

# 11 | CONCLUSIONS AND RECOMMENDATIONS

## Principal takeaways

- Wire centers with the lowest rates of customer drop-off have experienced the poorest levels of service quality. The likely reason for this is that a large number of customers still depend upon their legacy wireline service and lack meaningful access to competitive or alternative services.
- AT&T's investments in fiber upgrades have tended to favor higher-income communities, such that wire centers that serve areas with the lowest household incomes are also characterized by the poorest service quality.
- Despite Frontier's pervasive financial challenges, its California ILEC remains a critical component of the state's telecommunications infrastructure. Roughly 25% of all legacy POTS access lines in service in California as of December 31, 2017 were being provided by one of the Frontier ILECs.

## Recommendations

- **Recommendation 1:** Expand the financial penalties for carriers that fail to meet the minimum GO 133-C/D service quality standards.
- **Recommendation 2:** In an effectively competitive market, persistently poor service quality would drive customers to take their business elsewhere. Where competition is not present, fines imposed due to an ILEC's failure to meet service quality standards should be high enough so as to have the same financial consequences as poor service quality under competitive market conditions.
- **Recommendation 3:** The GO 133-C/D maximum Customer Trouble Report Rates of 6%, 8% or 10% (depending upon wire center size) of switched access lines per month are far too generous, and failure rates as high as these can hardly constitute acceptable service quality. The carriers have had little difficulty in meeting these standards, and they should be revised downward.

- **Recommendation 4:** Unless carriers can offer technically valid explanations as to how and why smaller wire centers experience the poorest service quality, the minimum GO 133-C/D standards should be applied uniformly for all wire centers.
- **Recommendation 5:** The GO 133-D fines should vary based upon the extent of a carrier's failure to meet any service quality standard, rising in magnitude as the extent of the shortfall increases.
- **Recommendation 6:** The Commission should retain its requirement that URF carriers maintain their Part 32 Uniform System of Accounts ("USOA") regulatory accounting records and submit annual ARMIS-type financial reports. The requirement should be expanded to also include wire center level accounting data, similar to those that ETI had obtained through multiple data requests in the course of this study. Carriers should be required to submit these to the Communications Division on a semi-annual basis.
- **Recommendation 7:** The Commission should establish a process to proactively examine the alternatives that would be available to maintain adequate service to Frontier California customers in the event that the parent company no longer has the financial resources to provide safe and reliable services in California.

CONCLUSIONS AND RECOMMENDATIONS

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**A persistent and long-term service quality problem for legacy services**

While a substantial portion of the demand for legacy circuit-switched residential POTS services has been supplanted by alternatives – both technological and competitive – it would be wrong as a policy matter to conclude that these services have outlasted their usefulness and that ongoing regulatory attention is no longer required. The highest drop-off rates – in excess of 70% since 2010 – have occurred primarily in the most densely populated areas; substantially lower drop-off rates have prevailed elsewhere in the state, as summarized in Table 11.1, for AT&T, below:

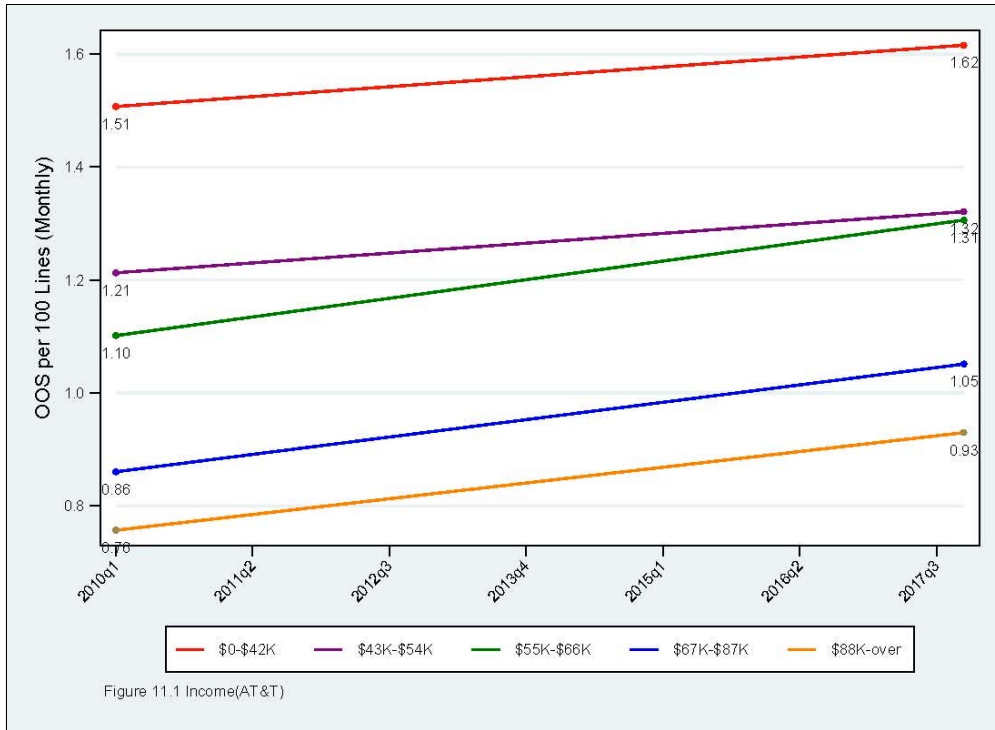
Table 11.1		
AT&T CALIFORNIA		
WIRE CENTER SIZE VS. ACCESS LINE LOSSES		
2010-2017		
Wire Center Size range	No. of Access Lines	Access Line Loss Pct.
0-1000 Lines		-55.6%
1001-2999 Lines		-66.0%
3000-10000 Lines		-70.7%
10001-20000 Lines		-71.9%
Over 20000 lines		-72.7%
Source: Wire Center Size as of 1/1/2010, compiled from GO 133-C/D reports and data		

The persistence of these geographic disparities in the adoption of technological and competitive alternatives despite massive and persistent price increases compels the conclusion that, for many customers, legacy services remain essential.

