regardless of the technology used. These standards²¹ should be set at the state level and should take into account:
 - a. the number of affected users and/or facilitates;
 - b. the duration of an outage;
 - c. response time to restoration of services;
 - d. notification times to the Commission;
 - e. notification times to affected users/facilitates; and
 - f. frequency of reoccurrence of outages by service location.
4. **Reporting requirements for outages:** Outage reporting requirements should be established and applied to all service providers regardless of technology, including wireline and wireless voice (including interconnected and over-the-top VoIP) and broadband internet access services. This should include formats and frequency of reporting that can be developed with industry and stakeholders’ input.

²⁰ The FCC defines “outage” as “a significant degradation in the ability of an end user to establish and maintain a channel of communications as a result of failure or degradation in the performance of a communication provider’s network.” 47 C.F.R. § 4.5 (a).

²¹ Although the FCC has established reporting requirements for outages and threshold criteria (47 C.F.R. Part 4 and threshold criteria § 4.9), the Commission should consider establishing standards and assessing the threshold criteria based on California’s specific market and consumer needs.

IV. ADDITIONAL RECOMMENDATIONS ON REPORTING PERFORMANCE

In addition to CD Staff's recommendations pertaining to the analysis of G.O.133-C performance results, the Commission should provide consumers with comparative results on the performance of individual service providers regardless of technology, including wireline, wireless voice (including interconnected and over-the-top VoIP), and broadband internet access services. These comparative results should include customer satisfaction survey results that the Commission should publish on a regular basis. Published and widely available comparative results on service performance and customer satisfaction survey outcomes by service provider will enhance consumers' ability to make informed decisions.

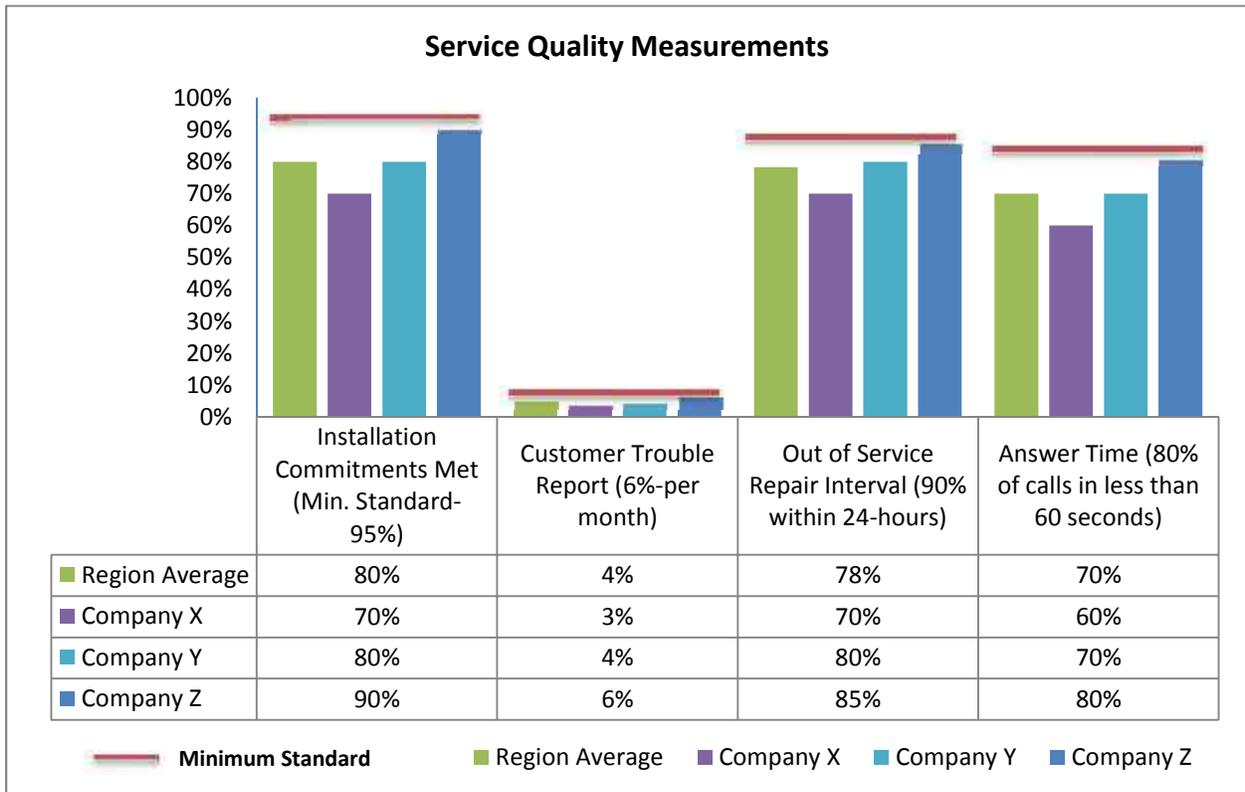
A. Visibility and Accessibility of Service Quality Information to Consumers

