

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of

Modernizing the FCC Form 477 Data
Program

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WC Docket No. 11-10

COMMENTS OF GENERAL COMMUNICATION, INC.

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October 10, 2017

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I. INTRODUCTION AND SUMMARY

General Communication, Inc. (together with its carrier subsidiaries, “GCI”) submits these comments in response to the Commission’s Further Notice of Proposed Rulemaking seeking comment on how it might improve the Commission’s Form 477 program.¹ GCI appreciates the importance of accurate, reliable data for policymaking, competition analysis, and consumer purchasing decisions. GCI supports many of the Commission’s suggestions for improving its Form 477 program, especially those that eliminate the collection of unhelpful data or otherwise reduce burdens on filers.

At the same time, the Form 477 program should not be redesigned to attempt to provide the agency with always-current, highly granular, uniformly collected data to meet any foreseeable policy need. The costs and burdens to filers would be far higher than they are today, and it is not at all clear that these costs would yield data that are substantially more accurate or informative than they currently are. Nor is it clear that the Commission and other stakeholders need current, highly granular and uniformly collected data from all filers, all the time. There are certainly occasions when the Commission needs something more than the Form 477 data. As it has done in the past, the Commission can continue to meet those needs through targeted collections that burden only the relevant filers and only for a relevant period of time. By making targeted improvements to the Form 477 program and relying on additional targeted collections when needed, the Commission can meet its needs for high-quality data while limiting the burdens on filers to manageable levels.

¹ *Modernizing the FCC Form 477 Data Program*, Further Notice of Proposed Rulemaking, 32 FCC Rcd. 6329 (2017) (“*Further Notice*”).

II. BACKGROUND

GCI brings a unique perspective and breadth of experience to the Form 477 discussion. GCI and its affiliates provide fixed and mobile broadband throughout the State of Alaska using a variety of technologies including cable modem, DSL, fixed wireless, satellite, and a host of mobile wireless technologies. GCI provides service not only in the three most urban areas of Anchorage, Fairbanks, and Juneau, but also in scores of small villages in remote Alaska, many of which are off the road system and hundreds of miles from the nearest city. GCI thus has experience with multiple aspects of the Form 477 program's requirements. GCI's experience also includes gathering and reporting data about broadband in some of the most rural and least densely populated areas of the country.

Over the last few years, GCI has had several occasions to revisit its broadband reporting. Like all other facilities-based broadband providers, GCI implemented the changes to the Form 477 program adopted in 2013. GCI has also complied with targeted requirements to report on its deployment of mobile services supported by the Tribal Mobility Fund Phase I and is currently preparing to report, on a more limited and targeted basis than the proposed 477 changes, deployments and upgrades that fulfill its Alaska Plan commitments. It also reports wireless coverage as required by the Commission's buildout reporting requirements in certain wireless services and bands.² Through these experiences, GCI has gained a broad perspective on the costs and utility of different methods of collecting and reporting deployment data.

² See, e.g., 47 C.F.R. § 27.14(l).

The Commission is familiar with the challenges that GCI and other carriers face to provide communications services in Alaska, particularly in its remote areas.³ The long, harsh winters with little or no daylight, for example, make travel and construction work hazardous, unpredictable, or impossible for much of the year. These challenges limit not only the ability to perform construction and maintenance work but any activity—such as data gathering—that would require going out into the field to gather geolocation information or to assess whether particular locations can be served from existing facilities.

As the Commission considers changes to the Form 477 program, GCI encourages it to take into account the varying conditions faced by filers across the country, the value of the data being collected to the Commission and other stakeholders, and the burdens on filers of collecting, analyzing, and filing their data on a regular basis. Any changes should be subject to a

³ As the Wireless Telecommunications Bureau recently restated:

The Commission has found that carriers in Alaska face unique conditions due to “its remoteness, lack of roads, challenges and costs associated with transporting fuel, lack of scalability per community, satellite and backhaul availability, extreme weather conditions, challenging topography, and short construction season.”

