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May 6, 2021

Via ECFS – Written Ex Parte

Hon. Jessica Rosenworcel
Hon. Brendan Carr
Hon. Geoffrey Starks
Hon. Nathan Simington
Federal Communications Commission
45 L Street NE
Washington, DC 20554

Re: Establishing the Digital Opportunity Data Collection, WC Docket No. 19-195; Modernizing the FCC Form 477 Data Program, WC Docket No. 11-10; Rural Digital Opportunity Fund (Auction 904), AU Docket No. 20- 34; Rural Digital Opportunity Fund, WC Docket No. 19-126; Connect America Fund, WC Docket No. 10-90; Telecommunications Carriers Eligible to Receive Universal Service Support, WC Docket No. 09-197

Dear Commissioners:

Pervasive errors in broadband data will soon send hundreds of millions of dollars of Federal broadband subsidies to areas of the country least in need of support. Last year, the Federal Communications Commission's Rural Digital Opportunity Fund ("RDOF") used a reverse auction in an attempt to direct billions of dollars of Federal subsidies to areas without access to broadband services of at least 25/3 Mbps.[1] The premise of RDOF Phase I was to target areas that the Commission "knew with certainty" were "currently unserved," so the proceeding therefore did not need to await a new data collection process to produce updated broadband maps.[2] But the premise is incorrect; deficient mapping means that instead of supporting areas that lack service, the Commission's RDOF program will subsidize broadband deployment in areas that obviously are served—including some of the nation's wealthiest, most densely populated areas:

[1] *Rural Digital Opportunity Fund, Connect America Fund*, Report and Order, 35 FCC Rcd 686, ¶ 2 (2020) ("*RDOF Order*").

[2] *Id.* ¶ 5.

- Fisherman's Wharf in San Francisco, California, which is one of the busiest and most well-known tourist attractions in the western United States;
- Portions of the inner loop central business district in downtown Chicago, Illinois, which is second only to midtown Manhattan in commercial activity;
- Some of the largest and busiest airports in the world; and
- Preeminent technology hubs such as Apple Headquarters in Cupertino, California and the MIT campus in Cambridge, Massachusetts.

These RDOF award sites are not aberrations, but—according to a comprehensive new analysis of publicly available data that Competitive Carriers Association ("CCA") has conducted—cover nearly 403,000 people, which is greater than the population of New Orleans, Tulsa, or Tampa. Furthermore, these areas have median incomes or population densities well above the national average and, by extension, are very likely already to have access to 25/3 Mbps broadband service. Indeed, spot checks of addresses within many of the census blocks slated to receive support revealed that many of these areas have access to *multiple*, competing broadband service providers offering services in excess of 25/3 Mbps.

All told, CCA estimates the FCC will improperly send between at least $115 million to as much as $745 million of ratepayer fees to locations with sites that actually receive fixed broadband service of 25/3 Mbps or more, and between at least $144 million to more than $1 billion of ratepayer fees to locations with sites that actually receive fixed or mobile broadband service of 25/3 Mbps or more. The flaws in the data risk having influenced bidding in unpredictable ways that would frustrate the goal of distributing RDOF funds to those areas truly in need. Subsidizing broadband services in wealthy, densely populated census blocks that have one or more service providers offering high-speed broadband wastes Federal funds, saps market incentives for facilities-based deployment, and deprives people and businesses in areas that truly need assistance from the support they deserve.

To assist the FCC in correcting the RDOF errors, CCA describes its analysis of publicly available data in detail in the attachment to this letter. Additional information is on file with CCA. Ideally, of course, the Commission would have identified these problems prior to the Phase I auction. But with the extent of the flawed data now apparent, the Commission has both the opportunity and authority to address the problematic areas before dispensing scarce funding to areas that do not need it.

Section 1.65 of the Commission's rules requires an applicant to maintain the accuracy and completeness of information furnished in its pending application and to notify the Commission of any substantial change that may be of decisional significance to that application.[3]

The Commission should consider whether applicants whose submissions contain Connect America Cost Model ("CAM") locations demonstrably ineligible for broadband subsidies, such as Apple Headquarters or downtown Chicago, are not substantially accurate and must be updated so the Commission has access to all decisionally significant information prior to acting on the pending long-form applications.

Independent of applicants' obligation to supply accurate information, CCA's analysis gives the Commission a path forward. The FCC has statutory authority and resources that CCA obviously does not have. Yet, by starting with speed test data available to the public and subsequently spot-checking subsidized locations, CCA quickly was able to identify hundreds of thousands of errors. Overlaying housing density and income—cost and profit drivers that determine private sector investment in broadband—provided another valuable method to detect errors.

Ratepayers may be on the hook for more than $20 billion of RDOF subsidies. With that amount of government assistance flowing from the Commission, we all have an interest in ensuring that resources are well spent. Correcting glaring errors like those CCA has identified in the attached study would be a good place to start.

We look forward to partnering with the Commission and outside parties to strengthen RDOF.

Sincerely,

/s/ Alexi Maltas

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[3] 47 C.F.R. § 1.65(a).

Missed Opportunity

How the Rural Digital Opportunity Fund Wastefully Subsidizes the Connected

May 6, 2021

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INTRODUCTION AND SUMMARY

In 2020, the Federal Communications Commission ("FCC" or "Commission") established the Rural Digital Opportunity Fund ("RDOF") to expand broadband deployment and increase speeds in underserved areas. As the Commission's "single biggest step to close the digital divide,"[1] the RDOF would rely on a reverse auction ("Auction 904") to distribute up to $20.4 billion over ten years in support of deploying "up to gigabit speed broadband networks in rural America."[2] The Commission front-loaded the program, with $16 billion allocated for an initial Phase I distribution intended for census blocks wholly lacking 25/3 Mbps broadband access.[3] The Commission decided to proceed with Phase I "expeditiously," based on the premise that it already "know[s] with certainty," without the need for additional mapping, which areas "are currently unserved."[4] The Commission allocated the remaining $4.4 billion for a subsequent Phase II directed toward locations that were only partially served, as well as areas not won in Phase I.[5]

The premise behind RDOF Phase I—namely, the Commission could identify wholly unserved areas "with certainty" and without additional mapping—was wrong. Competitive Carriers Association ("CCA") compared RDOF winning bids against reliable, publicly available data, including speed test data and population and income data. In a substantial number of cases, CCA determined that RDOF funds will not go to locations that are unserved. Instead, the Commission will direct scarce ratepayer funds to approximately 286,000 already connected locations, including some of the wealthiest neighborhoods, most densely populated financial centers, and most connected technology hubs. These locations represent nearly 403,000 people, a number greater than the population of New Orleans, Tulsa, or Tampa. In percentage terms, CCA's analysis identified about 5.5% of RDOF locations that likely include sites that have access to at least 25/3 Mbps fixed broadband and about 6.9% of RDOF locations that likely include sites that have access to at least 25/3 Mbps fixed or mobile broadband. All told, the FCC will improperly send between at least $115 million to as much as $745 million of ratepayer fees to locations with sites that actually receive fixed broadband service of 25/3 Mbps or more, and between at least $144 million to more than $1 billion of ratepayer fees to locations with sites that actually receive fixed or mobile broadband service of 25/3 Mbps or more.

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[1] *RDOF Order* ¶ 2.

[2] *Id.* ¶ 5.

[3] *See id.* ¶¶ 8-9.

[4] *See id.* ¶ 5.

[5] *See id.*

Immediate action from the Commission can help prevent valuable resources from being squandered on wasteful deployments that benefit those least in need. Failure to take corrective action risks undermining public confidence not only in the RDOF, but also in future Commission universal service programs, such as the 5G Fund for Rural America. The Commission can reaffirm its commitment to closing the digital divide by using its ample authority to prevent scarce, high-cost funds from needlessly subsidizing broadband deployment in areas that already have it.

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DISCUSSION

I. THE COMMISSION HAS ACKNOWLEDGED THAT THE CONNECT AMERICA COST MODEL DID NOT ACCURATELY REFLECT BROADBAND DEPLOYMENT.

The Commission based RDOF funding on the Connect America Cost Model's ("CAM") estimated cost of deploying broadband Internet to census blocks: (1) that were wholly unserved with fixed voice and broadband speeds of 25/3 Mbps,[6] and (2) where the CAM estimated the cost per location equaled or exceeded $40 per month.[7] To identify these areas, the Commission directed the Wireline Competition Bureau ("WCB") to incorporate the most recent publicly available FCC Form 477 data into the CAM.[8]

Geographic units are the foundation of this analysis because they determine eligibility for RDOF support. To illustrate the relationships among geographic units, the figure below shows three views of the same Census Block Group (CBG) near San Jose, CA. The first image in the figure shows the CBG's perimeter using a yellow line. CBGs are the largest areas relevant to this analysis. Within the CBG, the figure shows a collection of smaller, irregularly shaped "blocks," which are the most granular geography used by the Census Bureau, indicated by the gray lines. The FCC used its CAM to identify those blocks within each CBG that were wholly unserved by 25/3 Mbps broadband. The "wholly unserved" blocks the FCC identified for this CBG are shown shaded blue in the second image. Nationwide, the FCC identified nearly 787,000 blocks "wholly unserved" by 25/3 Mbps broadband as eligible for RDOF Phase I funding.

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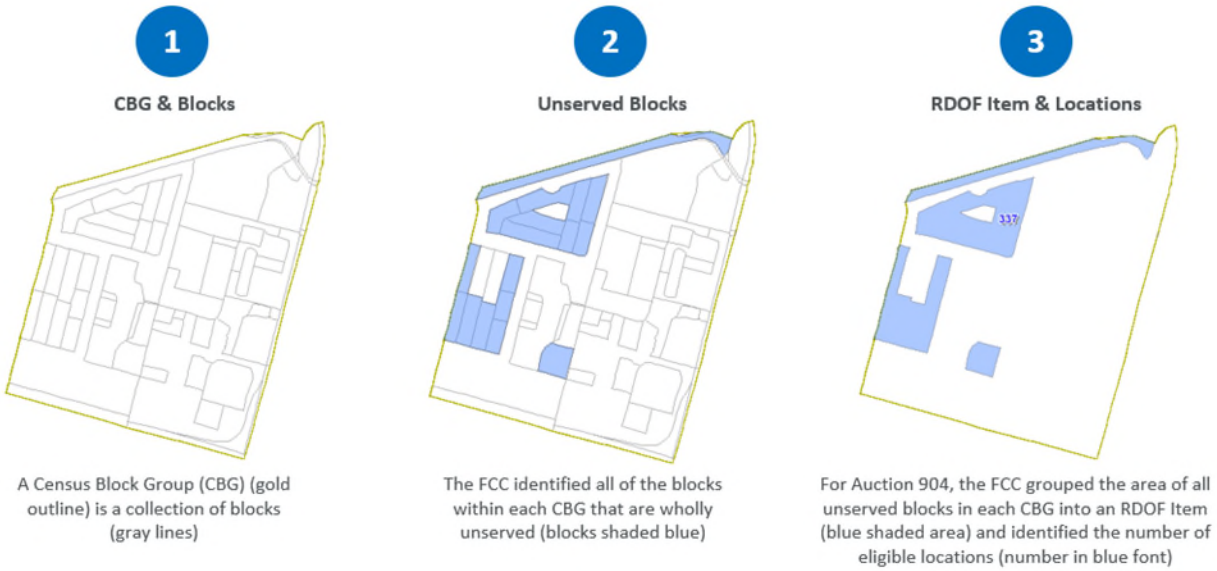
[6] *See id.* ¶ 9.

[7] *See id.* ¶ 15. For Tribal areas, FCC applied a funding threshold of $30 per month. *See id.* ¶ 16.

[8] *See id.* ¶ 10. The FCC determined that census block groups would be the minimum geographic unit for bidding in Auction 904. FCC, Auction 904 Updated Eligible Areas (June 25, 2020), https://bit.ly/32KaYAo. Census block groups are made up of census blocks, which are "statistical areas bounded by visible features, such as streets, roads, streams, and railroad tracks, and by nonvisible boundaries, such as selected property lines and city, township, school district, and county limits and short line-of-sight extensions of streets and roads" and are the smallest geographical units defined by the Census Bureau. FCC, More About Census Blocks (last revised Oct. 27, 2020), https://bit.ly/3sH7p8V (citing U.S. Census Bureau, 2010 Census Summary File 1, Technical Documentation, at A-10 (Sept. 2012), https://bit.ly/32X9uD6). An "item" is the collection of census blocks within a group that the CAM demonstrated to include locations that do not have access to 25/3 Mbps. These "locations" each represent a home, business, municipal building, or similar establishment. *See Wireline Competition Bureau and Office of Economics and Analytics Release Updated List and Map of Eligible Areas for the Rural Digital Opportunity Fund Phase I Auction*, 35 FCC Rcd 6499 (WCB 2020).