Currently, there is no published *comparative* data on performance of service providers, and consumers are left to conduct their own research based on published data on a provider's own website and/or purchase studies that could cost thousands of dollars. The Commission should publish and make widely available comparative service quality performance and customer satisfaction survey outcomes by service provider. This information should be displayed on the Commission's website and distributed to consumers through regularly issued press releases.²²

This information can show both the state average and the performance outcomes of individual service providers. The chart below illustrates how comparative service quality performance outcomes can be displayed.

²² For example, the FCC issues press releases on quality of service of local phone companies: http://transition.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/QualSvc/qual02.pdf

Illustrative Chart of Graphical Presentation of Comparative Service Quality Performance



Presenting service quality data in a comparative chart allows consumers to immediately compare the relevant service quality performance of each company. The ability to compare data would allow consumers to make informed buying decisions without having to conduct their own research into technical issues. This is particularly important given that consumers may not have access to all of the relevant information they would need to make such an assessment.

Publishing comparative data on service quality and customer satisfaction could serve to increase the competition between service providers and motivate providers to improve service quality performance.

B. Customer Satisfaction Surveys

Currently, ORA is not aware of any published, free information on consumer satisfaction surveys related to service providers in California.

In the past, the FCC's Automated Reporting Management Information System ("ARMIS") collected various data from the largest carriers, including customer satisfaction reports.²³ However, ARMIS filing requirements have been reduced significantly and carriers are not currently required to file customer satisfaction reports. The loss of such reporting requirements necessitates the Commission filling in this data gap through the creation of additional California-specific service quality metrics. It should also be noted that the carriers previously persuaded the CPUC to eliminate monitoring reports in favor of relying on the then-existing ARMIS reports. Subsequently, the carriers successfully persuaded the FCC to eliminate many of the ARMIS reports.

Customer satisfaction surveys should capture service quality metrics that are of significance to consumers. Such metrics could encompass a wider range of issues of importance to consumers than those currently captured by the G.O. 133-C rules. Customer-related concerns could encompass a spectrum of issues related to performance and reliability, such as promptness on providing or restoring a service, call quality, frequency of dropped calls, and the variety of services offered. Additional metrics should include the cost of services and billing issues such as initiation and termination fees, equipment fees, bundled services, clarity of information on a bill, and contractual terms and conditions.

To this end, the Commission should conduct a preliminary study, through an independent consultant(s), to establish the methodology and criteria for service quality related customer satisfaction surveys on all communication services including wireline, wireless voice (including interconnected and over-the-top VoIP), and broadband services. This preliminary study would establish the criteria that are significant to consumers in order to enable the Commission to create meaningful customer satisfaction surveys.