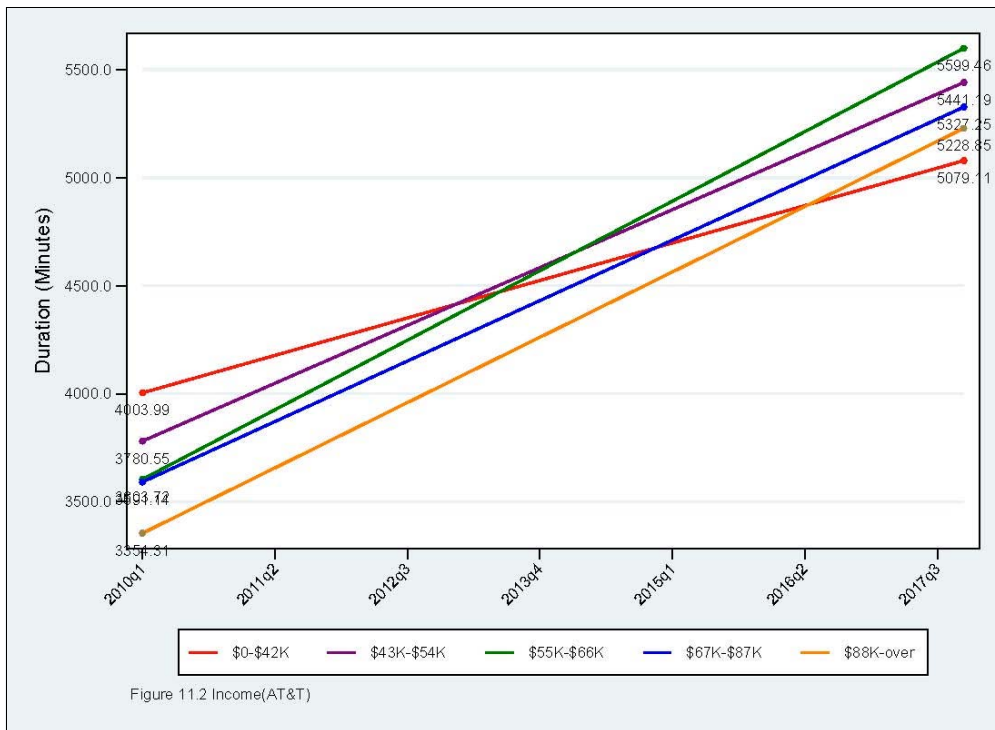


Wire centers with the lowest rates of customer drop-off have experienced the poorest levels of service quality. The likely reason for this is that a large number of customers still depend upon their legacy wireline service and lack meaningful access to competitive or alternative services.

Whether the result of a deliberate redlining policy or not, AT&T’s policies have had a disproportionate impact upon the state’s lowest income communities. Applying household income data obtained from the United States Census Bureau to the geographic areas being served by each AT&T wire center, we find a clear inverse relationship between household income and all of the principal service quality metrics, as shown on Figures 11.1 through 11.4 below.



**Figure 11.1.** Out-of-service incidents per 100 access lines in service is lowest in the highest income areas, highest in the lowest income areas.



