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| CalAdvocates Expert Witness: | Cameron Reed |


**Public Advocates Office**

**California Public Utilities Commission**

# Reply Testimony of Cameron Reed for the Proposed Transfer of Control of Sprint to T-Mobile and the Impact on Network Infrastructure

## PUBLIC

San Francisco, California
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## MEMORANDUM

This report was prepared by Cameron Reed of the Public Advocates Office at the California Public Utilities Commission (Public Advocates Office) under the general supervision of Program & Project Supervisor, Shelly Lyser. Attachment E to this testimony are redline versions of Mr. Reed's prior testimony in this proceeding. The Public Advocates Office is represented in this proceeding by legal counsel, Travis Foss and Michelle Schaefer.

This testimony is comprised of the following chapter:

| Chapter | Description |
|---|---|
| I | Responding to the Assigned Commissioner's October 24, 2019 Amended Scoping Ruling and subsequent Supplemental Testimony submitted by the Applicants and DISH Network Corporation regarding the effects on the proposed transaction of certain post-hearing commitments made by Sprint and T-Mobile, focusing on the impacts of spectrum, cell sites, and pre-paid customer divesture. |

## I. INTRODUCTION

The October 24, 2019 Assigned Commissioner's Amended Scoping Ruling (Amended Scoping Ruling) outlined eight new questions exploring the impact of the United States Department of Justice (US DOJ) [Proposed] Final Judgement (PFJ) and commitments made to the Federal Communications Commission (FCC) and in a Memorandum of Understanding with the California Emerging Technology Fund (CETF MOU) on the proposed merger. The Amended Scoping Ruling directed Sprint Spectrum L.P (Sprint), Virgin Mobile USA, L.P. (Virgin), T-Mobile USA, Inc., A Delaware Corporation (T-Mobile) (Collectively "Applicants") and DISH Network Corporation (DISH) to respond to these questions in supplemental testimony and for Intervenors to provide their reply testimony and comments. This Reply Testimony provides my response to the Applicants' November 7, 2019 supplemental testimony as well as to the questions outlined in the Amended Scoping Ruling.

The Amended Scoping Ruling asks several questions including:

- How the transfer of 800 megahertz (MHz) spectrum would impact the quality of T-Mobile's network (Question 4),
- How the divestiture of Prepaid Sprint, Boost, and Virgin customers impact California customers (Question 5),
- How the commitments to the US DOJ and FCC impact the benefits that Applicants claim for California customers (Question 7) and the terms of the CETF MOU (Question 2), and
- How the Network and In-Home commitments made to the FCC apply to California (Question 8).

The Applicants' supplemental testimony claims that the commitments and divestiture would not negatively impact the proposed merger and that Fifth Generation Wireless Service (5G) deployments would accelerate compared to the initial Application's timeline.[1] Based on my review of these new commitments, I find that several of the Applicants' claims are inaccurate and do not hold up to scrutiny.

[1] Supplemental Testimony of Neville R. Ray at p. 2.

Specifically, the divestiture of 14 MHz of Sprint's 800 MHz spectrum will negatively impact Sprint's 4G Long Term Evolution (LTE) customers' quality of service and reduce the amount of spectrum available for New T-Mobile's LTE customers post-merger. The divestment of the 800 MHz of spectrum places a rigid timeline on transitioning Sprint customers to New T-Mobile's network that could leave customers with degraded or non-existent service. Applicants have also constructed numerous loopholes and created enough room to circumvent commitments made to the FCC and in the CETF MOU. Furthermore, the download speed commitments promised to the FCC and in the CETF MOU by 2024 are minimal improvements over the status quo of the 5G landscape without the proposed merger. Finally, DISH would have minimal, if any, facilities-based rural coverage, no emergency backup equipment and will be responsible for ensuring divested customers have handsets that could work on New T-Mobile's network. This means pre-paid customers in California would have deteriorated facilities-based coverage, less reliability, and worse service quality than without the proposed merger. As such, the proposed merger is not in the public interest and the Commission should deny the proposed merger.

As demonstrated in the below analysis, several disputed facts remain unresolved and require additional hearings including:

- Whether the commitments in the CETF MOU and to the FCC, especially when considering the divestitures ordered in the PFJ, will lead to accelerated build-out and enhanced coverage and speed,[2]
- Whether the commitments made in the CETF MOU and to the FCC, especially when considering the divestitures ordered in the PFJ, will lead to rural areas getting the 5G benefits purported by this proposed merger,[3]
- Whether stand-alone T-Mobile could deploy 5G to rural areas absent the proposed merger,[4]

[2] Supplemental Testimony of Neville R. Ray at p. 2.

[3] *Id*.

[4] *Id* at p. 21.

- What will happen to the pre-paid customers with handsets incompatible with T-Mobile's network when they are divested to DISH,[5]
- And, whether DISH can become a successful, competitive carrier in California to replace the competitive loss of Sprint.[6]

## II. ANALYSIS

The Amended Scoping Ruling asks several questions to determine the impact of the Applicants' commitments to the FCC and the PFJ on the proposed merger. The Applicants claim the US DOJ divestments and FCC commitments will have limited impact on New T-Mobile's 5G network or the CETF MOU aside from slightly accelerating the planned build-out.[7] This Reply Testimony analyzes those claims in detail.

### A. The Divestment of 14 MHz of Spectrum will Make Service Quality Worse for 4G LTE Customers on New T-Mobile's Network Compared to Stand-Alone Sprint Absent the Proposed Merger.

The Amended Scoping Ruling asks how the proposed transfer of spectrum to DISH impacts the quality of New T-Mobile's current and future networks.[8] As discussed previously in Attachment 2 to the Supplemental Declaration of Mr. Cameron Reed, filed April 26, 2019, (Supplemental Declaration), New T-Mobile's aggressive spectrum refarming plan would result in worse service quality for Sprint's LTE customers.[9] The PFJ will worsen this service quality degradation by ordering New T-Mobile to divest 14 MHz of Spectrum to DISH three years following the closure of the proposed merger. The divestiture could also reduce the claimed speeds of New T-Mobile's 5G network if New

[5] *See* Testimony of Jeff Blum on behalf of DISH, response to Question 6.

[6] *See Id* response to Question five. *See also* Supplemental Testimony of Mark A. Israel at p. 2. The subject of competition is more thoroughly addressed by Dr. Lee Selwyn in his Reply Testimony. This testimony focuses on the inadequacies of the network available for DISH to acquire under the PFJ.

[7] Supplemental Testimony of Neville R. Ray at p. 4.

[8] Amended Scoping Ruling at p. 3. Question 4.

[9] Supplemental Declaration of Mr. Cameron Reed at pp. 50-51.

T-Mobile needs to devote more low-band or mid-band spectrum to LTE than planned to maintain LTE service quality.[10]

As T-Mobile's Chief Technology Officer (CTO) Mr. Ray explains in his supplemental testimony, the 14 MHz of Sprint's 800 MHz spectrum was intended to support "CDMA and LTE service for Sprint Customers during the migration period and LTE-based technologies such as narrow band IoT beyond that."[11] Mr. Ray further commented that narrow band Internet of Things (IoT) was just one of the many LTE technologies that New T-Mobile could support with the 800 MHz spectrum and that New T-Mobile does not plan to use the 800 MHz spectrum to provide 5G service.[12] While New T-Mobile did not plan to use the 800 MHz for 5G, Mr. Ray earlier stressed that the 800 MHz spectrum was important to the transition of customers to 5G in declarations submitted to the FCC, "the combined company will need to optimize the use of existing LTE spectrum resources (AWS, PCS, 600 MHz, 700 MHz, and 800 MHz) to provide enhanced LTE."[13] He would later elaborate in his reply declaration to the FCC stating that:

> It is vitally important to maintain the LTE network as I would expect that New T-Mobile will continue to operate the LTE network substantially beyond 2024 to support existing users on the network… the Sprint and T-Mobile PCS and AWS spectrum will provide a dense LTE layer in combination with the Sprint 800 MHz and T-Mobile 600 and 700 MHz spectrum assets and allow for 5G to be deployed without degrading the LTE experience.[14]

New T-Mobile's refarming plan partly relies on using the 800 MHz to support LTE spectrum and existing Sprint customers. Now New T-Mobile will need to divest that

[10] Generally low-band spectrum refers to spectrum in the 600 MHz to 1 Gigahertz (GHz) range and mid-band spectrum refers to spectrum in the 1 GHz to 6 GHz range.

