

Joe Gillan's paper on the recent Federal Communications Commission's Connect America Fund (CAF) Phase II auction is a valuable contribution to a dialogue about the use of auctions to award universal service support and the role of incumbent telecommunications carriers in rural markets.

The premise of Joe's paper is "The CAF II Auction provides empirical proof that alternative providers and technologies are capable of deploying broadband services to targeted high-cost areas and will compete for the support to do so."

—Carol Matthey, Matthey Consulting LLC

Lessons from the CAF II Auction and the Implications for Rural Broadband Deployment and the IP Transition

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The CAF II Auction provides empirical proof that alternative providers and technologies are capable of deploying broadband services to targeted high-cost areas and will compete for the support to do so. This conclusion is important to public policy in two ways. First, it demonstrates that competitive bidding is a more efficient means to determine support levels and recipients than approaches using cost-models and predefined outcomes. Second, as the CAF II Auction recipients deploy facilities, the parallel narrowband networks of the incumbent local exchange carriers will become redundant and obsolete, requiring companion regulatory reforms to facilitate exit and fully effect the IP transition.

Introduction

The term "transformative" is over-used. By its very nature, life is transformative. Change is inevitable — technologies change, cultures change, people change and, as a result, markets change. What has

been remarkable is how long the telecommunications industry has provided an exception to the rule.

During August 2018, however, an event transpired that directly challenged the most fundamental assumption of traditional universal broadband policy — *i.e.*, that the incumbent local exchange carrier is best positioned to deploy broadband to rural areas today served by its narrowband voice network. This event was the Connect America Fund (CAF) II Auction that offered \$198 million in annual subsidy for ten (10) years to providers willing to serve the locations within the service territories of price cap ILECs that would remain unserved even after the CAF II obligations of these price cap ILECs are fulfilled.

The CAF II Auction will accelerate the IP transition as CAF II awardees supplant price cap ILECs in the high-cost rural areas that benefit from the Auction.

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The July 2018 CAF II Auction was the nation's first widespread empirical test as to whether non-ILEC providers would be willing to provide broadband and voice services in rural areas if permitted to compete for support. The auction demonstrated that a variety of providers would employ a range of technologies to bring broadband speeds of at least 25/3 to unserved locations in the high cost areas served by price cap ILECs.²

The two defining metrics that measure the success of the CAF II Auction are: (1) the total support awarded by the auction (\$148.8 million/year) is **70% less** than the amount the Connect America Cost Model ("CAM") estimated would be needed,³ and (2) the number of unserved locations in the territories of the price cap ILECs will decline **by almost 75%** once the CAF Auction winners begin offering service.⁴

The purpose of this paper is to analyze the results of the CAF II Auction and to discuss what the auction suggests for future policy. The analysis is particularly important because of the looming "CAF III Auction" that will have a budget of \$1.5 billion per year (10 times larger than the CAF II Auction analyzed here) and is scheduled to occur when the six-year CAF II commitments made to price cap carriers expire.⁵

The analysis supports two broad conclusions. The first is that the CAF II Auction demonstrates that competitive bidding systems for broadband support

are generally more efficient at extending broadband than systems that provide support only to local exchange carriers, particularly support based on CAM-derived cost models.⁶

Second, the broadband networks funded by the CAF II Auction will largely cause the parallel narrowband networks of the price cap ILECs to be duplicative, unnecessary and almost certainly uneconomic in these areas.⁷ The CAF II Auction (and the CAF III Auction to follow) will accelerate the IP transition in high cost areas. It is not possible to embrace the goal of universal broadband — a goal that necessarily obsolesces the existing narrowband network — without simultaneously addressing the issues that arise as the traditional network is replaced.

As CAF II awardees supplant price cap ILECs in specific high-cost rural areas, the complex set of state-specific carrier-of-last-resort (COLR), or provider-of-last-resort (POLR), obligations (that are sometimes redundant to federal rules) will need reform. It is a public policy paradox to promote rural broadband networks *and* require legacy narrow-

The CAF II Auction demonstrates that competitive bidding systems are more efficient at extending broadband to rural areas than systems with predetermined outcomes.