In the Bidding Procedures Public Notice for Auction 904, the FCC sought comment on the minimum geographic area for Phase I of the RDOF, and later settled on Census Block Groups. Consistent with this decision, the FCC grouped all of the wholly unserved blocks within a CBG into a single – but often discontiguous – geography to serve as discrete biddable units for the auction, and the result for the CBG near San Jose is shown in the third image. This area is referred to as an "RDOF Item" and each RDOF Item has a number of eligible RDOF locations associated with it. Although each of the blocks in the second image in the figure below has at least one eligible location inside of it, the FCC did not release data indicating how many locations exist in each block. Rather, the Commission provided the number of locations only for each of the nearly 62,000 RDOF Items, which are the collection of discontiguous blocks shown in the third image.

***Figure 1*: A Census Block Group near San Jose, CA, its constituent census blocks, and its associated RDOF Item.**



Relying on "a combination of commercial data and census data to determine residential and business locations," the CAM "calculate[d] the total cost of serving an entire service territory within a state, and allocate[d] the shared costs between eligible and ineligible census blocks using a pro rata method based on the relative number of customers in each area."[9] Additionally, the CAM incorporated several assumptions: (1) "that Ethernet fiber connections tie central offices to the nearest tandem location"; (2) there were "connections to the nearest Internet access

[9] *Connect America Fund, High-Cost Universal Service Support*, Report and Order, 29 FCC Rcd 3964, ¶ 16 (2014).

point"; (3) "that each state is made up of three density zones – urban, suburban, and rural"; and (4) that "for each density zone, . . . [there was] a specific plant mix for each of three different parts of the network – distribution, feeder, and inter-office transport."[10]

For Auction 904, the Commission instructed WCB "to use the CAM with updated coverage data using the most recently publicly available FCC Form 477 data to identify census blocks that are unserved with broadband at speeds of at least 25/3 Mbps."[11] Despite the use of recent FCC Form 477 data, the Commission acknowledged that it did not possess perfect information about which Americans lacked broadband service because "location counts in the CAM [we]re based on 2011 Census data," creating a "disparity between the number of locations identified before the auction occurs and the 'facts on the ground.'"[12]

II. CCA'S ANALYSIS SHOWS THE COMMISSION WILL SUBSIDIZE BUILDOUT IN AREAS THAT ALREADY HAVE BROADBAND, INCLUDING THE WEALTHIEST AND MOST DENSELY POPULATED AREAS OF THE UNITED STATES.

Other parties have already presented data demonstrating that areas the Commission determined eligible for RDOF Phase I funding are not unserved, rural, low income, or otherwise most in need of subsidies. Analysis from Free Press, for example, showed that the Commission directed funds to serve golf courses, random stretches of highway, fancy homes, and the Pentagon's parking lots.[13]

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[10] *Id.* ¶ 16.

[11] *RDOF Order* ¶ 10. For Phase I, the Commission included the following in its list of eligible areas any census blocks: (1) for which price cap carriers currently receive CAF Phase II model-based support; (2) that were eligible for, but did not receive, winning bids in the CAF Phase II auction; (3) where a CAF Phase II auction winning bidder has defaulted; (4) that were excluded from the offers of model-based support and the CAF Phase II auction because they were served with voice and broadband of at least 10/1 Mbps; (5) served by both price cap carriers and rate-of-return carriers to the extent that the census block is in the price cap carrier's territory, using the most recent study area boundary data filed by the rate-of-return carriers to identify their service areas and determine the portion of each census block that is outside this service area; (6) that are unserved and outside of price cap carriers' service areas where there is no certified, high-cost eligible telecommunications carrier ("ETC") providing service, such as the Hawaiian Homelands, and any other populated areas unserved by either a rate-of-return or price cap carrier; and (7) that were identified by rate-of-return carriers in their service areas as blocks where they do not expect to extend broadband. *See id.* at ¶ 12.

[12] *RDOF Order* ¶ 47. For example, "rural areas may experience a decrease in population, and in other areas new housing developments may be built." *Id.*

[13] Letter from S. Derek Turner, Research Director, Free Press, to Marlene H. Dortch, Secretary, FCC, at 2-3 (filed Jan. 20, 2021), https://bit.ly/3npBetD; Letter from S. Derek Turner, Research Director, Free Press, to Marlene H. Dortch, Secretary, FCC, at 2 (filed Dec. 18, 2020), https://bit.ly/3u1Kkis.

Competitive Carriers Association ("CCA") has since conducted its own analysis of eligible areas against publicly available resources and has identified hundreds of thousands of RDOF locations slated to receive Federal subsidies that already have broadband service of 25/3 Mbps or better.

To conduct this analysis, CCA compared publicly available speed test data with the FCC's broadband map to identify locations that already offer the minimum broadband speed for RDOF eligibility. CCA then superimposed the speed test data against that portion of the 57,000 RDOF items funded in Auction 904 located in the contiguous United States, including the locations within each item that the Commission concluded did not have access to 25/3 Mbps broadband speeds. To the extent 25/3 Mbps broadband speeds were available in only subsets of any given study area, CCA counted only that number of RDOF locations proportional to the overlap as receiving service.

CCA next sought to validate the conclusions of the speed test data by studying urbanization, wealth, and population density statistics, which closely and positively correlate to the existence of high-speed Internet in any given area. While the urban, income, and density data were somewhat less granular than the speed test data, comparisons of the different data sets closely tracked the speed test results and provided support for the speed test analysis.

CCA found that despite the FCC's goal of subsidizing buildout for the rural and underserved communities most in need of service, a material percentage of RDOF support will instead be spent needlessly subsidizing deployments in densely populated, affluent areas most likely to already receive service.

A. Speed test data demonstrate that hundreds of thousands of RDOF locations already offer 25/3 Mbps service.

For up-to-date broadband speed data, CCA turned to Speedtest® by Ookla® data,[14] which makes publicly available results of performance measurements run on Speedtest.[15] Speedtest is Ookla's flagship network-testing platform, collecting tens of millions of measurements about the performance and quality of networks around the world each day.[16] When combined with FCC

[14] Ookla, www.ookla.com (last visited Apr. 29, 2021). The company markets itself as the global leader in internet testing, data, and analysis. Ookla's flagship product, Speedtest, has run over 35 billion Internet speed tests. *See id.*

[15] Speedtest by Ookla Global Fixed and Mobile Network Performance Map Tiles (last visited April 29, 2021), https://bit.ly/2S5Yf9a.

[16] *See* Speedtest, Ookla, https://bit.ly/332eCFW (last visited Apr. 29, 2021).

Form 477 data, the Commission has described Ookla's Speedtest data as "the most reliable and comprehensive available data that is currently available on the extent of mobile coverage."[17]

Speedtest measures both fixed and mobile broadband network performance in a dedicated foreground service. According to Ookla, "[o]nly a dedicated foreground service can accurately assess network performance and quality metrics such as: download speed, upload speed, latency, packet loss, jitter and other indicators of network conditions."[18] Speedtest also collects more than 300 million daily scans of coverage data in the background. These coverage scans identify where service is offered, what the quality of service is at each location, and information about a mobile user's "radio environment," including "the technology used (*e.g.*, 5G, 4G LTE, etc.), the cellular infrastructure to which they are connected, and the accompanying strength and quality of signal."[19] After assessing foreground performance measurements, Ookla sorts this data into geographic "tiles," which are roughly 610.8 meters by 610.8 meters at the equator and grow progressively smaller as tiles approach the Earth's poles.[20] In the contiguous United States, Ookla's tile size averages approximately 500 meters by 500 meters, which represents an area of 250,000 square meters or slightly less than one tenth of a square mile.[21]

The size of assigned RDOF areas, by comparison, range from a minimum of approximately two square meters to a maximum of more than four billion square meters, which translates into roughly 1,546 square miles.[22] The average assigned RDOF area is approximately 23.5 million square meters, or roughly nine square miles, and 60% of RDOF items have an area that is larger than an Ookla tile. Ookla tiles, therefore, generally provide more granular information about real-world performance data than possible using the RDOF-eligible blocks.

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[17] *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, 2020 Broadband Deployment Report, 35 FCC Rcd 8986, ¶ 33 (2020) ("2020 Broadband Deployment Report").

[18] Brian Connelly, *How Ookla Ensures Accurate, Reliable Data: A Guide to Our Metrics and Methodology (Updated for 2020)*, Speedtest (Apr. 28, 20201), https://bit.ly/3aR5OXT.

[19] *Id.*

[20] Speedtest by Ookla Global Fixed and Mobile Network Performance Map Tiles, GitHub, https://bit.ly/3e3sDtp (last visited Apr. 30, 2021). The size of tiles in the contiguous United States range from about 560 meters by 560 meters in Key West, FL to about 401 meters by 401 meters in northern Minnesota. *Id.*

[21] *Id*.

[22] For context, 1,546 square miles is larger than Rhode Island.

To begin, CCA took Ookla data for the contiguous U.S. ("CONUS")[23] and filtered out any tiles in which the average speed was less than 25 Mbps downlink or 3 Mbps uplink.[24] CCA overlayed the resulting Ookla tiles on the assigned RDOF blocks to determine the percentage geographic overlap of the latter. When Ookla tiles did not cover 100% of an assigned RDOF block, CCA assumed an even distribution of locations within the block, i.e., a 75% geographic overlap was assumed to include a 75% overlap of locations. CCA used this method for both Ookla's fixed and mobile data sets and assessed each separately.

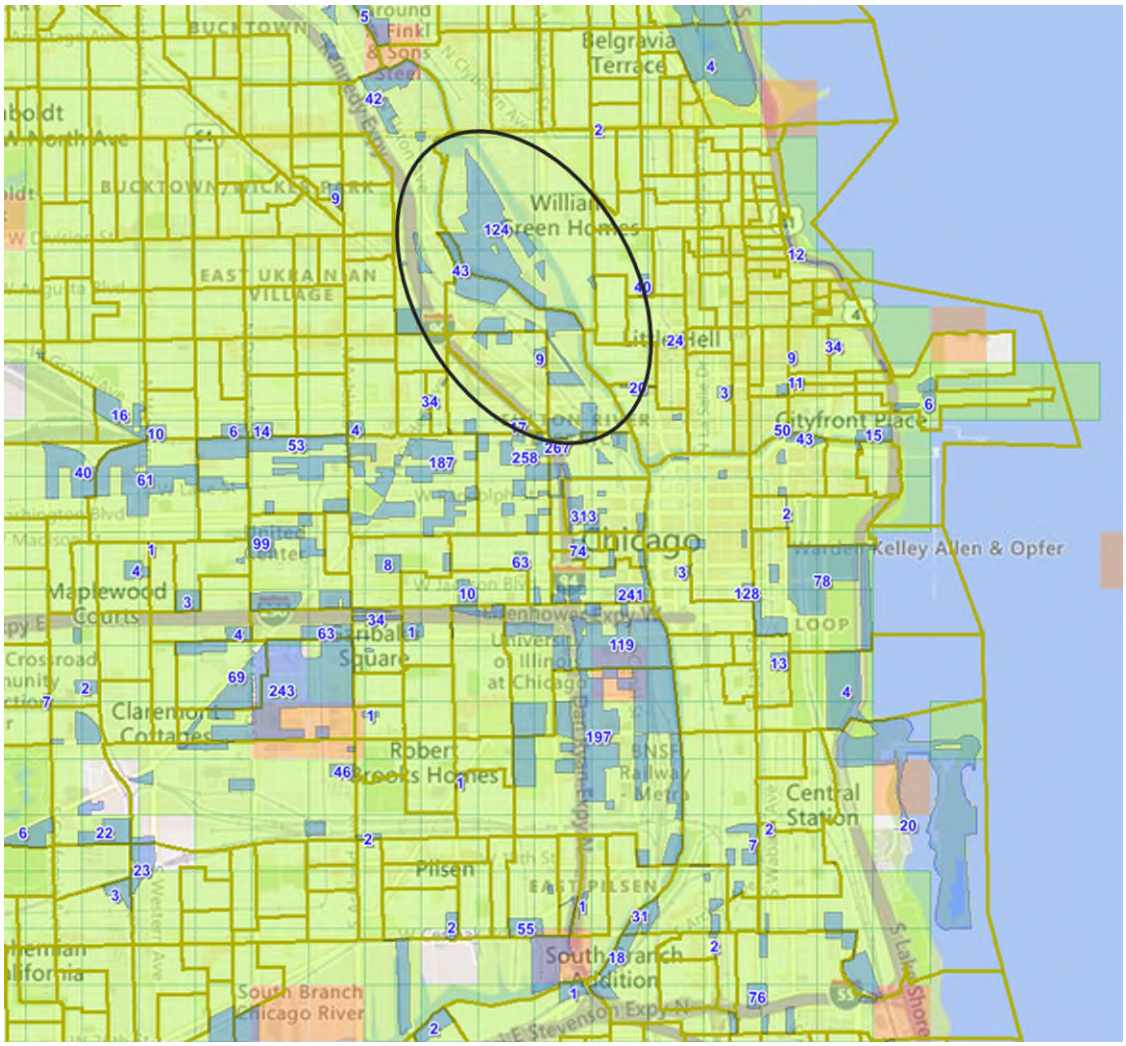
An example may help demonstrate how CCA performed its analysis. Below is an image of downtown Chicago. Block group boundaries that define RDOF items are shown in gold, assigned RDOF areas are shaded blue, the number locations for each RDOF item are identified in blue font, the Ookla tiles for which the average fixed speed exceeded 25/3 Mbps are green, and the Ookla tiles for which the average mobile speed exceeded 25/3 Mbps are orange:[25]

[23] The data files used were dated "2020-01-01" and therefore represented measurements taken in the fourth quarter of 2019.

