USTELECOM
THE BROADBAND ASSOCIATION

May 28, 2019

Ex Parte
Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 Twelfth Street, S.W.
Washington, D.C. 20554

Re: Modernizing the FCC Form 477 Data Program,WC Docket No. 11-10
Connect America Fund, WC Docket No. 10-90

Dear Ms. Dortch:

On May 23, 2019, B. Lynn Follansbee, Mike Saperstein and Patrick Halley, USTelecom; Mary Henze, Mike Lieberman and Brendan Haggerty, AT&T; Jeff Lanning, CenturyLink; Ian Dillner, Verizon, Jim Stegeman and Luis Rodriguez, CostQuest; Mike Jacobs, ITTA; Steve Coran, WISPA; and AJ Burton and Diana Eisner, Frontier (in person); and Richard Rousselot, CenturyLink; Kathy Franco, AT&T; Jody Souther and Zack Church, Riverstreet; Jimmy Hendricks, Chariton Valley; Sara Cole, TDS; Thomas Whitehead, Windstream; and Mike Skrivan and Barbara Galardo, Consolidated (via telephone) met with Kris Montieth, Justin Faulb, Ken Lynch, Becky Chambers, Mike Ray, Ying Ke and Kirk Burgee of the Wireline Competition Bureau; Giulia McHenry of the Office of Economics and Analytics; and Chelsea Fallon of the FCC Rural Broadband Auctions Task Force to discuss the FCC Form 477 proceeding and the Broadband Mapping Consortium's ("Consortium") broadband fabric mapping proposal. Consortium members have proposed a long-term solution that will substantially improve the Federal Communications Commission's ("Commission") current process for collecting information about broadband availability in the United States in a manner that will work best for policymakers, consumers, and broadband service providers.[1] The purpose of the meeting was held to update the staff on the progress of the Consortium's mapping pilot and to demonstrate the lessons already being learned about the acute challenges with inaccurate data in rural areas that the Consortium's approach is designed to address.

Jim Stegeman of CostQuest, the Consortium's vendor for the broadband serviceable location fabric ("BSLF" or "fabric") pilot program, reported some early view results from the pilot program (see attached) that demonstrate not only that this methodology works, but why it is superior to other proposals in the record. He indicated that early mapping results are providing strong evidence that the fabric approach is yielding very accurate and granular information about the actual location of serviceable locations.

[1] *See* Letter of B. Lynn Follansbee, VP Law & Policy, USTelecom to Marlene H. Dortch, Secretary, FCC, WC Docket No. 11-10, CC Docket No. 10-90 (Mar. 21, 2019) (*USTelecom Mar. 21 Letter)*.

The attached slides help to demonstrate that Consortium's proposed methodology, and that the creation of a national broadband serviceable location fabric is not only not "theoretical," it is realistic and necessary to ensure that we have an accurate map of where rural consumers are located, which will enable more granular reporting of where broadband service is available or is not. The presentation shows that the methodology being tested in the pilot works. CostQuest also noted that it has reduced its estimate of the time to create the fabric for the entire country from 18-24 months after the pilot results are submitted to just 12 months. The Coalition endeavors to present a report on the pilot program to the Commission by the end of this July. No other proposal before the Commission can approach the level of granularity or accuracy created by the BSLF, or offer results of the same caliber as quickly. The Consortium's proposal promises to revolutionize the nation's broadband mapping capability and expeditiously promote the Commission's policy objectives.

Under the Consortium's proposal, broadband providers will have the option to report on their coverage using polygons, addresses, or other suitable methodologies. Such reporting will be done on top of the BSLF. The resulting broadband map will be substantially more accurate and, unlike other mapping proposals, will identify where broadband is needed—where the *unserved* actually are located. When applied to future high-cost programs, this approach will obviate much of the need for a challenge process to resolve conflicts among providers over areas eligible for broadband support, and the increased visibility into unserved areas will better inform auction participants.

As previously noted, the BSLF methodology utilizes multiple algorithms to automatically process satellite imagery of building structures combined with parcel and land attribute data, address data, and other sources to identify and geocode structures that are broadband serviceable locations. CostQuest indicated that these multiple data sets are available for the entire country. Slides 2-4 demonstrate the methodology by showing some sample results from the BSLF that contain all structures on parcels in both suburban and rural areas, with the primary broadband serviceable structure highlighted. Slide 5 shows a contrasting view where two commercial geocoders (one depicted in orange color, another in purple) are compared to the BSLF results. The BSLF is more accurate than the commercial geocoders. Only in instances where the data conflicts or is incomplete are the records subjected to "visual review."