[11] Supplemental Testimony of Neville R. Ray at pp. 10-11.

[12] *Id* at p. 9 and p. 11.

[13] Rebuttal Testimony of Neville R. Ray filed January 29, 2019, Attachment A at p. 32.

[14] *Id* Attachment B, at p. 8.

spectrum after three years, reducing the amount of spectrum supporting New T-Mobile's LTE service. The divestiture of Sprint's 800 MHz spectrum places a firm timeline on the migration of Sprint's customers to T-Mobile's network. Such migration will negatively affect customers who cannot afford to or do not want to exchange their current handsets including low-income customers. These customers would now lose service, or at least have worsened service quality. Furthermore, losing access to the 800 MHz spectrum means New T-Mobile's 4G customers will have less low-band spectrum and therefore will endure more network congestion and slower speeds than they would without the proposed merger.

Attachment 2 to the Supplemental Declaration of Mr. Cameron Reed illustrates that even the Applicant's model predicted a decline in LTE service quality by 2022 as a result of the proposed merger. Specifically, New T-Mobile customers would have **<<Begin Confidential>>** [redacted] **<<End Confidential>>** than stand-alone Sprint customers. Also, the Commission should note that the Applicants' model is an optimistic prediction of 5G adoption rates and 5G deployment milestones. This means New T-Mobile's LTE service will likely be more congested than predicted in the Application.[15]

My Supplemental Declaration outlined how New T-Mobile's spectrum refarming plan underestimates future LTE use.[16] Under the PFJ, New T-Mobile would have to divest the 800 MHz of spectrum shortly after demand for LTE service begins to decline.[17] While this means that the congestion on LTE service would lessen over time, it also means that deteriorated LTE service could necessitate that New T-Mobile reevaluate its spectrum allotments and deploy more low-band or mid-band LTE spectrum in 2023

[15] Supplemental Declaration of Mr. Cameron Reed at pp. 22 and 38, Paras 41-43 and 70-71.

[16] *Id* at p. 20-21 paras 38-39.

[17] *Id* at p. 21, para 39. Applicants would divest the 800 MHz of spectrum after three years, which is roughly when LTE service would first begin to decline in total subscribership in North America.

and 2024. This could reduce the 5G capacity of New T-Mobile's 5G network, reducing 5G speeds.

Considering that Applicants must now divest 14 MHz of 800 MHz spectrum, New T-Mobile's customers and Mobile Virtual Network Operators (MVNO) customers on New T-Mobile's network will face slower LTE speeds, more congestion, and have worse service quality than they would absent the proposed merger.

### B. The Applicants Network Buildout Commitments made to the FCC and in the CETF MOU are Insufficient to Mitigate the Harms of the Proposed Merger, Will Not Improve the Status Quo, and Will Result in Slower Speeds and Less Coverage than the Claimed 5G Benefits.

The Amended Scoping Memo asks what changes are required to the terms of the CETF MOU resulting from the FCC Commitments and the US DOJ settlement. The Amended Scoping Ruling also asks what other ways the US DOJ and FCC commitments change the benefits that Applicants claim for California customers.[18] Mr. Ray comments that the FCC commitments and the PFJ do not require any changes to the CETF MOU.[19] He comments that the FCC commitments have national buildout benchmarks backed up with "voluntary contributions" or fines for failure to meet these benchmarks. He goes on to say that the FCC commitments will lead to accelerated build-out, enhanced coverage and speeds in California, including in rural areas, and there will be verification of the deployment.[20]

While it is true that the FCC commitments could have relatively little impact directly on the CETF MOU, T-Mobile included many loopholes in both the FCC and CETF commitments that New T-Mobile can later use to circumvent build-out responsibilities. Therefore, it is inaccurate to say the proposed merger would enhance 5G

[18] Amended Scoping Memo Questions 2 and 7.

[19] Supplemental Testimony of Neville R. Ray at p. 4.

[20] *Id* at p. 5.

coverage and speeds in California than what would otherwise occur without the proposed merger.

The Reply Testimony of Public Advocates Office witness Dr. Lee Selwyn contextualizes the fine and penalty framework of the US DOJ PFJ which is similarly applicable to the FCC commitment penalties for 2021.[21] Aside from the ineffectual nature of certain monetary fines contained in the PFJ, there are other concerns with how the FCC commitments and the CETF MOU commitments are structured. For example, the 90 percent build-out commitment in the CETF MOU would allow New T-Mobile to avoid costly rural deployments. In fact, this commitment is structured in a way that means most rural areas may not see any purported 5G coverage or speed benefits of the proposed merger.

As described further below, the CETF MOU requires that New T-Mobile deploy 5G to only 90 percent of the planned **<<Begin Confidential>>** [redacted] **<<End Confidential>>** 5G cell sites. This grants New T-Mobile leeway to avoid deploying 5G to isolated or otherwise expensive to upgrade cell sites, which typically are in rural areas. In addition, New T-Mobile committed in the CETF MOU to deploying 80 percent of a specified "speed tier" (defined as either 100 or 300 Mbps for a 5G site) on each site. This grants further leeway to allow for slower speeds for New T-Mobile's rural 5G sites.[22] This means that nearly 70 percent of the planned rural 5G cell sites may never get deployed. This also means that the infrastructure that does get deployed to rural areas may have slower speeds, as the more numerous urban towers would increase the average cell site speed to meet the speed tier commitments enshrined in the CETF MOU.

Mr. Ray provided the locations and speed tiers of the CETF MOU 5G sites in Attachment D to his supplemental testimony. Table 1 below summarizes these cell sites

[21] Reply Testimony of Dr. Lee Selwyn at p. 76 paras 87 and 88.

[22] CETF MOU 5G Buildout section at p. 10. Worth noting is that the initial merger benefit was average 5G speeds of 444 Mbps for New T-Mobile as noted by Figure 7 on page 20 of my Service Quality and Public Safety Testimony. Under the CETF MOU this average across all 5G towers would instead be **<<Begin Confidential>>** [redacted] **<<End Confidential>>** slower than claimed. *See* Attachment C to this testimony.

by speed tier and whether they are in an urban area or a rural area. Table 1 indicates that roughly **<<Begin Confidential>>** [redacted] **<<End Confidential>>** will be in rural areas as defined by the FCC.

**Table 1: Count and Percentage of CETF Settlement Towers by Speed and Urban/Rural Split**

**<<Begin Confidential>>**

| Count of Sites | 100Mbps | 300Mbps | Grand Total |
|---|---|---|---|
| Rural | | | |
| Urban | | | |
| **Grand Total** | | | |

| Percent of Sites | 100Mbps | 300Mbps | Grand Total |
|---|---|---|---|
| Rural | | | |
| Urban | | | |
| **Grand Total** | | | |

**<<End Confidential>>**

Again, New T-Mobile is committing to deploy 5G to 90 percent of the cell sites outlined in Table 1. This could lead to most rural cell sites not being upgraded with 5G. In totality, 90 percent of the planned **<<Begin Confidential>>** [redacted] **<<End Confidential>>** 5G cell sites is **<<Begin Confidential>>** [redacted] **<<End Confidential>>** cell sites. This is only **<<Begin Confidential>>** [redacted] **<<End Confidential>>** more 5G cell sites than Stand-Alone T-Mobile would have without the proposed merger and **<<Begin Confidential>>** [redacted] **<<End Confidential>>** fewer 5G cell sites than the combined Stand-Alone Sprint and T-Mobile would have.[23] As noted in my supplemental declaration, the Applicants have talked at length about spectrum depth and spectrum efficiency but have not proven why Stand-Alone T-Mobile is incapable of making such investments to bring 5G coverage to rural areas despite having similar cell tower footprints.[24]

[23] Supplemental Testimony of Mr. Neville R. Ray at p. 15.