²³ Federal Communications Commission, <http://transition.fcc.gov/wcb/armis/>

V. TECHNOLOGY-NEUTRAL SERVICE QUALITY STANDARDS

A. CD Staff's Recommendation for Technology-Neutral Service Quality Standards Should Be Adopted

The CD Staff's recommendation to apply service quality standards to interconnected VoIP and wireless carriers should be adopted, as doing so would advance safe and reliable technology-neutral voice services. As the CD Staff Report notes, "[w]ith more and more customers shifting from wireline service to interconnected VoIP and wireless services," it is all the more important for the Commission to address service quality for VoIP and wireless services.²⁴

B. Additional Recommendations on Technology-Neutral Service Quality Standards

The Commission should also adopt technology-neutral service quality standards. Developing technology-neutral service quality standards is particularly important given the migration of consumers from traditional telephone services to relatively new communications services such as wireless and interconnected VoIP.

1. Consumer Protection, Safety and Service Reliability

As the CD Staff Report demonstrates, the current G.O. 133-C service quality rules do not address service quality issues related to wireless and VoIP communication technologies.²⁵ For instance, there are no existing adopted standards for reliability for interconnected VoIP or wireless services. The Public Switched Telephone Network ("PSTN") is designed to carry voice over circuit switched networks with sophisticated engineering protocols to ensure redundancy and reliability. With the PSTN, consumers have access to 9-1-1 services with a high degree of reliability. The continuous increase in consumer migration from wireline to wireless and VoIP services places such consumers at risk, as there are no existing Commission service quality rules or standards that address consumer protection, safety, and service reliability for these service providers (other than

²⁴ CD Staff Report at p. 21.

²⁵ *Id.* at p. 21.

the Commission’s requirements regarding the provision of information on battery back-up requirements to VoIP consumers and accurate coverage maps for wireless consumers).

In a recent report issued by the FCC titled “*April 2014 Multistate 911 Outage: Cause and Impact*,”²⁶ a preventable software coding error that occurred at one location²⁷ affected 81 Public Safety Answering Point in seven states, including Washington, North Carolina, South Carolina, Pennsylvania, California, Minnesota, and Florida. According to the report, over 11 million Americans or about three and half percent of the population of the United States, were at risk of not being able to reach emergency services through dialing 9-1-1. In fact, about 88% of a total of 6,410 attempted calls to 9-1-1 in Washington, Minnesota, and North Carolina failed.²⁸ About 71% of those failed calls were VoIP and wireless, while 29% were wireline calls. This example illustrates the importance of setting strict standards to address all public safety regardless of the type of technology used to make calls. As stated in the report:

*The introduction of [Next Generation 911] NG911 and IP-based technologies will require industry as well as state, local, tribal and territorial governments and commissions to move aggressively to ensure that technology enabled optimization does not introduce unacceptable risks that threaten imperiling 911 reliability and resiliency. Everyone has a role in ensuring that 911 works as it should, when it is most needed.*²⁹

Therefore, as public safety and service reliability is paramount, the Commission should establish service quality standards that are technology-neutral and apply to all

²⁶ April 2014 Multistate 911 Outage: Cause and Impact, Report and Recommendations. Public Safety Docket No. 14-72. PSHSB Case File Nos. 14-CCR-0001-0007 at <http://www.fcc.gov/document/april-2014-multistate-911-outage-report>

²⁷ The fault occurred at Colorado-based Intrado, Inc.’s Englewood Emergency Call Management Center.

²⁸ According to the referenced report, about one-thousand additional calls failed in California, Florida, Pennsylvania, and South Carolina.

²⁹ April 2014 Multistate 911 Outage: Cause and Impact, Report and Recommendations. Public Safety Docket No. 14-72. PSHSB Case File Nos. 14-CCR-0001-0007 (page 2) at <http://www.fcc.gov/document/april-2014-multistate-911-outage-report> (emphasis in the original).

communications infrastructure. These service quality standards should also apply to broadband internet access because it is fast becoming the “pipe” over which multiple communications services are carried, including voice (interconnected and over-the-top VoIP). The ability to summon help in an emergency situation is no less important for telephone customers utilizing services carried over broadband internet access “pipes.” These standards should require service providers to:

- a) Have networks designed to prioritize public safety traffic and 9-1-1 services;
- b) Effectively educate customers regarding the limitations and risks of the their respective services;³⁰ and
- c) Provide backup batteries or information on where to obtain backup batteries to their customers, in the case of emergencies and power interruptions.