[24] *RDOF Order* at ¶ 9.

[25] Mobile measurements exceeding 25/3 Mbps are shown where they were available and fixed measurements exceeding 25/3 Mbps were not.

***Figure 2*: Coverage over downtown Chicago, IL**



As shown in the image, many small RDOF blocks and RDOF items are completely covered by a single Ookla tile, but several larger ones, such as the RDOF item east of Central Station (with 20 locations), are only partially covered by one or more Ookla tiles. At the same time, several large assigned RDOF Phase I areas, such as the two RDOF areas circled in black located east of Interstate 90 that have 124 and 43 locations each, show multiple contiguous Ookla tiles completely covering all the blocks included in the RDOF Phase I area. CCA's analysis accounts for these and all other aspects of partial and complete overlap by identifying as served only the proportionate share of the RDOF item where Ookla tiles identify actual broadband operations of at least 25/3 Mbps.

In the *RDOF Order*, the FCC said it would direct RDOF Phase I to "wholly unserved" areas because it had "the tools and the data" to identify the wholly unserved census blocks most in need of

support.[26] The *RDOF Order* added that the FCC was "not aware of cases in which the data have identified as 'unserved' a census block that is in fact served and funding would not go to census blocks that already received 25/3 Mbps broadband service."[27] The FCC said it anticipated that there would be unserved locations within census blocks that would not receive RDOF Phase I funding; these partially served areas would be addressed in RDOF Phase II. Given the FCC's exclusive focus on areas unserved by broadband greater than 25/3 Mbps in RDOF Phase I, CCA used the publicly available Ookla data, which identifies locations that receive 25/3 Mbps or greater broadband service, to identify the census blocks that should have been ineligible for RDOF Phase I support but received support nevertheless.[28]

CCA analyzed the percentage of each block comprising an RDOF area in CONUS that was overlapped by 25/3 Mbps Ookla data and logged the results in a spreadsheet. Although the analysis focused on fixed broadband services, CCA also included overlaps with Ookla data measured on mobile networks, as well as the intersection and union of fixed and mobile Ookla tiles. CCA was then able to assess the nationwide effects of directing RDOF funds in areas that Ookla's real-world Speedtest observations show as meeting or exceeding a performance standard of 25/3 Mbps.

This block-level analysis considered that there are two primary areas of uncertainty: (1) the coordinates of the locations within each RDOF area are unknown, and (2) the specific coordinates of each of the Ookla Speedtests within a tile are unknown. To address the first source of uncertainty, CCA needed to make some assumptions regarding how locations are distributed within RDOF Items.

[26] *See RDOF Order* ¶ 10.

[27] *See RDOF Order* ¶¶ 9-16. The RDOF Order includes numerous passages affirming census blocks as the base unit. *See, e.g.*, *id.* ¶ 13 ("Although we sought comment on whether there are any other areas that we should include in the initial list of eligible areas, such as areas in legacy rate-of-return areas that are almost entirely overlapped by an unsubsidized competitor, we decline to expand the list of eligible areas at this time and instead focus Phase I on the known wholly unserved census blocks.").

[28] To accelerate processing, this analysis considers RDOF blocks in CONUS only. Auction 904 also assigned funds to 1152 blocks in Hawaii and the Northern Marianas Islands, but those assignments (172 RDOF Items in Hawaii and 7 in the Northern Marianas Islands) are not included here and, thus, the total number of locations differs slightly from the Auction 904 total.

As a simplifying assumption, CCA distributed RDOF locations nearly equally among the blocks that comprise the RDOF item using integer values.[29] For example, if an RDOF item included three blocks and ten locations, two of the blocks would be assigned three locations and the third would be assigned four locations. Selection of which blocks received three and which got four was based on the order of the blocks in the list, which created a pseudo-random assignment process.

This distribution of locations within an RDOF item may be more accurate than an area-based distribution in which the locations within an RDOF item are evenly distributed geographically.[30] A higher degree of accuracy is likely using CCA's method than an even geographic distribution of locations across the entire area of the RDOF item because CCA's approach takes into account the size of the component blocks that comprise the RDOF item. CCA's method leverages the Census Bureau methodology in which block size is typically inversely proportional to population density and the density of other indications of "urban-ness" (office buildings, stores, small business, government buildings, etc.). In other words, CCA's approach recognizes that smaller blocks typically have more locations in them per square meter than larger blocks do. Therefore, the relatively small blocks within an RDOF item include a number of locations that is *not* proportional to the area they cover. Instead, small blocks in an RDOF item are more likely to have about the same number of locations as the larger blocks. Since blocks provide the lowest granularity possible, CCA then assumed that the locations allocated to each block were distributed evenly within the area of the block.

The percentage of an RDOF block's area that overlaps Ookla tiles provides some level of certainty that at least one location within the RDOF block is likely served with broadband speeds that exceed the FCC's minimum threshold for RDOF.[31] The table below shows the number of locations

[29] CCA also assumed that every census block involved in the RDOF Phase I auction had at least one location eligible for RDOF Phase I support. There are no RDOF items that include more Census blocks than locations.

[30] Using this model, a hypothetical 10 kilometer square RDOF Item with 100 locations would be assumed to have one location per square kilometer arranged in a uniform grid. Then if 50% of the RDOF item overlapped Ookla data, we can conclude that half of the locations have access to at least 25/3 Mbps broadband. This method also assumes that Ookla measurement locations are also evenly distributed within the tile. Given the relatively small size of the tiles, this is considered a reasonable assumption in most cases.

[31] This study focuses on the percentage of each RDOF block that is overlapped by Ookla data, but equally informative would be the percentage of each Ookla tile that overlaps RDOF areas. For example, a 25/3 Mbps Ookla tile that is completely contained within the area of an RDOF item would indicate that speeds in excess of the FCC's threshold are possible from at least one location within the RDOF block, and therefore the block should not have been included in the RDOF item or in Auction 904. In the interest of time and simplicity, CCA did not perform this complementary analysis.

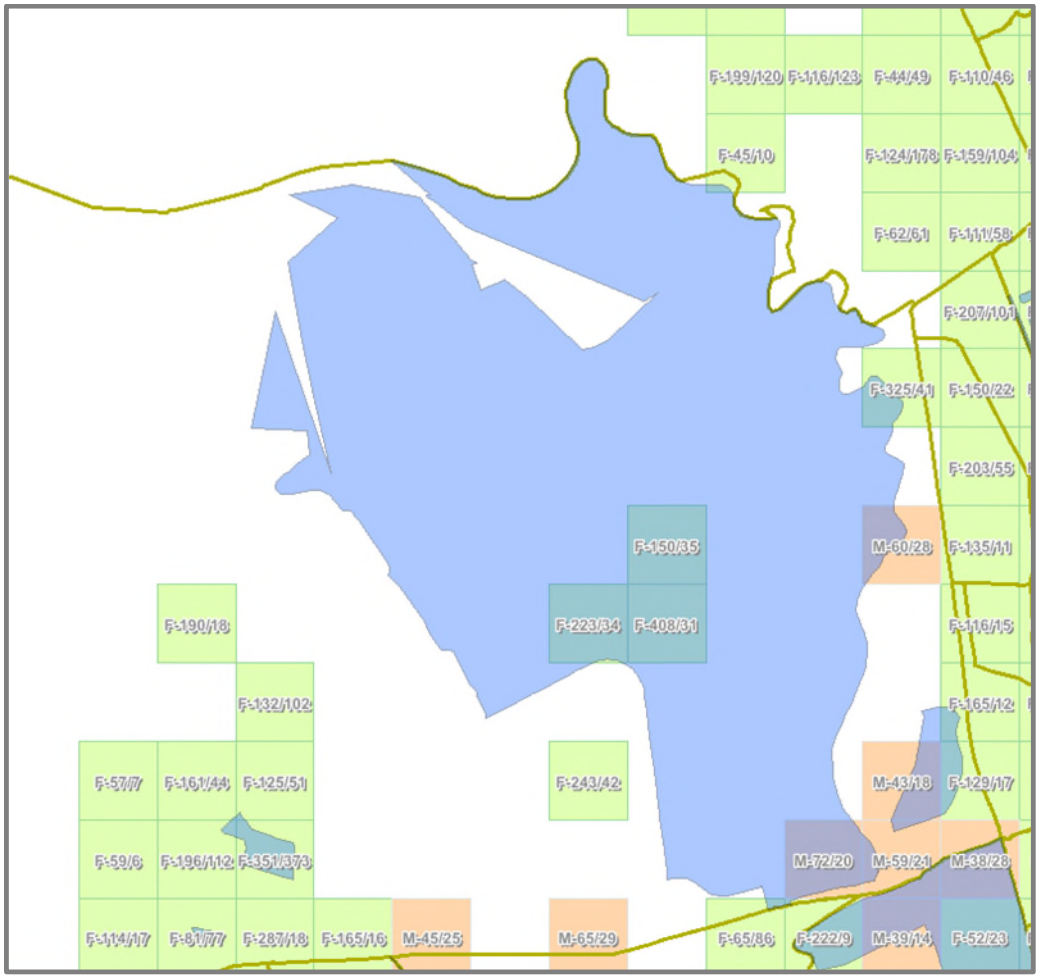
that are within RDOF blocks that overlap Ookla data by at least the percentage in the left-hand column. The second row from the bottom showing a *de minimis* percentage overlap is intended to indicate the number of locations in all RDOF blocks that intersect the Ookla data, regardless of the amount of overlap:

***Table 1*: Existing 25/3 Mbps Broadband Service In RDOF Locations**

Percent RDOF Item Area Cov'd by Ookla 25/3	Number of RDOF Locations			
	Ookla Fixed Cov'g	Ookla Mobile Cov'g	Ookla Fixed and Mobile Cov'g	Ookla Fixed or Mobile Cov'g
100%	136,782	61,146	36,537	166,715
99%	177,816	78,906	46,380	220,728
98%	180,665	80,769	47,117	224,405
95%	186,630	84,692	49,120	231,958
90%	195,109	90,224	51,733	242,475
75%	218,164	105,671	59,479	271,020
60%	242,446	122,699	67,093	301,964
50%	261,617	136,021	72,750	326,662
40%	284,230	150,801	79,304	355,668
25%	330,516	179,197	89,170	416,308
10%	413,241	235,815	103,254	534,371
5%	471,885	277,476	110,196	622,032
2%	531,926	322,332	116,822	713,125
1%	563,438	346,026	120,566	760,369
0.0000001%	626,487	392,762	128,435	851,727
All Assigned RDOF Items	5,212,270	5,212,270	5,212,270	5,212,270

If an RDOF block is completely covered by one or more Ookla tiles, then the speeds reported by the Ookla data probably originated within the area of the RDOF block. Said another way, given the relative size of Ookla tiles and most blocks, the likelihood that Ookla Speedtest measures that completely cover an RDOF block all happen to have fallen outside the RDOF block is relatively low, especially in areas otherwise served by 25/3 Mbps. As the percentage of overlap decreases and as the size of the RDOF block exceeds the size of the Ookla tiles, however, the certainty that the speeds reported by Ookla originated from within the block increases even more. And when an entire Ookla tile falls within the area of the block, the speeds reported by the Ookla data must have originated within the area of the RDOF block. An example of this last situation is shown in the map below.

***Figure 3*: Less Overlap=More Confidence: Speedtest measurements from small Ookla tiles wholly within a large block must have taken place inside the block.**



The large blue area is a single block that is part of a larger RDOF Item.[32] This block has two fixed Ookla tiles that are completely within the area of the block, one that measured 150/35 Mbps and another that measured 408/31 Mbps. A third Ookla tile that measured 223/34 Mbps is nearly entirely within the area of the block, although a small sliver extends past the southern boundary. Although this block is only partially covered by Ookla data and would be included in one of the lower rows in Table 1, there is no doubt that fixed measurements whose results greatly exceeded the FCC's threshold speeds originated from within the block. Therefore, the block is not "wholly unserved" and should not have been included in the RDOF auction, despite very lightly overlapping Ookla data on a percentage of area basis. That said, Table 1 above is helpful for establishing an upper and lower bound for the number of RDOF locations covered by Ookla data,

[32] The block depicted here is Block ID 060855046021000, and the RDOF Item is CA-085-5046021.

although it is not as helpful for determining the number of RDOF blocks that should not have been included in the auction.