[24] Supplemental Declaration of Mr. Cameron Reed at p. 37.

The CETF MOU memorializes something that is already happening. Sprint and T-Mobile have already completed their first 5G deployments in select cities around the country. Tests by FierceWireless in New York City demonstrated that Sprint's 5G network had average download speeds ranging from 123 Mbps to 237 Mbps.[25] Sprint's CTO John Saw stated that Sprint was seeing average download speeds of 328 Mbps in Chicago.[26] Tests by Tom's Guide done on T-Mobile's 5G deployments averaged 369 Mbps and peaked at 579 Mbps in New York City.[27] Early 5G tests are show each Stand-Alone company is delivering the speeds claims as benefits of the proposed merger, demonstrating that 5G is not a specific merger benefit.

As explained further below, the CETF MOU incorrectly claims a significant gain in 5G cell site over Stand-Alone T-Mobile. It is in fact a significant reduction in 5G cell sites compared to both Stand-Alone companies which will, because of conditions built into commitments, result in small, if not non-existent, increases in rural coverage.[28]

### 1. The Proposed Merger Will Not Meaningfully Increase Rural Coverage in California over Stand-Alone T-Mobile.

Geographic Information Systems (GIS) analysis of the CETF MOU 5G Network plan (5G Plan) reveals concerns with where New T-Mobile plans to deploy 5G. Notably, approximately a quarter of the planned rural 5G sites are located within a half mile of a primary road.[29] This is important because sites along primary roads would likely be

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[25] *See* https://www.fiercewireless.com/5g/sprint-delivers-5g-coverage-nyc-despite-delayed-rollout

[26] *See* https://www.fiercewireless.com/5g/5g-deployments-where-it-s-at-at-t-sprint-verizon-and-t-mobile

[27] *See* Speed tests done by Tom's Guide https://www.tomsguide.com/us/tmobile-5g-speed-test,news-30477.html

[28] As another example, the Applicant's in-home broadband commitments to the FCC have similar conditions which allow them to potentially avoid rural buildouts. **<<Begin Confidential>>** [redacted] **<<End Confidential>>** of the in-home broadband supported households of the total **<<Begin Confidential>>** [redacted] **<<End Confidential>>** national supported households could be in urban areas. This could allow for New T-Mobile to satisfy the 9.5 million simultaneous subscriber benchmark and terminate the in-home broadband commitment without building out to rural areas.

[29] Primary Roads are freeways, highways, interstates, and other large transportation corridors that are generally divided, limited-access highways with interchanges.

upgraded with 5G in the ordinary course of business and do not constitute a merger specific benefit. This implies that the proposed merger's 5G Plan will not increase coverage to rural areas.

Primary roads often pass through rural areas in their role as major transportation corridors. As such, carriers typically deploy infrastructure along primary roads in the ordinary course of business to provide service. However, the Applicants have contextualized a benefit of this proposed merger is improving rural coverage. This is important because New T-Mobile has the leeway to not upgrade 10 percent of the planned 5G sites and still meet its deployment obligations under the CETF MOU. Thus, the Commission should consider the number of cell sites located near primary roads as those sites would likely be upgraded to 5G in the ordinary course of business as primary roads are significant transportation corridors.

GIS analysis shows that New T-Mobile's 5G Plan has **<<Begin Confidential>>** [redacted] **<<End Confidential>>** rural cell sites located within a half mile of a primary road. This leaves a maximum of **<<Begin Confidential>>** [redacted] **<<End Confidential>>** of rural cell sites not near primary transportation corridors. Notably, this is less than the 10% of cell sites specified in the 5G Plan that New T-Mobile could elect to not to upgrade; this means many isolated rural areas could not see 5G under the CETF MOU.

This is a conservative analysis which leaves out several significant secondary roads in the US Highway or State Highway systems.[30] Similar to cell sites along primary roads, these cell sites also would likely be upgraded with 5G service in the ordinary course of business and therefore are not a merger-specific benefits. This is supported by the fact that Sprint, who admittedly has limited rural coverage, maintains LTE cell sites

[30] More rural cell sites exist along major secondary roads such as Highway 395, portions of Highway 50, and California State Route 62. *See* Reply Exhibit C-1 for a map of the CETF MOU Cell Sites, Sprint Cell Sites, and primary roads.

near most primary and secondary roads to provide service.[31] Figure 1 illustrates this point by comparing the CETF MOU sites to Sprint's Sites.

**Figure 1: CETF MOU and Sprint Sites Near Primary Roads in Southern California (Interstate Routes 15, 40, and 10)[32]**

**<<Begin Confidential>>**

**<<End Confidential>>**

Figure 1 shows that many cell sites closely align with the location of primary roads in Southern California. Despite a lack of rural coverage, Sprint has constructed cell sites along primary roads to provide service in its ordinary course of business. Stand-Alone Sprint and T-Mobile's primary road cell sites would likely be upgraded with 5G under the normal course of business. As such, we can assume these cell sites along primary roads will also receive upgrades under the CETF MOU. However, this is no different from the most likely future scenario. The 90 percent commitment to the 5G plan cell sites leaves New T-Mobile able to exclude costly or remote rural deployments, such as the existing Stand-Alone T-Mobile sites between **<<Begin Confidential>>** [redacted] **<<End Confidential**>>, and still satisfy the conditions of the CETF MOU.

[31] Rebuttal Testimony of Mr. Draper at p. 35, *Also See* Reply Exhibit C-1 the map of Sprint Cell Sites and Primary Roads.

Again, the notion that carriers build cell sites along highways to ensure coverage is not unusual. All four facilities-based carriers have infrastructure along most of California's primary roads. Thus, it is reasonable to assume that cell sites near primary roads would receive 5G upgrades in the ordinary course of business. This is especially true as autonomous vehicle, which will likely need wireless connections, become more prevalent in long haul transportation.[33]

Notably, both the FCC commitments and the CETF MOU are not significant improvements over the likely status quo of wireless coverage. In its ordinary course of business, T-Mobile deployed LTE to cover approximately 77 to 92 percent of rural America.[34] The Maps in Mr. Ray's Rebuttal Testimony Attachment D show that Stand-Alone T-Mobile could cover most of California with low-band 5G by 2024.[35] Most of these cell sites already exist and are the same as the planned 5G sites in the CETF MOU.[36] Stand-Alone T-Mobile has the cell sites needed to provide rural coverage; the proposed merger is a shortcut to acquiring the capital required for 5G radio deployment.

Furthermore, recent studies by the Rural Wireless Association (RWA) have shown that carriers exaggerate their rural coverage. Last year the RWA submitted an informal request to the FCC alleging that T-Mobile over-exaggerated its rural coverage in Vermont.[37] Three RWA members found that more than 90% of the time devices on T-Mobile's network couldn't establish an LTE connection or failed to achieve download

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[32] Full Maps are included in Confidential Reply Exhibit C-1.

[33] https://www.t-mobile.com/business/resources/articles/how-5g-mobile-networks-will-transform-transportation-infrastructure?icid=B2B_BB_P_19CONTENT_H5ZF6QGSM8AY1OI418152

[34] Tests done by open signal *see:* https://www.fiercewireless.com/operators/t-mobile-edges-out-at-t-rural-4g-availability-opensignal-results-show

[35] Supplemental Declaration of Mr. Cameron Reed at p. 38.