2 To be technically precise, a small amount of support was awarded to minimum speed bids (10/1). However, as this represents only 0.25% of the awarded locations, the exception deserves little more than a footnote reference (as done here).

3 <https://www.fcc.gov/document/fcc-staff-presentation-connect-america-fund-auction-results>

4 This paper analyzes the number of locations served/unserved as provided by the FCC, recognizing that the values are estimates. There are known, yet unquantified, compensating errors in the data whose net effect is unknown. The estimates may understate the number of unserved locations because of locations in census blocks that are only partially served; other experience suggests that the estimates may overstate the number of unserved locations, a fact that has led the FCC to review proposals to adjust deployment obligations downward (in exchange for corresponding reductions in support) to address circumstances where there are not enough actual locations for the provider to serve. See, for instance, *Wireline Competition Bureau Seeks Comment on Procedures to Identify and Resolve Location Discrepancies in Eligible Census Blocks Within Winning Bid Areas*, Federal Communications Commission WC Docket No. 10–90; DA 18–929. Despite these concerns, the data is nevertheless the best information publicly available.

5 The FCC has not yet adopted the term "CAF III" to describe the future auction(s) that will apply to the \$1.5 billion per year payments currently provided to price cap carriers as part of CAF II. The final year of CAF II support to price cap carriers is 2020.

6 This conclusion is not a call to unwind existing federal (or state) policies that have time-limited commitments of support. The CAF II Auction demonstrates, however, that structuring new programs based on the CAM or its small-ILEC derivative, the Alternative Cost Model (ACAM), is likely to be an inefficient means to encourage broadband service in rural areas.

7 This paper focuses on areas served by price cap carriers because federal policies are more mature in these areas. Obviously, rural terrain, rural communities and rural technologies are agnostic as to the regulatory structure (rate-of-return or price cap) that applies to the incumbent telephone company. As such, the policy community should expect that the same competitive diversity would likely emerge in areas served by rate-of-return carriers if comparable competitively-neutral support mechanisms (such as the CAF II Auction) existed.

band networks to coexist, particularly when the economics of the broadband network would improve with the gain in subscribers if the legacy

network were retired.⁸

It is a public policy paradox to promote rural broadband networks and require legacy narrowband networks to coexist, particularly when the economics of the broadband network would improve with the gain in subscribers if the legacy network were retired.

Facilitating the exit of narrowband providers (where that is their desire) should be a public-policy imperative, although it must also be recognized that doing so will raise end-stage issues where some residual customers may not have alternatives they find acceptable and the existing network cannot be maintained.

Managing the final stages of the IP Transition gives rise to significant public-policy issues that should not be

viewed as the commercial responsibility of any individual carrier (or a belief that “the market” will sort it out). It is beyond the scope of this paper to fully describe, much less resolve, the myriad of issues that accompany the shutdown of a TDM network as it is replaced with broadband. There are narrowband applications (essential alarm monitoring for instance) for which broadband is neither warranted nor desired (at least at present), and fully describing even the *federal* service-discontinuance process (which is only half the framework) would be a significant undertaking that this paper does not

attempt.⁹ The broader point of the paper, however, is that these end-stage issues should be confronted through reasonable transitions rather than continuing regulatory obligations that are no longer technologically rational.

The Empirical Lessons from the CAF II Auction

In some ways the success of the CAF II Auction should have been anticipated. Although the CAF program was structured to initially rely upon the incumbent local exchange carrier to extend broadband to rural areas, it was always the FCC’s intention to “... distribute universal service funding in the most efficient and technologically neutral manner possible, through market-based mechanisms such as competitive bidding.”¹⁰

As the FCC moved through layers of complexity to transform its universal service policies, it also began to test the willingness of participants other than the incumbent local exchange carriers to deploy broadband in high cost rural markets. The FCC’s first empirical test was its Rural Broadband Experiments (RBEs).¹¹ The RBE program had limited funding (\$100 million) and was designed to better inform the FCC as to how to advance the CAF’s implementation.¹²

Foreshadowing some of the lessons more broadly demonstrated by the CAF II Auction, the RBEs showed that non-ILEC providers would be willing to use a range of technologies (particularly wireless) to bring broadband to rural markets at significantly lower cost than the CAM estimated.¹³ Each of the

8 An assumption underlying this paper is that the target areas are not served by existing broadband networks (*i.e.*, there is no overbuilding) and that it is unlikely these areas would attract entry in the absence of support.