One way to estimate the median number of locations that may be covered by Ookla data would be to assume that the locations within each RDOF block are evenly distributed geographically. This method involves multiplying the number of locations assigned to each block by the percentage of area that overlaps with Ookla tiles that exceeds 25/3 Mbps. These values are then summed for all RDOF blocks. Using this method, CCA found that nearly 286,000 locations (or approximately 5.5% of the total) have access to fixed broadband service at speeds of at least 25/3 Mbps. When also considering access to mobile broadband, more than 361,000 (or approximately 6.9%) of all RDOF locations have access. These values are shown in the table below:

***Table 2*: Estimated RDOF Locations with Existing 25/3 Mbps Broadband Coverage**

Total Number of Locations	Ookla Fixed Cov'g	Ookla Mobile Cov'g	Ookla Fixed and Mobile Cov'g	Ookla Fixed or Mobile Cov'g
Equal Locations per Block and Even Dist of RDOF Locations within each Block	285,739	151,203	75,419	361,523
Percent of Total	5.5%	2.9%	1.4%	6.9%

CCA then measured the total population covered by RDOF blocks estimated to be already covered by fixed or mobile broadband greater than 25/3 Mbps. To do so, CCA used 2010 Census data to count the population covered in each RDOF block.[33] Again, the table below shows the population that are within RDOF Items whose area overlaps Ookla data by at least the percentage in the left-hand column:

[33] For partial Census blocks that were cut to exclude areas that were awarded funds under other state or federal programs, the population of the block was adjusted proportionally, and the adjusted value was used to calculate the RDOF item's covered population.

Table 3: **Estimated Population of Areas with Existing 25/3 Mbps Broadband Coverage**

Percent RDOF Item Area Cov'd by Ookla 25/3	Population			
	Ookla Fixed Cov'g	Ookla Mobile Cov'g	Ookla Fixed and Mobile Cov'g	Ookla Fixed or Mobile Cov'g
100%	163,531	65,390	43,954	188,427
99%	215,977	84,687	53,635	255,444
98%	218,815	85,945	54,392	258,778
95%	225,147	90,402	55,771	267,396
90%	237,478	96,797	59,039	282,812
75%	268,858	115,194	67,950	325,266
60%	306,295	141,226	79,940	377,648
50%	336,162	163,009	85,249	419,264
40%	374,113	186,224	94,391	470,387
25%	456,604	233,869	105,814	584,006
10%	655,550	356,842	128,177	872,467
5%	835,500	490,027	144,461	1,148,516
2%	1,032,466	649,394	160,499	1,465,425
1%	1,149,279	743,114	171,548	1,639,735
0.0000001%	1,367,838	910,085	191,346	1,956,601
All Assigned RDOF Items (excl. HI & MP)	9,236,117	9,236,117	9,236,117	9,236,117

Using the same method described previously to calculate the median, CCA found that the approximately 286,000 RDOF locations with existing fixed broadband service of 25/3 Mbps or greater represent more than 403,000 people served, based on 2010 census data. When also considering mobile broadband service of 25/3 Mbps or greater, the 361,000 RDOF locations with existing fixed or mobile services represent nearly 516,000 people. These results are shown in the table below:

Table 4: **Population receiving 25/3 Mbps broadband and RDOF support**

Total Covered Population	Ookla Fixed Cov'g	Ookla Mobile Cov'g	Ookla Fixed and Mobile Cov'g	Ookla Fixed or Mobile Cov'g
Equal Locations per Block and Even Dist of RDOF Locations within Blocks	403,299	202,873	90,384	515,788
Percent of Total	4.4%	2.2%	1.0%	5.6%

To place this finding in perspective, unwarranted subsidies are slated to go to areas with a total population greater than that of New Orleans, Tulsa, or Tampa. And if fixed or mobile broadband in excess of 25/3 Mbps were considered, the population actually served by broadband in excess of 25/3 Mbps that will still receive RDOF subsidies would exceed that of Atlanta, Kansas City, or Sacramento.

Finally, CCA measured the total amount of funding awarded to areas estimated to be already covered by fixed or mobile broadband. To do so, CCA used the FCC's data files from Auction 904 to assign winning funds to each RDOF Item, and a corresponding amount of funds to each location. This process included analyzing RDOF Items that were included in winning packages in which the assigned funds per location for the package was used to calculate the implied winning funds per RDOF Item. Then CCA used the distribution of locations to RDOF blocks described above to estimate the amount of funds awarded per RDOF block. The following table shows the total assigned funds (in millions) that are within RDOF Items whose area overlaps Ookla data by at least the percentage in the left-hand column:

***Table 5:* RDOF Funds Assigned to Areas with Existing 25/3 Mbps Broadband Coverage**

Percent RDOF Item Area Cov'd by Ookla 25/3	Total Assigned Funds ($M)			
	Ookla Fixed Cov'g	Ookla Mobile Cov'g	Ookla Fixed *and* Mobile Cov'g	Ookla Fixed *or* Mobile Cov'g
100%	$116	$46	$22	$144
99%	$146	$58	$28	$184
98%	$148	$60	$28	$188
95%	$155	$63	$29	$196
90%	$164	$68	$31	$208
75%	$187	$82	$36	$239
60%	$213	$98	$42	$273
50%	$235	$110	$46	$301
40%	$260	$126	$51	$336
25%	$316	$158	$59	$412
10%	$421	$224	$71	$564
5%	$501	$277	$77	$684
2%	$591	$337	$84	$820
1%	$640	$372	$88	$894
0.0000001%	$745	$444	$97	$1,047
All Assigned RDOF Funds (excl. HI & MP)	$9,202	$9,202	$9,202	$9,202

Thus, the range of possibilities is roughly $116 million to $745 million when considering only fixed broadband of 25 Mbps or more, and $144 million to more than $1 billion when considering fixed or mobile broadband of 25 Mbps or more. Using the method described previously to estimate the total amount of misdirected funding based on the percentage of Ookla coverage reveals that the median is approximately $268 million for fixed, and $350 million for fixed or mobile. These values are significant and worthy of further study.

Directing Federal subsidies to already served areas deprives truly unserved areas of the financial support they need to obtain broadband access. In essence, every dollar spent on duplicative support in areas that do not need it is one dollar less for areas that do. Subsidizing duplicative broadband deployment also diminishes existing market incentives for deployment and,

perversely, may reduce the amount of broadband service available in served areas by subsidizing a higher cost broadband supplier over a lower cost incumbent.

B. Many of the Commission's RDOF-eligible locations feature high population densities and median incomes, indicia that highly and closely correlate with broadband availability.

To further substantiate its analysis, CCA also considered the likelihood that RDOF locations already receive broadband service by studying population density and median income. Beyond site-specific speed tests, population density and median income are the two strongest indicators of whether an area receives high-speed Internet service. An analysis of each factor corroborated the findings from CCA's speed test models—that RDOF funds intended to help unserved Americans will instead be directed to benefit hundreds of thousands of people who already enjoy broadband access.

i. Consistent with the Ookla Speedtest measurements, areas with high population density are receiving large amounts of "rural" funds.

CCA sought to validate its application of Ookla Speedtest performance measures by using population density to assess the likelihood of broadband service delivery in CAM-eligible RDOF Phase I areas. The Commission has long recognized population density as an important indicator of whether broadband service is likely available in any given area.[34] As the Commission's 2010 Broadband Report found, "areas of extremely low population density are some of the most difficult and expensive areas to serve."[35] While emerging technologies, such as low-earth orbit satellite broadband platforms, may one day change network cost models, present-day broadband deployments in excess of 25/3 Mbps remain closely—and positively—correlated with areas of higher population densities; conversely, lack of broadband service is closely correlated with areas of lower population density.[36] The reason is simple: despite important variations by

[34] Population density is the total population residing in a census block group divided by the square miles of land in the census block group.

[35] *See* The Broadband Availability Gap, OBI Technical Paper No. 1, FCC, at 19-20 (Apr. 2010), https://bit.ly/3e43Wgl ("2010 Broadband Report"). While other factors, such as road miles per housing unit may demonstrate an even greater correlation to areas unserved by broadband than areas of low population density, an analysis of road miles per housing unit is beyond the scope of the present analysis.

[36] *See* 2020 Broadband Deployment Report ¶ 45 ("On average, [broadband] deployment is highest in census block groups with the highest median household income, the highest population density and the lowest household poverty rate."); 2010 Broadband Report at 19-20 ("Unserved census blocks have a much lower density [than the national average], with an average of only 13.8 people per square mile."); Andrew

the technology used to deliver service, upfront capital investments and operating expenses increase as terrestrial broadband deployments move to less densely populated areas.[37]

Deployment statistics validate the Commission's data. As of 2019, rural Americans consistently had lower levels of broadband adoption and were approximately 12% less likely than other Americans to have home broadband.[38] Public opinion mirrors this finding, too. In 2018, rural Americans were much more likely than urban Americans to identify access to high-speed Internet as a major problem.[39]

To demonstrate the reliability of Ookla data versus CAM-eligible RDOF Phase I awards, CCA relied on publicly available 2010 population data from the U.S. Census Bureau.[40]

To validate the Ookla Speedtest data, CCA queried the Census Bureau database to identify the number of FCC-assigned, RDOF Phase I areas that intersect with "urban" areas. CCA did not seek to overlay "urban" areas with assigned RDOF Phase I areas, but rather sought to use the intersection of "urban" and assigned RDOF Phase I areas to provide an additional measure of confidence in the Ookla performance data.[41] The results show a remarkable degree of conformity with the Ookla data: RDOF items accounting for 341,359 locations, or 6.5% of the

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Perrin, *Digital Gap Between Rural and Nonrural America Persists*, Pew Research Center (May 31, 2019), https://pewrsr.ch/2RWw1Od.

[37] In the case of fixed line services, reaching underserved areas can mean "fiber extension, electronics upgrades and significant outside plant reconstruction and rearrangement." In the case of mobile line services, reaching unserved areas can mean "using more spectrum or adding more cell sites or both" and will typically require outside plant and tower construction. 2010 Broadband Report at 60-61.

[38] Andrew Perrin, *Digital Gap Between Rural and Nonrural America Persists*, Pew Research Center (May 31, 2019), https://pewrsr.ch/2RWw1Od.

[39] Monica Anderson, *About a Quarter of Rural Americans Say Access to High-Speed Internet is a Major Problem*, Pew Research Center (Sept. 10, 2018), https://pewrsr.ch/3dEcBWK.

[40] The Census Bureau provides a file on its website that indicates those parts of the country that it classifies as "urban" areas. *See* 2010 Census Urban and Rural Classification and Urban Area Criteria, U.S. Census Bureau, https://bit.ly/2SdKOUS (last visited Apr. 29, 2021). The Bureau effectively defines "rural" as everything that is not classified as "urban." *Id.* As with many terms, the Census Bureau's use of the phrase "urban" areas is a term of art. Specifically, "urban" areas are not limited to densely populated cities or other land that meets minimum population density requirements but can include "adjacent territory containing non-residential urban land uses as well as territory with low population density included to link outlying densely settled territory with the densely settled core." *Id.*

[41] For purposes of this analysis, any intersection between a Census Bureau defined "urban" area and RDOF area qualified as an intersection.

total number of assigned RDOF locations, intersect areas identified as "urban" by the Census Bureau.

These numbers are striking. The Commission stated that RDOF was intended to connect "rural communities" so that those previously without service could finally take advantage of "the digital economy and the opportunities for better education, employment, healthcare, and civic and social engagement."[42] In fact, RDOF was supposed to "represent[] the Commission's single biggest step to close the digital divide by providing up to $20.4 billion to connect millions more *rural homes and small businesses* to high-speed broadband networks."[43] As CCA's findings show, however, much of the RDOF Phase I support is destined to subsidize overbuilding in the country's most densely-populated urban areas.

ii. An analysis of RDOF locations in high-income counties corroborates CCA's speed test analysis.

CCA also measured the likelihood of broadband access in RDOF Phase I areas by studying median income by county and combined this with population density data. Research studies consistently demonstrate that high-income Americans are much more likely to have access to broadband Internet than low-income Americans. As the Commission's Broadband Deployment Advisory Council noted last year, "higher-speed broadband services are deployed to higher-income neighborhoods sooner than they are to lower-income neighborhoods."[44]

This result should come as no surprise. Investment decisions are often based on demand for services and expected return on investment. Lower-income communities are less able to afford broadband service and "upstream" products and services that increase broadband demand, such as over-the-top streaming applications, home security systems, and connected smart devices.[45] Similarly, Pew Research Center concluded that broadband service is "nearly ubiquitous" among households that annually earn $100,000 or more.[46] As a result, wealthier communities are more

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[42] *RDOF Order* ¶ 1.