[36] Supplemental Declaration of Mr. Cameron Reed at pp. 30-32.

[37] The Rural Wireless Association's Informal Request for Commission Action filed December 26, 2018 at p. 7. The Request can be found here: https://ruralwireless.org/recent-government-study-confirms-rural-wireless-associations-conclusions-t-mobile-is-exaggerating-its-4g-lte-coverage-across-rural-parts-of-the-country-a-new-study-by-the-state-of-vermont-is/ "When 2,248,794 (95.8 percent) of 2,346,588 test points tested by only three challengers fail, it calls into question all of the data submitted by T-Mobile."

speeds higher than 5 Mbps.[38] The informal request's findings where confirmed by the Vermont Department of Public Service. RWA goes on to state that "T-Mobile's actions cast doubt on the unsubstantiated promises of rural coverage the company is making to justify their anti-competitive merger with Sprint. The company's recent track record confirms that rural Americans will be harmed if the merger is approved."[39] Simply put, New T-Mobile could repeat the same practice post-merger and claim to cover areas with 5G where it offers no strong connection to end-users.

The conditions of the CETF MOU show that the proposed merger would bring little improvement over a business as usual approach. My supplemental declaration and new GIS analysis both show that Stand-Alone T-Mobile has infrastructure in the areas where the Applicants claim New T-Mobile will deploy 5G. Aside from New T-Mobile plans to use Sprint's 2.5 GHz spectrum for 5G and vague claims of merger synergies, the Applicants have not proven why New T-Mobile is uniquely capable of upgrading cell sites that Stand-Alone T-Mobile already has in order to improve rural 5G coverage.[40]

### C. DISH's Challenges in Becoming the Fourth National Facilities Based Wireless Carrier Puts Public Safety and Customer Welfare at Risk.[41]

On July 26, 2019, the US DOJ and five state Attorney Generals jointly filed a *Complaint* in the United States District Court for the District of Columbia alleging that the proposed merger of T-Mobile and Sprint would extinguish substantial competition and result in increased prices and less attractive service offerings.[42] As Dr. Selwyn notes

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[38] *Id*.

[39] https://ruralwireless.org/recent-government-study-confirms-rural-wireless-associations-conclusions-t-mobile-is-exaggerating-its-4g-lte-coverage-across-rural-parts-of-the-country-a-new-study-by-the-state-of-vermont-is/

[40] Supplemental Declaration of Mr. Cameron Reed at p. 37, paras 67-68.

[41] The Amended Scoping Memo asks about DISH's service obligations in California (Question 3), how the divestiture of the pre-paid businesses impacts California customers (Question 5) and how the US DOJ commitments change the benefits California customers will receive from the proposed transaction. (Question 7)

[42] Reply Testimony of Dr. Lee Selwyn at pp. 5-8.

in his Reply Testimony, DISH's ability to perform as a viable competitor is a critical component of the structure of the PFJ.[43] The US DOJ intends that DISH replace Sprint as a competitor to preserve four facilities-based national wireless carriers. The role intended for DISH in the PFJ makes DISH's role in this proposed merger pivotal, not incidental. As such, the Commission must examine DISH's ability to construct and operate a 5G network in California to understand what will happen to the customers Sprint is divesting to DISH, the overall impact of the proposed merger, and whether the proposed merger is in the public interest.

In order to facilitate DISH becoming the fourth national Mobile Network Operator (MNO), the PFJ outlines several terms including a seven-year mobile virtual network operator agreement, divesting the prepaid customers of Sprint, Boost Mobile, and Virgin brands, and cell site asset transfer agreements. The Amended Scoping Memo focuses on this issue, asking how the divestiture of the pre-paid businesses impacts California customers and how the US DOJ commitments change the benefits California customers will receive from the proposed transaction. In short, these pre-paid customers will be transferred over to DISH who, as discussed in the testimony of Dr. Lee Selwyn, faces significant operational challenges to becoming a competitive facilities-based carrier.[44] Furthermore, because DISH has no existing cellular infrastructure or emergency equipment,[45] the negative effects on provider diversity and cell site resiliency would still be present for years following the proposed merger at the least. This will negatively impact all California customers and it will harm the divested pre-paid customers most significantly as discussed in the reply testimony of Eileen Odell.[46]

[43] *Id* at p. 8.

[44] Reply Testimony of Dr. Lee Selwyn at pp. 62-63, para 67.

[45] DISH Response to DR 1.

[46] Reply Testimony of Eileen Odell at p. 10.

### 1. The PFJ Does Not Remedy the Harms to Infrastructure and Provider Diversity Caused by the Proposed Merger, Which Reduces Emergency Response Capabilities.

The PFJ allows DISH to buy an undetermined number of Sprint's decommissioned cell sites. On the surface this means not as many cell sites would be decommissioned as previously considered under the initial proposed merger application. However, the Commission has no gauge of DISH's performance as a wireless carrier.[47] Furthermore, as DISH has no cellular emergency equipment, or experience operating a cellular network, DISH's operational resilience to communications service disruptions and emergencies is uncertain. This is salient as fires and public safety power shutoffs have recently caused significant communications disruptions in California.[48]

At the least, resilience and redundancy would be negatively impacted in the several years it takes for DISH to get cell sites and emergency equipment online. As such this loss of infrastructure diversity will reduce provider choice for emergency responders and the public, especially impacting the pre-paid customers that Sprint will transfer to DISH.

### 2. The Network DISH Inherits from Sprint's Divested Cell Sites Has Limited Coverage, Which Means that Even If DISH Becomes a Viable MNO, the Prepaid Customers will have been Transferred to a Network with Inferior Service

Among the challenges DISH faces is the fact that DISH has no existing cellular network and must build a greenfield 5G network.[49] DISH has the option but, as T-Mobile's witnesses have repeatedly stressed, not the obligation to purchase decommissioned Sprint cell sites. However, this option will be available over a five-year

[47] Reply Testimony of Dr. Lee Selwyn at pp. 16-18, paras 17 and 18

[48] FCC Communications Status Report 10/27/19 - Attachment 4.

[49] DISH Response to DR 1.

period.[50] This prolonged decommissioning, purchasing, and redeploying cell towers is antithetical to the rapid build-out of a facilities-based network that DISH needs to meet its deadlines.[51] Furthermore, the cell sites DISH could acquire are fewer in number than Sprint currently has. These cell sites are also concentrated mostly around urban areas and primary roads. This means that even if DISH were to purchase every decommissioned cell site, which it is under no obligation to do, it would have worse facilities-based coverage than Sprint does currently. Figure 2 below compares current Stand-Alone Sprint's cell sites in Fresno and Kings Counties to the potential cell sites available for DISH to purchase to illustrate this gap in coverage in rural and urban areas.[52]

**Figure 2: Comparison of Current Sprint Cell Sites and Divested Cell Sites DISH could Potentially Acquire (Fresno and Kings Counties)[53]**

**<<Begin Confidential>>**

[50] Reply Testimony of Dr. Lee Selwyn at p. 74, para 84.

[51] Reply Testimony of Dr. Lee Selwyn at pp. 75-76, para 85-86.

[52] A Confidential Map of the Potential Cell Sites Available to DISH is included in Reply Exhibit C-1.

[53] The Cell Sites considered "potential dish tower sites" are the sites noted in T-Mobile's Response to Cal PA DR 2-6 as "keep sites" marked with "False." In other words, they are the sites T-Mobile currently plans to decommission. Maps of Fresno and Kings Counties are included in Confidential Reply Exhibit C-1 to this testimony.