Slides 6-10 take a closer look at the step-by-step process of the BSLF methodology, showing the capability to precisely identify the actual structure on each parcel that will serve as the primary serviceable location for the purpose of the BSLF pilot program. Sequentially, the BSLF process is as follows: Step 1 layers the parcel boundaries onto the pictured rural agricultural area using parcel and tax assessor data to show with more accuracy the types and number of structures on each parcel. Step 2 adds the building footprint data as a filter to ultimately identify the primary structures that will be selected as the serviceable locations for the pilot program (Slides 8-9).[2]

Slides 10-14 show more contrasting views of the superior BSLF capabilities as contrasted with the limited capabilities of commercial geocoders. These slides show that the alternative commercial geocoders produce varying results and sometimes project the placement of the structure in the wrong spots on the parcel.

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[2] The Consortium informed Commission staff that it is utilizing current FCC guidelines for identifying the primary residence or business on a parcel as the broadband serviceable "location" and acknowledged that should the Commission make a different determination as to the definition of a "broadband serviceable location," the applied logic used in the creation of methodology could be adjusted accordingly. CostQuest will retain the data for all structures so that the map could be quickly updated if the definition of "location" should change.

Some commercial geocoders often are correct to the parcel centroid but not to the actual location of a structure while still other commercial geocoders locate to points on roads instead of parcel centroids. These differences are of particular importance to providers attempting to serve rural areas. These slides demonstrate that in rural areas where the parcels are often quite large, there could be hundreds of feet (if not miles) between where the geocoder places the location and where the actual physical structure exists. The Consortium noted in the meeting that this will be of paramount importance to providers attempting to bid on service to rural locations in future high-cost program auctions. The cost of building to a primary residence or business is often substantially more than anticipated if a provider needs to trench additional miles down a rural route to lay fiber to the primary structure. The differences among geocoders in the placement of locations makes it clear that it could be very difficult to determine appropriate bids for these types of locations without knowing where they actually are.

These variances between where multiple geocoders place a location versus where the actual location exists demonstrates once again the difficulties that some Consortium members have had with reporting their location into USAC's HUBB database. In the meeting, Consortium members renewed their concerns about the standard for HUBB reporting that requires accuracy within 4 inches which is virtually impossible to meet given the poor and varying quality of commercial geocoders.[3] Furthermore, geocoding locations for purposes of HUBB reporting is a daunting prospect for smaller providers that do not readily have the resources to purchase geocoding software or other datasets for such purposes. The BSLF approach thus could benefit HUBB reporting as well as Form 477 reporting, by standardizing reporting for both reporting requirements and eliminating unnecessary but substantial costs for smaller providers.

Slides 13-14 depict geocoded locations that are quite a distance away from where the structure actually resides and in some instances the locations are missed altogether. This is precisely why the Consortium has repeatedly called for a single, harmonized geocoding methodology so that all providers are "singing from the same sheet of music" and referencing the same locations.[4] These slides, and the ones that follow, also demonstrate why filing by geospatial polygon without a rigorously developed and consistently geocoded underlying fabric or template is neither granular nor accurate.[5] A polygon is created using a set of geocoded points to outline a service area and the assumption is that any location within that area is considered served. Without the underlying fabric, such a polygon provides no information on where locations in the service area are located, which is particularly important for unserved locations in rural areas. In addition, if companies file polygons using different commercial geocoders, the relationship between service areas will vary widely.

While the submission of geospatial polygons is a viable method of indicating coverage area, that submission should occur *after* a process has been established to identify and geocode all of the broadband serviceable locations that exist in a given area. For example, if one imagines a polygon laid on top of some of the rural areas pictured in these slides based on commercially geocoded results it is apparent that the polygon may not encompass the actual locations of the buildings it claims to serve. Relying on

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[3] *See* Letter of Mike Saperstein, VP Law & Policy, USTelecom to Marlene H. Dortch, Secretary, FCC, WC Docket No. 10-90 (Mar. 28, 2019).
[4] *See e.g., USTelecom Mar. 21 Letter.*
[5] Some mapping proposals refer to geospatial polygons as "shapefiles." According to ESRI Corporation, "[a] shapefile is an ESRI vector data storage format for storing the location, shape, and attributes of geographic features … used in GIS desktop applications such as ArcMap." https://doc.arcgis.com/en/arcgis-online/reference/shapefiles.htm

commercial geocoding in rural areas also risks missing or undercounting locations. The inset on Slide 14 shows a location in the woods, off of what appears to be a dirt road. That home is entirely missed by a commercial geocoder and is far from any established catalogued road. Locations like this include American consumers that may not be receiving broadband service simply because the building does not yet appear in commercially available data sets. When the policy goal is to close the rural digital divide and locations in rural America aren't always where commercial geocoders place them, it becomes quite clear that "good enough" does not cut it.

Please contact the undersigned should you have any questions.