**Figure 11.2.** Out-of-service duration is shortest in highest income areas.

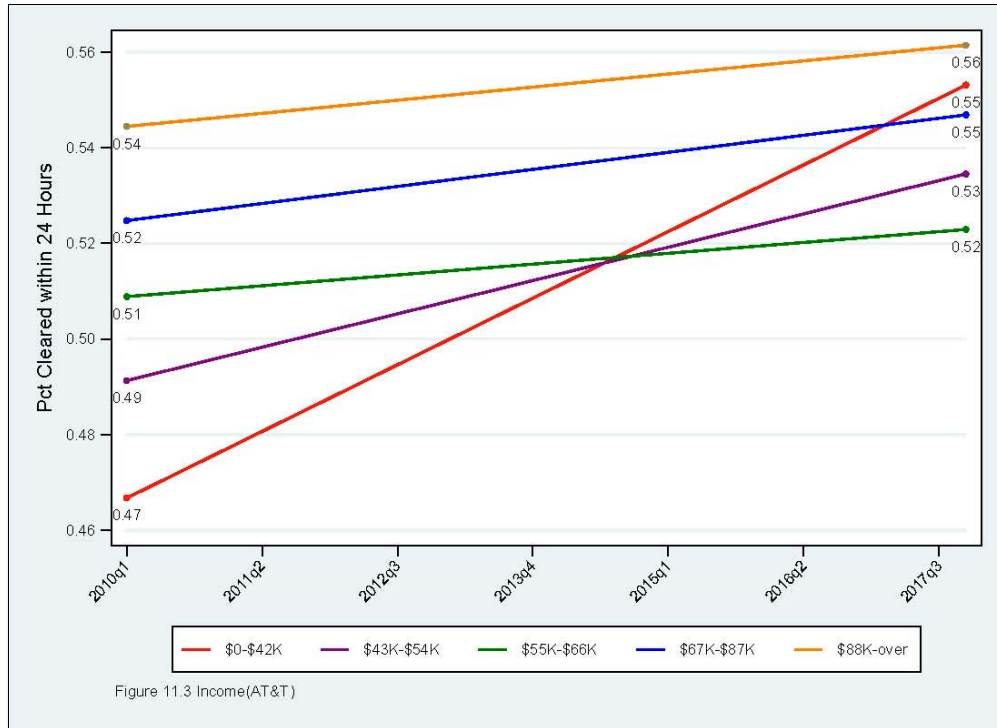


Figure 11.3 Income(AT&T)

**Figure 11.3.** Areas with highest household incomes also have the highest percentage of outages cleared within 24 hours.

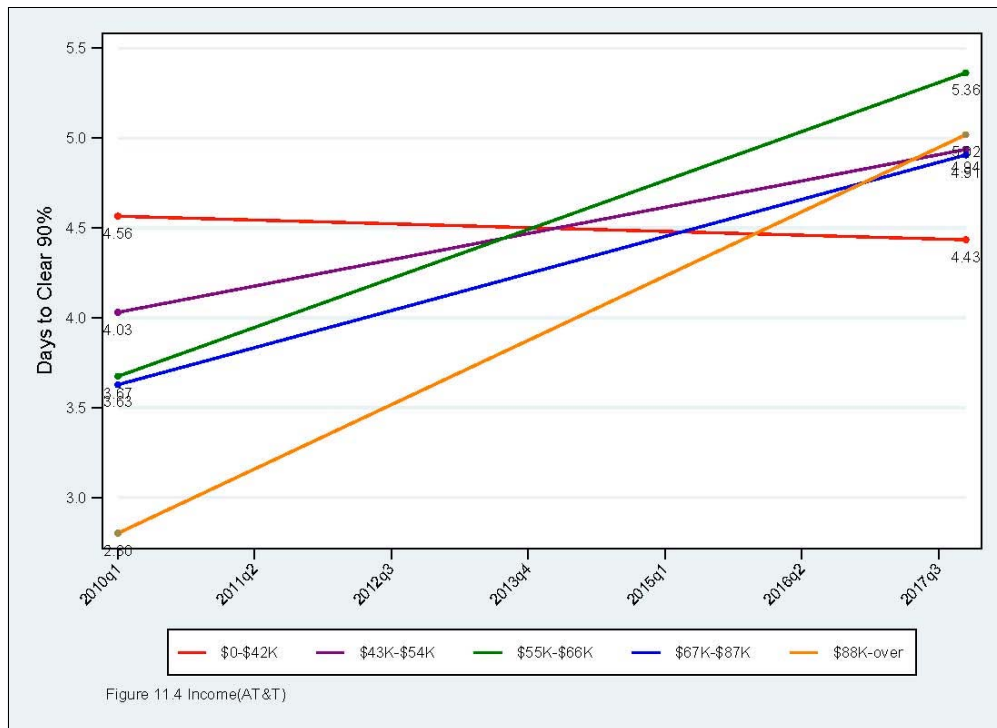


Figure 11.4 Income(AT&T)

**Figure 11.4.** High income areas generally require the fewest days to clear 90% of out-of-service conditions.

All four of these metrics exhibit a degradation in service quality over the 2010-2017 study period. The highest income areas have the lowest incidence of service outages; the lowest income areas have the highest (Figure 11.1). The average duration of out-of-service conditions over 24 hours has increased for all five income categories, but remains the shortest in the highest income areas. Notably, however, the lowest income areas, which had the highest average duration at the beginning the period, had experienced a lower rate of degradation in this metric, and by the end of the period had the shortest average duration of 5079 minutes (3.53 days) (Figure 11.2). The highest income areas had the highest percentage of outages cleared within 24 hours (56%), although the two lowest income categories showed the best rates of improvement (Figure 11.3). Finally, the number of days required to clear 90% of service outages grew longer in all but the lowest income category, while still being shortest in the two highest income categories for most of the study period (Figure 11.4).

Some evidence of an AT&T household income-driven investment policy can be seen in the case of wire centers that have been upgraded with Fiber-to-the-Node (“FTTN”) and other capabilities that support *U-verse* branded broadband Internet access, VoIP, and IPTV services. Table 11.2 below provides the weighted average median annual household income in areas served by wire centers that have been upgraded with fiber vs. those that have not:

<b>Table 11.2</b>		
<b>AT&amp;T CALIFORNIA</b>		
<b>WEIGHTED AVERAGE MEDIAN HOUSEHOLD INCOME</b>		
<b>IN WIRE CENTERS WITH AND WITHOUT FIBER UPGRADES</b>		
<b>Fiber availability</b>	<b>No. of Wire Centers</b>	<b>Weighted Average Median Annual Household income</b>
Yes	██████	\$72,024
No	██████	\$60,795
All	██████	\$70,549
Source: AT&T Response to DR-01A, US Census Bureau 2010 American Community Survey. Due to limitations on the geographic mapping of Census Blocks to AT&T wire center serving areas, Median Household Income was available for only ██████ AT&T wire centers.		