9 See, for instance, Accelerating Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment Report and Order, Declaratory Ruling, and Further Notice of Proposed Rulemaking, Federal Communications Commission WC Docket No. 17-84.

10 See *Connect America Fund et al.*, WC Docket No. 10-90 et al., Report and Order and Further Notice of Proposed Rulemaking, FCC 11-161 (rel. Nov. 18, 2011) (“*USF Transformation Order*”) at ¶ 1.

11 See *Technology Transitions et al.*, GN Docket No. 13-5 et al., Order et al., (2014) (“*Tech Transitions Order*”) at ¶ 94-97.

12 See *Connect America Fund; ETC Annual Reports and Certification*, WC Docket Nos. 10-90, 14-58, Report and Order and Further Notice of Proposed Rulemaking, 29 FCC Rcd 8769 (2014) (*Rural Broadband Experiments Order*) at ¶ 10.

13 The RBEs also suggested the need for a structured approach to test the financial and operational ability of non-traditional bidders. Of the 37 provisional recipients the FCC earmarked for RBEs, 22 were later disqualified for being unable to demonstrate their qualifications. See *Wireline Competition Bureau Announces Entities Provisionally Selected for Rural Broadband Experiments; Sets Deadlines for Submission of Additional Information*, WC Docket No. 10-90, Public Notice, DA 14-1772 (Wireline Comp. Bur. rel. Dec. 5, 2014) and *Connect America Fund; Rural Broadband Experiments*, WC Docket Nos. 10-90, 14-259, Order, DA 15-139 (Wireline Comp. Bur. rel. Jan 30, 2015). Although the CAF II Auction includes procedures to avoid a similar result, there remains unavoidable uncertainty as to its ultimate success.

RBE proposals sought amounts of support at or below CAM-calculated levels, and high-performance network bidders (i.e., areas that bidders were required to build to 100 Mbps download and 25 Mbps upload) collectively requested \$69 million in annual support for census blocks that would have received \$149 million in model-based support.¹⁴

The RBE program foreshadowed that alternative technologies — and, just as importantly, alternative providers — would be willing to provide broadband services in high cost rural areas if they were able to access CAF II support payments. The CAF II Auction provided a structured opportunity to do just that, combined with a much more significant budget (\$1.98 billion over 10 years), and a framework that enabled participants to prepare the market-specific information critical to a bid. The CAF II Auction opened with 172 bidders that collectively requested \$598 million in support.¹⁵ Ultimately, the auction concluded with 103 winning bidders and awarded \$148.8 million in annual support. A review of the winning bids established four key findings:

1. A wide variety of providers are willing to provide broadband service in high cost rural areas;
2. Winning bidders will offer significantly higher broadband speeds (25 Mbps down and 3 Mbps up) than the lower (10Mbps down/1 Mbps up) required for the CAF support allocated to the ILECs;
3. The CAF II Auction lowered support costs compared to the levels estimated by the Connect America Cost Model; and
4. The CAF II Auction will significantly reduce the

number of unserved locations in the areas served by the price cap carriers.

First, as to the types of providers that successfully participated in the CAF II Auction, Table 1 (following) shows CAF II Auction winners organized into key categories. Importantly, wireless providers in general (and fixed wireless providers specifically) received over half of the total support awarded in the auction. Other entities that successfully participated in the auction were electric utilities (or their affiliates) that already maintain physical networks in rural areas, as well as rural local exchange carriers (or their affiliates). In addition, a satellite provider (ViaSat) participated and, although it was awarded only 8% of the support, represents more than a quarter (27%) of all the locations that will be served through CAF II Auction support.¹⁶

Table 1: CAF II Auction Winners by Provider Type¹⁷

Provider Type	Annual Support (\$ Millions)		Locations	
Satellite	\$12.2	8%	190,595	27%
Cable	\$4.1	3%	10,165	1%
Electric utility/affiliates	\$26.5	18%	91,852	13%
Fixed Wireless	\$71.8	48%	263,752	37%
Other Wireless	\$9.8	7%	47,870	7%
Rural LECs/Affiliates	\$15.2	10%	59,910	8%
Price Cap ILEC ¹⁸	\$1.1	1%	3,726	1%
Other	\$8.2	5%	45,306	6%
	\$148.8		713,176	