All of these minimum requirements are consistent with the Commission’s mandate to ensure that the state’s communications infrastructure is reliable and maintained and operated in a manner that promotes the health and safety of Californians.³¹

2. Fundamental Service Quality Standards

According to the International Telecommunication Union (“ITU-T”), quality of service is defined as the “totality of characteristics of a telecommunications service that bear on its ability to satisfy stated and implied needs of user of the service.”³² Quality of service comprises both network performance pertaining to quality of service provided and achieved by the service providers, such as bit-error rate, latency, etc., as well as

³⁰ The Commission ordered service providers who provide services that require backup power on the customer’s premises to enhance or implement a customer education program to comply with customer education and outreach guidelines specified in Decision 10-01-026: *Decision Adopting Guidelines for Customer Education Programs Regarding Backup Power Systems Pursuant to Assembly Bill 2393* (Rulemaking 07-04-015).

³¹ See Pub. Util. Code § 451, which states in relevant part: “Every public utility shall furnish and maintain such adequate, efficient, just, and reasonable service, instrumentalities, equipment, and facilities, including telephone facilities, as defined in Section 54.1 of the Civil Code, as are necessary to promote the safety, health, comfort, and convenience of its patrons, employees, and the public.”

³² ITU-T Recommendation E.800, Definition of terms related to quality of service, September 2008, at <http://www.itu.int/rec/T-REC-E.800-200809-I>

non-network performance pertaining to the quality of service experienced by the user, such as provision time, repair time, and complaint resolution time.³³

The end-to-end quality of service depends on the contribution made by the various components of services including core network, access network, and terminal equipment (for voice service, it is equivalent to “mouth-to-ear quality”).³⁴ Quality of service contribution to end-to-end performance from a core network will be governed by the contributions from individual network components (whether single or multiple providers), the technology used (digital multiplexing, IP, etc.), and the transmission media (air, cable optical or metal), among other factors.³⁵

To ensure end-to-end quality of service, the Commission should extend to all service providers - including wireless and VoIP service providers - that contribute to all components of a network the requirement that providers should be required to terminate traffic regardless of whether they are involved in a commercial dispute.³⁶ The California rule, adopted in D.97-11-024, was a response to a carrier practice of refusing to complete calls because of disputes over the inter-carrier compensation arrangements. The Commission should also apply this call-termination standard to interconnected and over-the-top VoIP providers and broadband internet access providers, who should also not be permitted to use interconnection disputes to block or degrade traffic.³⁷ This will provide consumers with the assurance that their traffic, particularly real time public safety traffic, will flow unimpeded across multiple networks.

³³ *Id.*

³⁴ *Id.*

³⁵ *Id.*

³⁶ See e.g. D.97-11-024 at <ftp://ftp2.cpuc.ca.gov/Telco/Important%20Decisions/D.97-11-024.pdf>

³⁷ See also Pub. Util. Code § 558 (“Every telephone corporation and telegraph corporation operating in the State shall receive, transmit, and deliver without discrimination or delay, the conversations and messages of every other such corporation with whose lines a physical connection has been made.”).