As the graphs in Figures 11.1 through 11.4 demonstrate, those areas with the lowest household incomes tend to have the highest trouble report rates, the longest out-of-service durations, the lowest percentages of outages cleared within 24 hours, and the longest times required to clear 90% of service outages. As we noted in Chapter 4A above, wire centers that have experienced the smallest access line drop-off rates have exhibited the poorest performance on all service quality metrics. Clearly, those communities that AT&T perceives as the most

captive are afforded the lowest levels of attention by the company. Since, as we have also found, wire centers that have received fiber upgrades exhibit superior performance on all of the service quality metrics, the fact that these upgrades have favored higher income communities may well explain the apparent inverse relationship that we have observed as between household incomes and service quality overall.



AT&T's investments in fiber upgrades have tended to favor higher-income communities, such that wire centers that serve areas with the lowest household incomes are also characterized by the poorest service quality.

AT&T's track record on service outages has deteriorated over the 2010-2017 period that was the subject of this study. In almost every service quality metric – from the basic “Trouble Reports Per Hundred access lines (“TRPH”) through the duration of service outages, the percentage cleared within 24 hours, and the length of time it took AT&T to achieve the GO 133-C/D target 90% cleared level – AT&T's performance has worsened over the study period. Despite its growing revenues and profits overall and being awash in cash, the parent company AT&T Inc. has disinvested in its California ILEC subsidiary, has extracted capital through dividends that have been well in excess of the ILEC's earnings, and has maintained the overall level of the ILEC's revenues by continuously raising prices that only the most captive of residential customers have been forced to pay. AT&T's overarching approach to its stewardship of the California ILEC infrastructure has been a “harvesting strategy” that relies upon customer captivity and inertia, rather than providing good quality service. “Harvesting” of this legacy service customer base allows AT&T to maintain revenue levels and to extract the maximum amount of capital from the California ILEC entity in order to support the parent company's wireless, video distribution, video content, and other business initiatives – activities that have captured the overwhelming bulk of management's attention.

Unlike AT&T, whose interest in ILECs had been in decline for many years, Frontier's only business is that of operating ILECs in some 29 states across the country. Unfortunately, while Frontier's attention is being directed at maintaining and growing its ILEC properties, its financial resources have deteriorated to the point where this will become increasingly difficult going forward. Frontier's common stock price has dropped by around 98% since its high in February 2015. Frontier's market cap is currently about \$ [REDACTED] (as of mid-January 2019) – less than the amount of Gross Plant Additions that Frontier had invested in California alone over the first 21 months of its ownership. Its earnings have been negative in every quarter from the second quarter of 2016 onward, its \$1.9-billion in annual debt service payments were consuming [REDACTED] % of its total operating revenues, and its prospects for raising addition debt or equity financing were all but gone.

And unlike AT&T, which has made minimal investments in upgrading its ILEC infrastructure to support broadband services – only [REDACTED] % of homes passed by AT&T California



are being served with fiber-to-the-premises (“FTTP”) distribution plant – Verizon, and Frontier after its takeover, have been actively pursuing FTTP upgrades throughout the study period. By the April 2016 date when Frontier took over the company, FTTP plant was available to roughly [REDACTED] or about [REDACTED]% – of the population in areas served by Verizon California. Since [REDACTED] company, Frontier has added areas with another [REDACTED] people to its FTTP network, and by the end of the study period, FTTP was available to slightly more than two-thirds of all people living in Frontier-served areas.

On the other hand, Verizon’s interest in its ILEC properties had been on the wane for many years. Almost immediately after the Bell Atlantic/GTE merger that formed Verizon in 2000, the parent company had begun divesting many of its ILEC operations. While most of these divestitures involved legacy GTE ILECs, four former Bell states were also divested. Verizon California did not pursue the kind of massive rate increases that AT&T had done since the onset of URF, and did not engage in capital extraction through excessive dividends. However, Verizon’s strategy in this respect may well have been driven by its ultimate goal of divesting the California ILEC, which needed to remain financially intact in order to be marketable to a would-be buyer. Frontier’s decision to purchase Verizon California in 2015 was, however, both ill-timed and ill-conceived. In the 14 months between February 2015 when the deal was first announced and the April 1, 2016 date when the transaction closed, Verizon California had lost some 240,000 POTS access lines (and there were undoubtedly corresponding line losses in Texas and Florida). However, the purchase price that had been agreed to in February 2015 was never adjusted to reflect this substantial change in condition. In agreeing to the \$10.54-billion price tag for the California, Texas and Florida purchase, Frontier had failed to consider the full extent to which the legacy wireline local exchange telephone business was in decline.



Despite Frontier’s pervasive financial challenges, its California ILEC remains a critical component of the state’s telecommunications infrastructure. Roughly 25% of all legacy POTS access lines in service in California as of December 31, 2017 were being provided by one of the Frontier ILECs.

Yet Frontier’s operations in California remain a critical component of the state’s telecommunications infrastructure. Over the 21 months under Frontier ownership from April 2016 through December 2017, Frontier did make Gross Plant Additions in the range of \$ [REDACTED] [REDACTED]<sup>244</sup> much of it likely going to fund the FTTP upgrades that were completed during that time frame. But that investment level is approximately the same as Frontier’s [REDACTED] [REDACTED] and thus is likely not sustainable on a going forward basis. The Commission will need to address the potential impact of Frontier’s financial condition – and potential financial collapse – on the existing Frontier infrastructure and the customers that it continues to serve.