14 See *Connect America Fund; ETC Annual Reports and Certifications; Petition of USTelecom for Forbearance Pursuant to 47 U.S.C. § 160(c) from Obsolete ILEC Regulatory Obligations that Inhibit Deployment of Next-Generation Networks*, WC Docket Nos. 10-90, 14-58, 14-192, Report and Order, FCC 14-190, (rel. Dec. 18, 2014) (“December CAF Order”) Dec 2014 at ¶ 85.

15 An additional 47 providers completed the process to qualify to bid but did not do so.

16 Arguably ViaSat *already* has the capability to serve its awarded areas, suggesting that its bids were calculated to meet pricing and service obligations (in contrast to network expansion). For instance, ViaSat’s bids were all in the baseline performance tier, which requires 25/3 service and a monthly usage allowance of 150 Gbs., and the FCC has determined that the reasonable comparable rate must be less than \$95/month. In comparison, ViaSat’s standard Unlimited Gold package (25/3) is priced at \$150/month after its promotional period, and the customers’ traffic is “prioritized” (which is to say it will *lose* priority) compared to other subscribers once a customer reaches a 100 Gbs. in a month.

17 Table 1 categorizes providers based on the company’s website, which may not always be descriptive of its network. In addition, the technology a CAF II Auction winner intends to deploy to provide broadband in the awarded area *may* differ from the technology currently used to provide service to its existing customer base. That said, the effect of a mis-categorization (if any) is likely to be small and inconsequential to the analysis and conclusions presented in this paper.

18 The majority of the support (89%) provided to price cap carriers is associated with Verizon’s bids to provide gigabit service in the same states that it had declined the statewide offer of support in CAF II.

Participants in the catch-all “Other category” include tribal governments,¹⁹ an entrant using TV white spaces,²⁰ and system integrators (that also provide broadband). The CAF II Auction demonstrated that competitive bidding will attract new technologies and new providers to even these rural, high cost, markets. This is particularly true where existing providers were positioned to incrementally expand service to contiguous areas.

As noted, the table suggests the technology that will be used to provide service in high cost areas is the same as the technology the provider deploys today. This is an *assumption*, as it remains unclear whether the latency associated with satellite technologies can be overcome to support real-time requirements such as VoIP. Although the CAF II Auction assigned a weight to disadvantage high latency proposals, the weight could be offset by significantly lower cost. For instance, ViaSat’s was awarded \$640 per location in support, while the average support awarded all other recipients is \$2,614 per location. Ultimately, however, addressing latency may require a more imaginative network design than a pure satellite connection.

In addition, the weighting system favored higher speed offerings and resulted in winning bids of at least 25/3, exceeding the speed obligation of the earlier CAF programs (10/1).²¹ Overall, 53% of the CAF II Auction locations will be provided service with download speeds of at least 100 megabits per second, and an additional 19% will have gigabit service available.²² The CAF II Auction demonstrated that higher speeds are the norm for entrants that are not otherwise constrained by existing technologies,

architectures or regulatory obligations.²³

One of the key lessons from the CAF II Auction is that “*local* is more important than *large*.” Although price cap companies are large (relative to other ILECs), that size does not appear to necessarily provide a meaningful advantage when deploying broadband services in rural markets.

Table 2: The CAF II Auction Attracts Small Providers (WPS Information and Engineering)

Awarded Area	Annual Support	Locations
Area 1	\$7,525	147
Area 2	\$7,310	274
Area 3	\$5,776	176
Area 4	\$4,500	152
Area 5	\$4,007	57
Area 6	\$978	42
Area 7	\$741	18
Area 8	\$542	48
Area 9	\$542	15
Area 10	\$479	25
	\$32,401	954

Indeed, of the 182 winner/state combinations,²⁴ nearly 25% of bids/state were for 200 locations or less in *that* state, with the individual bids tailored even more precisely.

