

# **An Industry in Transition**

Regulatory Overview of Pending Petitions Likely to Speed the Telecommunications Industry's TDM-to-IP Transition and a Preliminary Review of Potential Impacts on Federal Agencies

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## **EXECUTIVE SUMMARY**

The Federal Communications Commission ("FCC") is currently considering multiple petitions aimed at managing the inevitable transition of telecommunications networks from circuit-switched (or TDM - "time division multiplexed") services to Internet Protocol ("IP")-based services. While the various petitions differ in the manner by which they request the FCC to proceed, each of the petitions recognizes that IP-based services will ultimately replace TDM-based services and that consumers will need to adjust accordingly.

The various petitions differ primarily by (a) the speed at which they believe the transition should be accomplished and (b) the role that regulation should play in the transition. Primary among the disputes is whether the FCC should establish a "sunset" date by which all carriers and consumers would be required to replace TDM-based facilities and services with IP-based alternatives. The AT&T petition is by far the most "aggressive" of the petitions in this regard. AT&T's petition supports a "sunset" approach much like the FCC used in transitioning broadcast television ("TV") signals from analog to digital, thereby requiring consumers with analog reception equipment to purchase alternative equipment if they wanted to continue receiving broadcast TV. AT&T's proposal asks the FCC to force customers off of TDM-based services after the sunset date regardless of whether they still want/need those services and regardless of whether suitable replacement services are available or not. Although AT&T does not propose a specific sunset date, the FCC's Technical Advisory Council has recommended a PSTN sunset date of 2018. AT&T also advocates, however, that the mandated transition should happen almost immediately in various "trial" wire centers chosen by AT&T and the other incumbent local carriers that choose to participate (*e.g.*, Verizon, CenturyLink, Frontier, etc.).

The federal government relies heavily on TDM-based services. More than 50% of all Networkx related Fair Opportunity notices provided by Federal Agencies in 2011 and 2012 include services likely to be discontinued in the event TDM-based products are "sunsetting." That percentage increases for contracts signed prior to 2011. While it is likely that alternative IP-enabled services may provide additional features and functions not-available with the existing TDM-based services, the time, expense and potential disruption to existing services are issues that Federal Agencies will need to manage during any transition period. The requirement to use

IP-based alternative services will almost certainly require Federal Agencies to revise existing User-to-Network Interfaces ("UNIs") as well as Service Enabling Devices ("SEDs") and Customer Premises Equipment ("CPE") at locations where TDM-based services are discontinued. Likewise, future contracting requirements may need to change dramatically as the majority of services currently purchased by Federal Agencies - particularly basic TDM voice services - will no longer be available. For certain Federal Agencies such as the Federal Aviation Administration ("FAA"), for example, the stakes are even higher; FAA indicates that it has a 92% reliance rate upon TDM services provided by telecommunications providers and the elimination of TDM-based services would seriously jeopardize its mission of ensuring air traffic safety throughout the nation.<sup>1</sup>

The FCC has not yet made a decision as to how it will participate in the transition described above, including the manner by which it might attempt to speed the transition or mandate the transition for consumers. It is currently weighing the technological, consumer and competitive impacts of the various petitions and is still accepting comments from interested parties. For example, reply comments are due in relation to the TelePacific petition (described in more detail below) on March 20, 2013. Likewise, the FCC generally entertains *ex parte* comments until shortly before it makes a decision. Moreover, the FCC has not yet opened a rulemaking proceeding which would be the likely outcome of any decision it makes relative to the various petitions currently before it. That proceeding should allow ample opportunity for additional comments.

## **SECTION 1: Introduction**

The Public Switched Telephone Network ("PSTN") has been evolving since its inception. The replacement of manual operator stations with mechanical step-by-step switches and the substitution of analog signals with digital transmission are two of the more notable technological updates that have transformed communications networks in the United States in the past 100 years. Technological advancement, however, is now accelerating at a substantial pace, and the

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<sup>1</sup> Comments of Harris Corporation, GN Docket No. 12-353, January 28, 2013, pp. 2, 7, 8, 11.

network and the industry stand on the cusp of a major transition that is likely to replace all traditional TDM<sup>2</sup> based products with IP-enabled alternatives.

Many of the technological enhancements impacting the wireline industry over the past few decades have largely been isolated to the internal networks of communications carriers. For example, even though communications carriers undertook a major technological upgrade of their switching infrastructure in the 1990s from analog to digital switching, and again in the last decade from digital TDM to IP-based switches, customers could still rely upon the same, or similar, services to those they had purchased and used for decades. Likewise, the interface between customers and carriers remained generally unchanged, as did the equipment that customers used to access their services. However, with the transition to IP-based services, and the related transition from copper-based "last mile" facilities to fiber or wireless based facilities, the relatively static nature of the customer experience is likely to change dramatically – and soon.

The question facing the telecommunications industry is not whether a transition from TDM to IP technologies (and copper to fiber/wireless) will happen, but how quickly and in what fashion? This is the question posed to the FCC by various requests and petitions from the industry in the past few months. The purpose of this report is to: (a) describe those proposals and, (b) discuss how the resultant proceedings may impact the transition from TDM-to-IP and retirement of copper, and in turn, potentially impact Federal Agencies under the current Network program as well the upcoming NS2020 program.

Section 2 of this report discusses three primary petitions pending before the FCC involving the TDM-to-IP transition and copper retirement as follows: (1) AT&T's November 7, 2012 petition requesting the FCC launch a proceeding to address the transition from TDM to IP networks and services;<sup>3</sup> (2) the National Telecommunications Cooperative Association's ("NTCA's") November 19, 2012 petition to initiate a rulemaking to address the transition from

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<sup>2</sup> Time Division Multiplexing, or Time Division Multiplex, is a technique for transmitting a number of separate data, voice and/or video signals simultaneously over one communications medium by interleaving each signal one after another. See 19th Edition of Newton's Telecom Dictionary. Internet Protocol or "IP" transmits voice and data signals in "packets" from the source to the destination over the Internet using IP addresses.

<sup>3</sup> *In the Matter of AT&T Petition to Launch a Proceeding Concerning the TDM-to-IP Transition*, GN Docket No. 12-353, AT&T Petition to Launch a Proceeding Concerning the TDM-to-IP Transition, filed November 7, 2012 ("AT&T Petition"). The AT&T Petition is attached as Appendix 1.

TDM to IP;<sup>4</sup> and, (3) a January 25, 2013, request by a group of competitive local exchange carriers (“CLECs”) asking the FCC take expedited action to update its copper retirement rules to preserve and promote affordable broadband over copper.<sup>5</sup> Section 3 examines the telecommunications services currently purchased by the federal government via Networkx contracts to determine which of those services would be most readily impacted by the TDM-to-IP transition. Initial analysis indicates that more than half of all Networkx awards announced during 2011 and 2012 would likely be impacted whether during the term of existing Networkx contracts or the upcoming NS2020 program. Finally, Section 4 of this report identifies impacts the federal government should expect if the FCC grants AT&T’s Petition and permits a rapid TDM-to-IP transition (or TDM sunset) in trial wire centers.

## **SECTION 2: Petitions Pending Before the FCC Attempt to Reshape the Telecommunications Ecosystem**

For more than 100 years the PSTN was based on copper loops and copper interoffice facilities. For each conversation a "circuit" was opened through the metallic properties of the copper wire and a single conversation could be accommodated. Telephone switches, transmission and other equipment interfaced with these copper facilities using Time Division Multiplexing based technologies. Despite the technological advances and innovation that occurred during that timeframe, including the proliferation of fiber-based facilities throughout much of the inter-office network, copper remained the predominant medium over which telecommunications services were provisioned to reach end user customers. This final leg of a telecommunications circuit reaching ultimately to the customer's premises is often referred to as the "last mile" and continues today, in the wireline network, to be comprised predominately of copper facilities.

