17 CONCLUSIONS AND RECOMMENDATIONS

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Managing the transition from legacy to current technology services

As we noted in our Phase 1 report, a substantial source of the persistent service quality shortcomings that have plagued legacy POTS services over the past decade has resulted from 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.

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 with the onset of competition and deregulation that began in the 1980s, this is no longer the case. When a customer migrates from a legacy circuit-switched service to an IP service such as VoIP or to wireless, the regulatory regime that had overseen the legacy service ceases to apply. 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 Frontier have been doing exactly that. They have directed their capital investment away from legacy serivces and over to wireless, to broadband and, most recently, to *content*.

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 involved. 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 or market models.

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.

Conclusions

Following is a brief summary of the principal conclusions resulting from Economics and Technology, Inc.'s ("ETI's") Phase 2 examination of the network infrastructures and quality of service of California's two principal Incumbent Local Exchange Carriers ("ILECs"), AT&T California and Frontier California for the 2018-2019 study period.

- *Ongoing deterioration of ILEC service quality*. The quality of AT&T and Frontier voice services, which had been steadily deteriorating throughout the 2010-2017 Phase 1 study period, has become decidedly worse over the 2018-2019 Phase 2 period; the frequency of service outages has been increasing, as has their average duration.

- *Persistent disinvestment*. The persistent disinvestment, payments of dividends in excess of earnings, and annual depreciation accruals that exceeded gross additions that had characterized the Phase 1 study period have persisted into Phase 2; moreover, the infrastructure investments that both ILECs did make appeared aimed primarily at nonregulated broadband service upgrades rather than at improving legacy service plant.

- *Further decline in the number of POTS customers*. By the end of 2019, 79.1% of the legacy service access lines that were being served by AT&T California at the beginning of 2010 had discontinued their service. Frontier had lost 52.3% of the legacy service customers it had on April 1, 2016, the date on which it took over the California ILEC from Verizon. Both companies have, for all practical purposes, stopped marketing legacy circuit-switched Plain Old Telephone Service ("POTS"), focusing instead on broadband service as their strategy for maintaining and growing their revenue stream while allowing POTS service quality to continue to degrade. This lack of interest in POTS, coupled with the inconsequential financial penalties imposed by GO 133-D for failure to meet minimal service quality performance metrics, would seem to explain why both ILECs have allowed POTS service quality to erode further. The potential revenue from migrating customers to broadband voice/Internet and video bundles, together with the costs the ILECs avoid by ignoring needed legacy service improvements, easily outweighs whatever financial penalties the Commission may impose for violating minimum service quality standards.

- *A focus upon broadband, not POTS.* Investments that were made during 2018-2019 continue to be primarily directed toward supporting new broadband services that bundle high-speed Internet access, Voice over Internet Protocol ("VoIP"), and Video. These broadband-focused upgrades have nevertheless conferred some benefit in improving POTS service quality in locations where such investments have been made. POTS service quality is decidedly better in such locations, but even in these locations, POTS service quality performance under most General Order 133-D metrics deteriorated even faster after 2017.

- *By the end of 2019, AT&T California had become an even smaller part of the overall AT&T corporate organization that it had been two years earlier.* Over the 2010-2017 period, AT&T California's parent AT&T Inc. had experienced significant growth in its overall

gross revenues, rising 29.2% from $124.3-billion in 2010 to $181.2-billion in 2019. The primary sources of AT&T's revenue growth have come from wireless services, where the number of AT&T Mobility connections nationwide grew by 73.9%, from 95.4-million in 2010 to 165.9-million in 2019,[117] and from several key acquisitions, including DirecTV and Time Warner. AT&T California revenues have been moving in the opposite direction. falling from $9.70-billion in 2010 to $6.63-billion by the end of 2019. AT&T California's share of total AT&T Inc. revenues has fallen by an even greater amount, from 7.80% in 2010 to 3.66% in in 2019. The parent company's willingness to allocate capital to the Califronia ILEC has dimished accordingly.

- *Failure to adapt network infrastructure to withstand varying weather and environmental conditions*. The strong correlation between significant adverse weather conditions and the incidence of service outages that we had observed in the greater Los Angeles area in our Phase 1 study has now been confirmed to be occurring statewide. This pattern suggests that the networks of AT&T and Frontier are not as robust as they need to be to withstand weather and climate conditions in the state. The occurrence of extreme weather events in California certainly can be anticipated to a certain degree and should thus be incorporated into the companies' engineering, design and construction, and maintenance practices. These networks must be able to withstand all types of inclement weather and provide safe and reliable service to customers.