[43] *RDOF Order* ¶ 2 (emphasis added).

[44] FCC Broadband Deployment Advisory Council, Increasing Broadband Investment in Low-Income Communities Working Group, at 15 (Dec. 2020), https://bit.ly/2SiErQh (citing Vamsi Gadiraju, et. al., Who Gets Broadband When? A Panel Data Analysis of Demographic, Economic, and Technological Factors Explaining U.S. Broadband Deployment (Oct. 22, 2018), https://bit.ly/3nzVxnW).

[45] *Id.* at 15-16.

[46] Monica Anderson and Madhumitha Kumar, *Digital Divide Persists Even as Lower-Income Americans Make Gains in Tech Adoption*, Pew Research Center (May 7, 2019), https://pewrsr.ch/3nd6qvY. *See also*

likely to have access to broadband Internet, while Americans in less affluent areas continue to wait.

To determine median income, CCA used publicly available 2019 data from the Census Bureau.[47] The Census Bureau conducts the Current Population Survey ("CPS"), which reaches 54,000 households monthly.[48]

CCA relied on county-level CPS income data and population density to validate its Speedtest analysis. The Census Bureau calculates the average population density by dividing the total U.S. population by the total U.S. land area[49] and makes this data available to the public.[50] As of 2019, the average population density in CONUS was approximately 98 residents per square mile of land.[51]

For its analysis, CCA considered an area with a population density of 250 residents per square mile as "densely populated." To determine the total number of assigned RDOF locations in high-income, densely populated counties, CCA mapped RDOF locations by county. The chart below compares the percentage of nationwide median income of a county (with 100% representing the nationwide mean) with the number of RDOF locations. Because Census Bureau income data are available at the county level, the table calculates average population density at the county level as well. The chart below shows the results of this analysis:

Teresa Mathew, *Broadband is Largely Inaccessible to Those Who Need it Most*, Bloomberg (Sept. 18, 2017), https://bloom.bg/3elAl16.

[47] Income and Poverty in the United States: 2019, U.S. Census Bureau (Sept. 15, 2020), https://bit.ly/3e1R4aw.

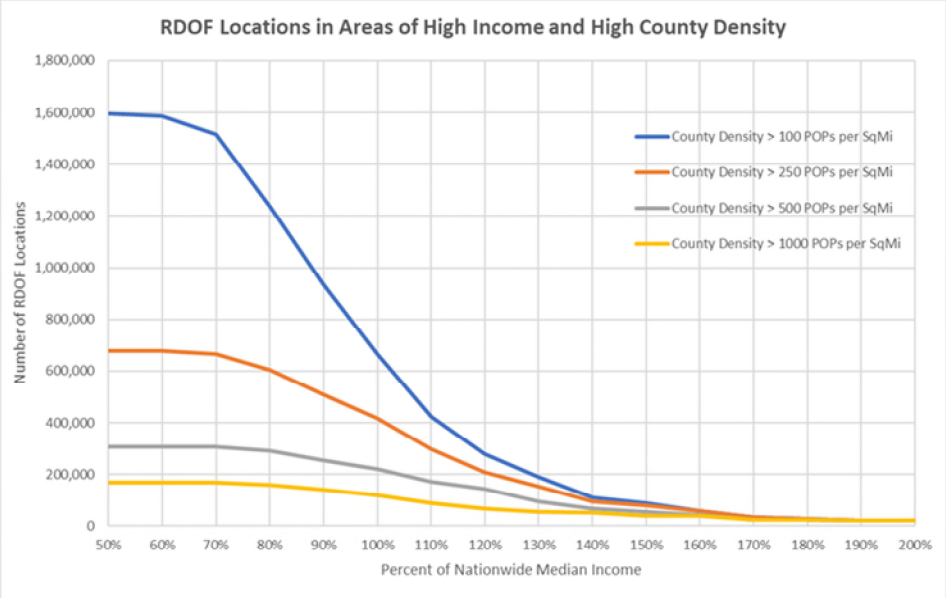
[48] All of these households are scientifically selected to measure median income across the country, down to more granular county levels. Current Population Survey, 2020 Annual Social and Economic (ASEC) Supplement, U.S. Census Bureau, at 2-1 (2020), https://bit.ly/2RbRaU0. This data are then compiled and regularly published, and CPS's statistics are also used to update similar information collected during the decennial census. According to the Census Bureau, "CPS is the only source of monthly estimates of total employment . . . and . . . wage and salary employees." *Id.*

[49] Darryl Cohen, *Understanding Population Density*, U.S. Census Bureau, (March 4, 2015), https://bit.ly/3dJexx1.

[50] The 2010 Census counted 306,675,006 people in the contiguous United States, covering an area of 3,119,888 square miles. *See* National Population Totals and Components of Change: 2010-2019, U.S. Census Bureau, (last revised April 20, 2021), https://bit.ly/3e2jgdj.

[51] *Id*.

***Figure 4*: RDOF Locations in Areas of High Income and High County Density**



Looking only at counties that average at least 110% of the nationwide median income and a population density of 250 persons per square mile, CCA found that approximately 300,000 RDOF locations are in very densely populated counties where the median income is at least 10% higher than the national median. This finding means that funds for nearly 6% of all RDOF locations will be spent in some of the wealthiest, most populous parts of the country, where broadband infrastructure is significantly more likely to already exist.

C. Some of the nation's busiest and most affluent areas will receive subsidies meant for rural America.

Due to the large number of RDOF locations found in high-income, densely populated areas, it is hardly surprising that some of the nation's most affluent urban areas are slated to receive millions in public funds.

i. Chicago – Inner Loop

RDOF winners will receive taxpayer subsidies to offer service in downtown Chicago, one of the largest cities in the United States. According to the Census Bureau's American Community Survey, which uses millions of data points to provide detailed population and housing information, the Chicago Loop had a total approximate population of 37,647 residing on less than 1.6 square miles in 2018.[52] This figure represents an average of nearly 24,000 persons per square mile, more than 244 times the average population density in the contiguous United States.[53] The median household income for residents of the Loop in 2018 was $107,246,[54] which was 166% of the national median income that year.[55] All available evidence confirms common sense—winning bidders in Chicago's financial district will not use FCC monies to connect unserved locations. Rather, the RDOF process will wastefully subsidize overbuilding in census blocks that already have multiple broadband options well above the Commission's 25/3 Mbps minimum service threshold.

The following visual snapshot of Chicago's central business district illustrates the point. The blue regions depict census blocks for which the Commission will make RDOF funds available and the gold lines indicate block group boundaries that define how blocks are grouped into the RDOF items that were assigned funds in Auction 904. The blue numbers represent the number of locations in each RDOF item. The green regions show Ookla tiles in which measurements from fixed broadband offerings showed average downlink and uplink speeds of at least 25/3 Mbps. The orange regions represent census blocks where fixed broadband performance measurement data in excess of 25/3 Mbps is unavailable or unreported, but mobile broadband performance data meet or exceed speeds of 25/3 Mbps. The XXX/YY values in gray font identify the average downlink (X) and uplink (Y) speeds in Mbps measured in those tiles.

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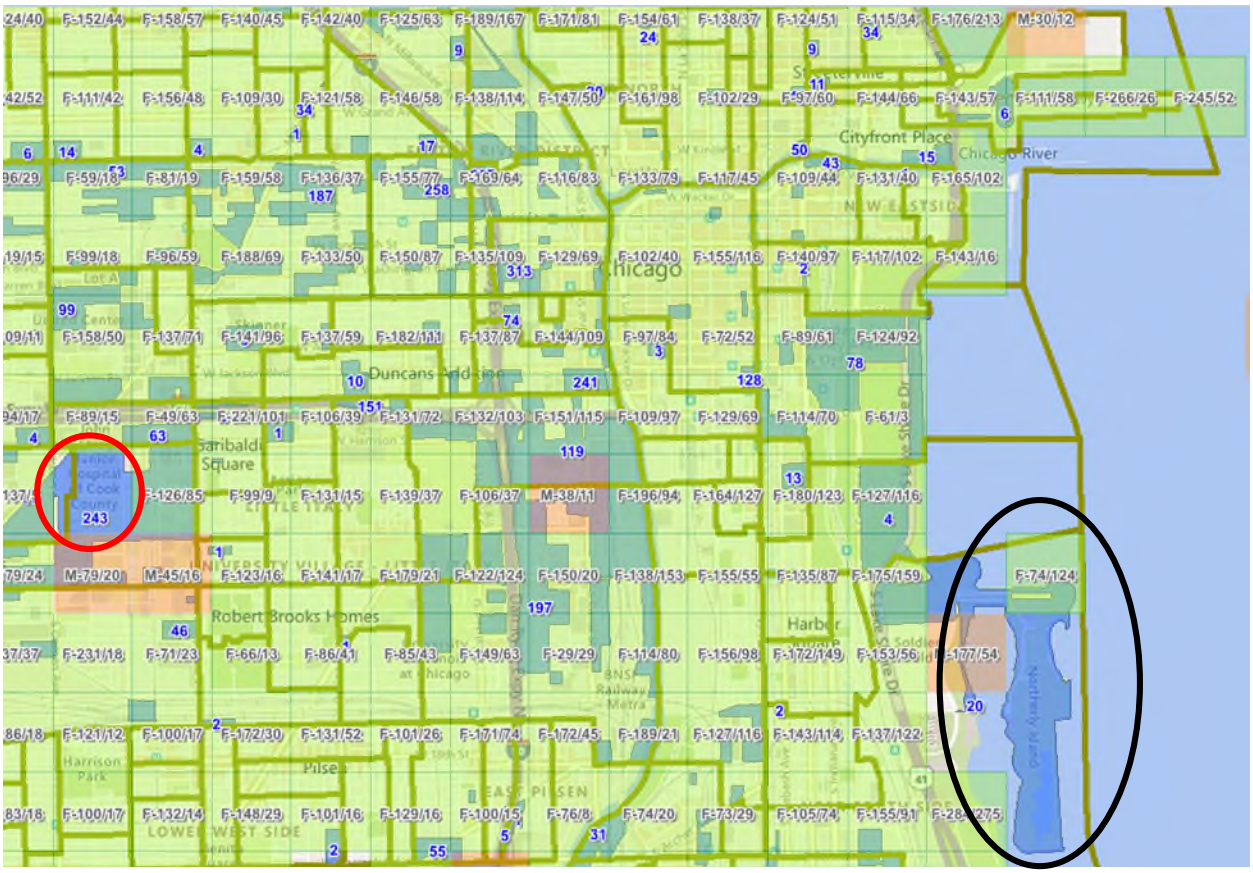
[52] Chicago Metropolitan Agency of Planning, Community Data Snapshot, The Loop, Chicago Community Area, at 3 (June 2020), https://bit.ly/3xAjikA.

[53] Census Bureau, National Population Totals and Components of Change: 2010-2019 (last revised April 20, 2021), https://bit.ly/3e2jgdj.

[54] Chicago Metropolitan Agency of Planning, Community Data Snapshot, The Loop, Chicago Community Area, at 5 (June 2020), https://bit.ly/3xAjikA.

[55] Jessica Semega et al., *Income and Poverty in the United States: 2019*, U.S. Census Bureau, (Sept. 15, 2020), https://bit.ly/2S6Hz1t.

***Figure 5*: Chicago, IL Broadband Coverage**



Although most of the area shown in the map above is covered by fixed or mobile broadband in excess of 25/3 Mbps, there are a few areas for which data was not available or showed speeds less than the FCC's threshold, but even these areas appear suspect. Consider, for example, the John H. Stroger, Jr. Hospital of Cook County, which appears in the red circle in the western region of Figure 5 above. Stroger Hospital is part of the larger Illinois Medical District, which includes the flagship University of Illinois Hospital. The hospital campus sits immediately south of Interstate 290 and the United Center, where the Chicago Bulls play, and approximately a mile west of the University of Illinois at Chicago and the city's Inner Loop. The Chicago Marriott is located two blocks east of the hospital.

Confirming the obvious, Ookla's fixed performance data reveal that the Stroger Hospital is not situated in a broadband desert. The facility is surrounded on all sides by Ookla tiles that exceed the Commission's 25/3 Mbps threshold many times over. For instance, the property immediately east of the hospital (which itself appears to be another hospital) receives fixed speeds of 125/83 Mbps—five times the FCC's minimum download speeds and nearly 28 times the agency's minimum upload speeds. Even assuming fixed broadband does not extend next door to the Stroger Hospital, the Ookla tiles to the south of the hospital receive *mobile* speeds of 79/20 Mbps

and 46/16 Mbps. For the RDOF results to withstand scrutiny, one would have to suspend disbelief and surmise that Stroger Hospital—a facility that enjoys significant financial resources and presumably cannot provide life-saving medical care today without more than primitive broadband access—lacks 25/3 Mbps speeds when every single adjacent location (including other medical facilities) has access to fixed and mobile broadband far exceeding the FCC's minimum download/upload criteria.