**<<End Confidential>>**

Figure 2 shows significant cell site coverage gaps in DISH's potential new network in populated areas of Fresno and Kings counties, as well as a significant reduction in available cell sites within the City of Fresno. New T-Mobile is retaining most of the cell sites within the City of Fresno for increased urban capacity. This means DISH would have significant hurdles to remedy to provide adequate coverage and capacity for 5G service in both rural and urban areas of Fresno and Kings counties.

Simply put, the divested cell sites DISH could purchase will have significant coverage gaps in populated areas of Fresno, Kings, and Tulare counties, among others, compared to what Stand-Alone Sprint currently has. These gaps place significant limitations where DISH could successful deploy a cellular network and are a material decrease in coverage over Sprint's status quo.

For example, as shown in Figure 2 DISH would have between **<<Begin Confidential>>** [redacted] **<<End Confidential>>** cell sites in western Fresno. Even if DISH acquires all of these sites there is a dead zone on the outskirts of Fresno where DISH would have to construct

new infrastructure to provide coverage.[54] To underscore this discrepancy, Table 2 summarizes the differences between the number of Sprint's current cell sites and the number of divested sites DISH could potentially acquire.

**Table 2: Summary of Sprint's Current Sites and DISH's Potential Cites for Fresno, Kings, and Tulare Counties[55]**

**<<Begin Confidential>>**

| County | Potential DISH Sites | Sprint Sites | Difference |
|---|---|---|---|
| Fresno | [redacted] | [redacted] | [redacted] |
| Tulare | [redacted] | [redacted] | [redacted] |
| Kings | [redacted] | [redacted] | [redacted] |
| **Grand Total** | [redacted] | [redacted] | [redacted] |

**<<End Confidential>>**

Figure 2 and Table 2 demonstrate that the coverage and infrastructure difference between what Sprint has and what DISH could acquire are significant. DISH would have roughly 60% of the cell sites Sprint has now, assuming DISH purchases all the available cell sites. As such, not only would T-Mobile need to decommission cells sites in a timely manner which allows DISH to then retrofit for its equipment,[56] but DISH would also need to raise capital and mobilize labor crews to build new cell towers in order create its facilities-based network. DISH would need to build at least an additional**<<Begin Confidential>>** [redacted] **<<End Confidential>>** cell sites over the divested cell sites to match the coverage Sprint has now. Then DISH would need thousands more to achieve the cell site coverage of AT&T, Verizon, and New T-Mobile. Considering that New T-Mobile must divest the 800 MHz spectrum, New T-Mobile has an incentive to keep Sprint's old infrastructure operational to support Sprint's old customers until it no longer

[54] Compared to Table 4 of the Supplemental Declaration of Mr. Cameron Reed on p. 31 means that DISH network would have the least cell sites in western Fresno of any carrier.

[55] A tabulation of the differences between Sprint's current sites and DISH's potential future sites is included as Confidential Attachment D to this testimony.

[56] The assumption that New T-Mobile would easily realize post-merger efficiencies has its own problems, *See* Supplemental Declaration of Cameron Reed at p. 38.

has the 800 MHz spectrum. This will further delay DISH's ability to acquire these cell sites.

The gradual nature of the divestiture means that DISH would not have a network operational in California for several years.[57] Again, DISH is not obligated to buy every decommissioned cell site. DISH could elect not to purchase isolated rural cell sites to prioritize urban deployments with higher returns on investment. In total, DISH's future facilities-based coverage is uncertain, but it will certainly be worse than the status quo for the next three years. The Commission cannot rely on DISH to fill the gap left behind by the elimination of Sprint as a competitive carrier.

### 3. The Pre-Paid Customers Sprint is Divesting to DISH Could be Left Behind Without Compatible Handsets.

DISH's coverage gaps and limited infrastructure is especially concerning despite the MVNO agreement because some pre-paid customers that Sprint will divest to DISH have incompatible handsets with T-Mobile's existing network. The Applicants have explained these customers are now DISH's responsibility to ensure continuity of service.[58] This means that customers with imcompatible handsets could be left behind. As established above, New T-Mobile now must divest Sprint's 800 MHz spectrum to DISH, which was going to be used to support existing Sprint LTE customers in addition to divesting Sprint's pre-paid customers. These two terms of the PFJ combine to create an unfavorable scenario. Sprint will divest its pre-paid customers to a carrier that doesn't have an LTE network, DISH, who will then provide these customers service through an MVNO agreement with New T-Mobile. New T-Mobile plans to then decommission the cell sites and must divest the spectrum that support these pre-paid customers' handsets after three years. This can leave some of these customers with no service.[59]

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[57] Reply Testimony of Dr. Lee Selwyn at p. 76, para 86.

[58] Supplemental Testimony of Mr. Neville R. Ray at p. 19.

[59] Handsets have an average life longer than three years, *See* Testimony of Cameron Reed on 5G wireless service and *See Also* https://www.fiercewireless.com/wireless/t-mobile-cfo-dish-rivalry-bring-it where T-Mobile Chief Financial Officer Braxton Carter comments that handsets have longer lifecycles, with T-

(continued on next page)

DISH does not currently have a plan to transition these customers and is in the process of conceptualizing its greenfield network deployment.[60] DISH noted that the PFJ has provisions for T-Mobile to facilitate the transition that may include handling customers with incompatible handsets. Mr. Ray states that DISH will be responsible for its customers' handset upgrades and compatibility after the divestiture.[61] While New T-Mobile will provide DISH some amount of operational support, the ability for these customers to get cell service is uncertain especially for those pre-paid customers who could not afford new phones. Pre-paid customers with incompatible handsets could be left behind post merger.

## III. CONCLUSION

The US DOJ PFJ, the FCC Commitments, and the CETF MOU do not outweigh the significant competitive harm caused by the proposed merger. These harms include increased prices, degraded service, and potentially pre-paid customers left without service. Many of the proposed merger benefits are simply 5G benefits, a fact that has only been reinforced now that early 5G service has been deployed. The Commission should deny the proposed merger.

(continued from previous page)
Mobile's customers hanging onto handsets for almost four years. Low-income customers likely hold onto handsets for longer, or get older cheaper handsets, to save money.

[60] DISH response to DR 3-3.

[61] Supplemental Testimony of Mr. Neville R. Ray at p. 19.

# ATTACHMENT A

## QUALIFICATION OF WITNESS

# PREPARED TESTIMONY AND QUALIFICATION
# OF
# CAMERON REED

Q1: Please state your name and business address.

A1: My name is Cameron Reed. My business address is 505 Van Ness Avenue, San Francisco, California.

Q2: By whom are you employed and in what capacity?

A2: I am currently employed by the California Public Utilities Commission (Commission) Public Advocates Office as a Utilities Engineer in the Communications and Water Policy Branch.

Q3: Briefly state your educational background and experience.

A3: I have a Bachelor of Science in Mechanical Engineering from the University of California-Davis. My studies included courses in engineering control systems, electrical circuits, experimental methodology, and mechanical systems design. I am a member of the Phi Theta Kappa honor society.

I began work with the Commission on July 5, 2016. I have previously submitted testimony concerning Telecommunications Public Safety in the general rate case (GRC) of Sierra Telephone Company (Application 16-10-003), Service Quality and Public Safety in the GRC of Ducor Telephone Company, (Application 17-10-003), Service Quality in the GRC of Foresthill Telephone Company (Application 17-10-004), and Public Safety and Cybersecurity in the Application of Pacific Gas and Electric for a Certificate of Public Convenience and Necessity to become a Competitive Local Exchange Carrier (Application 17-04-010).

I reviewed the merger between CenturyLink and Level 3 Communications (Application 17-03-016). I have reviewed thousands of the Federal Communications Commission's Network Outage Reporting System outage reports.

Q4: What is the scope of your responsibility in this proceeding?