- *Effect of wildfires upon service quality and infrastructure investment*. Unlike for weather, we found no identifiable correlation between wildfire events and elevated service outage rates. Service outages are heavily impacted by rainfall, which tends to occur in the late fall and winter, whereas wildfires are most frequent in the summer, when rainfall is minimal. Restoration of landline telephone service, or even reporting of service outages themselves, is not likely to be of high priority in the aftermath of a destructive wildfire, so even if service has been interrupted, individual service outages may not be reported. We had also been asked to examine whether the ILECs had directed infrastructure investment to areas that had been heavily impacted by wildfires. However, no such investment pattern has been present for AT&T California, and only a minimal correlation could be identified for Frontier California.

- *Investment focus on higher income communities*. Both AT&T California and Frontier California appear to have prioritized their investments in fiber optic feeder and distribution facilities and in other broadband infrastructure to favor higher income communities. And since areas that have received such upgrades tend to perform better with respect to the various GO 133-D service quality metrics, the result is better service quality for these communities as well.

- *Increased focus on areas most heavily impacted by competition*. Both carriers continued to experience a persistent and massive erosion in demand for POTS lines over the 2018-2019

117. AT&T Inc. Annual Reports, 2010, 2019 .

study period. The greatest drop-offs – in some locations of as much as 90% or more – have occurred primarily in the more densely populated urban and suburban areas where customers have a wider choice of available providers and services. Notably, it is the areas with the lowest POTS drop-off rates that have experienced the steepest deteriorations in service quality. AT&T and Frontier appear to have focused most of their attention in those communities where competition and the potential for loss of customers is greatest. Where POTS demand erosion has been greatest, the availability of broadband has offset some of the revenue losses.

- *Financial Capability*. AT&T Inc. has the financial resources to maintain and upgrade its wireline network in California, but has been pulling capital out of the state rather than putting new capital into its network here. Frontier has a strong interest in pursuing such upgrades, but lacks the financial capacity to make the necessary investments. Moreover, Frontier has suffered a financial meltdown since its 2016 purchase of the Verizon ILECs in California, Texas and Florida. Having grossly overpaid for these assets, the company has been unable to achieve an adequate and sustainable revenue stream, and was forced to seek Chapter 11 bankruptcy protection in April 2020. Even if it is successful in emerging from bankruptcy, the company will have little ongoing ability to raise capital needed to maintain and upgrade its network.

- *VoIP service quality*. VoIP is the principal alternative to legacy POTS for those who want to retain a wireline connection. AT&T VoIP service experiences a slightly higher rate of service outages than AT&T legacy services. Unlike circuit-switched services, VoIP is dependent upon locally-provided power, battery backup, and complex customer premises equipment that is not generally required for legacy circuit-switched services. The seemingly higher incidence of VoIP service outages *vis-à-vis* POTS could well be the result of customer premises conditions that are unique to VoIP. Finally, the so-called "digital divide" -- an issue whose importance has increased as a result of the COVID-19 crisis – raises the potential for the loss of high quality wireline voice services in rural and low-income populations that have not been targeted for broadband upgrades. With the sunset of §710 that went into effect as of the beginning of 2020, a comprehensive regulatory approach that embraces all providers of VoIP type services should clearly be a top priority.

- *CPUC Consumer Affairs Branch (CAB) complaints*. The number of consumer complaints received by the CAB amounts to a minuscule fraction of the total number of trouble reports received and processed by the two ILECs. Moreover, the majority of CAB compalints relate mainly to billing and other business relationship issues, not to service outages. CAB collects geo-coded customer location information, but this does not include customer of record/account data that is contained in the ILECs' trouble report records. Consequently, CAB complaint records cannot be directly linked to or correlated with carrier trouble tickets. That said, complaints relating to Frontier service that CAB received in 2018-2019 were substantially greater on a relative basis than those pertaining to AT&T, which is consistent with the rapidly deterioring service quality that Frontier experienced during these two years.