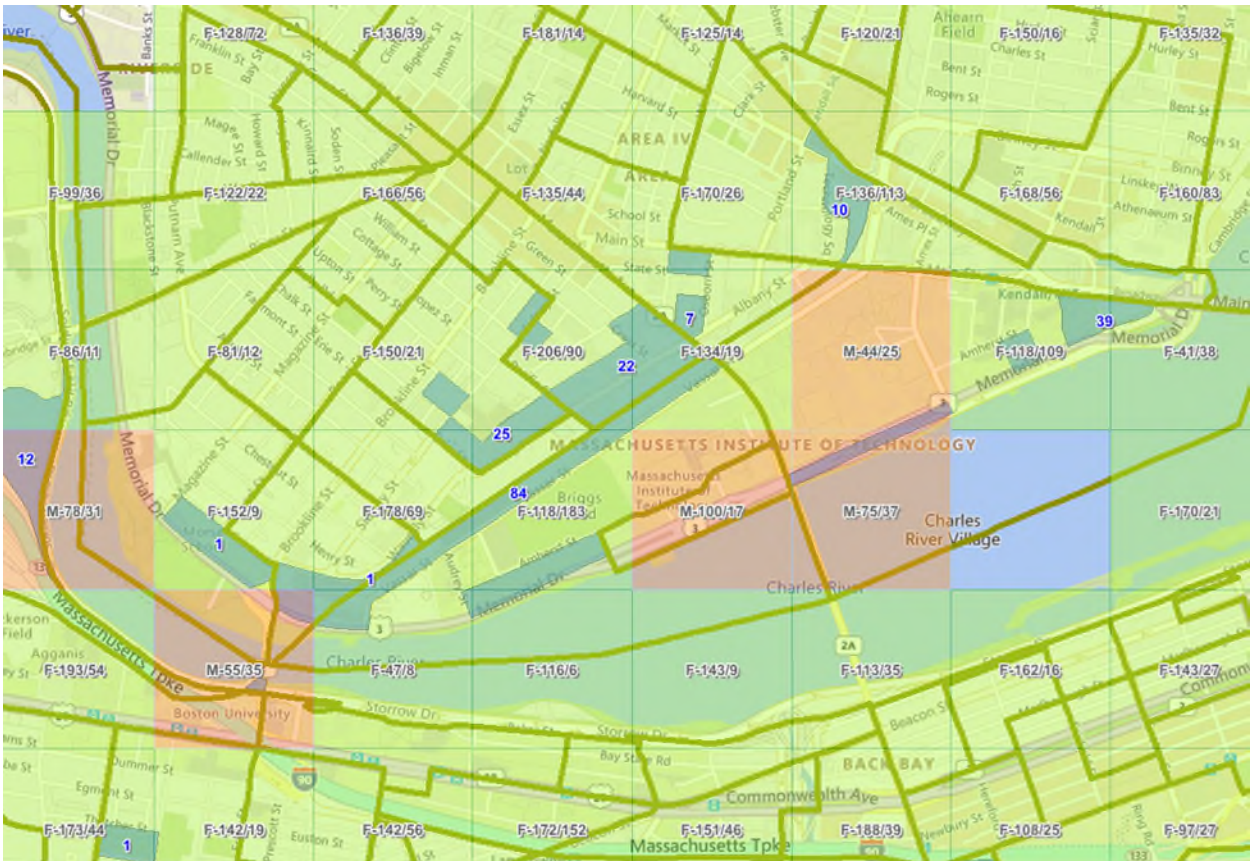
The FCC's decision to award subsidies to serve Northerly Island, which appears in the black circle on the easternmost point of Figure 5 above, similarly defies credulity. The northernmost portion of the island supports a planetarium, the world-renown Shedd Aquarium, and several other tourist attractions. According to Ookla's data, those facilities are already supported with fixed broadband speeds of 74/124 Mbps. The southern part of the island is an uninhabited, unoccupied park that features running trails, natural wildlife habitats, yachting, and other leisure activities for the well-heeled.[56] Even if fixed broadband were unavailable in this nature preserve for which the Commission awarded RDOF funds, all available evidence suggests the island has ample mobile connectivity. The area immediately west of Northerly Island receives mobile speeds of 177/54 Mbps. Further underscoring the absurdity of this award, it remains unclear who would or could deploy a user terminal in an area that is apparently off limits to human construction or habitation. Simply put, this area should never have been included in the Commission's RDOF inventory.

[56] Northerly Island Park, Chicago Park District, https://bit.ly/3uakGZ2 (last visited Apr. 29, 2021).

ii. Cambridge – MIT

The Massachusetts Institute of Technology ("MIT") is located in downtown Cambridge, Massachusetts, one of the wealthiest regions in the United States. The median household income in Cambridge is $103,154; the average house costs $768,300; and nearly 90 percent of the city has a broadband subscription.[57] For its part, MIT is at the forefront of scientific and engineering knowledge among the world's research institutions, including cognate studies associated with broadband deployment. The university boasts an endowment of more than $18 billion, and annual tuition is more than $50,000 per year.[58] If any location in the United States were to have internet speeds exceeding the Commission's minimum 25/3 Mbps threshold, it would be MIT's campus, situated in the middle of a regional research hub that also includes Harvard University. Yet the Commission awarded RDOF subsidies for approximately 150 locations on or adjacent to the MIT campus.

***Figure 6*: MIT Campus Broadband Coverage**



Again, the Ookla data confirm that MIT's campus is served by excellent broadband. In one RDOF item, the Commission awarded funds for 84 locations near Briggs Field, the home of the MIT softball program. The Ookla data, however, show that the area currently receives fixed speeds of 118/183 Mbps. Right across the street, in an RDOF area that includes 22 RDOF locations near

Simmons Hall, the student dormitory, Ookla data reveals the area has access to fixed speeds of 206/90 Mbps. Mobile speeds near the campus are similarly impressive, with speeds as fast as 100/17 Mbps. In fact, every single area on the MIT main campus where the Commission awarded RDOF funds boasts speeds at least double the Commission's minimum download and upload thresholds. No reasonable observer could conclude that the MIT campus—even in its nominally empty softball field—is an "unserved" location deserving of broadband subsidies.

iii. Large International Airports

Like the world's best research universities, some of the largest international airports in the United States were the beneficiaries of RDOF Phase I awards. While the Ookla data demonstrate that these airports enjoy already high-speed fixed and mobile broadband, the RDOF subsidies apparently went to empty areas within airports, including runways and parking lots, which the FCC's data show to be unserved.

Consider, for example, the Dallas Fort Worth International Airport ("DFW"), one of the largest airports in the United States. The largest hub for American Airlines, DFW was the tenth busiest airport in the world by passenger traffic in 2019[59] and became the world's busiest airport in 2020.[60] Given its indispensable role connecting business travelers and managing hundreds of flights per day, one would expect reliable broadband connectivity within the airport. That is precisely what the Ookla data reveal.

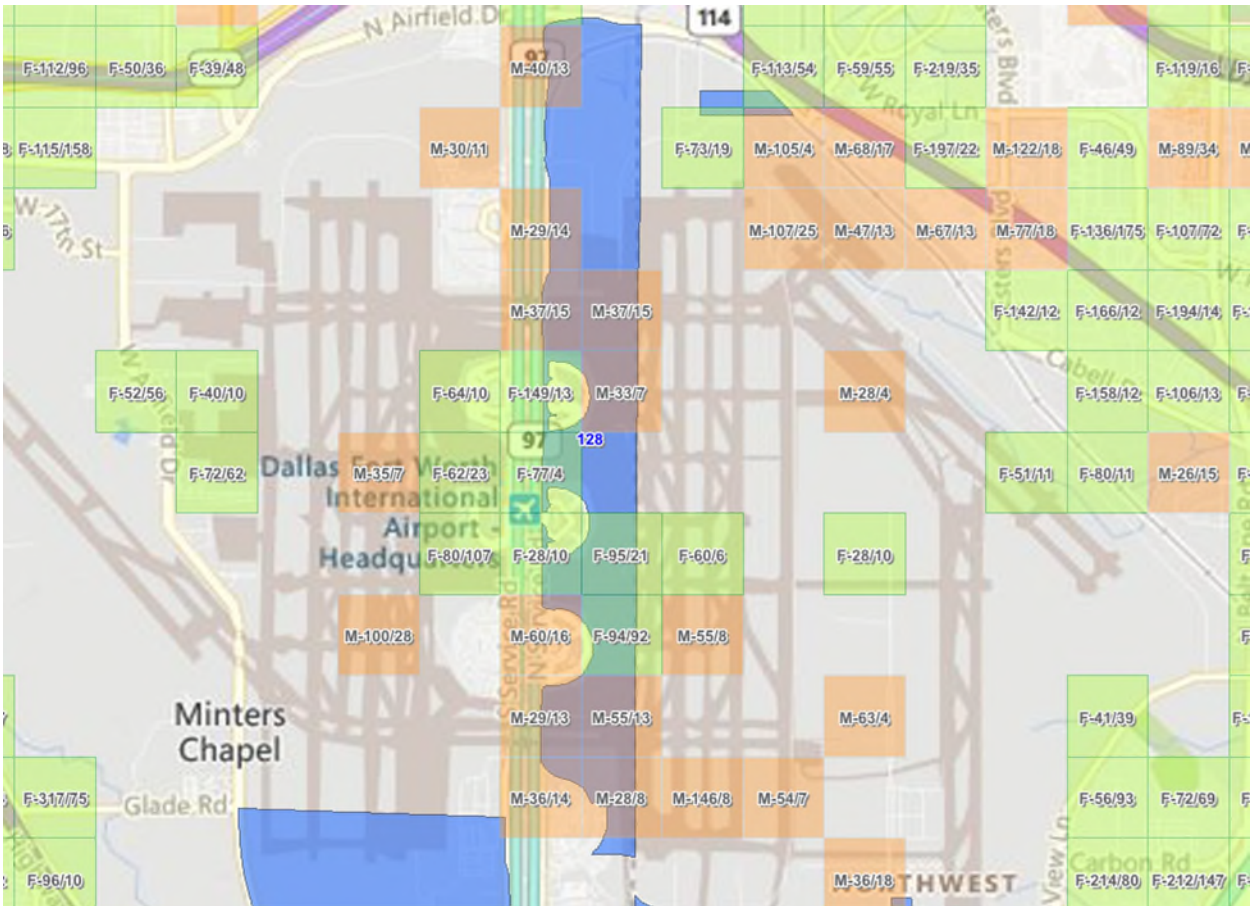
[57] QuickFacts: Cambridge City, Massachusetts, U.S. Census Bureau, https://bit.ly/3eLRlOh (last visited Apr. 29, 2021).

[58] MIT News Office, MIT Releases Financials and Endowment Figures for 2020, MIT News (Sept. 11, 2020), https://bit.ly/3xBQt7q; Cost of Attendance, Student Financial Services, MIT, https://bit.ly/3xAkCUI (last visited Apr. 29, 2021).

[59] Marnie Hunter, *The World's Busiest Airports in 2019 Face a Steep Uphill Climb*, CNN (Oct. 7, 2020), https://cnn.it/2QGOtKo.

[60] Andrew Curran, COVID-19 Pushes Dallas Fort Worth to World's Busiest Airport, Simple Flying (Aug. 10, 2020), https://bit.ly/2PAnUpD.