By way of example, consider WPS Information and Engineering, whose website indicates it offers wireless internet, as well as services designed for

19 For instance, CAF II winning bids were submitted by Northern Arapaho Tribal Industries and the Fond du Lac Reservation Business Committee.

20 Declaration Networks Group, Inc., was awarded support for the Eastern Shore of Maryland and Virginia. In addition, Declaration Networks is in a partnership with Microsoft as part of its Rural Airband Initiative to provide broadband services using TV White Spaces. See <https://www.prnewswire.com/news-releases/declaration-networks-group-and-microsoft-announce-agreement-to-deliver-broadband-internet-to-rural-communities-in-virginia-and-maryland-300635160.html>.

21 As noted, a very small number of locations (866 in Massachusetts and 921 in Oklahoma) will be provided 10/1 broadband service by CAF II Auction winning bidders.

22 <https://www.fcc.gov/document/fcc-staff-presentation-connect-america-fund-auction-results>

23 It is beyond the scope of this paper to discuss the reduced incentives/capabilities to deploy new networks when older technologies must be maintained to support legacy services.

24 Several of the 103 CAF II Auction winners were awarded support for bids in multiple states.

schools and libraries.²⁵ WPS is a relatively small participant in the CAF II Auction, but its experience is illustrative of a broader point: The auction brought

The CAF II Auction will render the parallel narrowband networks of price cap ILECs duplicative, unnecessary and almost certainly uneconomic.

a “thousand points of light” approach to rural broadband. No individual participant solved the rural broadband gap, but *collectively* the CAF II Auction empowered over a 100 (relatively) small firms to make a difference.

Another useful comparison is between the level of support awarded by the auction to the level of funding the CAM estimated would be needed. As the FCC calculated, the reserve price (i.e., the support level the cost model estimated would be needed) was \$5 billion dollars (over 10 years), while the auction winners required only \$1.48 billion (70% less). This comparison demonstrates the savings possible when market forces are used to direct subsidies to the lowest cost provider, rather than award subsidies based on cost models.²⁶

Table 3 shows that the CAF II Auction will reduce significantly (by almost 75%) the estimated number of unserved locations in the territories of the price cap carriers. Although the CAF II auction is small in comparison to the CAF III auctions yet to come, its effectiveness at bringing broadband to high cost rural markets is dramatic and real, demonstrating

that alternative technologies can solve much of the rural dilemma.

Table 3: Effect of the CAF II Auction on the Number of Unserved Locations in Areas Served by Price Cap Carriers

Estimated Number of Unserved Locations at Start of Auction ²⁷	983,582
Locations to be Served as a Result of the CAF II Auction	713,176
Remaining number of Unserved Locations	270,356
Reduction in unserved locations from Auction	-72.5%

The CAF II auction, which awarded \$148.8 million/year, is merely the precursor to the much larger CAF III auction(s) on the horizon. As such, it is useful to distill the lessons from CAF II to better anticipate and realize the benefits possible with CAF III.

The Implications of the CAF II Auction for Public Policy

The central lessons of the CAF II Auction are described above. The CAF II Auction proved that competitive bidding systems can bring more broadband, to more locations, at faster speeds, than other mechanisms. The initial CAF II commitment of \$1.5 billion per year to the price cap ILECs will end in 2020. The FCC has long expressed a preference for competitive bidding systems and the nation should anticipate that \$1.5 billion per year that will be offered through CAF III Auction(s) by 2021.²⁸ The CAF II Auction provides the model, but it will be CAF III that has the largest impact.

25 <http://wpsinc.com>

26 Although this may seem a technical point, there is a significant difference between the CAM as used to develop the statewide offers to price cap carriers and its use here. The statewide offers to the price cap carriers only required that the CAM be reasonably close on *average*, as the price cap LEC was presented with the opportunity/obligation to accept CAM-based funding for its entire territory in the state — less those census blocks defined as too costly to include in the offer and are now included in the auction. In contrast, by allowing companies to bid for individual census-block groups, the CAF II Auction effectively presumes that the CAM is accurate at the census-block group level. All cost models have errors, and the smaller the area examined, the more likely the estimate for that specific area is inaccurate. There is no reason to expect that the CAM can produce accurate cost estimates for each individual census-block group, even if the CAM is otherwise accurate when averaged over much larger areas (a conclusion that the paper does not assert).