244. See Table 8.11. As noted in Chapter 6 above, Frontier has provided data on its Gross Plant Additions from several sources, no two of which provide the same amounts.

## Recommendations

It has become painfully clear that the competition for legacy POTS services that has developed since the adoption of URF in 2006 has failed to provide any meaningful market incentives to the ILECs to improve service quality for their legacy services. The Commission has already taken steps aimed at addressing the ongoing ILEC service quality issues through its 2016 adoption of GO 133-D §9, which introduced explicit financial penalties for failure to achieve the GO 133-C/D §3.3(c) and §3.4(c) performance standards. Expansion of these penalties should be considered. By confronting the ILECs with explicit financial consequences of inadequate service quality, they can include these in weighing the economic merit of investments and maintenance expenses directed at improving service quality against that of other investments that offer the prospect of increased revenues and profits. To be effective, however, the financial penalties included in GO 133-D need to be rigorously enforced.



**Recommendation 1:** Expand the financial penalties for carriers that fail to meet the minimum GO 133-C/D service quality standards.

It is also important that the financial penalties be more than nominal fines. If the market were sufficiently competitive to induce the ILECs to address and improve service quality issues, the financial consequences of their failure to do so would result in a loss of business as customers “voted with their feet” to competing providers that offered superior service quality. Absent marketplace forces sufficient to provide such financial incentives, the financial consequences that need to be imposed via regulation must be comparable to those that would result under truly competitive market conditions – a simulation of the “competitive result” that has traditionally served as a bedrock principle of economic regulation of noncompetitive industries.

The Commission can look at one specific example of the effectiveness of confronting the ILEC with financial consequences of insufficient service quality performance. As discussed above, when the Commission issued D.15-12-005 in December 2015 authorizing the sale of Verizon California to Frontier, it expressly conditioned its approval upon Verizon compliance with GO 133-D service quality standards prior to the date of closing. Faced with the prospect of delaying or perhaps even losing what was for Verizon a highly advantageous \$10.54-billion deal, Verizon did manage to meet those requirements in February and March 2016 – a feat that had never been achieved prior to that time, and that has not been achieved (by Frontier) since. Verizon’s action clearly demonstrates the importance of confronting the ILEC with explicit financial consequences of inferior service quality.



**Recommendation 2:** In an effectively competitive market, persistently poor service quality would drive customers to take their business elsewhere. Where competition is not present, fines imposed due to an ILEC's failure to meet service quality standards should be high enough so as to have the same financial consequences as poor service quality under competitive market conditions.

As we discussed in Chapter 2, we believe that the GO 133-C/D specification for Trouble Reports Per Hundred access lines in service (“TRPH”) – a maximum of 6, 8 or 10 per 100 access lines depending upon the size of the “reporting unit” (typically a wire center) – is unduly generous. Even the poorest performing wire centers for each of the two ILECs under examination here have reported results that are consistently well below these limits, and neither ILEC has ever failed to meet this standard.

ETI believes that the TFPH standards need to be revised downward. The incidence of just under 6%, 8% or 10% of all access lines in service experiencing failures that would result in the creation of a trouble ticket in any given month could not be considered to constitute “good” service quality. Under these standards, and assuming for the sake of discussion that no single customer experiences more than one trouble condition in any given year, these standards would allow failures of 72%, 96%, and 120% respectively each year.

For example, consider the case of AT&T's [REDACTED] wire center which, in 2017, had one of the highest Trouble Report counts among all AT&T wire centers. In that year, [REDACTED] had an average of [REDACTED] access lines in service, which would put it in the 1000-3000 line (mid-size) category. For a wire center in this size range, the “standard” maximum number of Trouble Reports per Hundred access lines would be 8.0 *per month*, if the “per month” interpretation of this requirement is to be maintained. Over the full 2017 year, the average TRPH per month for the [REDACTED] wire center was 7.12. While among the highest TRPH counts in AT&T territory and the highest TRPH in the 1000-3000 line size category, [REDACTED] as still below the maximum 8.0 TRPH threshold.

But looking beyond a single month suggests a different picture. Over the full year 2017, there were 1,526 trouble reports in [REDACTED] or 85.44 trouble reports per hundred access lines. There were many instances where the same customer had experienced multiple trouble conditions. In 2017, a total of [REDACTED] average number of access lines in the [REDACTED] wire center, had experienced at least one trouble condition at some point during the year. It is difficult for us to imagine that this high an incidence of service problems in a single wire center would still be considered as “acceptable.”

In fact, and as we have noted, ETI’s reading of GO 133-C/D suggests the possibility that the TRPH standards set forth therein may well have been misinterpreted and misapplied. §3.0(c) reads as follows:

Minimum Standard Reporting Level. Report number of trouble reports per 100 working lines (excluding terminal equipment reports). Six trouble reports per 100 working lines for reporting units with 3,000 or more working lines, eight reports per 100 working lines for reporting units with 1,001-2,999 working lines, and 10 reports per 100 working lines for reporting units with 1,000 or fewer working lines.

Note that *no specific time frame* (e.g., per month, per quarter, etc.) is being specified here – only the number of reports per 100 access lines. However, §3.3(e) may shed some light on this lack of specificity:

Reporting Frequency. Compiled monthly, reported quarterly.