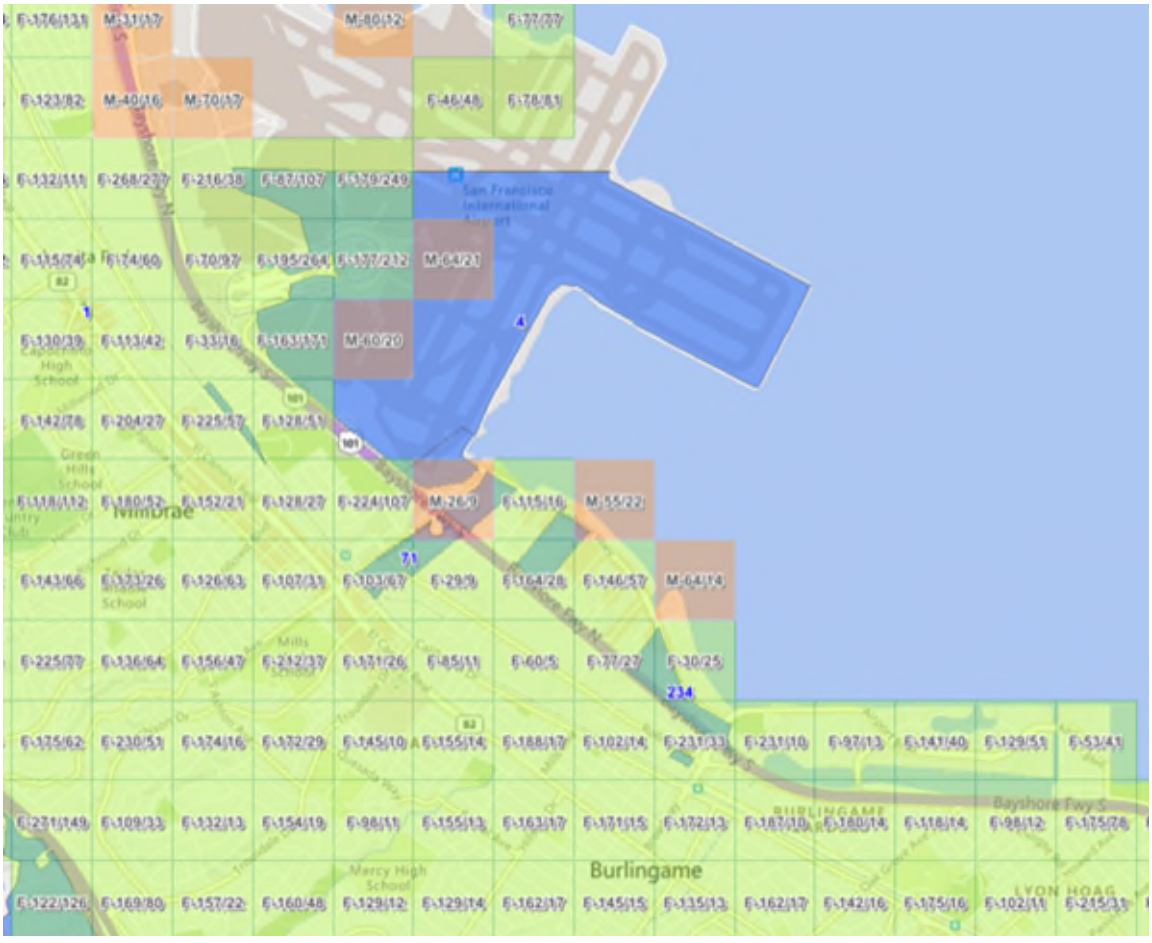
Figure 7: **DFW International Airport Broadband Coverage**



The blue area running from north to south is part of an RDOF item that includes 128 locations for which RDOF funds were awarded. The actual airport facilities, including passenger terminals and air control towers, show more than adequate fixed broadband speeds. Where fixed facilities are not available on the empty land, the Ookla data reveal that the airport building complex receives excellent mobile service exceeding the FCC's minimum service thresholds. The adequacy of existing broadband at DFW is wholly unsurprising, given the volume of business travelers and air traffic that the airport authorities need to manage.

The San Francisco International Airport ("SFO") is depicted in Figure 8 below. The Commission's methodology allowed bidders to receive RDOF funds to cover the airport control tower, the passenger concourses, airport runways, and traffic control facilities. As the Ookla data show, the airport's main facilities receive outstanding coverage—fixed speeds as high as 177/212 Mbps and mobile speeds as high as 64/21 Mbps. Indeed, the areas surrounding SFO routinely have fixed download speeds exceeding 100 Mbps. For example, just south of SFO there are two RDOF areas with 71 and 234 locations, respectively, for which the Commission diverted funds that show Ookla speeds mostly well in excess of the Commission's threshold. Businesses and hotels, such as the four-star Hyatt Regency San Francisco Airport and the Hampton Inn & Suites San Francisco-Burlingame-Airport South, crowd into these ostensibly "wholly unserved" sites, and it defies belief–and publicly available data–that these well-travelled commercial locations do not receive broadband service in excess of 25/3 Mbps.

***Figure 8*: SFO International Airport Broadband Coverage**

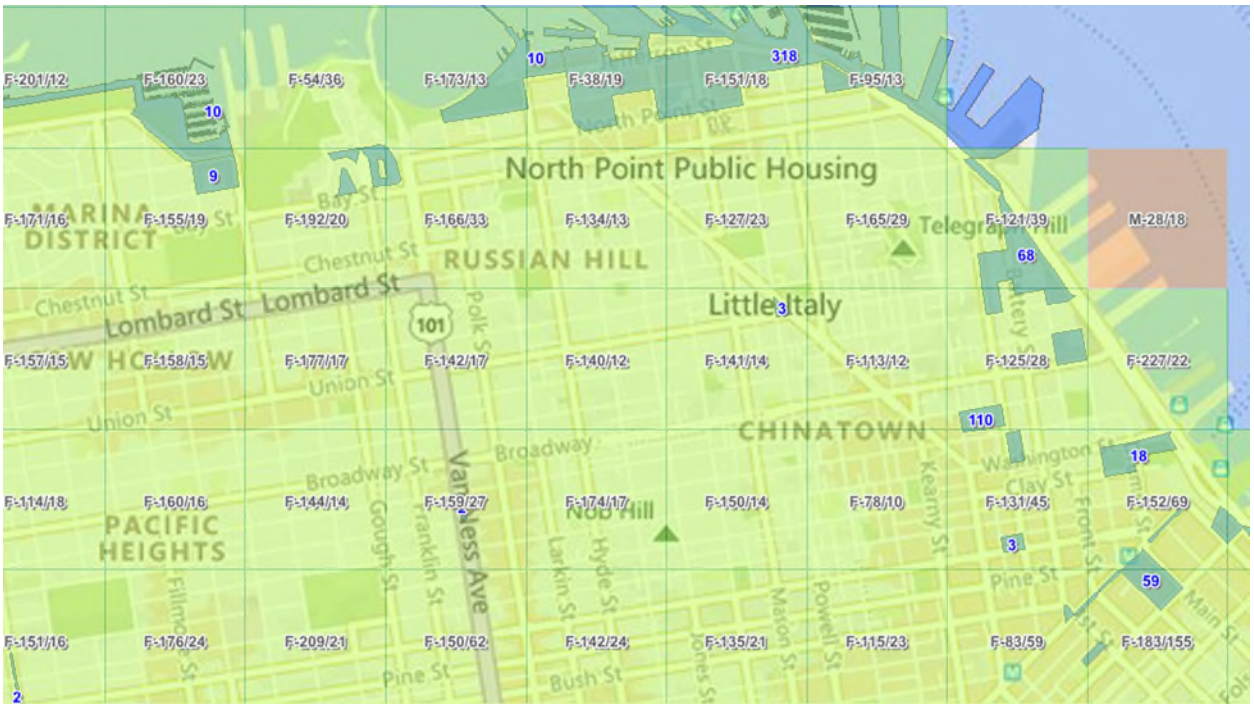


iv. Bay Area

The faulty data that led the Commission to subsidize broadband deployment at and near SFO exemplify a more troubling pattern of RDOF awards in the greater Bay Area.

Take Fisherman's Wharf, an affluent tourist haunt located in the densely populated downtown area. The commercial area surrounding the wharf is replete with restaurants and shops. According to the Ookla data, these businesses receive fixed speeds substantially above 25/3 Mbps already. The Commission, however, diverted funds to serve 318 of them.

***Figure 9*: San Francisco Bay Area Broadband Coverage**

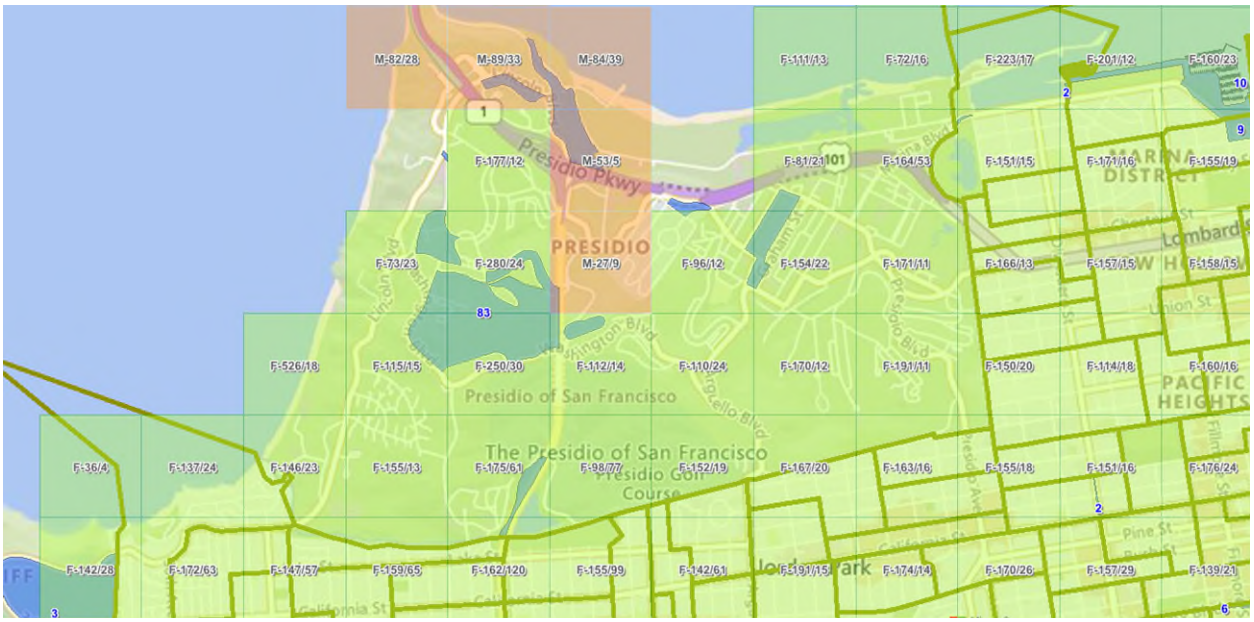


Meanwhile, in the Presidio, one of San Francisco's toniest neighborhoods, the Commission diverted RDOF funds to fund broadband to 83 locations. Any households covered by the RDOF funds are among the most expensive in San Francisco and undoubtedly are served by existing broadband under any meaningful definition.[61] According to publicly available broadband mapping data, at least one broadband provider serves all of these neighborhoods, and most blocks feature multiple providers, in direct contravention of the RDOF eligibility requirements:[62]

[61] The average home value in Presidio Heights is $4,674,127. Presidio Heights Home Values, Zillow, https://bit.ly/3nygjV0 (last visited Apr. 29, 2021).

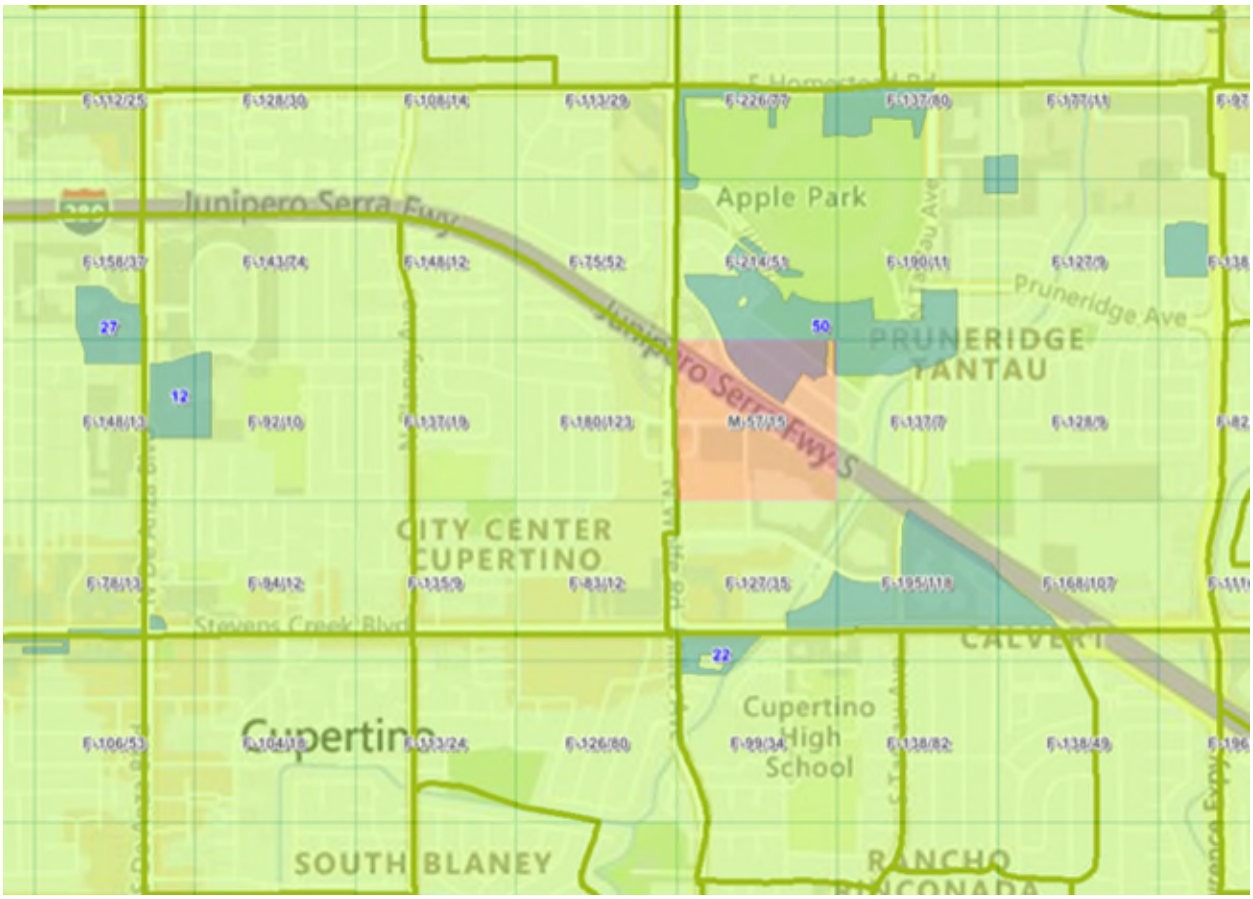
[62] Broadband Now, Internet Provider Competition Map For San Francisco (last accessed April 29, 2021), https://broadbandnow.com/.