A4: I have previously submitted testimony in this proceeding.

Q5: Does this complete your testimony at this time?

A5: Yes, it does.

# ATTACHMENT B

**Tabulated CETF MOU Cell Sites within A Half Mile of a Primary Road**

**<<Begin Confidential>>**

Rural Areas

| County | Total Cell Sites | Total Sites Near Primary Roads |
|---|---|---|
| Alameda | [redacted] | [redacted] |
| Alpine | [redacted] | [redacted] |
| Amador | [redacted] | [redacted] |
| Butte | [redacted] | [redacted] |
| Calaveras | [redacted] | [redacted] |
| Colusa | [redacted] | [redacted] |
| Contra Costa | [redacted] | [redacted] |
| Del Norte | [redacted] | [redacted] |
| El Dorado | [redacted] | [redacted] |
| Fresno | [redacted] | [redacted] |
| Glenn | [redacted] | [redacted] |
| Humboldt | [redacted] | [redacted] |
| Imperial | [redacted] | [redacted] |
| Inyo | [redacted] | [redacted] |
| Kern | [redacted] | [redacted] |
| Kings | [redacted] | [redacted] |
| Lake | [redacted] | [redacted] |
| Lassen | [redacted] | [redacted] |
| Los Angeles | [redacted] | [redacted] |
| Madera | [redacted] | [redacted] |
| Marin | [redacted] | [redacted] |
| Mariposa | [redacted] | [redacted] |
| Mendocino | [redacted] | [redacted] |
| Merced | [redacted] | [redacted] |
| Modoc | [redacted] | [redacted] |
| Mono | [redacted] | [redacted] |
| Monterey | [redacted] | [redacted] |
| Napa | [redacted] | [redacted] |
| Nevada | [redacted] | [redacted] |
| Orange | [redacted] | [redacted] |
| Placer | [redacted] | [redacted] |
| Plumas | [redacted] | [redacted] |
| Riverside | [redacted] | [redacted] |
| Sacramento | [redacted] | [redacted] |
| San Benito | [redacted] | [redacted] |

Urban Areas

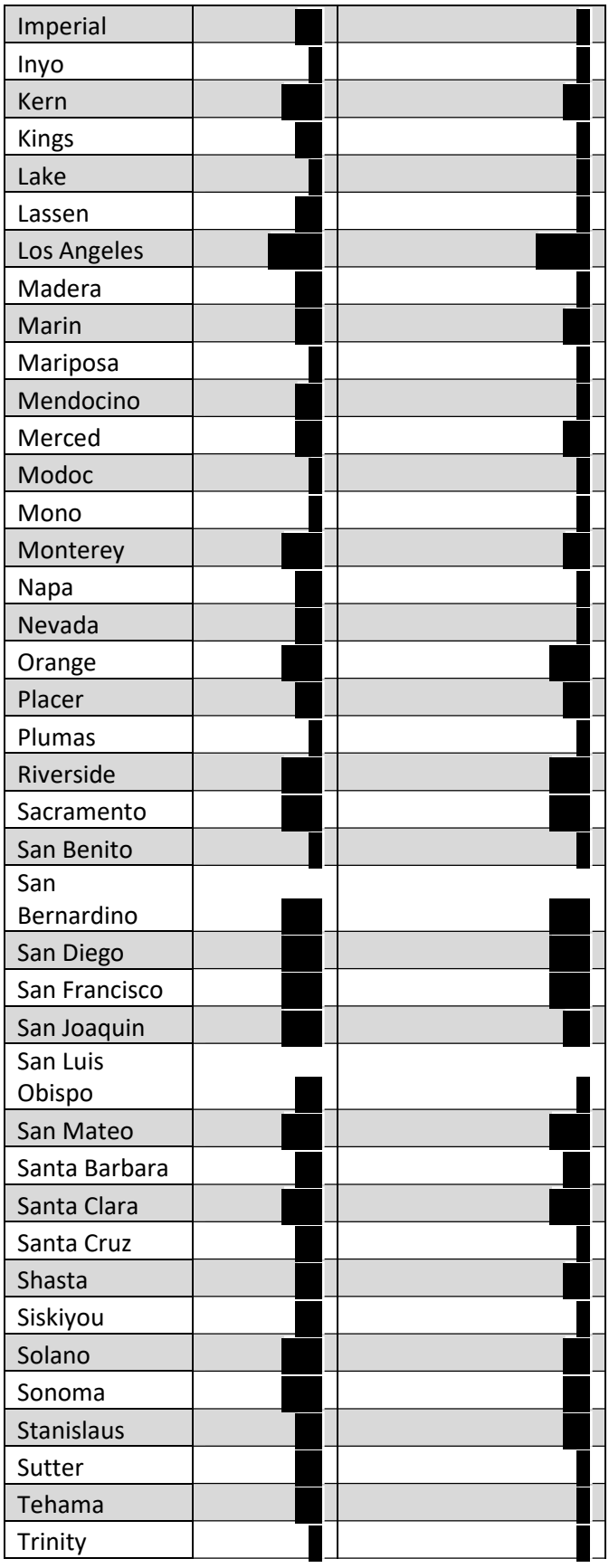
| County | Total Cell Sites | Total Sites Near Primary Roads |
|---|---|---|
| Alameda | [redacted] | [redacted] |
| Alpine | [redacted] | [redacted] |
| Amador | [redacted] | [redacted] |
| Butte | [redacted] | [redacted] |
| Calaveras | [redacted] | [redacted] |
| Colusa | [redacted] | [redacted] |
| Contra Costa | [redacted] | [redacted] |
| Del Norte | [redacted] | [redacted] |
| El Dorado | [redacted] | [redacted] |
| Fresno | [redacted] | [redacted] |
| Glenn | [redacted] | [redacted] |
| Humboldt | [redacted] | [redacted] |
| Imperial | [redacted] | [redacted] |
| Inyo | [redacted] | [redacted] |
| Kern | [redacted] | [redacted] |
| Kings | [redacted] | [redacted] |
| Lake | [redacted] | [redacted] |
| Lassen | [redacted] | [redacted] |
| Los Angeles | [redacted] | [redacted] |
| Madera | [redacted] | [redacted] |
| Marin | [redacted] | [redacted] |
| Mariposa | [redacted] | [redacted] |
| Mendocino | [redacted] | [redacted] |
| Merced | [redacted] | [redacted] |
| Modoc | [redacted] | [redacted] |
| Mono | [redacted] | [redacted] |
| Monterey | [redacted] | [redacted] |
| Napa | [redacted] | [redacted] |
| Nevada | [redacted] | [redacted] |
| Orange | [redacted] | [redacted] |
| Placer | [redacted] | [redacted] |
| Plumas | [redacted] | [redacted] |
| Riverside | [redacted] | [redacted] |
| Sacramento | [redacted] | [redacted] |
| San Benito | [redacted] | [redacted] |

| | | |
|---|---|---|
| San Bernardino | | |
| San Diego | | |
| San Francisco | | |
| San Joaquin | | |
| San Luis Obispo | | |
| San Mateo | | |
| Santa Barbara | | |
| Santa Clara | | |
| Santa Cruz | | |
| Shasta | | |
| Siskiyou | | |
| Solano | | |
| Sonoma | | |
| Stanislaus | | |
| Sutter | | |
| Tehama | | |
| Trinity | | |
| Tulare | | |
| Tuolumne | | |
| Ventura | | |
| Yolo | | |
| Yuba | | |
| Grand Total | | |

| | | |
|---|---|---|
| San Bernardino | | |
| San Diego | | |
| San Francisco | | |
| San Joaquin | | |
| San Luis Obispo | | |
| San Mateo | | |
| Santa Barbara | | |
| Santa Clara | | |
| Santa Cruz | | |
| Shasta | | |
| Siskiyou | | |
| Solano | | |
| Sonoma | | |
| Stanislaus | | |
| Sutter | | |
| Tehama | | |
| Trinity | | |
| Tulare | | |
| Tuolumne | | |
| Ventura | | |
| Yolo | | |
| Yuba | | |
| Grand Total | | |