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<sup>4</sup> *In the Matter of Petition of the National Telecommunications Cooperative Association for a Rulemaking to Promote and Sustain the Ongoing TDM-to-IP Evolution*, GN Docket No. 12-353, Petition of the National Telecommunications Cooperative Association for a Rulemaking to Promote and Sustain the Ongoing TDM-to-IP Evolution, filed November 19, 2012 (“NTCA Petition”). The NTCA Petition is attached as Appendix 2.

<sup>5</sup> Request to Refresh Record and Take Expedited Action to Update Copper Retirement Rules to Promote Affordable Broadband Over Copper filed by Mpower Communications Corp.; U.S. Telepacific Corp.; ACN Communications Services, Inc.; Level 3 Communications, LLC; TDS Metrocom, LLC; and Telecommunications for the Deaf and Hard of Hearing, Inc., WC Docket No. 12-353 and RM-11358, filed January 25, 2013 (“Telepacific Petition”). The Telepacific Petition attached as Appendix 3.

Recently, the largest telecommunications companies in the nation – AT&T and Verizon – have expressed their intent to fully transition to all-IP-based networks. This transition would involve eliminating, over time, all TDM-based services and connections currently used by end user customers and other carriers. Both AT&T and Verizon have included as part of this general protocol transition, their desire to dramatically remake the physical network facilities as well by asking the FCC to allow them to retire their copper networks.<sup>6</sup> Not surprisingly, the far reaching impact of this transition on consumer choice, competitive access to incumbent facilities, and the manner in which carriers would interconnect with one another in this new environment elevate these topics to center stage at the FCC. The primary questions to be decided are:

- (1) What role should regulation play in the transition from TDM-to-IP and copper-to-fiber, relative to the role played by the competitive market and the desire of consumers?
- (2) At what pace should the transition be allowed, or mandated, to proceed?
  - (i) Should the FCC "sunset" TDM services/facilities and/or copper-based services on a date certain, and if so, on what date? Or, alternatively, should carriers be allowed/encouraged to incent consumers to willingly choose IP-based alternatives over time?
  - (ii) Should the FCC allow incumbents like AT&T to conduct trials that would implement an immediate "sunset" of TDM-based services in select wire centers so as to gauge the impact on consumers, competition and the public good?
- (3) Should the transition from TDM-to-IP be accompanied by a substantial reduction in regulations currently applicable to incumbent carriers?
  - (i) For example, should rules that currently govern the manner by which competing carriers interconnect with one another be abolished when interconnections are accomplished via IP rather than TDM?
  - (ii) Should incumbents be allowed to retire copper facilities from their networks, even when competitors may be using those facilities (or desire to use those facilities) to provide IP-based products like Ethernet-over-Copper?
  - (iii) Will significant stranded investment arise if existing retirement or unbundling rules remain, even though AT&T and Verizon (and other

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<sup>6</sup> The term "retiring" as used in this context means to stop using the copper network altogether, and potentially, in some cases, removing copper facilities from the outside plant (*e.g.*, removing copper wires from conduit, poles, etc.).

carriers) intend to move their consumer services to newer IP- and fiber-based products?

- (4) Should the FCC implement rules that force consumers to move to IP-based products even though they may be using, and prefer, their existing TDM-based services? Could FCC rules in this regard disturb existing contractual relationships like those the Federal Agencies have with AT&T and Verizon through the Networx program?

AT&T, Verizon, and smaller IP-based service providers advocate for the transition to take place quickly and without regard to whether customers or carriers want to maintain traditional services copper-based connections. Likewise, the FCC's Technology Advisory Council has recommended that the FCC take steps to expedite the transition, with a target date of 2018 for a PSTN sunset.<sup>7</sup> On the other hand, consumer advocate groups, smaller incumbents, and competitive companies who still rely on copper infrastructure advocate for a more methodical transition, and in some cases, the preservation of more traditional services and copper-based networks.

Currently, three pending petitions are primarily shaping the debate:

- **AT&T Petition**: On November 7, 2012, AT&T filed a petition with the FCC to launch a proceeding to address the transition from TDM to IP networks and services (hereafter referred to as "AT&T Petition").
- **NTCA Petition**: On November 19, 2012, the NTCA<sup>8</sup> filed a petition to initiate a rulemaking to address the transition from TDM to IP (hereafter referred to as "NTCA Petition").
- **Telepacific Petition**: On January 25, 2013, a group of CLECs<sup>9</sup> filed a request with the FCC to take expedited action to update its copper retirement rules to preserve and promote affordable broadband over copper (hereafter referred to as "Telepacific Petition").

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<sup>7</sup> FCC Technology Advisory Council, Status of Recommendations, June 29, 2011.

<sup>8</sup> NTCA is an industry association representing nearly 600 network service operators in rural America. Each member is a "rural telephone company" as defined in the Telecommunications Act.

<sup>9</sup> These CLECs include: Mpower Communications Corp.; U.S. Telepacific Corp.; ACN Communications Services, Inc.; Level 3 Communications, LLC; TDS Metrocom, LLC and Telecommunications for the Deaf and Hard of Hearing.

An analogy that has been used to compare these competing proposals is to envision the existing telecommunications regulatory framework as a house with a leaky foundation.<sup>10</sup> In such a scenario, the homeowner has several options: (1) knock down the foundation with a sledgehammer and build anew, (2) analyze individual bricks of the foundation in order to repair or replace faulty bricks, or (3) leave the foundation alone and clean up leaks if and when they arise. The AT&T Petition is best characterized as the “sledgehammer” approach, whereby virtually the entire telecommunications regulatory framework at the federal and state levels would be dismantled. The NTCA Petition advocates for analyzing individual regulations (bricks) and addressing those which need repaired, replaced or eliminated as a result of the TDM-to-IP transition. The Telepacific Petition would to a large extent leave the foundation alone – based on the premise that the copper network still holds value – but repair a few “bricks” to preserve access to the copper network for the provision of broadband services. These petitions are summarized below.

#### **A. AT&T Petition**

“AT&T asks the Commission to consider conducting, for select wire centers chosen by...ILECs that elect to participate, trial runs of the transition to next-generation services, including the retirement of...TDM facilities and offerings and their replacement with IP-based alternatives.”

*AT&T Petition, p. 1.*

The overarching purpose of the AT&T Petition is to persuade the FCC to conduct trials which analyze the impacts of retiring TDM networks and facilities and replacing them with IP-based services. These trials would be conducted in wire centers selected by AT&T and other incumbent phone companies who choose to participate. The major themes of AT&T’s Petition are that maintaining a TDM network misallocates scarce resources and otherwise delays or precludes investment in next-generation networks. Further, according to AT&T, existing regulations force incumbent carriers to undertake the costly exercise of maintaining two different networks (IP and TDM). AT&T claims that the FCC can, by taking the steps it proposes in its petition, free up billions of dollars for additional investment in new IP technologies and

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<sup>10</sup> See, NTCA Petition.

infrastructure. According to AT&T, the proposed trials will: (a) assist the FCC in understanding technological and policy impacts of the transition; (b) identify regulatory reforms needed as a result of the transition; (c) facilitate an industry-wide dialogue on the appropriate regulatory framework; (d) test that framework on a trial basis; and (e) answer questions and learn lessons that can be used to shape nationwide reforms. AT&T's Petition envisions a four step process for conducting its proposed trials:

1. ***Initiate Proceeding:*** FCC opens a proceeding to consider trials. The notice initiating this proceeding would elicit proposals from incumbent phone companies who want to conduct trials for: (a) specific wire centers in which the trials would be conducted, (b) identification of the network modifications that would be needed, (c) identification of the existing services that would be replaced by IP-based services, (d) identification of the steps to notify customers, and (e) timelines specifying when these various steps would occur.
2. ***Regulatory Reform:*** Eliminate regulations that require telecommunications carriers to maintain legacy networks and services in the selected wire centers, including those regulations that currently provide competitors with access to those facilities. AT&T refers to this as a "regulatory experiment."
3. ***Interconnection:*** Preclude carriers from demanding interconnection and services in TDM format in the selected wire centers. In addition, avoid establishing rules governing the rates, terms and conditions of IP interconnection.
4. ***End Users:*** Prevent end user customers from delaying the transition by establishing a hard "sunset" date in the selected wire centers and requiring end users customers to select alternative services (or permitting the service provider to select alternative services for customers) before that date.