***Figure 10*: The Presidio, San Francisco Broadband Coverage**



Outside the San Francisco metropolitan area, RDOF funds will go to serve areas adjacent to the brand-new Apple Campus in Cupertino. Far from "unserved," the Apple Campus is one of the most connected places in the entire world.

***Figure 11*: Cupertino, CA Broadband Coverage**



Particularly relevant is the Commission's decision to award RDOF subsidies immediately outside Apple Park. These areas do not correspond to unserved or low-income communities. Instead, they are immediately south of the main headquarters and include the 1000-seat Steve Jobs Theater. And for good measure, the Ookla data unsurprisingly confirms that the entire area currently has access to fixed and mobile speeds far above 25/3 Mbps.

III. THE COMMISSION HAS ACKNOWLEDGED THAT GOOD POLICY REQUIRES ACCURATELY ALLOCATING RDOF'S LIMITED FUNDS TO ACTUALLY UNSERVED LOCATIONS AND HAS THE AUTHORITY TO CORRECT COURSE.

In her partial dissent to the *RDOF Order*, then-Commissioner Rosenworcel made the common-sense observation that "the FCC should know in detail where service truly is and is not . . . *before* sending federal funds to who knows where to build who knows what."[63] Noting that "[t]he FCC's

[63] *RDOF Order* at 785 (Statement of Commissioner Jessica Rosenworcel Approving in Part, Dissenting in Part) (emphasis added).

broadband maps have an error rate as high as two-in-five,"[64] she clarified that the Commission was acting "before getting our facts straight about where service is and is not on the ground."[65]

Commissioner Starks echoed these arguments for fiscal responsibility, stating his concern that the Commission was "mak[ing] funding decisions . . . using data we all know is wrong. That is a 'ready, fire, aim' approach that favors speed of funding over the lasting results that Americans really need."[66]

Also recognizing issues with the existing mapping data, Commissioner Carr stated before a Senate subcommittee that "[f]or those areas where . . . our maps aren't good at differentiating where there's service and where there's not, let's do a deep dive. Let's fix that problem."[67] This commitment has not waned. In March, Commissioner Carr called on the Commission to accelerate its efforts to resolve the broadband mapping issues by Fall 2021: "[g]etting those maps done is the key to unlocking the funding that will be needed to close the digital divide."[68]

For his part, Commissioner Simington lamented the impact of delays in setting service standards on mapping during his confirmation hearing: "The [broadband service] standards contemplated under the Broadband Data Act, although a great improvement, are still some time from being implemented. And that's particularly painful because we're in the middle of RDOF right now and we face the prospect of breaking ground before we've gotten to the best quality of Geomapping and, in some cases, just operating with bare census [blocks] although we're doing our best to get beyond that."[69]

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[64] *The Rural Digital Opportunity Fund Action (Auction 904) et al.*, Order on Reconsideration, 35 FCC Rcd 10820, at 10830 (2020) (Statement of Commissioner Jessica Rosenworcel, Approving in Part, Dissenting in Part).

[65] *Id*.

[66] *RDOF Order* at 787-88 (Statement of Commissioner Geoffrey Starks Approving in Part, Dissenting in Part).

[67] *Hearing on Fiscal 2021 Budget Proposal for the Fed. Commc'ns Comm'n Before the S. Appropriations Subcomm. on Fin. Servs. and Gen. Gov't* (2020), https://bit.ly/3gMcvy (testimony of Commissioner Brendan Carr).

[68] *Keynote Remarks of FCC Commissioner Brendan Carr at the American Enterprise Institute* (Mar. 15, 2021), at 5-6, https://bit.ly/3gUNeSE.

[69] *Nominations Hearing Before the S. Comm. on Commerce, Science, and Transportation* (2020), https://bit.ly/3eJXdr9 (testimony of Nathan Simington, nominee for FCC Commissioner).

CCA shares the commissioners' concern regarding government waste and agrees that high-speed broadband Internet is a necessity.[70] Simply stated, the Commission should be "focusing support to areas in the greatest need of broadband deployment."[71] As demonstrated above, the most current data show that a significant amount of RDOF Phase I funds will go to areas that do not need support. The FCC has statutory authority and resources that CCA obviously does not have and may be able to further assess the accuracy and reliability of the eligible RDOF Phase I locations. CCA used only publicly available data to identify numerous errors and inconsistencies in the FCC's analysis. Other parties or the FCC, which may have access to additional resources or data, can build on CCA's work so the Commission, broadband internet access service providers, and communities throughout the country can address the problem before hundreds of millions of dollars are misspent. Unquestionably, it would have been preferable if these data flaws had come to light prior to the Phase I auction. But the Commission has an opportunity to addresses these problems now, prior to distributing funding.

Fortunately, the Commission has the necessary statutory and regulatory tools to correct course. The Commission has a public interest obligation under section 254(b)(3) of the Communications Act[72] to prevent the waste of limited public resources by removing known areas with existing baseline 25/3 Mbps broadband service from RDOF eligibility. The Commission also possesses broad authority to alter course in its policy determinations. The Supreme Court has held that there is "no basis in the Administrative Procedure Act or in [the Court's] opinions for a requirement that all agency change be subjected to more searching review. . . . [I]t suffices that the new policy is permissible under the statute, that there are good reasons for it, and that the agency *believes* it to be better."[73] Indeed, the Commission is "entitled to assess administrative records and evaluate priorities" in light of its current policy judgments.[74]

The Commission's latitude for policy course corrections is particularly broad when determining how to efficiently and effectively allocate and distribute funding, including universal service support. As a general principle of administrative law, "unless the statute itself or surrounding circumstances indicate that such conveyances are intended to be irrevocable, the government

[70] *See RDOF Order* ¶ 2.

[71] *Id.* ¶ 125.

[72] *See* 47 U.S.C. § 254(b)(3) ("Consumers in all regions of the Nation, including . . . those in rural, insular, and high cost areas, should have access to telecommunications and information services . . . that are reasonably comparable to those services provided in urban areas.").

[73] *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 514, 515 (2009) (emphasis in original).

[74] *Nat'l Ass'n of Home Builders v. EPA*, 682 F.3d 1032, 1043 (D.C. Cir. 2012).

does not forfeit its right to withdraw those benefits or qualify them as it chooses."[75] Here, no statutory basis exists to suggest RDOF awards are irrevocable, nor do the "surrounding circumstances" suggest the Commission intended to bind itself or prohibit future changes to the RDOF program.

Consistent with this principle, the Commission has corrected course in the past. For example, the Commission has previously altered its universal service rules "to limit reimbursable capital expenses and operating expenses,"[76] explaining that its "universal service reforms [were] targeted at eliminating *inefficiencies* and *closing gaps* in our system."[77] That precedent is even stronger where the Commission has not yet disbursed any funds or approved any long-form applications. While a long-form application is pending, applicants have no reliance interest in the Commission not modifying its service rules or policies,[78] nor do they have any legitimate, investment-backed expectations in the *status quo*.[79]

In addition, the review process for long-form applications has not yet been completed. As acting Chairwoman Rosenworcel recently explained, "[N]o detail is too small for our review because we need to make sure that those who were chosen in the auction before the election can truly deliver the broadband services rural areas need."[80]

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[75] *Members of the Peanut Quota Holders Assoc. v. United States*, 421 F.3d 1323, 1335 (Fed. Cir. 2005).

[76] *Connect America Fund et al.*, Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd 17663, ¶ 214 (2011) ("*2011 CAF Order*"); *see also Protecting Against National Security Threats to the Communications Supply Chain Through FCC Programs et al.*, Report and Order, Further Notice of Proposed Rulemaking, and Order, 34 FCC Rcd 11423, ¶ 105 (2019) ("Commission and judicial precedent make clear that carriers have no vested property interest in ongoing USF support.").

[77] *2011 CAF Order* ¶ 287 (emphasis added).

[78] *See United States v. Storer Broadcasting Co*., 351 U.S. 192, 205 (1956) (upholding dismissal of pending application for new station due to rule change limiting the number of licenses that could be held by one owner); *see also Chadmoore Commc'ns, Inc. v. FCC*, 113 F.3d 235, 240-41 (D.C. Cir. 1997) ("In this case the Commission's action did not increase [the applicant's] liability for past conduct or impose new duties with respect to completed transactions. Nor could it have impaired a right possessed by [the applicant] because none vested on the filing of its application.").

[79] *See Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Second Order on Reconsideration, 30 FCC Rcd 6746, ¶ 82 n.309 (2015) ("[M]ere applicants have minimal equities in favor of preservation [in the incentive auction repacking process] considering that they have not acted in reliance on Commission grants, have not made any investment in constructing their requested facilities, and have not begun operating the proposed facilities to provide service to viewers").

[80] Paul Kirby, *Rosenworcel Stresses RDOF Bidder Reviews*, TR Daily (Apr. 12, 2021), https://bit.ly/32Eqfmn; *see also id.* ("'We're combing through those *preliminary* commitments carefully,' Ms. Rosenworcel said . . . .") (emphasis added).

The Commission and the courts have recognized that "[t]he FCC relies heavily on the honesty and probity of its licensees in a regulatory system that is largely self-policing."[81] For this reason, section 1.65 of the Commission's rules requires an applicant to maintain the accuracy and completeness of information furnished in its pending application and to notify the Commission of any substantial change that may be of decisional significance to that application.[82]

In the case of Auction 904 for RDOF Phase I funds, winning bidders were required to file a post-auction application for support—also referred to as FCC Form 683—and remain subject to an obligation to notify the Commission of any substantial change to the information or certifications included in its pending application.[83] New information about the ineligibility of CAM locations for which the applicant has won financial support is both substantial and material.[84] Section 1.65 states in relevant part that "whenever the information furnished in the pending application is no longer substantially accurate and complete in all significant respects, the applicant shall as promptly as possible . . . unless good cause is shown, amend or request the amendment of the application so as to furnish such additional or corrected information as may be appropriate."[85]

In sum, judicial and Commission precedent, the Communications Act, the Commission's rules, and the current posture of the RDOF proceeding provide the Commission with broad authority to better direct RDOF funding to the census blocks that need it. Subsidizing potential overbuilding in crowded San Francisco tourist attractions, Chicago's business district, the Apple headquarters, or busy international airports does not bring "digital opportunity to Americans living on the wrong side of the digital divide."[86]

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[81] *Commercial Radio Service, Inc.*, Order to Show Cause, 21 FCC Rcd 9983, ¶ 12 (2006) (citing *Contemp. Media, Inc., v. FCC*, 214 F.3d 187, 193 (D.C. Cir. 2000)); *Cumulus Licensing, LLC*, Memorandum Opinion and Order and Notice of Apparent Liability, 22 FCC Rcd 13711, ¶ 13 (MB 2007) ("[I]t is essential that licensees make full and clear disclosure of all material facts in every application . . . .").

[82] 47 CFR § 1.65(a).

[83] *Rural Digital Opportunity Fund Phase I Auction Scheduled for October 29, 2020, Notice and Filing Requirements and Other Procedures for Auction 904*, Public Notice, 35 FCC Rcd 6077, ¶ 183, n. 408 (2020).

[84] As the Commission explained in its Instructions for Form 683, a determination of whether an applicant is qualified to receive support "is based upon all of the information that is submitted with the long form application," including the eligibility of CAM locations. *See* FCC Form 683, Application for Rural Digital Opportunity Fund Phase I Support, Auction 904, Instructions, at 37 (Dec. 7, 2020), https://bit.ly/3u7gQQz.

[85] 47 CFR § 1.65(a).

[86] *RDOF Order* ¶ 1.

IV. CONCLUSION

Fulfilling the promise of the Rural Development Opportunity Fund requires the Commission to act promptly and direct Federal funds for unserved areas away from sites that already enjoy robust high-speed broadband services to the many areas of the country that do not have access to broadband services and remain truly in need of support. Failure to do so would run directly counter to the goals of the RDOF, resulting in waste and ultimately depriving American citizens and businesses that truly need assistance of the support they deserve.