Total

| County | Total Cell Sites | Total Sites Near Primary Roads |
|---|---|---|
| Alameda | | |
| Alpine | | |
| Amador | | |
| Butte | | |
| Calaveras | | |
| Colusa | | |
| Contra Costa | | |
| Del Norte | | |
| El Dorado | | |
| Fresno | | |
| Glenn | | |
| Humboldt | | |


Imperial
Inyo
Kern
Kings
Lake
Lassen
Los Angeles
Madera
Marin
Mariposa
Mendocino
Merced
Modoc
Mono
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Napa
Nevada
Orange
Placer
Plumas
Riverside
Sacramento
San Benito
San Bernardino
San Diego
San Francisco
San Joaquin
San Luis Obispo
San Mateo
Santa Barbara
Santa Clara
Santa Cruz
Shasta
Siskiyou
Solano
Sonoma
Stanislaus
Sutter
Tehama
Trinity

| | | |
|---|---|---|
| Tulare | [redacted] | [redacted] |
| Tuolumne | [redacted] | [redacted] |
| Ventura | [redacted] | [redacted] |
| Yolo | [redacted] | [redacted] |
| Yuba | [redacted] | [redacted] |
| Grand Total | [redacted] | [redacted] |

**<<End Confidential>>**

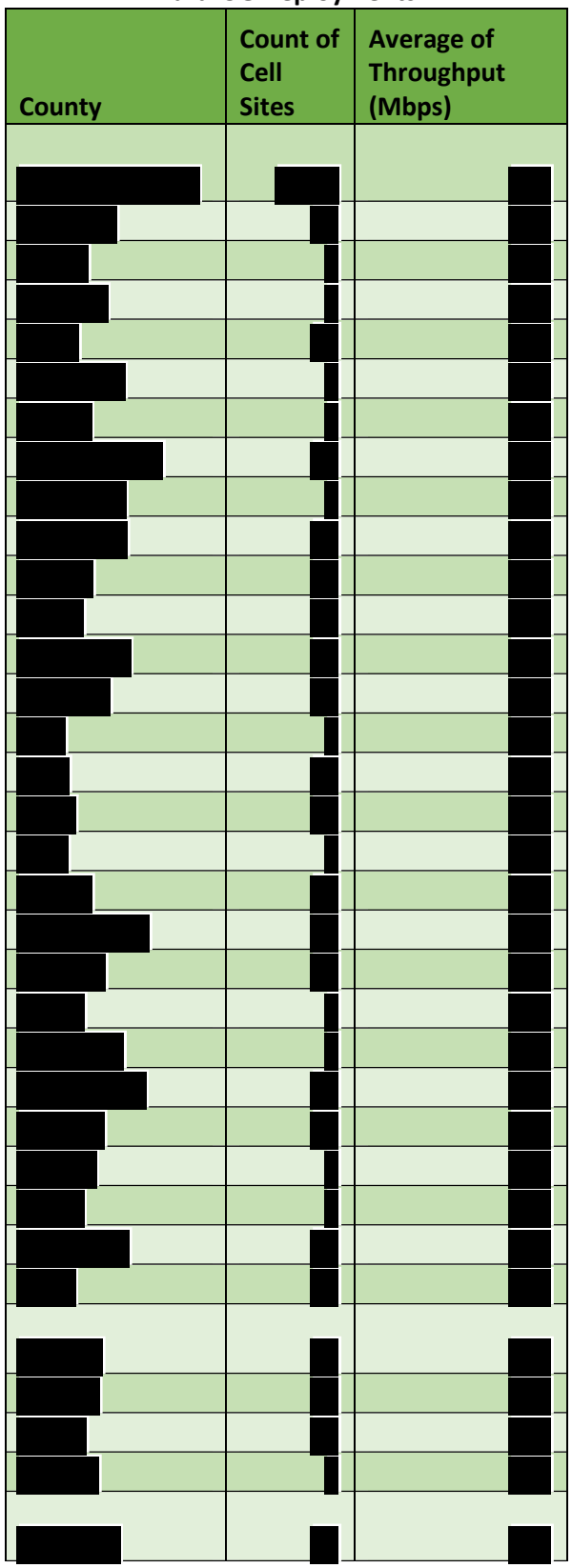
This Information based off GIS Analysis of Attachment D to Mr. Ray's Supplemental Testimony and Census Bureau information on Primary Roads.

# ATTACHMENT C

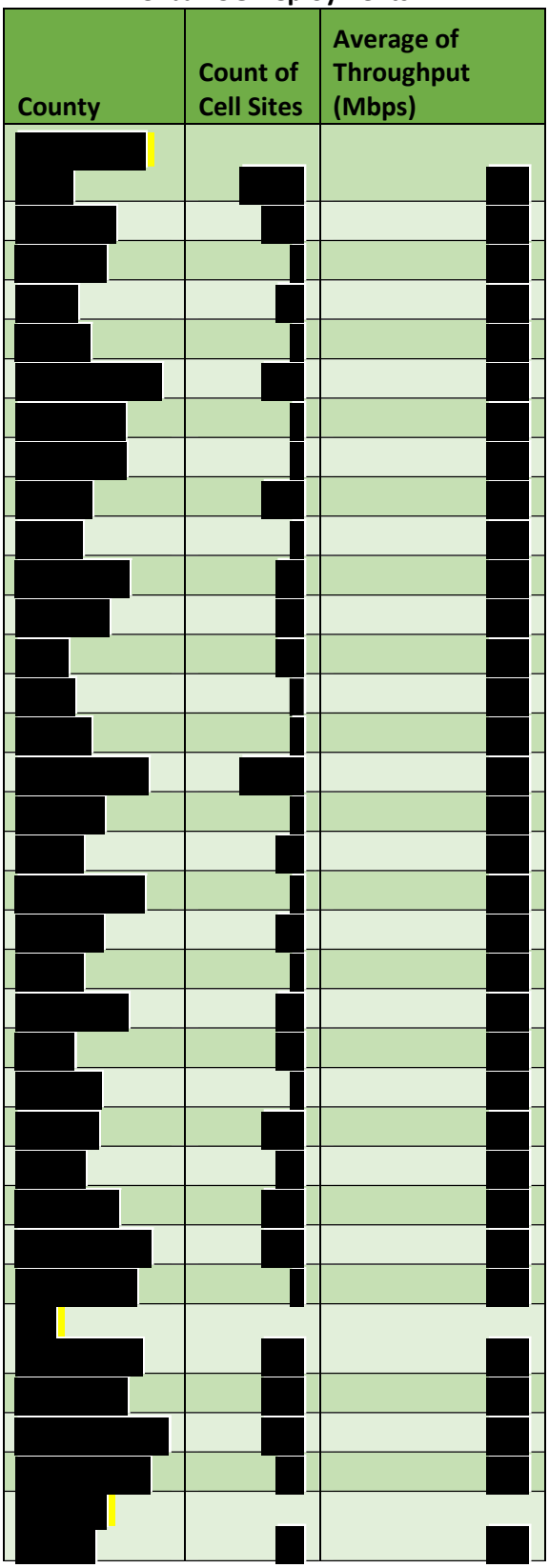
**Average Speeds Committed to Across CETF MOU Cell Sites by 2024-2026**