Thus, while the *compilations* are to be accomplished on a monthly basis, the “reporting” is to be done on a *quarterly* basis. The term “Reporting” (not compilation) also appears at §3.3(d), which refers to “Reporting unit” as an “Exchange or wire center, whichever is smaller.”

The 6%, 8% and 10% minimum standard reporting levels make much more sense if interpreted as applying *quarterly* rather than monthly. Viewed on an annual basis, they would still consider as satisfactory trouble report rates for the three “reporting unit” sizes of just under 24%, 32% and 40%. In fact, it seems difficult to believe that annual trouble rates in excess of these levels would or should ever be deemed to be acceptable.



**Recommendation 3:** The GO 133-C/D maximum Customer Trouble Report Rates of 6%, 8% or 10% (depending upon wire center size) of switched access lines per month are far too generous, and failure rates as high as these can hardly constitute acceptable service quality. The carriers have had little difficulty in meeting these standards, and they should be revised downward.

There are three possible approaches that the Commission should consider in addressing this issue:

- (1) Revise the language of §3.0(c) to make it clear that the 6%, 8% and 10% apply to the *quarterly* reporting period, not monthly.

- (2) If a monthly TRPH standard is to be retained, these maximum levels should be reduced to no more than 1/3 of their currently stated levels – i.e., to no more than 2%, 2.67% and 3.33%, respectively, for small, mid-size and large wire centers.
- (3) Adopt a new set of maximum acceptable TRPH levels that offers an improved set of incentives for satisfactory service quality performance.

Our examination of the effects of wire center size upon service quality has clearly indicated that the smallest wire centers exhibit the highest TRPH rates, the longest out-of-service durations, the lowest percentages of service outages cleared within 24 hours, and the largest number of days to achieve the target 90% cleared rate. At a superficial level, then, the notion of basing the maximum acceptable TRPH or any other service quality standard upon wire center size may not be unreasonable.

However, there is no specific basis upon which to conclude that wire center size has any *causal* relationship with service quality. The apparently inferior service quality prevalent at small wire centers is at least as likely to result from insufficient investment in these locations' outside plant both for basic rehabilitations as well as for upgrades. Smaller wire centers have the lowest rates of customer drop-offs and also tend to be located in communities with relatively low household incomes. A policy that tolerates higher rates of trouble reports and poorer service quality compliance simply assists the ILECs in maintaining this discrimination in their treatment of customers. Unless the ILECs are able to affirmatively demonstrate a specific set of exogenous conditions – conditions that are demonstrably beyond management's control – that would account for the presence of persistently and consistently poor service quality in smaller wire centers, the Commission should eliminate the wire center size distinction in any service quality standard.



**Recommendation 4:** Unless carriers can offer technically valid explanations as to how and why smaller wire centers experience the poorest service quality, the minimum GO 133-C/D standards should be applied uniformly for all wire centers.

GO 133-C/D §3.4(c) establishes as a minimum standard that 90% of out-of-service conditions must be cleared within 24 hours, a condition that AT&T has never met and that Verizon met for only two months under penalty of having its sale to Frontier delayed or disallowed. In our analysis of service quality, we also considered as an additional metric the number of days required for the ILEC to reach the 90% cleared objective. Viewed on a quarterly basis, for AT&T this number ranged between 1.67 and 11.15 days, with an increasing trend over

the full 8-year study period; for Verizon/Frontier, the quarterly figures were slightly better, ranging between 1.85 and 5.22 days, with a lengthening trend over the full study period.<sup>245</sup>

We believe that, in addition to the seemingly unachievable 90% within 24 hours standard, GO 133-C/D should be amended to also include some financial consequences for the length of time it actually takes to reach the 90% cleared level. Under the current arrangement, GO 133-D §9.3 imposes a fine for a carrier's failure to meet the out-of-service repair interval standard, but the amount of the fine is not affected by the extent to which the carrier has actually fallen short of meeting the standard. Thus, if a carrier clears only 80% of out-of-service conditions within 24 hours for three or more months, the fine is exactly the same as it would be if that same carrier had cleared only 20% of out-of-service conditions within 24 hours for three or more months. If the 90% goal cannot be achieved and a fine will therefore need to be paid, the carrier has no incentive to bring the clearance rate closer to the 90% level.

By way of example, the fine for exceeding the highway speed limit is typically linked to the speed at which the driver was going – if the speed limit is exceeded by 20 MPH, the fine is lower than if it was exceeded by 50 MPH. But the structure of fines under GO 133-D §9.3 is not affected by the extent to which the carrier has failed to meet the standard. That should be changed. In addition, an additional fine should be imposed that is related to the days required to meet the 90% cleared requirement. If the 90% cleared requirement is not met for 5.0 days, the fine should be substantially greater than if the carrier, while still missing the 90%/24 hour standard, is able to reach the 90% cleared rate in 2.0 days.



**Recommendation 5:** The GO 133-D fines should vary based upon the extent of a carrier's failure to meet any service quality standard, rising in magnitude as the extent of the shortfall increases.