Alaska is a land of atypical geography, with hundreds of islands, many undeveloped; vast mountain ranges, including America’s highest peak, Denali; and extreme weather. Alaska’s mean winter temperature is 4° F; in the north, it is -13° F, and certain parts average -20 to -30° F. Travel in Alaska can be extraordinarily difficult: many areas can only be reached by aircraft, and others only by Alaska’s famed ice roads in the winter months.

Letter from Roger S. Noel, Chief, Mobility Division, Wireless Telecommunications Bureau, FCC, to Cindy Hall, The Alaska Wireless Network, LLC, 32 FCC Rcd. 4728 (Wireless Telecomms. Bur. 2017) (footnotes omitted); *see also, e.g., Connect America Fund*, Order, 31 FCC Rcd. 12,086, 12,092 ¶ 24 (2016) (granting ACS a 10-year term of support to allow time for deployment given shortened construction season and other factors); *Connect America Fund et al.*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd. 10,139, 10,141 ¶ 5 (2016) (noting “Alaska’s large size, varied terrain, harsh climate, isolated populations, shortened construction season, and lack of access to infrastructure”).

rigorous cost-benefit analysis before being adopted.⁴ Indeed, the Commission is required by the Paperwork Reduction Act to weigh these considerations.⁵

III. REPORTING MORE GRANULAR DATA REGARDING FIXED BROADBAND WOULD BE VERY COSTLY IN ALASKA

GCI appreciates the Commission's careful review of its Form 477 program to identify ways to reduce the burdens of filing without compromising the quality of the data.⁶ As explained above, GCI acknowledges the importance of accurate, reliable data for policymaking, competition analysis, and consumer purchasing decisions.⁷ GCI's experience suggests the Commission's existing collection of fixed broadband subscription and deployment data is generally sufficient. There are very few occasions when an additional collection of data would significantly improve the Commission's decision making in the public interest. And where those occasions exist, the Commission's goals are adequately served by targeted collections from the relevant stakeholders to supplement the Commission's baseline data.

Indeed, as the Commission has proposed, there are ways to streamline the existing Form 477 data collection without negatively impacting the Commission's goals, such as eliminating the separate reporting of committed information rate ("CIR") data for enterprise services and requiring Form 477 filings on an annual, rather than semi-annual, basis.⁸ GCI also supports

⁴ See, e.g., Remarks of FCC Chairman Ajit Pai at the Hudson Institute, "The Importance of Economic Analysis at the FCC" (Apr. 5, 2017) (noting the importance of cost-benefit analysis to the Commission's activities).

⁵ 44 U.S.C. § 3506(c).

⁶ See *Further Notice*, 32 FCC Rcd. at 6338 ¶ 31.

⁷ See *supra* Section I.

⁸ See *id.* at 6348 ¶ 56.

giving fixed providers the option to submit polygons depicting their coverage areas; for some filers, this may be easier than reporting a list of census blocks, and the Commission can itself overlay the polygons onto census blocks.⁹

The Commission should avoid the temptation of thinking that gathering more granular data always improves the quality of the data or always is worth the cost of that collection. Two methods for more granular reporting raised in the *Further Notice*—by street address or by geolocation—would be very costly to implement in Alaska to the extent that they can be implemented at all. GCI urges the Commission not to require reporting at this level of granularity, where the costs of reporting greatly outweigh any marginal improvement in reporting accuracy. Instead, it should continue with the approach it has used successfully to date and employ targeted data collections to supplement Form 477 data when needed to inform specific policy initiatives or decisions.

A. Street Addresses Are Not Used in All Areas

In the *Further Notice*, the Commission asks how it might collect fixed broadband availability data at a level of granularity smaller than the census block. As one specific option, the Commission asks about collecting availability data at the street-address level.¹⁰ As the *Further Notice* acknowledges, collection by street address will be burdensome for filers. But in Alaska, it is more than just burdensome. As the Commission has previously acknowledged,

⁹ See *id.* at 6341 ¶ 38.

¹⁰ See *id.* at 6342 ¶ 39.

many locations in remote Alaska¹¹ do not have street addresses at all;¹² thus, they *cannot* be used to identify locations where fixed service is available.