Respectfully submitted,

USTELECOM

By: B. Lynn Follansbee
B. Lynn Follansbee
Vice President –Policy & Advocacy

cc: Nick Degani
Preston Wise
Arielle Roth
Jamie Susskind
Travis Litman
Randy Clarke
Kris Montieth
Justin Faulb
Steve Rosenberg
Kirk Burgee
Ken Lynch
Becky Chambers
Mike Ray
Ying Ke
Chelsea Fallon
Giulia McHenry

Broadband Serviceable Location Fabric

The Early View: Volume 1

Focus on Specificity of Location Identification

BSLF: Sample Area

- Suburban area with unique geography
- Secondary structures filtered out (garages, carports, sheds, etc.)
- Green triangles represent the results from the BSLF

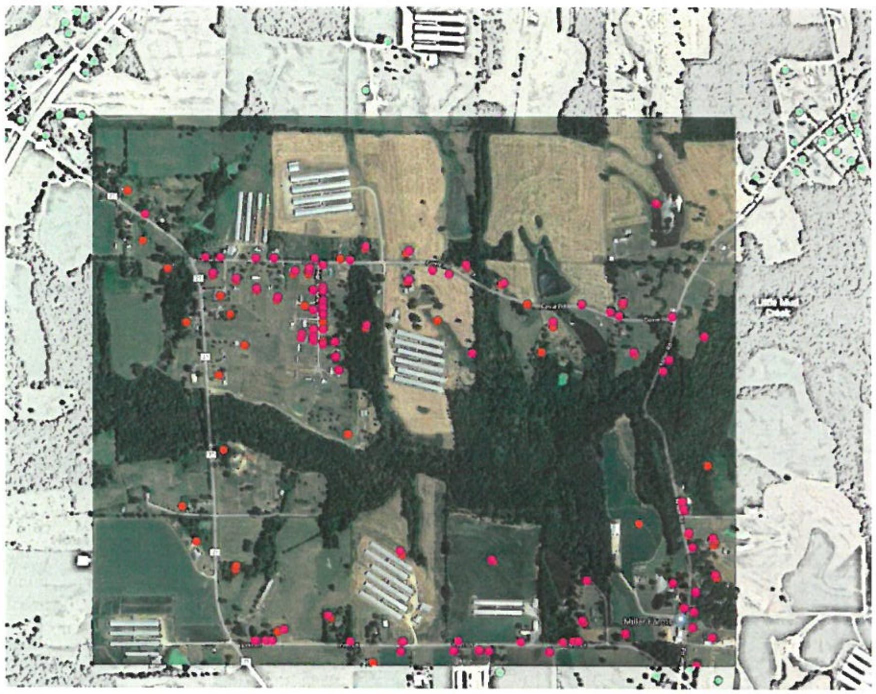
BSLF: Sample Area

- Small farm with many buildings of varying sizes
- Need to correctly identify nearby primary serviceable structures
  - Example: house with a pool (circled)

BSLF: Sample Area

- Broad overview of some rural farm land showing the removal of numerous structures deemed not serviceable

BSLF: Sample Area



- Partial geocoded view of rural farm land
  - Orange represents one geocoder, purple another

BSLF: Process Step Through

- Agricultural area with barns, chicken coops and farm equipment storage
- Challenge is to successfully identify the primary serviceable structure
  - Based on Tax Assessor's identification of Primary Structure
  - Often this is the residence

BSLF: Process Step Through

- Step 1:
  - Overlay parcel data
  - Use Tax Assessor and parcel attribute data to categorize parcels
    - Are there multiple locations?
    - Does the land use indicate there may be a serviceable structure?
    - Consider improvement value, information on secondary structures, etc.

BSLF: Process Step Through

- Step 2:
  - Incorporate building footprint data
    - Footprints identify candidate locations for the BSLF
    - Footprints replace an interpolation of textual address data with real-world accuracy of where serviceable structures are