AT&T contends that the FCC has the legal authority to conduct these trials based on its waiver and forbearance authority, and can preempt any inconsistent state regulations. The AT&T Petition identifies the regulations listed below as "investment-detering" and ripe for elimination, substantial modification or forbearance:<sup>11</sup>

- **Carrier of Last Resort ("COLR") Obligations.** AT&T seeks elimination (including forbearance or preemption) of state COLR obligations that require incumbent phone companies to serve all requesting customers within their service territory. AT&T also seeks elimination of Eligible Telecommunications Carrier ("ETC") rules that require

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<sup>11</sup> A list of regulations specifically earmarked in AT&T's Petition for elimination is provided in Appendix 4.

certain carriers to provide stand-alone TDM-based services as a result of universal service obligations.<sup>12</sup>

- **Interconnection Obligations.** Any requirement to interconnect with other carriers on an IP basis should not be adopted and any requirements to connect on a TDM basis should be eliminated in all IP areas. All carriers are required to interconnect with other carriers pursuant to obligations under § 251 of the federal Telecommunications Act. AT&T and others have interpreted the § 251 interconnection obligations to apply only to TDM technology, and not to IP technology (which they claim are classified as “information” services instead of “telecommunications” services). To further support its proposal for a “hands off” approach for IP interconnection, AT&T states that all IP-based services are properly defined as interstate, over which the FCC has exclusive jurisdiction. According to AT&T, the market (rather than regulations) should be relied upon for establishing rates, terms and conditions for IP interconnection.<sup>13</sup>
- **Right to Discontinue Service.** Currently, § 214 of the federal Telecommunications Act requires carriers to obtain a certificate from the FCC before discontinuing, reducing or impairing service to a community. AT&T contends that these requirements do not apply when TDM-based services are eliminated in favor of IP-based services because services will not be discontinued, reduced or impaired – but instead replaced and enhanced by IP-based service. If the FCC disagrees with AT&T on this point, AT&T asks for service discontinuance requirements to not apply in the case of replacing TDM with IP. Otherwise, according to AT&T, it would be burdensome and impractical to obtain a certificate to discontinue all the many different TDM-based services that would be eliminated in the trial wire centers.<sup>14</sup>
- **Network Change Notices.** Currently, incumbent phone companies are required to provide notice to the FCC and other carriers of certain network changes, such as when copper is retired. Affected carriers can object to the notice, which will delay the network change for up to 6 months (but not stop it). Such objections are triggered by the date on which the FCC issues a Public Notice (as opposed to the date on which the incumbent phone company provides its notice). AT&T contends that the clock for objections should begin with the filing of the notice (which may be weeks or months earlier than the FCC’s Public Notice) in order to avoid unnecessary delay.<sup>15</sup>
- **Equal Access.** Equal access allows telephone customers to choose an authorized long distance company by dialing a specific access code. According to AT&T, the all-IP world blurs the distinctions between local and long distance calling, and as such, there is

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<sup>12</sup> AT&T Petition, pp.15-18.

<sup>13</sup> AT&T Petition, p.21.

<sup>14</sup> AT&T Petition at pp. 13-15.

<sup>15</sup> AT&T Petition, pp 15-17.

no need for a “local” provider to be required to permit customers to access a specific “long distance” provider. AT&T advocates the elimination of equal access obligations.<sup>16</sup>

- **Dialing Parity.** Dialing parity requires carriers to offer their customers the opportunity to preselect a specific long-distance provider. Again, according to AT&T, the all-IP world blurs the distinctions between local and long distance calling, and as such, there is no need for a “local” provider to permit the customer to preselect a “long distance” provider. AT&T requests the FCC eliminate these obligations.<sup>17</sup>
- **Hybrid Loop Requirements.** Currently, incumbent phone companies are required to provision unbundled copper-based loops for their competitors, over which those competitors provision their own services. If a loop is a “hybrid” loop – meaning that it is partly copper and partly fiber – then the incumbent must either provision an all-copper loop to the competitor or provide a loop “channel” over the hybrid technology. AT&T seeks elimination of this requirement. This AT&T proposal in effect would prevent competitor access to unbundled loops in areas where there are hybrid or fiber loops and where copper is retired.<sup>18</sup>
- **Miscellaneous.** AT&T states that the list of regulations in its Petition for which it seeks elimination is not comprehensive. AT&T also suggests that regulations should be examined in more detail during the requested trials. The company refers more generally to other regulations it states have no relevance in an all-IP environment, including Open Network Architecture/Comparably Efficient Interconnection (“ONA/CEI”),<sup>19</sup> record-keeping, accounting, guidebooks, payphones and data collection.<sup>20</sup> These items have traditionally been used by regulators as tools for regulatory oversight, and have provided information to consumers about the availability, rates, terms, and conditions of various communications services.<sup>21</sup>

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<sup>16</sup> AT&T Petition, p.18.

<sup>17</sup> AT&T Petition, p.19.

<sup>18</sup> AT&T Petition, pp. 19-20.

<sup>19</sup> The FCC’s ONA/CEI rules were devised in the 1980s as part of its *Computer III inquiry*, and were intended to ensure that the Bell Operating Companies (“BOCs”) provided their competitors with non-discriminatory access to their narrowband networks to support competitive provision of enhanced services, such as voicemail and directory assistance. AT&T does not mention that the FCC already has proposed to eliminate the ONA/CEI rules, and in August 2011 its Wireline Competition Bureau issued an Order that granted the BOCs (including AT&T’s BOC subsidiaries) a waiver from those rules and filing requirements until the FCC issues its final decision on them. See WC Docket No. 10-32 et al, Order DA 11-1392, released August 11, 2011, available at: [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DA-11-1392A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-11-1392A1.pdf)

<sup>20</sup> AT&T Petition, p. 20.

<sup>21</sup> “Guidebooks” are documents that contain the rates, service descriptions, and terms and conditions for services that have qualified for reduced regulatory oversight. In many instances, AT&T and other ILECs now file guidebooks in lieu of tariffs with the FCC and state regulatory commissions. See, e.g., the AT&T Service Agreements and Guidebooks page at <http://cpr.bellsouth.com/guidebook/> which lists fifteen states in which

## B. NCTA Petition

“A ‘smart regulation’ approach acknowledges that an IP migration is not to be encouraged for its own sake, but precisely because IP-enabled networks are presumed to – and must – promote affordable access to higher-quality communications services for all Americans.”