The service territories of GCI's incumbent local exchange carrier affiliates ("UUI") illustrate the problem. UUI serves 62 exchanges in remote Alaska. Only one of these exchanges is in a community with a substantial number of street addresses—Bethel—and even in that community, street addresses are not ubiquitous. Residents without street addresses rely on post office boxes for the delivery of mail. The lack of street addresses is also a problem for GCI's CLEC operations—GCI estimates that 11,000 of its current CLEC customers do not have street addresses. In total, GCI (not including UUI) estimates that approximately 18 percent of its cable telephony customers outside of Anchorage, Fairbanks, and Juneau do not have street addresses. As such, any street-address level reporting requirements would be uninformative for remote Alaska. GCI would imagine that filers providing service in other remote and Tribal areas that lack traditional street addresses would have similar problems.

B. Gathering Geocodes for Individual Fixed Locations Would Be Very Expensive

The *Further Notice* also asks whether the Commission should require filers to report locations where broadband service is available by geocodes.¹³ It should not. Even developing a dataset of existing customer locations would require a tremendous outlay of time and resources. The Commission, however, is also interested in knowing where providers make service available

¹¹ Consistent with the Commission's rules, we use the term "remote Alaska" to refer to areas outside of Anchorage, Fairbanks, and Juneau. See 47 C.F.R. § 54.307(e)(3)(i).

¹² See, e.g., *Improving Communications Services for Native Nations*, Notice of Inquiry, 26 FCC Rcd. 2672, 2673 ¶ 1, 2691 ¶ 42 (2011).

¹³ See *Further Notice*, 32 FCC Rcd. at 6342 ¶ 40.

even if they have no customers in those locations.¹⁴ It is simply not feasible for GCI to provide an accurate dataset of geocodes for every building where service is available (but not subscribed to). In some cases, GCI does not know whether it can serve a particular location until a subscriber requests service at that location, which is what creates the business justification to pay for the costs of that investigation. This may be a larger issue in rural America than in urban areas due to the need to deploy new facilities and where a site inspection may be required to know whether it would be feasible to deploy a new access line or whether the topography is suitable for fixed wireless service.

The truth is, GCI can satisfy its customers' needs and GCI's other business purposes with a well-informed approximation of the contours of its service footprint. There is no reason to believe that the Commission's general purposes cannot similarly be adequately satisfied by a reasonable approximation of service availability.¹⁵ Even if highly granular datasets could be developed, they would have to be maintained network-wide over time to be relevant, adding additional expense and burden.¹⁶ As stated above, GCI believes that the Commission can rely on

¹⁴ *See id.*

¹⁵ GCI therefore opposes as overly burdensome any requirement "to identify on Form 477 three categories of service areas for each technology code: (1) areas where there are both existing customers served by a particular last-mile technology, and total number of customers using that technology can, and would, be readily increased within a standard interval upon request; (2) areas where existing customers are served but no net-additional customers using that technology will be accommodated; and (3) areas where there are no existing customers for a particular technology but new customers will be added within a standard interval upon request." *Id.* at 6340 ¶ 34 (footnotes omitted).

¹⁶ As discussed at 9-10, *infra*, GCI is undertaking more limited and targeted reporting in connection with its Alaska Plan obligations.

the existing Form 477 data collection for most purposes and augment the data with special, targeted collections when necessary to meet a particular need.

As the Commission notes, one way to develop a geocode dataset for locations of existing subscribers is to use a geocoding software or service to translate street addresses into latitude and longitude coordinates.¹⁷ But, as explained above, substantial numbers of served locations lack street addresses. Moreover, using “desktop” solutions would be very labor-intensive (if possible at all) and in many cases would not yield results that accurately describe specific individual locations. GCI suspects that in remote Alaska, a highly granular geocoding requirement for individual locations would in many or all cases require technicians to physically travel to the locations to capture the latitude and longitude.

GCI has recent experience in estimating the costs of this type of field work. A one-time collection for all locations in one village in remote Alaska that is not accessible by road would likely cost about \$50 per location. This includes traveling to the location, surveying the structures, and providing the coordinates. This survey would have to be repeated regularly to account for newly constructed buildings, expansions in service territory or upgrades to network plant, and in some cases even the movement of whole communities.¹⁸

GCI acknowledges that, as an Alaska Plan participant, UUI must gather and submit geocodes for some of its locations as part of its high-cost reporting obligations. Over the ten-

¹⁷ See *Further Notice*, 32 FCC Rcd. at 6342 ¶ 40.