BSLF: Process Step Through

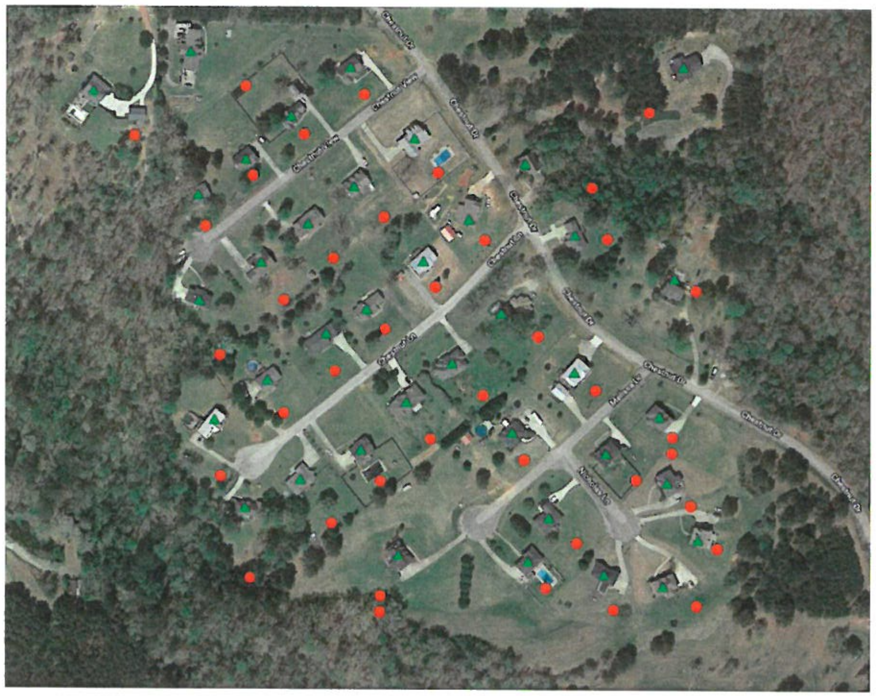
- The BSLF, after applying logic against the aggregate of the input data to inform a best estimate of the serviceable structure(s) on a parcel

BSLF: Process Step Through

- Comparing the Fabric locations to two geocoding products
  - Orange represents one geocoder, purple another
  - Green represents the location fabric output

BSLF: Geocoding Comparison

Comparison between output from a geocoder (orange) and the location fabric process (green)



- Sample 1:
  - Geocodes are generally correct to the parcel, but not to the building footprint

BSLF: Geocoding Comparison

Comparison between output from a geocoder (orange) and the location fabric process (green)

- Sample 2:
  - Geocodes are in the appropriate area, but the locations are not ideal

BSLF: Geocoding Comparison

Comparison between output from a geocoder (orange) and the location fabric process (green)

- Sample 3:
  - Sparsity of geocoded locations
  - The fabric was able to determine the appropriate serviceable structures
  - The orange geocoded locations are not ideal and there are locations without geocoded address points

BSLF: Geocoding Comparison

Comparison between output from a geocoder (orange) and the location fabric process (green)

- Sample 4:
  - An extreme case
  - Location identified in fabric
  - The remote residence/road is far off any established catalogued road

BSLF: Geocoding Issues

There is not agreement amongst geocoders if a location exists and where it is at

- Sample 1:
  - Orange represents one geocoder, purple another
  - Green represents the location fabric output

There is not agreement amongst geocoders if a location exists and where it is at

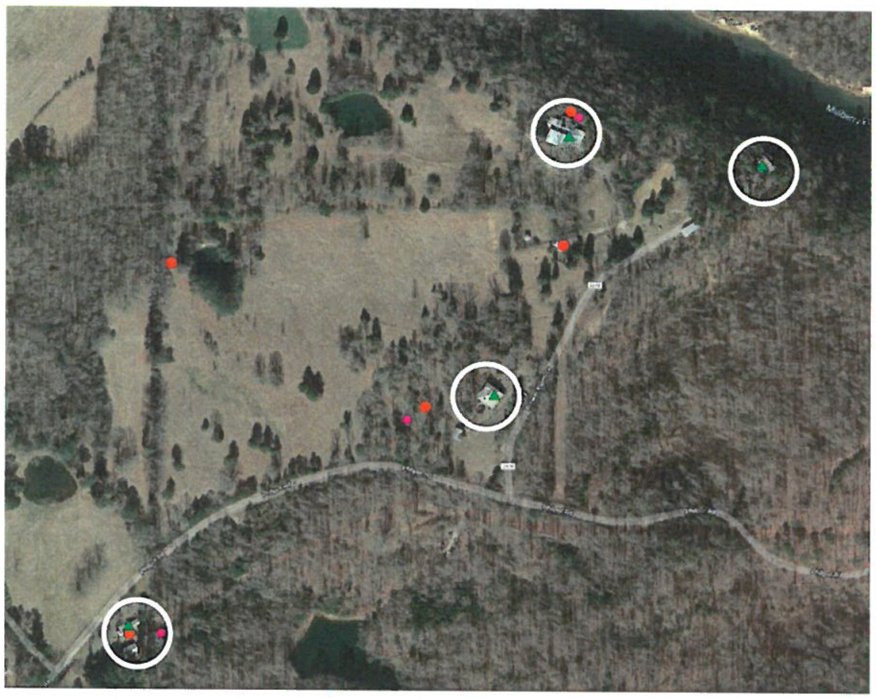
BSLF: Geocoding Issues

- Sample 2:
  - Orange represents one geocoder, purple another
  - Green represents the location fabric output

Actual serviceable locations circled

BSLF: Geocoding Issues

There is not agreement amongst geocoders if a location exists and where it is at



- Sample 3:
  - Orange represents one geocoder, purple another
  - Green represents the location fabric output