*NTCA Petition, p. iii.*

The NTCA Petition proposes what it calls “smart regulation” to promote and sustain the ongoing evolution of TDM to IP. This “smart regulation” would involve maintaining certainty by retaining and reasserting a regulatory foundation, while coordinating with state regulators and consumer advocates to examine which “bricks” of the regulatory foundation need maintained, replaced, repaired or removed. The “smart regulation” focuses squarely on reviewing applicable telecom regulations and providing economic incentives for additional investment; it does not include the “trial” approach or PTSN sunset requested in the AT&T Petition. NTCA proposes a 4 step process for “smart regulation”:

1. ***Initiate Proceeding:*** Initiate a rulemaking proceeding to review regulations.
2. ***Identify Regulations to be Reviewed:*** Develop a list of specific existing regulations that may have limited or no applicability in the delivery of IP-enabled services because of technological change, competitive forces, or other regulatory, market or economic developments. The NTCA Petition, unlike the AT&T Petition, does not list any specific regulations that should be changed.
3. ***Seek Comment on Regulations:*** Comments filed on which regulations might be: (a) eliminated for enhancing the TDM-to-IP migration while furthering the protection of consumers, promotion of competition, and ensuring universal service; (b) retained in their current form; or (c) modified/replaced for enhancing the TDM-to-IP migration.
4. ***Deadline:*** Set firm deadline for completing the regulations review.

In addition, NTCA proposes certain economic incentives it states will spur investment in IP-enabled infrastructure, including: (a) confirmation by the FCC that *all* interconnections (including IP interconnection) are subject to the requirements of § 251 of the federal Telecommunications Act; (b) allow carriers to recover, through intercarrier compensation charges, costs incurred when exchanging traffic over IP interconnections. NTCA also advocates

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AT&T files guidebooks, as well as several guidebooks for interstate access and toll services that it files with the FCC.

for providing small rural incumbent phone companies sufficient and predictable universal service support regardless of technology used.

### **C. TelePacific Petition**

“The advantage of technology is that it can turn what was once considered ‘old’ into something ‘new.’ Copper loops are a fundamental building block in communications networks, including the IP-based networks that both industry and regulators aspire to deploy across America.”

*Telepacific Petition, p. 3.*

The Telepacific Petition asks the FCC to refresh the record in a prior proceeding which established copper retirement rules and take expedited action to update those rules to preserve and promote affordable broadband over copper. Telepacific states that copper loops are a fundamental building block in communications networks, including IP-based networks, and that they will continue to be a prevalent and important part of the network for some time. Telepacific notes that even AT&T’s U-Verse service – AT&T’s “triple-play” product combining video, voice and Internet services – relies on copper subloops; thus, AT&T’s claim that preserving copper slows the transition to all-IP networks is misplaced.

Telepacific points to Ethernet over Copper (“EoC”) as a technology that has emerged to provide broadband (including IP-based) services over existing copper facilities. The Telepacific Petition states that the FCC’s existing copper retirement rules impede a competitor’s ability to provide broadband over copper at affordable prices. This is because the copper retirement rules permit incumbent phone companies to retire copper (after notice) over the objections of CLECs, even if a customer is currently served by the copper infrastructure being retired. Telepacific states that once EoC is available, quotes for fiber services drop by half – or, in other words, EoC spurs competitive prices for fiber. Telepacific asks the FCC to change the copper retirement rules to accomplish the following objectives: (a) ensure customers currently receiving broadband over copper loops do not lose their broadband service; (b) ensure that the rules promote the regulatory certainty needed to further investments of new technologies over copper; (c) require incumbent phone companies to provide CLECs access to copper loops even where permission has been granted to retire the copper loops; and (d) prohibit incumbent phone companies from

removing copper loops from the network without affirmative permission from the FCC. The specific rule changes proposed by Telepacific are summarized below:

1. On an interim basis pending the rulemaking, suspend the current copper retirement rules absent emergency circumstances.
2. Require incumbent phone companies to provide interconnecting carriers advance notice of permanent disabling/removal of copper and an opportunity to object. If an existing customer is being served broadband over the copper, permission will only be granted by the FCC based on an affirmative finding that disabling/removal is in the public interest, customer will not have service disrupted, and customer will have a competitively priced alternative.
3. Clarify that retirement does not equate to physical removal and that permission to retire copper facilities does not also grant leave to remove them from the network.
4. Separately permit removal only in very few circumstances.
5. Apply the copper retirement rules to the feeder portion of the loop.
6. Require incumbent phone companies to maintain a comprehensive database that allows CLECs and regulators to look up the availability of copper loops.
7. Allow states to adopt restrictions on copper disconnection, removal, or disabling.
8. Deny AT&T's request to start the network notice objection timeframe when notification is given rather than when the FCC's public notice is issued.

Telepacific states that the FCC has the authority to make these rule changes under various sections of the federal Telecommunications Act.

### **SECTION 3: The Federal Agencies Currently Rely Heavily On TDM-Based Services and Copper-Based Networks To Meet Their Telecommunications Needs**

The federal government is a major consumer of TDM-based communications services. As a result, the TDM-to-IP transition, and more specifically the AT&T Petition that would significantly speed that transition and potentially "sunset" existing TDM-based services, will have a major impact on the communications infrastructure and services used by the federal government. For purposes of perspective, it is worth noting that more than half of all Fair Opportunity notices related to Networx contracts during 2011 and 2012 included services that would be discontinued if the FCC were to "sunset" TDM-based services. That percentage increases for older acquisitions (e.g., 2010, 2009, etc.). More specifically, 33.3% of all 2011 and

2012 notices involved basic (TDM-based) *voice* services. All of these services would likely be discontinued in the short term in trial wire centers if AT&T's Petition is granted, assuming the government's existing contracts (including Networx and others) do not preempt any related FCC decisions in that regard.

### **A. Networx Contracts**

The General Services Administration ("GSA") has indicated that a majority of the telecommunications services provided to federal government customers throughout the United States are purchased through the Networx program.<sup>22</sup> In fact, the GSA Networx program comprises the largest set of government contracts offering comprehensive telecommunications services to Federal Agency locations in the United States and abroad. Understanding which services purchased under the Networx contracts will be directly impacted by the TDM-to-IP transition is a critical first step in determining what affects the federal government can expect.

The Networx acquisition is valued at \$68.2 Billion over 10 years and is comprised of two separate contracts: *Universal* and *Enterprise*.<sup>23</sup> Announced in March of 2007, the larger *Universal* contracts are designed to replace FTS2001 and other FTS contracts by providing a wide range of mandatory services – including TDM-based services –while guaranteeing continuity of traditional telecommunications services during the transition to Networx based services.<sup>24</sup> The *Universal* contracts (valued at \$48.1 Billion) were awarded to incumbent phone companies AT&T, Verizon, and Qwest. The *Enterprise* contracts include a "set of mandatory IP services...with access at speeds greater than or equal to T3 and one or more FTS2001 data services" or a "set of wireless services" within 90% of metropolitan statistical areas and 90% of rural statistical areas.<sup>25</sup> These *Enterprise* contracts (valued at \$20.1 Billion) were awarded to incumbent phone companies AT&T, Verizon, and Qwest, as well as competitive carriers Level 3 and Sprint. In total, GSA has estimated that the FTS2001 Transition Baseline Inventory ("TBI")

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<sup>22</sup> Section C.1.5 of the current Networx contracts specify that "Authorized Users" of the Networx contracts include "all Federal Agencies, authorized Federal Contractors, Agency-sponsored universities and laboratories, other organizations as defined in Section H.2, and, when authorized by law or regulation, state, local and tribal governments." Federal Agencies and Authorized Users are used interchangeably in this report.

<sup>23</sup> See <http://www.gsa.gov/portal/content/101611> and <http://www.gsa.gov/portal/content/101612>.

<sup>24</sup> See Universal contract section C.1.3.