¹⁸ See Newtok Planning Group, Division of Community and Regional Affairs, Department of Commerce, Community, and Economic Development, State of Alaska, <https://www.commerce.alaska.gov/web/dcra/planninglandmanagement/newtokplanninggroup.aspx> (describing the process of moving the village of Newtok to a different site due to advancing erosion, permafrost degradation, and flooding).

year course of the Alaska Plan, UUI will collect geolocation data for locations that it newly deploys or upgrades pursuant to the commitments it made in its performance plan.¹⁹ The first filing deadline is March 2018, for locations deployed or upgraded in 2017. Thus, as UUI performs the actual field work needed to meet its commitments, it can collect on a one-time basis the necessary information specific to those locations. But that collection of information, while burdensome, is far more manageable than what would be required to geocode every location in UUI's and GCI's service areas at which service is available and maintain that dataset on an ongoing basis. UUI's Alaska Plan reporting obligation addresses only a subset of its locations—only the locations that UUI deployed or upgraded in the prior calendar year in fulfillment of its Alaska Plan obligations. Extending that obligation to all of UUI's areas, all of GCI's areas, and requiring that all geocodes be provided correctly on an annual basis, would be far more burdensome. UUI suggests instead that the Alaska Plan reporting obligations provide an example of how the Commission can obtain granular deployment or availability data from specific providers in specific areas when it has a specific policy need.

IV. THE COMMISSION SHOULD AVOID ONE-SIZE-FITS-ALL RULES AND COSTLY NEW REGULATORY BURDENS FOR REPORTING OF MOBILE COVERAGE

GCI supports the Commission's efforts to ensure that wireless coverage reporting is as consistent as possible, and leaves as little room as possible for carriers that might seek to exaggerate their wireless coverage. The Commission recently adopted some sensible

¹⁹ See 47 C.F.R. § 54.316(a)(6).

improvements to its data-collection standards in its *MF-II Challenge Process Order*,²⁰ which would also bring welcome improvements in uniformity if applied to its regular Form 477 data collections. In particular, the Commission should adopt a uniform cell-edge probability of 70 percent.²¹ This standardization can be easily implemented, with little to no additional cost, and would significantly improve the consistency of reported data. While it would not eliminate every possible source of inconsistency—such as those that arise from differing local conditions or patterns of use—adopting a uniform cell-edge probability for all Form 477 submissions would at least improve the commensurability of different carriers’ coverage analyses, holding these external factors constant. And unlike propagation-model tuning parameters that account for real-world variation in external conditions, there is little risk that mandating common assumptions about cell-edge probability would introduce new sources of inaccuracy in the reported data.

Similarly, GCI supports the Commission’s efforts to streamline the Form 477 filing. In particular, GCI supports eliminating the requirement that mobile filers report deployment data by spectrum band.²² GCI also supports reducing the number of wireless technologies for which carriers must individually report coverage.²³ The Commission’s proposal to require reporting by four categories of technology—3G, 4G non-LTE, 4G LTE, and 5G—will capture relevant differences in technology, but the Commission should also maintain a category for 2G/voice. While almost all areas in the country are served by at least 3G, there remain parts of remote

²⁰ *Connect America Fund, Universal Service Reform—Mobility Fund*, Order on Reconsideration and Second Report and Order, 32 FCC Rcd. 6282 (2017) (“*MF-II Challenge Process Order*”).

²¹ *See id.* at 6298 ¶ 34.

²² *See id.* at 6335 ¶ 19.

²³ *See id.* at 6335 ¶ 20.

Alaska that rely on 2G/voice (or are entirely unserved). The Alaska Plan will bring 3G or LTE to many of those areas, but until then and to avoid confusion in reporting obligations, GCI suggests that the Commission maintain a category for areas that have service at technology below 3G levels.