27 The number of initial unserved locations in Table 3 is developed from the final list of eligible census block groups released by the FCC. <https://www.fcc.gov/document/wireline-bureau-announces-caf-phase-ii-auction-final-eligible-areas>. This total is slightly lower than the number of eligible locations (974,223) listed as available in the FCC’s auction summary spreadsheets, although the discrepancy is not material. https://auctiondata.fcc.gov/public/projects/auction903/reports/round_summary

28 See *USF Transformation Order* at ¶ 178: [W]e expect that support after such five-year period [later changed to six-years] will be awarded through a competitive bidding process in which all eligible providers will be given an equal opportunity to compete. Thus, we anticipate that funding will soon be allocated on a fully competitive basis.

As the market prepares for CAF III, it is important to consider the corollary repercussions for price cap carriers as these auctions successfully render their narrowband networks in these areas obsolete.²⁹ The diversity of providers in Table 1 is important not only by who successfully participated in the auction, but who did not — *i.e.*, the price cap carriers.³⁰ The CAF II Auction signals that as subsidy becomes available to any provider, the price cap ILEC may not always be best positioned to be the broadband provider in every rural high-cost market. Instead, in many instances it is likely that smaller firms, geographically focused on specific individual areas, will be able to develop lower cost entry strategies.³¹ If so, the CAF auctions will reduce the price cap ILECs' share of the rural markets as subscribers shift to the IP-based services offered by auction winners.

There are two motivations for price cap ILECs (or an affiliate) to partner with auction winners. The first is to provide the auction winner with transport and Internet backhaul where economies of scale are present. As noted earlier, when it comes to access, it appears that local is more important than large. In the transport market, however, the opposite is true — there are economies of scale that give large the advantage over local.

As a result, a natural economic fit would be for locally-focused providers to provide the last-mile access component, while the price cap ILEC provides the middle-mile transport facilities to aggregate rural markets and interconnect their networks to the world at large.

The second reason that price cap ILECs should consider partnering with CAF II Auction winners is to manage the transition to IP as the legacy network atrophies. With almost 75% of the remaining high-cost locations (potentially) served by CAF II Auction winners, the market for legacy services will shrink.

As a practical matter, to achieve an *orderly* transition as the legacy network is phased out will require coordination between the price cap ILEC and the CAF II Auction winner, and that coordination would be easier if there is already a commercial relationship between the two.

The purpose of the CAF II Auction is to obsolete the incumbent's narrowband network, and this means that companion transition policies will be necessary.³² Fortunately, the CAF II process will provide some runway for companion policies to be developed as it will take time for the FCC to conclude vetting the applicants and for the network expansion contemplated by the Auction bid to occur.³³ This runway should not be wasted, however, but used expeditiously to address the logical consequences described above.

The final stage of the IP transition — deliberately moving customers from services they find acceptable to services they have not voluntarily chosen —

The most obvious path forward for price cap ILECs in areas awarded to an entrant in the CAF II Auction is to partner with that provider for transport and to coordinate the IP transition.

29 The FCC has not adopted rules to address how the \$1.5 billion will be used when the 6-year commitment to price cap ILECs expires. To date, the CAF system focused on the *deployment* of network facilities to reduce the number of unserved areas. It is likely that a variety of claims will be made on the \$1.5 billion, including claims that support is needed to *maintain* the broadband networks deployed as part of CAF II, which would reduce the support available for deployment to the remaining unserved locations.

30 It is likely that price cap carriers will participate more aggressively in the CAF III Auction(s). In part this is because of the larger budget for CAF III, but it is also because the network deployments funded by CAF II will lower the incremental costs to expand service to those contiguous areas that will qualify for the CAF III Auction(s). In addition, there will likely be efforts to obtain on-going support to maintain CAF II networks (ftn. 30 *supra*).

31 This is particularly true if the area is served by a technology not typically deployed by the ILEC.

32 These issues are before the FCC and this paper does not address that proceeding. Rather the point here is to encourage commercial relationships that facilitate the transition, without prejudging the regulatory environment that prevails. See *Accelerating Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment Report and Order, Declaratory Ruling, and Further Notice of Proposed Rulemaking*, Federal Communications Commission WC Docket No. 17-84.