<sup>25</sup> See Enterprise contracts at Section C.1.3.

included telecommunications services provided to more than 72,000 Service Delivery Points ("SDPs"), or locations, and to 3.7 million end users.<sup>26</sup> As shown in Table 1 below, the Universal contracts provide for 36 mandatory services across 5 "service type" categories, and the Enterprise contracts provide for 10 mandatory services across 4 service type categories.<sup>27</sup>

**Table 1: Networx Services by Type and Contract**

TELECOMMUNICATIONS SERVICE TYPE			SECURITY SERVICES TYPE		
Service Description	Universal	Enterprise	Service Description	Universal	Enterprise
<b>Communications Transport Services Category</b>			Managed Firewall	Mandatory	Mandatory
Voice Services	Mandatory	Optional	Intrusion Detection and Prevention	Mandatory	Mandatory
Circuit Switched Data	Mandatory	Optional	Managed Tiered Security	Mandatory	Mandatory
Toll-Free	Mandatory	Optional	Anti-Virus Management	Mandatory	Mandatory
Combined	Mandatory	Optional	Managed E-Authentication	Mandatory	Optional
Private Line	Mandatory	Optional	Vulnerability Scanning	Mandatory	Optional
Frame Relay	Mandatory	Optional	Incident Response	Mandatory	Optional
Asynchronous Transfer Mode	Mandatory	Optional	Secure Managed Email	Mandatory	Optional
Ethernet	Optional	Optional			
<b>IP Based Services Category</b>			<b>SPECIAL SERVICES TYPE</b>		
Network-Based IP VPN	Mandatory	Mandatory	Service Description	Universal	Enterprise
Voice over IP Transport	Mandatory	Mandatory	Land Mobile Radio	Optional	Optional
Internet Protocol	Mandatory	Mandatory	Mobile Satellite	Optional	N/A
Premises-Based IP VPN	Mandatory	Optional	Fixed Satellite	Optional	N/A
Content Delivery Network	Mandatory	Optional			
Converged IP	Mandatory	Optional	<b>WIRELESS SERVICES TYPE</b>		
IP Telephony	Mandatory	Optional	Service Description	Universal	Enterprise
IP Video Transport	Optional	Optional	Cellular/PCS *	Mandatory	Mandatory
Layer 2 VPN	Optional	Optional	Multimode/Wireless	Mandatory	Optional
<b>Optical Services Category</b>			Cellular Digital Packet Data	Optional	Optional
Synchronous Optical Network (SONET)	Mandatory	Optional	Paging	Optional	Optional
Optical Wavelength	Mandatory	Optional	* Cellular/PCS is "Mandatory" only for Enterprise wireless contracts.		
Dark Fiber	Optional	Optional			
<b>MANAGEMENT AND APPLICATION SERVICE TYPE</b>					
Service Description	Universal	Enterprise			
Managed Network	Mandatory	Mandatory			
Customer Specific Design and Eng	Mandatory	Mandatory			
Video Teleconferencing	Mandatory	Optional			
Audio Conferencing	Mandatory	Optional			
Teleworking	Mandatory	Optional			
Call Center/Customer Contact Center	Mandatory	Optional			
Web Conferencing	Mandatory	Optional			
Dedicated Hosting	Mandatory	Optional			
Co-Located Hosting	Mandatory	Optional			
Storage Services	Mandatory	Optional			
Unified Messaging	Optional	Optional			
Collaboration Support	Optional	Optional			
Internet Facsimile	Optional	Optional			

<sup>26</sup> The end user counts comprise service delivery instances including, for example, unique telephone numbers, whether wireline or wireless.

<sup>27</sup> See Networx Universal contracts at Section C.2.1.1.

Based on the Networx contract descriptions as well as Table 1 above, the Universal contracts focus more on telecommunications service types that have traditionally relied on TDM technology (*e.g.*, basic voice, private line, circuit switched data, etc.). Enterprise contracts, on the other hand, focus more on (1) IP-based services, (2) management and application services, and (3) network security services.

## **B. Federal Agency Purchases**

To determine which of the specific services identified in Table 1 above would be impacted by the AT&T Petition (or, more generally, a TDM-to-IP transition), all Networx related Fair Opportunity notices published between August of 2007 and December of 2012 were reviewed. The result of that review indicates that a majority of the approximately 125 distinct Federal Agency customers purchasing services through Networx contracts rely on basic TDM-based voice telecommunications services that would be impacted by AT&T's Petition assuming the existing Networx contract provisions do not preclude AT&T's proposals taking affect prior to the expiration of the Networx contracts in 2017.

All Fair Opportunity awards for the two-year period January 1, 2011 through December 31, 2012, were also analyzed in more detail. The results of that more detailed analysis are presented in Table 2 below (with service categories likely to be impacted by the TDM-to-IP transition highlighted in blue). In total, more than 50% of all awards from 2011 and 2012 included services that would be eliminated or significantly altered by the transition.<sup>28</sup>

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<sup>28</sup> It is important to note that while many services are not likely to be directly impacted by a transition from TDM-to-IP, many IP-based services are currently accessed via TDM-based access methods. For example, Section C.2.7.3.3.2 of the Networx Universal contracts states that IP -Based VPN services shall support, for example, "Analog dialup at 56 kbps." All Networx access methods which rely upon any non IP-based services may potentially be disrupted by a transition to an all IP world as proposed by AT&T. Moreover, finding a "last mile" connection after TDM is retired may be difficult, if not impossible, for some federal government customers. For example, the FAA's air/ground radios and navigational aids have to be located in rural areas to provide the required airspace coverage. Non-TDM "last mile" connections in many of these areas are a challenge to find and expensive to construct. Comments of Harris Corporation, GN Docket No. 12-353, January 28, 2013.

**Table 2: Network Services Provided to Federal Agencies  
 (2011-2012) Fair Opportunity Notices**

TELECOMMUNICATIONS SERVICE TYPE		SECURITY SERVICES TYPE	
Service Description	2011-2012 FO Notices	Service Description	2011-2012 FO Notices
<b>Communications Transport Services Category</b>		Managed Firewall	0.6%
Voice	33.3%	Intrusion Detection and Prevention	0.6%
Circuit Switched Data	4.5%	Managed Tiered Security	1.3%
Toll-Free	16.7%	Anti-Virus Management	0.0%
Combined	1.3%	Managed E-Authentication	0.0%
Private Line	21.8%	Vulnerability Scanning	0.0%
Frame Relay	2.6%	Incident Response	0.6%
Asynchronous Transfer Mode	0.0%	Secure Managed Email	0.6%
Ethernet	1.9%		
<b>IP Based Services Category</b>		<b>SPECIAL SERVICES TYPE</b>	
		Service Description	2011-2012 FO Notices
Network-Based IP VPN	10.9%	Land Mobile Radio	0.6%
Voice over IP Transport	0.0%	Mobile Satellite	0.0%
Internet Protocol	32.1%	Fixed Satellite	0.0%
Premises-Based IP VPN	1.9%		
Content Delivery Network	0.6%		
Converged IP	0.0%		
IP Telephony	5.8%		
IP Video Transport	0.0%		
Layer 2 VPN	0.6%		
<b>Optical Services Category</b>		<b>WIRELESS SERVICES TYPE</b>	
		Service Description	2011-2012 FO Notices
Synchronous Optical Network (SONET)	0.6%	Cellular/PCS *	1.3%
Optical Wavelength	0.0%	Multimode/Wireless	0.0%
Dark Fiber	0.0%	Cellular Digital Packet Data	1.3%
		Paging	0.6%
<b>MANAGEMENT AND APPLICATION SERVICE TYPE</b>			
Service Description	2011-2012 FO Notices		
Managed Network	15.4%		
Customer Specific Design and Eng	0.0%		
Video Teleconferencing	1.3%		
Audio Conferencing	5.8%		
Teleworking	0.0%		
Call Center/Customer Contact Center	0.6%		
Web Conferencing	0.6%		
Dedicated Hosting	0.0%		
Co-Located Hosting	0.6%		
Storage Services	0.0%		
Unified Messaging	0.6%		
Collaboration Support	0.0%		
Internet Facsimile	0.0%		