Beyond these improvements, however, the Commission has few reasonable options for increasing accuracy and consistency. Below, GCI addresses some of the specific ideas discussed in the *Further Notice*. However, two fundamental challenges permeate this analysis. First, wireless subscribers are mobile. This means that subscribers' locations often cannot readily be determined from their billing addresses or other static information. But it also means that usage patterns and, therefore, network performance exhibits complex annual, seasonal, and diurnal cycles which vary from place to place. Second, there are real variations from place to place and from network to network in the propagation characteristics of wireless signals, making it impossible to produce accurate coverage data nationwide using a single model with uniform parameters.

A. The FCC's Proposal to Require the Use of a Uniform Propagation Model for Wireless Coverage Filings Will Reduce Accuracy

The Commission has asked whether it should require Form 477 filers to use a standard propagation model and, possibly, implement that model using an approved set of input parameters. While there may be limited room for standardization, the role of tuning parameters in adapting a model for use in a specific location with a specific network may limit the benefit of these efforts. The Commission might consider identifying a collection of "safe harbor" models that are known to be acceptable and specify the conditions under which they are known to be appropriate. Models are typically known, for example, to be valid over only certain frequencies

or geographic distances.²⁴ The Commission should be wary, however, about limiting innovation by locking carriers into a limited menu of options. Therefore, it should ensure that carriers are not forbidden from using innovative models that the Commission has not explicitly approved or disapproved for a particular purpose.

The Commission should also bear in mind, however, that every model is driven by a number of tuning parameters, which reflect variations in local conditions, network design, and other real-world factors. For example, models must typically be adjusted for variations in the type of ground cover, building density, typical soil moisture levels (which influences the dielectric constant of the ground), climatic zone, typical building construction, and other factors. Therefore, on the one hand, any Commission effort to restrict the propagation models that carriers are allowed to use will be of only limited value in standardizing Form 477 reporting data if the tuning factors are not also controlled. But, on the other hand, one-size-fits-all tuning parameters may actually *decrease* accuracy by limiting carriers' ability to account for their local conditions.

For example, in Alaska, models must be adjusted to compensate for building loss that is often far higher than in the rest of the United States, due to the extra insulation commonly used in structures and the additional steel used in modern buildings for earthquake proofing. In GCI's case, any standardization that required it to use the same values, or ranges of values, as all other carriers would cause GCI's Form 477 reports to significantly overestimate GCI's wireless coverage by failing to properly account for regional variation.

²⁴ See, e.g., The undisturbed-field model: A propagation model for close-in distances and very low antenna heights, <http://ieeexplore.ieee.org/document/6525050/> (describing a model that is applicable at frequencies between 150 and 6000 MHz, and distances up to 300 meters).

Although the Commission could consider adopting ranges of permissible values for each of these tuning factors, this would require extensive analysis and would need to account for the different tuning factors used in different models. And even if the Commission were to conduct such an intensive review, it appears unlikely that the Commission could identify ranges that would suitably reduce variability in reported data, while also allowing enough flexibility for all carriers to report accurate results.

It is also unclear how the Commission could suitably account for diurnal and seasonal variation in usage loads, device capabilities, and other factors. These considerations are especially significant in Alaska where many users are students, seasonal workers, tourists, and other populations that vary significantly over time. To be useful, a uniform model would need to account for this significant variability. Failing to account for them would yield data with at least as much variability as there is today. But, as with model tuning parameters, to take all of these local patterns into account and develop a “uniform” model would be a huge undertaking for the Commission, and it is unclear whether it would ultimately be possible to select values that would be suitable nationwide.

B. Mandatory Drive Testing Would Be Overly Burdensome in Alaska

The *Further Notice* asks if the Commission should require “on-the-ground” data as part of operators’ Form 477 submissions.²⁵ “On-the-ground” data could take a variety of forms. However, the Commission should bear in mind that any form of on-the-ground data collection that requires a carrier to actively circumnavigate its coverage area would be tremendously burdensome in Alaska, and likely other rural areas.

²⁵ See *Further Notice*, 32 FCC Rcd. at 6333-34 ¶ 14.