The data-driven approach utilized by ETI in conducting this study included, in addition to the raw trouble report and out-of-service records, various financial records and data provided by the two ILECs. The sources of this data included the annual ARMIS-type financial reports that the two ILECs had been required to submit to the California PUC despite the discontinuation of this requirement by the FCC after 2007.<sup>246</sup> We also obtained, through data requests, various accounting and other financial data that the ILECs had been maintaining pursuant to the FCC's Uniform System of Accounts ("USOA"), 47 CFR §32. Access to this data enabled us to examine the nature and extent of ILEC capital investment and maintenance expenses at the

245. See Tables 4A.8 and 4F.7. *supra*. These figures reflect adjustments in actual out-of-service durations to eliminate Sunday and holiday hours and causal factors considered to be beyond management's control. Actual durations ranged between 2.82 to 7.44 days for AT&T, and between 2.11 to 13.08 days for Verizon/Frontier. Trends based upon actuals for both companies increased over the study period.

246. See, GO 104-A, D. 93-02-019.

individual wire center level, and was instrumental in forming our conclusion that much of the service quality problems of concern to the Commission can be attributed to disinvestment in the ILEC infrastructures by the two carriers.

In 2017, the FCC determined that “price cap ILECs” – those large carriers that are subject to FCC price cap rather than rate-of-return regulation – will no longer be required to maintain separate USOA accounting records after 2017, and will be allowed (by the FCC) to maintain only a single set of books organized pursuant to Generally Accepted Accounting Principles (“GAAP”).<sup>247</sup> This study has benefitted greatly from the availability of ARMIS-type reporting by the two ILECs that are under examination here; GAAP does not require that this type of detail be maintained. Although the FCC no longer requires that AT&T California and Frontier California maintain accounting records pursuant to the USOA as it had existed prior to the 2017 ruling, the FCC Order explicitly provides that “[n]othing in this Order precludes a state or regulatory agency, or another party as part of a contractual requirement, from requiring a carrier to maintain the Class A accounts or otherwise maintain the USOA. See, e.g., 17 CFR § 1770.11 (requiring Rural Utility Service borrowers to maintain Class A accounts).”<sup>248</sup> And in her *Statement Approving in Part and Concurring in Part*, FCC Commissioner Mignon L. Clyburn remarked, “So to those carriers who advocate for decreased regulatory burdens, let me assure you: I am with you. However, the next time this Commission or a state commission asks for cost data, to support a rulemaking, investigate a complaint, or bring an enforcement action, I hope we do not hear protestations that the request is too burdensome because the data is not kept in the format that the FCC or state commission needs.”

Much of the USOA accounting data that we had been able to obtain from AT&T and Frontier was itself being maintained in order that these ARMIS-type reports could be prepared. We believe that ongoing monitoring of the ILEC’s investment and maintenance practices, together with ongoing monitoring of trouble tickets and other physical service quality data, is essential to any revisions to and enforcement of service quality standards on an ongoing basis. We therefore recommend that the Commission require that AT&T California and Frontier California continue to maintain USOA-type accounting records consistent with 47 CFR Part 32 *as it had existed prior to the FCC’s 2017 Order*, and that the Commission continue to require the same annual ARMIS-type financial reporting that proved so essential to this study. Moreover, we recommend that the USOA reporting requirement be expanded to include the wire center- and account-level data of the type that was covered by our data requests.

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247. *I/M/O Comprehensive Review of the Part 32 Uniform System of Accounts*, WC Docket No. 14-130; *Jurisdictional Separations and Referral to the Federal-State Joint Board*, CC Docket No. 80-286, *Report and Order*, FCC 17-15, Rel. February 24, 2017.

248. *Id.*, at 7, fn. 51.



**Recommendation 6:** The Commission should retain its requirement that URF carriers maintain their Part 32 Uniform System of Accounts ("USOA") regulatory accounting records and submit annual ARMIS-type financial reports. The requirement should be expanded to also include wire center level accounting data, similar to those that ETI had obtained through multiple data requests in the course of this study. Carriers should be required to submit these to the Communications Division on a semi-annual basis.

Finally, in view of the precarious financial condition in which Frontier California's parent company finds itself, it is important that the Commission proactively consider what steps it may be required to undertake in the event that the California ILEC is unable to adequately maintain its network. The imposition of fines for failure to achieve required service quality standards will have little effect if the ILEC lacks even the financial wherewithal to pay such fines. This initiative needs to commence without delay, because the prospect of the parent company's financial collapse cannot be ignored.



**Recommendation 7:** The Commission should establish a process to proactively examine the alternatives that would be available to maintain adequate service to Frontier California customers in the event that the parent company no longer has the financial resources to provide safe and reliable services in California.

### **Managing the transition from legacy to current technology services**

A substantial source of the persistent service quality shortcomings that have plagued legacy POTS services over the past decade and that we have examined in this study has been a failure to develop and manage the migration from legacy circuit-switched wireline technology to state-of-the-art IP-based and wireless services. Numerous technology transitions have occurred in the telecommunications industry over the past century or more, but the current one is unique in a number of critically important respects.