33 An exception concerns the areas where ViaSat was the winning bidder and, as a satellite-based provider, is likely to begin offering broadband service quickly (subject to the previously noted caveat as to how ViaSat will address latency and its effect on VoIP).

is a public-policy dilemma that should not be made the responsibility of a legacy carrier. Understanding exactly what issues arise as legacy networks disappear — and determining which of these issues justify intervention — is a task best accomplished through transparency and cooperation.

Conclusion

The CAF II Auction is an important and remarkably successful step towards universal broadband, but more remains to do. The first important lesson from the CAF II Auction is that market mechanisms can be used effectively to achieve broadband deployment. As we approach the much larger CAF III Auction(s), this paper closes with a caveat and recommendation.

First, the caveat. There are over 100 CAF II Auction recipients proposing a variety of technologies to offer services that are, even with the CAF II support, characterized by thin margins. As with *any* market entry, there is uncertainty as to whether they will be able to deliver on their services, prices and deployments described in their bids. Logic and experience suggest that at least some of these proposals will confront unexpected difficulties that directly challenge the assumptions in their business models and they will have to adapt, which could result in the auction recipient not achieving all that they hoped (and thus bid). Any such future event, however, should not be interpreted as a failure of the auction process, but rather the unavoidable consequence of such a large experiment in entry.

Second, a recommendation. As noted above, the CAF II price cap offers are scheduled to expire in 2020 and \$1.5 billion/year in support will be available to CAF III.³⁴ Because CAF auction commitments are for ten (10) years, the current structure could result in a single large auction and a decade-long gap before a similar auction is held. Importantly, the CAF II Auction awarded 75% of its initial budget.³⁵ If this proportion holds, then even after the CAF III

Auction is held there would be approximately \$375 million/year in support to fund a follow-up auction. That said, there would be considerable merit in *deliberately* restructuring the CAF III auction(s) to occur in several tranches (say of \$500-700 million each) over a period of years rather than the cicada-like approach currently embedded in federal orders.

Conducting several auctions over a period of years would also allow the market to explore new technologies, adapt and mature, while the rolling nature of the support (i.e., auctions would occur every few years) would provide the developers of new technologies a continuing incentive to innovate. For instance, low earth orbit technologies are today being tested, but have not yet been deployed. Moreover, it is logical to expect that 5G investment will initially focus on urban markets, but over time there may be scale and scope economies that facilitate the deployment of such networks in rural areas (particularly if such technologies can compete for support). It makes little sense to only conduct auctions every 10 years when technological change is so rapid. As such, smaller auctions held more frequently would appear preferable to the current (implied) schedule.

In conclusion, the CAF II Auction demonstrates that alternative technologies and providers are positioned to bring broadband services to rural markets if permitted to compete for support. This conclusion means that public policy should favor competitive bidding strategies, but it also means that such subsidy mechanisms must be matched with thoughtful exit paths that recognize the economic reality that rural broadband networks will render the existing narrowband network obsolete.

34 As noted, the FCC has not yet adopted rules to define how CAF III will be implemented.

35 The CAF II Auction awarded \$148.8 million/year of the \$198 million/year budget. The gap between funds-available and funds-committed arises from the structure of the auction. The auction first uses *inter-area* bidding to reach the budget, and then engages in further bidding for areas with duplicative bids. As these contestation rounds (i.e., rounds to select winners in areas with more than one bid) occur, the total requested support declines.

Reaction to Joe Gillan’s Paper, “Lessons from the CAF Phase II Auction and Implications for Rural Broadband Deployment and the IP Transition”

By Carol Matthey, Matthey Consulting LLC¹

Joe Gillan’s paper on the recent Federal Communications Commission’s Connect America Fund (CAF) Phase II auction is a valuable contribution to a dialogue about the use of auctions to award universal service support and the role of incumbent telecommunications carriers in rural markets.