As the Commission knows, Alaska is by far the largest U.S. state, and it is by far the least densely populated.²⁶ GCI has towers throughout Alaska, including in many remote villages, many of which are inaccessible by road. Merely to conduct drive-testing of GCI's coverage *within villages* would often require a technician, and all the necessary equipment, to be flown, using small aircraft and remote airstrips, into these villages at significant expense. In the past, when GCI has occasionally been required to conduct these sorts of field measurements at specific sites, either to diagnose specific technical issues or to comply with other regulatory requirements, it has found that even these limited tests cost thousands of dollars *per tower*. And to conduct drive testing in the extremely rural, and perhaps totally unpopulated, coverage areas *outside of* the villages may be literally forbidden by U.S. Department of the Interior ("DOI") rules banning roads and motorized vehicles, or require a lengthy and expensive permitting process.²⁷ And this is to say nothing of the challenges of conducting some alternate form of "drive testing" in roadless terrain under weather conditions that are often extremely harsh.

GCI acknowledges that it already bears some of the burdens of drive testing. As a recipient of Tribal Mobility Phase I support and as an Alaska Plan participant, GCI has certain, defined obligations to verify the quality of the deployments and upgrades it makes in fulfillment of its specific commitments.²⁸ But conducting limited, one-time drive tests of specific deployments is very different from conducting recurring drive tests of its entire service area. As

²⁶ See Resident Population Data, U.S. CENSUS BUREAU, <https://www.census.gov/2010census/data/apportionment-dens-text.php>.

²⁷ See 66 Fed. Reg. 3243 (Jan. 12, 2001).

²⁸ See 47 C.F.R. § 54.321 (requiring Alaska Plan mobile participants receiving more than \$5 million annually in support to accompany five-year and ten-year milestone certifications with drive test data); *id.* § 54.1006 (requiring drive tests from winning bidders in Mobility Fund Phase I).

the Commission has done in the universal service context, for example, it can require additional data collection from specific providers when it has a particular policy need for the information, rather than imposing ongoing and very expensive requirements on the entire industry.

Even if it were imposed, this sort of testing would also not resolve some of the most significant causes of variability in reported Form 477 data. Any data collected through drive testing will necessarily reflect only the state of the network in a given place at a single moment in time. There is no guarantee that those measurements will represent real-world user experiences as usage patterns change from hour-to-hour and from month-to-month. It also would not accurately reflect variability in users' device capabilities, or indoor coverage which, for the reasons above, is an especially important consideration in Alaska.

B. Mobile Subscriber Locations Are Difficult to Report at a Granular Level in Any Useful Way

As the *Further Notice* points out, the Commission currently collects subscriber location information at the state level, but it seeks comments on ways to obtain more specific subscriber location data. Unfortunately, this is another area where Alaska's unique challenges will make collection of this information very difficult.

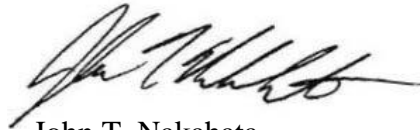
Most significantly, subscriber billing addresses are an especially unreliable indicator of subscriber location in Alaska. Although some subscribers may have billing addresses that are near where they actually use GCI's service, a large number do not. Many GCI subscribers, in fact, list out-of-state billing addresses. This is especially common among seasonal workers whose ordinary home or business address may be in the continental United States, but who use GCI's services when they travel to Alaska to work. This pattern is also common for users who live in Alaska—they may use their home or business address for billing purposes, but travel long distances throughout the state using GCI's service.

Moreover, as discussed above,²⁹ many communities in Alaska do not have street addresses. In these areas, the billing address would likely resolve to the location of their nearest post office—which may, in some cases, be quite distant from where wireless service is actually used. And as with fixed service locations, even locations that have street addresses may not reliably be geocoded due to the inconsistent resolution of census data in Alaska, and might require a technician to physically travel to each site to determine the correct coordinates.

V. CONCLUSION

The Commission can meet its data needs by continuing to supplement its already robust Form 477 program with targeted collections when necessary. There is no reason to burden all filers with highly granular reporting requirements or to require one-size-fits-all solutions that will not accurately reflect the state of deployment in all the many different circumstances in the nation.

Respectfully submitted,



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October 10, 2017

²⁹ See *supra* p. 7.