Past transitions, such as from manual switchboards to dial, from step-by-step to crossbar central office switches, from electromechanical to electronic switches, from analog to digital switching, from baseband twisted-pair copper to frequency-division multiplexing to digital time-division multiplexing, from rotary dial to touch-tone, and from copper to fiber optics, have all occurred through a process that took place in the background, one that was largely invisible to the consumer and which, in most cases, involved little affirmative customer decisions or actions. If new customer premises equipment was required (e.g., from manual to dial telephone sets), it



was provided by the telephone company at no additional charge to the customer. In cases where the new technology made new services and features available (e.g., touch tone dialing, call waiting, caller id), customers were afforded the opportunity to purchase them on an optional basis, but could still retain the preexisting service, enhanced by the technological migration, but without the optional feature. If an additional charge was involved (e.g., from rotary dial to touch-tone), the transition was generally optional on the customer's part. In 1989, the Commission determined "that residential use of Touch Tone has increased to the point where it should be considered a basic service" and eliminated the touch tone surcharge altogether.<sup>249</sup>

This process for technology transition was successful largely because the regulatory regime within which it occurred was technology-blind – i.e., the regulatory model remained the same under the previous and the new technology. But this is no longer the case. The two major telecommunications technology transitions that have been underway for the past decade or so – from wireline to wireless and from circuit-switched to IP – each involve a total replacement of the applicable regulatory model. When a customer migrates from a legacy circuit-switched service to an IP service such as VoIP, the regulatory regime that had overseen the legacy service ceases to apply. The same happens when a customer replaces a wireline service with wireless. The *deregulation* that applies to post-transition services presents the service provider with a radically changed set of financial incentives that essentially compel it, acting in the best interests of its shareholders as it has a fiduciary duty to do, to shift management and financial resources to these potentially far more profitable nonregulated services. Both AT&T and Verizon have been doing exactly that. They have directed their capital investment away from legacy services and over to wireless, to broadband and, most recently, to *content*.

To the extent that continued provision of a baseline voice telephone service via wireline infrastructure is considered essential as a matter of public policy, there can be no justification for effectively precluding a technology transition to support these essential services merely because the replacement technology is linked to a fundamentally different regulatory model. The migration from circuit-switching to packet-switching, from analog to IP, from basic wireline voice service to basic wireless voice service, and even from voice to data, should be allowed to occur without the regulatory distortions that currently prevail.

In that regard, the enactment of PU Code §710 by the California legislature in 2012 (effective January 1, 2013)<sup>250</sup> has likely contributed to the deteriorating service quality that pervades legacy circuit-switched services *precisely because it has undermined an ILEC's ability*

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249. *I/M/O Alternative Regulatory Frameworks for Local Exchange Carriers.; In the Matter of the Application of Pacific Bell (U 1001 C), a corporation, for authority to increase intrastate rates and charges applicable to telephone services furnished within the State of California*, D.89-10-031, I.87-11-033, 1989 Cal. PUC LEXIS 576; 33 CPUC2d 43; 107 P.U.R.4th 1, at FOF 8; Ordering Paragraph 1.

250. Stats. 2012, Ch 733, Sec 3. (SB 1161) Effective January 1, 2013. Repealed as of January 1, 2020, by its own provisions.

*and incentive to replace older circuit-switched central offices with packet switched technology* in the same manner in which, in previous transitions, electromechanical switches were replaced by electronic, or analog electronic switches were replaced by digital. When the same regulatory model is applied to both the preexisting and the new technology, the ILEC can control the transition with an expectation of the ability to recover its investment in the new technology and earn a reasonable return thereon. Under cost-plus type regulation, the cost of the new technology could be spread over all ratepayers, sometimes by general rate increases and sometimes through feature-based surcharges. A technology-neutral incentive regulatory model of the type adopted in the *New Regulatory Framework* (“NRF”) can produce a similar outcome. The post-*URF*, post-§710 regulatory structure, however, has given the ILECs the capability to increase rates for legacy technology services without providing any feature or technology enhancements to consumers. It has allowed ILECs to degrade service quality for these services, in part because of their exclusion from technology upgrades. And it has permitted ILECs to use the often substantial rate hikes as a device to coerce consumer migration to the new– and now nonregulated – technology platform.

The scope of regulation should apply with respect to the set of *functionalities* that is deemed essential and in need of some level of regulatory protection, and *not* with respect to the particular technology that is used to provide those functionalities. Thus, if basic voice and some minimal level of Internet access service is deemed essential, these services should be provided in the most efficient manner in each situation, whether by wireline or wireless, or by circuit- or packet-switching technology. If reliable access to emergency services (E911) and connectivity that can remain active in the event of a local power interruption are considered essential minimum service requirements from a public policy standpoint, efficient solutions can be developed under any of the technology platforms. If it is most cost effective to utilize wireless to serve sparsely populated rural areas rather than construct networks of low-capacity wireline facilities, that evaluation should not be distorted by the existence of different regulatory regimes, as is the case today. PU Code §710 is scheduled to sunset in 2020 unless extended by the California legislature. The Commission should use the reconsideration of this provision of the PUC code as an opportunity to replace it with an alternative whose focus is on functionality rather than technology, so as to reestablish a regulatory environment that is more conducive to orderly technology transition.

Fixing this problem is, at bottom, a political matter, and we do not pretend to offer a political solution. However, what is clear is that the existing arrangement is not producing anything close to an optimal result, and needs to be reexamined and revised at a fundamental level.

## **Conclusion**

In undertaking this study, ETI has benefitted from the extensive and valuable assistance and involvement by Communications Division staff, to whom we are extremely grateful. Throughout our work on this project, we have keep CD informed as to our methodology, preliminary results, and potential recommendations.

We believe that the analytical tools that we have developed in the course of this project can be beneficially utilized on an ongoing basis by CD to continue to monitor and analyze the service quality performance of the two URF ILECs, and strongly recommend that the analyses we have presented in this report be continued and maintained on an ongoing basis as additional data is submitted and compiled.