\* Cellular/PCS is Mandatory for Enterprise Wireless Contracts

Table 2 shows that 33.3% of all Fair Opportunity notices related to Network contracts during 2011 and 2012 included basic (TDM-based) voice services, 21.8% include private line

services, 16.7% include toll-free services, 4.5% include circuit switched data services, 2.6% include frame relay services, 1.9% include Ethernet services, and 1.3% include combined services. With the exception of Ethernet services, these services included in the “Communications Transport Services Category” shown in Table 2 would be eliminated or significantly altered in the all-IP environment envisioned by AT&T’s Petition. A review of the descriptions of these services in the Networx contracts indicates that they depend upon the availability of TDM connections at the end users' location (or Service Delivery Point - "SDP") and/or the availability of copper facilities.<sup>29</sup>

Voice service, for example, is a mandatory component of Networx Universal contracts, and is an optional component of the Networx Enterprise contracts. Table 2 shows that 33.3% of the 156 Networx Fair Opportunity decisions identified in 2011 and 2012 include voice services. This percentage is even higher for Fair Opportunity decisions that took place between 2007 and 2010.<sup>30</sup> When all Fair Opportunity decisions between 2007 and 2012 are considered, it is estimated that half of them include Voice Services. Voice service is used by Federal Agencies to support voice calls, whether initiated from on-net or off-net locations by direct station-to-station dialing.<sup>31</sup> As pictured in Diagram 1 below, voice service can be accessed through numerous end-user devices, such as agency Private Branch Exchanges (PBXs), Centrex capable central offices, secure phones and various mobile devices.<sup>32</sup> Voice Service includes the ability to place calls to users on the PSTN as well as certain custom calling features and calling cards.<sup>33</sup> All of

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<sup>29</sup> The IP-based services category is unlikely to be impacted by a transition to IP-based services unless the underlying access facilities became unavailable due to copper retirement. Based on the service descriptions included in Networx contract Section C, the Optical Services Category, Management and Applications Service Type, Security Services Type, Special Services Type and Wireless Services Type are not likely to be directly impacted by a transition to IP-based services or retirement of copper facilities.

<sup>30</sup> Summary of Fair Opportunity Decisions Made on Networx Contracts as of January 15, 2013 located at <http://www.gsa.gov/portal/content/103896#faiopp>.

<sup>31</sup> See glossary of terms included in Universal contract Section J.11 for the definition of "On-Net Location" as follows: For a specific service (such as Voice Service), a location that is presubscribed to the service if provided by the Networx contractor, i.e., a location “on” the network that is used to provide the contractor’s Networx service. On-net locations may be implemented using either dedicated access or a presubscribed switched access arrangement. On-net locations shall be construed to include presubscribed terrestrial and satellite service-based wireless handsets or terminals.

<sup>32</sup> Voice Service technical description in the Networx Service Guide located at <https://releasedprices.networx.gov/guide/#s-AVMS>.

<sup>33</sup> See, for example, Networx Universal contract section C.2.2.1.2.1.

these services are currently configured based upon TDM and/or copper based interfaces and specifications that would be discontinued in trial wire centers under AT&T's petition.

**Diagram 1: Voice Service**

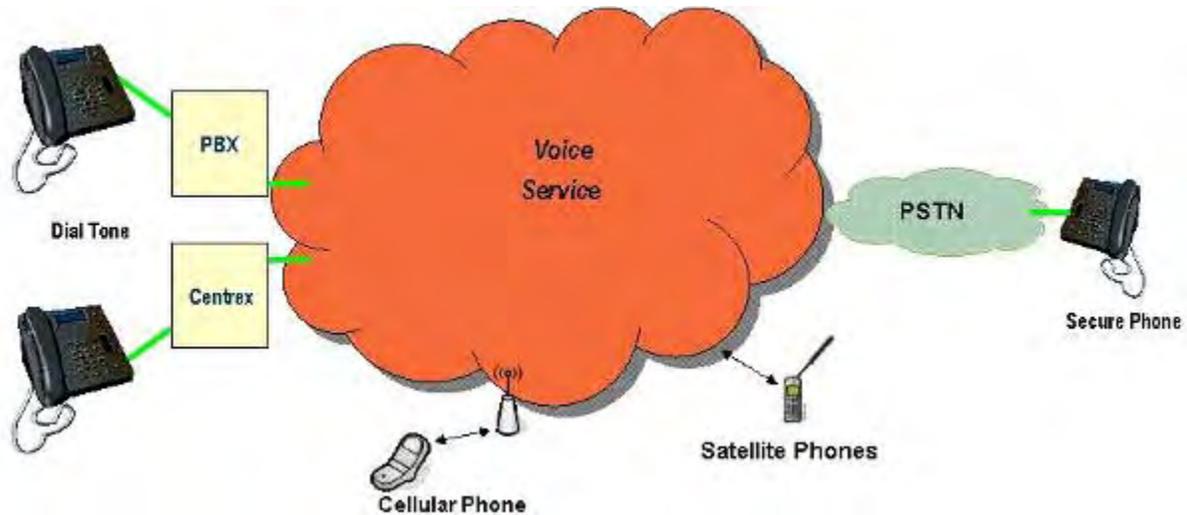


Table 3 below demonstrates that the UNIs applicable to voice service include basic interfaces supported by SS7 signaling, such as analog lines and trunks and digital trunks (*e.g.*, ISDN, T1 and DS3).<sup>34</sup> All of these facilities and services – SS7 signaling, analog lines/trunks, digital trunks – would be discontinued if/when TDM-based networks are "sunsetted."

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<sup>34</sup> Networkx Universal at section C.2.2.1.3.1 and Networkx Enterprise at section C.2.2.1.2.1.

**Table 3: Voice Services Interface Detail**

UNI Type	Interface Type and Standard	Payload Data Rate or Bandwidth	Signaling Type
1	Analog Line: Two-Wire (Std: Telcordia SR-TSV-002275)	4 kHz Bandwidth	Line-Loop Signaling
2	Analog Line: Four-Wire (Std: Telcordia SR-TSV-002275)	4 kHz Bandwidth	Line-Loop Signaling
3	Analog Trunk: Two-Wire (Std: Telcordia SR-TSV-002275)	4 kHz Bandwidth	Trunk-Loop Signaling (loop and ground start)
4	Analog Trunk: Four-Wire (Std: Telcordia SR-TSV-002275)	4 kHz Bandwidth	Trunk-Wink Start Signaling
5	Analog Trunk: Four-Wire (Std: Telcordia SR-TSV-002275)	4 kHz Bandwidth	Trunk-E&M Signaling
6	Digital Trunk: T1 (Std: Telcordia SR-TSV-002275 and ANSI T1.102/107/403)	Up to 1.536 Mbps	T1 Robbed-Bit Signaling
7	Digital Trunk: ISDN PRI T Reference Point (Std: ANSI T1.607 and 610)	Up to 1.536 Mbps	ITU-TSS Q.931
8	Digital: T3 Channelized (Std: Telcordia GR-499-CORE)	Up to 43.008 Mbps	SS7, T1 Robbed-Bit Signaling
9 (Non-US)	Digital Trunk: E1 Channelized (Std: ITU-TSS G.702)	Up to 1.92 Mbps	SS7, E1 Signaling
10 [OPTIONAL]	Optical: SONET OC-1 (Std: ANSI T1.105 and 106)	49.536 Mbps	SS7
11 [OPTIONAL]	Electrical: SONET STS-1 (Std: ANSI T1.105 and 106)	49.536 Mbps	SS7
12 (Non-US)	Digital: E3 Channelized (Std: ITU-TSS G.702)	Up to 30.72 Mbps	SS7, E1 Signaling
13	Digital Line: ISDN BRI S and T Reference Point (Std: ANSI T1.607 and 610)	Up to 128 kbps (2x64 kbps)	ITU-TSS Q.931

Moreover, many of the mandatory interfaces identified in Table 3 above have traditionally been supported by copper facilities, meaning that a high percentage of the voice services identified in the Fair Opportunity notices would be eliminated due to a PSTN sunset.