The premise of Joe’s paper is *“The CAF II Auction provides empirical proof that alternative providers and technologies are capable of deploying broadband services to targeted high-cost areas and will compete for the support to do so.”*

In my view, it is too early to say whether the results of the auction prove the first point — that alternative providers and technologies are capable of providing broadband services. To date, many of the winning bidders have not completed the long-form review process; we do not know at this point whether all of them will be able to demonstrate their financial and technical capabilities to deliver the service for which they are the winning bidders. Moreover, it is possible — and indeed likely — that some of the winning bidders ultimately will fail to comply with the performance obligations they have committed to meet. It is instructive to look at the FCC’s experience with past auctions for universal service support and also spectrum licenses. In the Mobility Fund Phase I auction and the Rural Broadband Experiments, a number of the winning bidders defaulted, for various reasons, before award of support; in the spectrum context, licensees have not always met their required build-out obligations. Joe himself acknowledges some Phase II bidders may not successfully meet their performance

commitments in his conclusion.

I do agree, however, with the second point — the results of the auction demonstrate unequivocally that alternative providers and technologies are willing to compete for support — and that this is positive development. And I generally agree with the point that the Phase II auction demonstrates that auctions can be a more efficient way to allocate support than the use of cost models, as auctions force companies to reveal the price they are willing to accept to serve an area, rather than methods that assume a uniform cost structure to serve an area.

An important question is whether “efficiency” is the only goal for regulators. Joe concludes that competitive bidding is generally more efficient than programs that distribute support only to incumbents, particularly support based on cost models. While not urging the FCC to break current commitments to provide cost-based support for a defined time period, he suggests the results of the Phase II auction demonstrate that it likely would be inefficient to award support based on the FCC’s cost models (CAM or ACAM) in the future (footnote 6). While it is true that the Phase II auction resulted in lower support payments than the cost model estimates in areas with winning bids, not all areas received winning bids. Will holding another auction fully close the gap? All we know now, for sure, is that auctions will spur competitive interest in entering markets.

I wholeheartedly agree with Joe’s conclusion that as universal subsidies are increasingly provided to

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non-incumbent service providers, it's time to confront the policy implications of managing the IP-transition and reform traditional regulatory constructs applicable to incumbent carriers. States will need to examine their carrier-of-last-resort policies as non-incumbents increasingly receive subsidies through the Connect America Fund. We should expect that some incumbents will want to exit the market for the provision of narrowband services.

It is notable that the incumbent price cap carriers were not major players in the CAF Phase II auction. Slightly less than one million locations were up for bid in the Phase II auction. CenturyLink did not apply to participate in the auction at all. AT&T submitted a short form application and was qualified to bid, but ultimately did not bid. Frontier and Windstream bid, but only on a small number of locations (less than 10,000 locations between the two). Windstream dropped out of bidding before the clearing round. In the first round, Frontier bid on 1,771 locations in six states, but ultimately was a winning bidder for only 23 locations in California. Verizon — which had declined the offer of model-based support for all of its incumbent states with a limited exception for several states it was in the process of selling to Frontier — initially placed bids on less than 60,000 locations nationwide, including states where it is not the incumbent. It ultimately was the winner bidder for less than 3,500 locations, all on the east coast. Regulators must accept the reality that there are some areas of the country that the incumbents do not want to serve for the amount of available support and be open to alternatives.

Joe suggests the auction results demonstrate that “local” is more important than “large.” It appears that a number of locally-based smaller providers viewed the auction as an opportunity to finance some modest incremental expansion. It's heartening to see smaller providers are willing to undertake smaller scale projects that collectively will make good progress in expanding broadband availability; the only policy concern is whether the remaining “leftovers” (areas without winning bids) will be attractive to anyone to serve.

In concluding the paper, Joe recommends that the CAF Phase III auction be conducted in several tranches over a period of years. Some might be concerned that such an approach would reduce competition in the auction, and thereby reduce the efficiency of the auction. Doing multiple sequential auctions would entail more work for the FCC, thereby impacting the execution of other priorities, including spectrum auctions.

Joe's suggestion, nonetheless, is intriguing. The FCC will not know whether the Phase II auction can be judged a success in terms of delivering the promised service to rural households for many years. Moreover, as Joe points out, technologies will continue to evolve. A staggered Phase III auction approach could provide an opportunity to make course corrections, if necessary. The question is whether rural residents, and Congress, are willing to wait for future funding opportunities years down the road.

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