Recommendations

The overarching result of this Phase 2 examination is that the service quality failures that we had identified and documented in Phase 1 have actually become even more serious. Accordingly, we have expanded, revised and reiterated the specific recommendations that we had offered in our Phas 1 report:

- **Recommendation 1:** Given the enormous rate at which customers have been discontinuing legacy circuit-switched POTS-type services over the past decade, the Commission should reevaluate the role that regulation is to play with respect to legacy as well as current technology services going forward. If assuring universal availability of high quality public switched network access is to remain a central focus of regulatory policy, then advanced services, including VoIP and broadband, should be included within the scope of this policy review. There seems little reason to single out legacy services as the sole focus of service quality regulation.

- **Recommendation 2:** With §710 no longer in effect, GO 133 should be extended to apply to all wireline voice services whether furnished by ILECs or other large service providers.

- **Recommendation 3:** Expand the financial penalties for carriers that fail to meet the minimum GO 133-D service quality standards both with respect to the types of shortcomings that will be assessed and the financial magnitude of the fines or other penalties that will be imposed. We have seen no specific evidence that investments made in lieu of fines as permitted in GO 133-D §7 (a) would not have been made anyway, and (b) have resulted in specific remedial measures ained at overcoming the service quality shortcomings. The practical result of these alternative investments is simply to negate the effectiveness of the financial penalty itself, and as such the program should be discontinued.

- **Recommendation 4:** In an effectively competitive market, persistently poor service quality is expected to drive customers to take their business elsewhere. The continuing erosion of both ILECs' legacy customer base that persisted throughout Phase 1 nad that has continued through Phase 2 indicates that competition for and alternatives to legacy POTS-type services has been growing and "cord-cutting" has become even more pervasive. Yet even when faced with growing competition, both ILECs' POTS service quality has been on the decline. Whether due to inertia, the non-availability of cost-effective alternatives, or a perceived need to retain a telephone service that does not require local power, customers who retain their legacy service appear to be more captive to the ILEC than those able to switch. Where competition is limited or not present, continued regulatory monitoring and enforcement of minimal service quality standards remains necessary, and financial penalties imposed due to an ILEC's failure to meet service quality standards should be sufficiently high so as to have the same financial consequences as would poor service quality under competitive market conditions.

- **Recommendation 5:** The GO 133-D maximum Customer Trouble Report Rates of 6%, 8% or 10% (depending upon wire center size) of switched access lines per month remain 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 6:** Fines imposed by GO 133-D §9 are currently applied for aggregate service quality shortfalls calculated on a companywide basis. Instead, these fines and other financial penalties should be imposed with respect to individual wire center service quality performance, and should escalate based upon the extent to which the carrier falls short of meeting the service quality standards for each such wire center. Frontier's practice of administratively consolidating groups of individual wire centers may hae the effect of masking those with particularly poor performance and in so doing potentially escaping the imposition of a penalty. Frontier should not be permitted to continue reporting its results for consolidated "reporting units" rather than separately for each individual wire center. AT&T has not engaged in a similar type of administrative consolidation.

- **Recommendation 7:** Unless carriers can offer technically valid explanations as to how and why smaller wire centers experience the poorest service quality, a uniform set of minimum GO 133-D standards should be applied to each individual wire center.

- **Recommendation 8:** 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 and/or persists for an extended period of time.

- **Recommendation 9:** The Commission should retain its requirement that URF carriers maintain their Part 32 Uniform System of Accounts ("USOA") regulatory accounting records and continue to submit annual ARMIS-type financial reports using the same accounts and account definitions that they have been required by the CPUC to maintain notwithstanding the FCC's decision to discontinue ARMIS reporting requirements after 2007. If an ILEC wants to substitute GAAP reporting for Part 32 USOA, it should be required, first, to submit a formal application for the right to make this substitution and, in that application, demonstrate that GAAP-type reporting will still meet the Commission's need for financial data sufficient to permit the type of year-over-year monitoring of investment, retirements, depreciation accruals, write-offs and write-downs, operating results, debt and debt service payments, and other financial data necessary for the Commission to carry out its regulatory mission. If the CPUC authorizes the ILEC's use of GAAP, the ILEC should be required to retroactively restate its USOA reports consistent with GAAP for a minimum of five (5) prior years. The financial reporting requirement should be extended to also include wire center level accounting data, similar to those that ETI had obtained through multiple data requests in the course of both Phase 1 and Phase 2 of this study. The ILECs should be required to submit these reports separately for each physically distinct wire center rather than for the groups of wire centers that Frontier had administratively

consolidated for reporting purposes. The carriers should be required to submit these reports to the Communications Division on a semi-annual basis.

- **Recommendation 10:** 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.