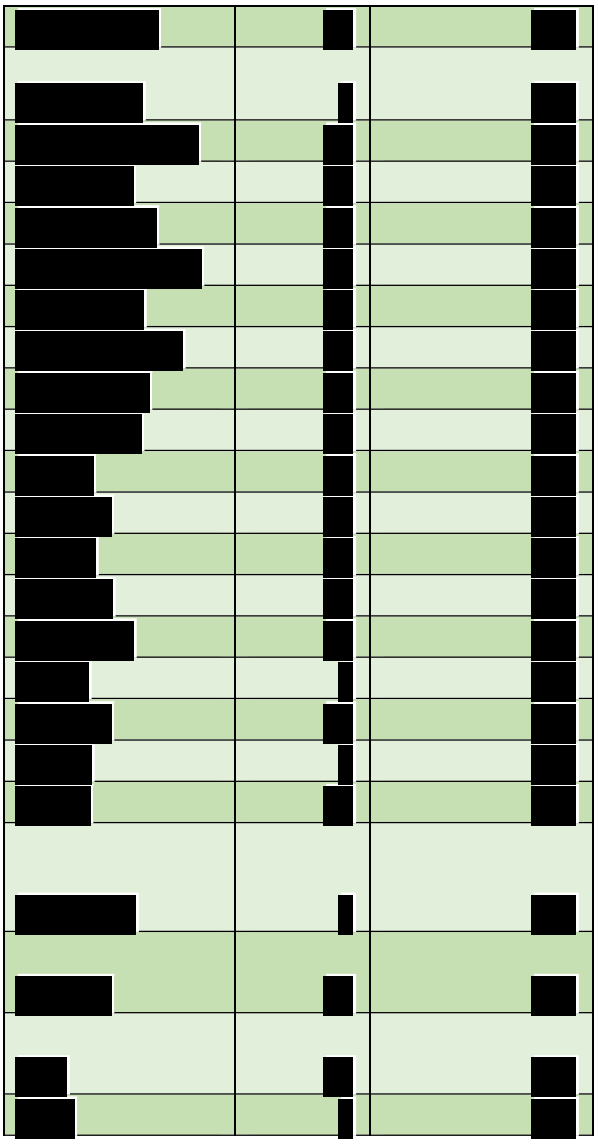
<<Begin Confidential>>

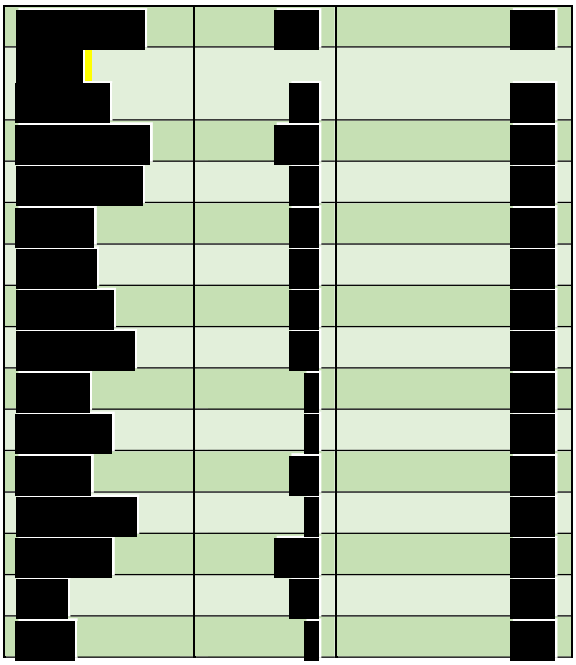
Rural 5G Deployments




Urban 5G Deployments







**Statewide Totals**

| Area | Count of Cell Sites | Average of Throughput (Mbps) |
|---|---|---|
| Rural Area Total | | |
| Urban Area Total | | |
| Grand Total | | |

**<<End Confidential>>**

This Information is taken from Attachment D to Mr. Ray's Supplemental Testimony

# ATTACHMENT D

**Tabulated of Existing Sprint Cell Sites Compared to Cell Sites Available to DISH by County**

<<Begin Confidential>>

| County | Potential DISH Cell Sites | Sprint Cell Sites | Difference |
|---|---|---|---|
| Alameda | [redacted] | [redacted] | [redacted] |
| Alpine | [redacted] | [redacted] | [redacted] |
| Amador | [redacted] | [redacted] | [redacted] |
| Butte | [redacted] | [redacted] | [redacted] |
| Calaveras | [redacted] | [redacted] | [redacted] |
| Colusa | [redacted] | [redacted] | [redacted] |
| Contra Costa | [redacted] | [redacted] | [redacted] |
| Del Norte | [redacted] | [redacted] | [redacted] |
| El Dorado | [redacted] | [redacted] | [redacted] |
| Fresno | [redacted] | [redacted] | [redacted] |
| Glenn | [redacted] | [redacted] | [redacted] |
| Humboldt | [redacted] | [redacted] | [redacted] |
| Imperial | [redacted] | [redacted] | [redacted] |
| Inyo | [redacted] | [redacted] | [redacted] |
| Kern | [redacted] | [redacted] | [redacted] |
| Kings | [redacted] | [redacted] | [redacted] |
| Lake | [redacted] | [redacted] | [redacted] |
| Lassen | [redacted] | [redacted] | [redacted] |
| Los Angeles | [redacted] | [redacted] | [redacted] |
| Madera | [redacted] | [redacted] | [redacted] |
| Marin | [redacted] | [redacted] | [redacted] |
| Mariposa | [redacted] | [redacted] | [redacted] |
| Mendocino | [redacted] | [redacted] | [redacted] |
| Merced | [redacted] | [redacted] | [redacted] |
| Modoc | [redacted] | [redacted] | [redacted] |
| Mono | [redacted] | [redacted] | [redacted] |
| Monterey | [redacted] | [redacted] | [redacted] |
| Napa | [redacted] | [redacted] | [redacted] |
| Nevada | [redacted] | [redacted] | [redacted] |
| Orange | [redacted] | [redacted] | [redacted] |
| Placer | [redacted] | [redacted] | [redacted] |
| Plumas | [redacted] | [redacted] | [redacted] |
| Riverside | [redacted] | [redacted] | [redacted] |
| Sacramento | [redacted] | [redacted] | [redacted] |
| San Benito | [redacted] | [redacted] | [redacted] |
| San Bernardino | [redacted] | [redacted] | [redacted] |
| San Diego | [redacted] | [redacted] | [redacted] |

| | | | |
|---|---|---|---|
| San Francisco | [redacted] | [redacted] | [redacted] |
| San Joaquin | [redacted] | [redacted] | [redacted] |
| San Luis Obispo | [redacted] | [redacted] | [redacted] |
| San Mateo | [redacted] | [redacted] | [redacted] |
| Santa Barbara | [redacted] | [redacted] | [redacted] |
| Santa Clara | [redacted] | [redacted] | [redacted] |
| Santa Cruz | [redacted] | [redacted] | [redacted] |
| Shasta | [redacted] | [redacted] | [redacted] |
| Sierra | [redacted] | [redacted] | [redacted] |
| Siskiyou | [redacted] | [redacted] | [redacted] |
| Solano | [redacted] | [redacted] | [redacted] |
| Sonoma | [redacted] | [redacted] | [redacted] |
| Stanislaus | [redacted] | [redacted] | [redacted] |
| Sutter | [redacted] | [redacted] | [redacted] |
| Tehama | [redacted] | [redacted] | [redacted] |
| Trinity | [redacted] | [redacted] | [redacted] |
| Tulare | [redacted] | [redacted] | [redacted] |
| Tuolumne | [redacted] | [redacted] | [redacted] |
| Ventura | [redacted] | [redacted] | [redacted] |
| Yolo | [redacted] | [redacted] | [redacted] |
| Yuba | [redacted] | [redacted] | [redacted] |
| **Grand Total** | [redacted] | [redacted] | [redacted] |

**<<End Confidential>>**

This Information is taken from Attachment E to Mr. Ray's Supplemental Testimony