Appendix 5 to this report provides detailed descriptions of the eight telecommunications services included in the "communications transport services" category included in Table 2 above,

as well as a discussion about the extent to which a TDM-to-IP transition is likely to impact Federal Agency telecommunications purchases of those services over time. A summary of that analysis is presented in Table 4 below.

**Table 4: Likelihood That Services Will Be Directly Impacted by Transition to IP and/or Copper Retirement**

<b>Network Telecommunications Service Type</b>	<b>Impacted by Transition to IP and/or Copper Retirement</b>
Voice	Very Likely
Circuit Switched Data	Very Likely
Toll-Free	Very Likely
Combined	Very Likely
Private Line	Very Likely
Frame Relay	Likely
Asynchronous Transfer Mode	Likely
Ethernet	Somewhat Likely

In addition to the telecommunications services noted in the table above, it is possible that any service provided to Federal Agencies by or through non-IP-based access methods or non-fiber-based facilities (*e.g.*, copper loops, DSL loops, special access, etc.) would be impacted by a transition to an all-IP-based ecosystem. For example, customers oftentimes access IP telephony services via a copper loop, and IP-based VPS often times permit off-site access via 56kb dial-up access. Under this scenario, the IP-based telephony service itself would not be impacted by the TDM-to-IP transition; however, the copper “last mile” connection used to access that service would be retired in the trial wire centers under AT&T’s Petition as a result of the full transition to an IP-based infrastructure that is largely reliant on fiber facilities. That connection would need to be replaced by IP or wireless technology, which may also lead to the replacement of interface equipment or customer premises equipment owned, managed, or purchased by the Federal Agency customers.

**SECTION 4: Potential Impact of Petitions and TDM-to-IP Transition on Federal Agencies’ Telecommunications Services Contracts**

The TDM-to-IP transition is re-shaping the telecommunications ecosystem regardless of what transpires related to the three pending petitions at the FCC. Over the last few years, incumbent phone companies have been “grandfathering” (*i.e.*, eliminating for new customers) TDM and copper-based services, and shifting capital investments from copper wireline networks and facilities to wireless and IP networks and facilities. There has also been a recent trend for state legislatures and state regulators to free incumbent phone companies from regulations that require the maintenance of copper-based services, such as elimination of service quality standards and COLR obligations. The petitions at the FCC will not determine *whether* the TDM-to-IP transition occurs and copper facilities are retired as time marches on, but instead *when* and *how* that transition takes place.

The petition that has the greatest likelihood of impacting Federal Agencies is AT&T’s Petition. The impacts of the NTCA Petition would not become evident until such time as it is granted and more concrete recommendations are proposed. The Telepacific Petition, if granted, is unlikely to directly impact Federal Agency customers because it does little to speed the retirement of copper or TDM networks or infrastructure – and in fact, would make it more difficult for copper and TDM to be retired.

It is worth noting that the AT&T Petition has the potential for both short-term and long-term impacts. If AT&T’s Petition is granted, the short-term impacts on Federal Agencies will depend on whether incumbent phone companies select wire centers for the trials in which Federal Agency customers are located. To the extent selected trial wire centers do not include those in which Federal Agency customers are located, short-term (*i.e.*, one to three years) impacts on Federal Agency customers would be minimal. This, however, is an extremely unlikely outcome given that Federal Agency customers are served in thousands of wire centers nationwide. GSA estimates that the FTS2001 TBI covers more than 72,000 SDPs and 3.7 million end users in wire centers across the country. It has been reported that a single Federal Agency customer, the FAA (who uses the FAA Telecommunications Infrastructure (“FTI”) Program, the largest non-military network in the federal government), receives TDM services in

more than 3,300 wire centers.<sup>35</sup> The much more likely outcome is that incumbent phone companies will pick wire centers for the trial in which one or more Federal Agency customers currently use TDM services. In those cases, the following impacts can be expected assuming the terms of existing government telecommunications contracts (including Networx and others) do not preclude the changes proposed by AT&T during existing contract terms:<sup>36</sup>

- **Certain Networx based services would be discontinued.** The TDM and copper based telecommunications services currently purchased by Federal Agency customers listed in Table 4 above would be eliminated or significantly altered in the wire centers participating in the trials.<sup>37</sup> As noted above, this would impact roughly half of the contracts for telecommunications services purchased by Federal Agency under the Networx contracts in the recent past. The extent to which a discontinuance of service results in a forced migration to IP-based services and the time allotted for such a migration, however, will likely be dictated by the conditions of any trial established by the FCC. Notably, AT&T's Petition makes clear that no customers should be permitted to retain copper-based services or delay implementation after the sunset date established for the trials. It is unclear how a PSTN sunset and forced migration to IP-services would impact Networx or other similar contracts that exist between AT&T and the federal government.
- **Federal Agencies would be forced to replace services included in the Networx contracts, and alternative services may be difficult or impossible to find.** Regardless of the technology currently used to serve Federal Agency customers and regardless of whether Federal Agency customers continue to have a need for copper/TDM based services, AT&T's Petition envisions forcing customers off of copper/TDM based services and requiring them to replace those services with IP or wireless services in the trial wire centers. And there can be no question that TDM services are vitally important for certain Federal Agency customers, such as the FAA, which relies on TDM services 92% of the

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<sup>35</sup> Comments of Harris Corporation, GN Docket No. 12-353, January 28, 2013.

<sup>36</sup> At this point the extent to which FCC rules could disrupt the existing contractual relationship that exists between the Federal Agencies and its various service providers, including AT&T and Verizon, is unknown. It is possible that the Networx contracts would protect Federal Agencies from any impact resulting from AT&T's Petition, including a PSTN sunset as advocated by AT&T. For example, Networx Section H.6 appears to contemplate that contractors will provide all services described in the Networx Universal contracts throughout the initial and subsequent renew terms, and that the Contracting Office may provide Notice of a service extension requiring contractors to provide service for one full year past term of the last contract extension. However, the clear intent of AT&T is to set a date certain for the sunset of TDM services, and not permitting any customer to delay that transition or maintain TDM services after the sunset date.