The current service quality rules in G.O. 133-C address a limited set of quality of service elements for non-network performance. ORA recommends³⁸ that the Commission consider fundamental service quality metrics as experienced by the customers/users (i.e., non-network quality of service elements), regardless of the type of technology (i.e., wireline wireless voice, including interconnected and over-the-top VoIP, and broadband internet access technologies). These fundamental service quality metrics, based on ITU-T³⁹ definitions of terms related to service quality, should include, but not be limited to, the following:

1. **Service provision:**⁴⁰ including all activities related to a carrier's *provisioning* of a service (measures may include mean service provisioning time) as well as all activities associated with *cessation* of a service by a service provider.
2. **Call set-up:** including measures such as:
 - **Call set-up time:** the period starting when the address information required for setting up a call is received by the network and finishing when the called party busy tone, or ringing tone or answer signal, is received by the calling party.
 - **Service accessibility performance:** the ability of a service to be obtained when the user requests it.
 - **Mean service access delay:** the expectation of the call duration between the moment of the customer's initial bid attempt to use a service and the instant the user has access to the service. In essence, the customer should be able to obtain the service within specific tolerances and other given operating conditions.
3. **Call Progress:** including measures such as:
 - **Interruption (break of service):** temporary failure of a service that persists for more than a specified time duration, characterized by a

³⁸ These elements could be considered in addition to the current G.O. 133-C or could be used to modify the current G.O. 133-C rules.

³⁹ ITU-T Recommendation E.800, Definition of terms related to quality of service, September 2008, at <http://www.itu.int/rec/T-REC-E.800-200809-I>

⁴⁰ An additional measure of overall service quality is service integrity performance: the degree to which a service is provided without excessive impairment; once obtained- an acceptable level of impairments has to be specified.

change beyond given limits in at least one parameter essential to the service.⁴¹

- **Quality of service variable:** any performance variable,⁴² such as congestion, delay etc., which is perceivable by a user.

4. **Service restoration/repair:** including measures such as:

- **Service restoration:** a set of automated or manual methods, invoked after service failure related to network and/or non-network issues,⁴³ to enable successful communications to be restored.
- **Repair (corrective maintenance):** the maintenance carried out after fault recognition and intended to restore an item to a state where a required function can be performed.

5. **Speed:** performance criterion that describes the time interval that is used to perform the function or the rate at which the function is performed (the function may or may not be performed with the desired accuracy).

6. **Accuracy:** performance criterion that describes the degree of correctness with which the function is performed (the function may or may not be performed with the desired speed).

7. **Dependability:** performance criterion that describes the degree of certainty with which the function is performed regardless of speed or accuracy, but with a given observation interval.

8. **Availability:** availability of an item to be in a state to perform a required function at a given or any instant of time within a given time interval, assuming the external resources, if required, are available.

9. **Reliability:** the probability that an item can perform a required function under stated conditions for a given interval.

10. **Simplicity:** ease and lack of complexity to the benefit of the user of a function of service utilization.

11. **Charging and Billing:** charging measures include incorrect charging or accounting probability (the probability that a call attempt receiving

⁴¹ An interruption of a service is generally an interruption of the transmission, which may be characterized by abnormal value of power level, noise level, signal distortion, error rate, etc. Interruption may also be caused by disabled states of the items used for the service or external reasons such as high service demand.

⁴² Other measures may include speech quality, speech transmission quality, conversational quality, and conversational speech quality.

⁴³ Service failure may involve failure of network elements, failure of functionalities, and/or human errors causing disconnections of service.

incorrect charging or accounting treatment); undercharging probability (the probability that a call attempt will be undercharged for any reason); overcharging probability (the probability that a call attempt will be overcharged for any reason). Billing measures include: billing error probability (the probability of an error when billing a user of a service), and billing integrity (the probability that the billing information presented to a user correctly reflects the type, destination, and duration of the call attempt).

The above list of fundamental service quality metrics should be addressed when setting up service quality standards for all service providers regardless of the technology provided. For instance, to address reliability metrics, standards for fixed telecommunication services might state unsuccessful call ratio (for example, less than 1% dropped calls at peak hour usage), whereas more than one metric would be required for other technologies such as unsuccessful call ratio, dropped calls rate, latency effects, etc.