<sup>37</sup> Whether the trial requested in AT&T's petition is granted or not, it is unlikely that Ethernet services will be discontinued over the next several years. Nonetheless, see Appendix 5 (pg. 12) for discussion of how AT&T's Petition may impact Ethernet services purchased by the Federal Agencies. As discussed in Appendix 5 to this report, however, a sub-set of ethernet services may become unavailable due to lack of copper facilities in certain areas.

time for critical air traffic operations.<sup>38</sup> Nonetheless, depending upon the terms of the specific government contracts at issue in each location, AT&T's Petition could require Federal Agency customers to change from TDM-based services to IP-based services by a date certain established during the trials. This would require Federal Agency customers to closely analyze the services currently purchased, determine which services would be eliminated, and select alternative services to meet their communications needs. According to AT&T's Petition, if the customers do not select alternative services by the sunset date, the service provider would select the replacement services on the customers' behalf. Moreover, it is unclear what would happen if there is not a suitable replacement service available in the new IP world, which is not an unlikely scenario. Certain functions and capabilities needed by the relatively sophisticated Federal Agency customers may not be available from IP-based services,<sup>39</sup> or carriers may choose not to provide alternative services in certain territories.<sup>40</sup>

- **Federal Agencies would be forced to deploy new CPE and SEDs.**<sup>41</sup> As described above, more than 50% of the recent Federal Agencies awards include TDM-based services which rely upon CPE and/or SEDs designed to interface specifically with copper/TDM technologies. This equipment would most likely need to be replaced with CPE and SEDs that are compatible with IP or wireless technologies. This would include CPE such as PBXs and handsets, and/or SEDs such as switches, routers and gateways owned or leased by Federal Agency customers. For example, it has been reported that eliminating TDM would require the FAA to update hundreds of NAS voice switches,<sup>42</sup>

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<sup>38</sup> Comments of Harris Corporation, GN Docket No. 12-353, January 28, 2013, p. 3.

<sup>39</sup> For example, the FAA's National Airspace System ("NAS") are "highly reliant on the ability to create channels or tributaries allowing transmission of multiple subscribers' data along the same transmission medium without the risk of contention for resources or intrusions from other users. This inherent Constant Bit Rate (CBR) capability of TDM services enables NAS applications to establish clock synchronization as well as deterministic latency and jitter performance...ensuring the underlying NAS applications do not suffer from the Variable Bit Rate (VBR), 'best effort' nature of Packet Switched [IP] networks...Without inherent synchronous capability of TDM, applications will experience out of sync clocks, resulting in buffer overflows, lost frames and variable latency; such a result will have a detrimental impact on the operation of these critical NAS applications..Simply put, without TDM service availability, the FAA's National Airspace System is at best degraded and at worst put at significant risk." Comments of Harris Corporation, GN Docket No. 12-353, January 28, 2013, pp. 6, 8. It is unclear whether any IP-based services would be available that could provide the functionality needed by NAS applications if TDM services were retired.

<sup>40</sup> AT&T's Petition would eliminate the COLR obligation, which for the last hundred years has required the incumbent phone company to provide service to any requesting carrier upon demand. Without this requirement, the incumbent phone company can decide not to serve certain customers or territories.

<sup>41</sup> For example, the Networx service guide states as follows regarding SEDs to support Internet Protocol Telephony Service (IPTeS): "*Service Enabling Devices (SEDs) such as telephones may be required to implement IPTeS [Please note that SEDs under Networx replace the FTS2001 User-to-Network Interfaces and Access Adaptation Functions (UNIs/AAFs). SEDs may differ between Networx providers. The pricing structure for SEDs provides for either a one-time payment or monthly term payments for purchase, plus a NRC for installation and a MRC for maintenance.]*"

<sup>42</sup> Comments of Harris Corporation, GN Docket No. 12-353, January 28, 2013, p. 9.

and the FAA manages a total of 16,800 distributed network devices containing over 104,000 manageable components.<sup>43</sup>

- **Federal Agencies would be forced to transition to IP services and upgrade equipment and facilities more quickly than planned.** While a specific PSTN sunset date is not indicated in AT&T's Petition, the FCC's Technology Advisory Council has proposed a PSTN sunset in the year 2018 (in five years). Even for Federal Agency customers that are taking steps to migrate to IP, this aggressive schedule would - if permitted by existing government contracts - force Federal Agency customers off TDM services faster than planned. For example, it has been reported that the replacement of the hundreds NAS voices switches discussed above will require a 10 year transition period (by 2022).<sup>44</sup> At a minimum, this transition would take five years (by 2017), but that would require a significant increase to the program's current funding and more risk.<sup>45</sup> Hence, it is highly unlikely that this Federal Agency customer could completely migrate all of its equipment to IP-compatible technology by the sunset date that would be established in the trial wire centers.
- **Services provided to Federal Agencies by non trial participants may be disconnected.** To the extent that regulations impacting competitors' access to incumbent facilities (or interconnection) in trial exchanges are lifted, this could impact services received by the Federal Agencies from those competitors. Sprint and Level 3 are two service providers under the Enterprise contract, and they strongly oppose AT&T's Petition. Indeed, Level 3 is one of the CLECs who banded together to file the Telepacific Petition in an attempt to preserve copper networks currently being used by CLECs, including Level 3, to provide services to end user customers. Sprint has stated that the quick TDM-to-IP transition advocated in AT&T's Petition is premature, and that regulations governing IP interconnection are critical given the market power of AT&T and other incumbent phone companies.<sup>46</sup>
- **Virtually all regulatory oversight will be eliminated.** AT&T's Petition clarifies its position that in trial exchanges, state regulatory oversight should be eliminated and federal oversight should be minimized. For example, under AT&T's view, incumbent phone companies would no longer have a COLR obligation, meaning that they would not be required to serve Federal Agency customers or locations, or any other customers, if they choose not to. Also, under AT&T's Petition, there would be no pricing constraints or service quality standards applicable to the IP-based services in the trial wire centers. This could lead to price increases for the same features and functionalities, as well as a deterioration in short-term and long-term service quality. The likelihood of price and service quality impacts are amplified by the fact that AT&T advocates for no regulations

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<sup>43</sup> Comments of Harris Corporation, GN Docket No. 12-353, January 28, 2013.

<sup>44</sup> Comments of Harris Corporation, GN Docket No. 12-353, January 28, 2013, p. 9.

<sup>45</sup> Comments of Harris Corporation, GN Docket No. 12-353, January 28, 2013, p. 9.

<sup>46</sup> Comments of Sprint Nextel Corporation, GN Docket No. 12-353, January 28, 2013.

governing IP interconnections, which may give large, vertically integrated companies like AT&T and Verizon the ability to dictate the rates, terms and conditions of interconnection to competitors (that is, if they agree to interconnect at all).

- **Competitive alternatives may be more difficult to find.** Competitors of incumbent phone companies may find it increasingly difficult to compete in some exchanges because: (a) the link over which they provision services to end user customers would be retired, and (b) they would likely face less favorable rates, terms and conditions for IP interconnection compared to the incumbent phone companies (or may be refused IP interconnection altogether). A decrease in competition of this sort could lead to upward pressure on prices and has the potential to diminish innovation in the long run. Arguably, the most lasting benefit of a competitive marketplace is that new entrants often introduce innovations that incumbent phone companies are unable or unwilling to bring to market. To the extent that the regulatory framework for IP-based services does not promote competitive market forces and the innovations they can bring, Federal Agency customers may face a telecommunications market that fails to deliver all of the services and technological innovations that they need.

AT&T proposes that the results of the wire center trials be examined at their conclusion, at which time it will be determined whether or to what extent the reform implemented in trial wire centers will be expanded to other wire centers, and potentially nationwide. If the decision is made to expand the reform, the impacts listed above could be expected on a wider scale and potentially throughout all 50 states.

Moreover, though the NS2020 program has not yet been implemented, the program will be impacted by the general transition from TDM-based services to IP-based services and copper retirement. Regardless of how AT&T's Petition is received by the FCC, telecommunications service providers are unlikely to offer TDM-based services and access methods any longer than absolutely necessary and unlikely to provide a significant commitment to provide TDM-based services into the NS2020 contract period (which is currently expected to begin in 2017 – shortly before the PSTN sunset date recommended by the FCC's Technology Advisory Council). With the exception of Ethernet services, it is unlikely that telecommunications service providers will offer services included in the communications transport services category listed in Table 2 above for any significant portion of the NS2020 term.