The quality of service pertaining to network performance depends on the various components of network architecture and transmission efficiency. For example, the quality of service level of VoIP applications depends on many parameters, such as bandwidth, One Way Delay, jitter, Packet Loss Rate, and voice data length.⁴⁴ ORA agrees with Staff's recommendation that the specific details of the changes to the service quality rules should be developed with industry and other stakeholder input.⁴⁵ In addition, the Commission should establish benchmarks for evaluating the performance of service providers that take into account end-to-end service quality metrics, including elements of network performance and non-network performance.

Finally, the Commission should consider adopting service quality standards for over-the-top VoIP services, such as Vonage, and for broadband Internet access services, including standards that address public safety and 9-1-1.

⁴⁴ H. Toral-Cruz, J. Arguez-Xool, L. Estrada-Vargas and D. Torres-Roman (2011). An Introduction to VoIP: End-to-End Elements and QoS Parameters, VoIP Technologies, Dr Shigeru Kashihara (Ed.), ISBN: 978-953-307-549-5, InTech, Available from: <http://cdn.intechopen.com/pdfs-wm/13379.pdf>

⁴⁵ CD Staff Report at p. 3.

VI. PENALTY/INCENTIVE METHODOLOGIES

A. CD Staff's Recommendation for Penalties Should Be Adopted

CD Staff's recommendation to establish a penalty methodology that takes into consideration the size of the carrier in some manner, such as number of access lines or intrastate revenues, is sensible.⁴⁶ The CD Staff Report, as discussed above, highlights real and practical concerns over the conduct of service providers that engage in highly subjective interpretations of certain requirements, such as catastrophic events and widespread service outages. Establishing clear definitions of terms and standards, as well as measurement methodologies and reporting requirements, while necessary, would have limited effect if the Commission does not institute and enforce a penalty structure.

The CD Staff Report makes clear that current requirements are insufficient to improve service even under the minimal G.O. 133-C standards. As the CD Staff Report demonstrates, most of the URF carriers (especially AT&T and Verizon) have failed to meet OOS repair interval and answer time measures.

B. Additional Recommendations to Ensure Reporting Accuracy and Accountability

Currently, G.O. 133-C lacks a mechanism for the Commission to ensure that carriers are reporting accurate data and calculating that data in a consistent manner. Therefore, in addition to CD Staff's recommendations, the Commission should establish a process for auditing service providers on quality of service measurements and reporting compliance. The audits would provide a tool to ensure consistency in measurement and reporting, and increase transparency and accountability in carrier performance. Service providers should fund the audits, which should be performed by an independent entity under CD's oversight. Audits should be conducted on a regular basis (annually or biannually), with the results published and made widely available to the public. The purpose of the audits would be to:

⁴⁶ *Id.* at p. 26.

1. Verify the accuracy of the data reported by service providers;
2. Ensure consistent and comparable measurement techniques amongst service providers;
3. Provide findings that support setting new service quality standards and/or maintain or update current standards. This is especially important because of the rapidly evolving state of technology in telecommunications broadly and of broadband in particular; and
4. Provide feedback to consumers on the service quality they are receiving from their service providers and how it compares to that of other service providers.

In addition, the results from the audits could supplement CD Staff's oversight of service providers, especially when it is linked to a penalty/incentive mechanism.

VII. NEED TO FUND STUDIES

The Commission should establish a funding mechanism that would provide CD staff with sufficient resources (including, software development and acquiring consultants services on technical matters) to:

1. Perform the necessary research and studies required to assess the adequacy of current service quality rules given the evolving communication technology and market;
2. Conduct audits to verify reported claims on service quality supplied by service providers in California; and
3. Support consumer education and outreach activities, such as publishing comparative performance data on service providers in California to consumers through web postings and/or press releases.

VIII. CONCLUSION

Clearly defined, measurable, and enforceable service quality standards would ensure that Californians are served with safe and reliable communications infrastructure. Service quality standards should apply to all service providers regardless of the technology used, including wireline, wireless voice (including circuit switched and interconnected and over-the-top VoIP), and broadband internet access services. The Commission should adopt the recommendations in the CD Staff Report, as well as ORA's additional recommendations.

Respectfully submitted,

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