

## **ULTRA UNRELIABLE:**

How a bad deal with Verizon has cost San Diegans, three years later

**NOVEMBER 2022** 

## Executive Summary

In pre-pandemic April 2019, Mayor Kevin Faulconer signed a Public Private Partnership with Verizon, giving the Company discounted rent for use of public assets and shortened permitting timeframes to deploy infrastructure for the Company's 5G wireless network. The deal was initiated and negotiated by a Verizon lobbyist, entirely bypassing City Council and public input.

Faulconer touted the Verizon deal saying it would "increase services and expand our smart cities capabilities, at no additional costs to taxpayers." However, three years into the 10-year deal term, San Diegans are subsidizing the buildout of Verizon's 5G network, and promised community benefits have failed to materialize, potentially costing taxpayers over a million dollars.

There were no mechanisms or provisions to ensure an equitable build-out of the network and address the digital divide, a seemingly-deliberate blindspot reflected in network access and usability today. San Diego workers weren't considered or prioritized – the deal lacked any support for local workers in the hiring process or any requirement that Verizon or its contractors pay family-supporting wages and benefits.

## San Diegans have a critical opening in the deal to bring Verizon to the table and negotiate equitable, worker and community-centered terms moving forward by:

- 1. Reviewing the deal to answer crucial outstanding questions about contractual obligations as well as questions around network deployment priorities, with a focus on whether deployments have taken place in underserved neighborhoods, and if local workers were hired for the work.
- 2. Using the findings to determine the City's fiscal position and prepare for contractually required Right to True-Up negotiations with Verizon, set to begin January 2023.
- 3. Establishing an ongoing monitoring process that allows for public input as the deal is renegotiated and implemented.



## Introduction

The economic realities of post-pandemic life have amplified the need to close the digital divide and make fast, reliable and affordable broadband services available and accessible everywhere. In San Diego, there are an estimated 53,000 households without home internet.<sup>2</sup> Nearly 1 in 4 San Diego households earning less than \$20,000 per year, or about 36,000 people, don't have any internet subscription, including a cell phone.<sup>3</sup> These households and families tend to live in poorer and systematically under-resourced neighborhoods, mostly in south and southeast San Diego.<sup>4</sup>

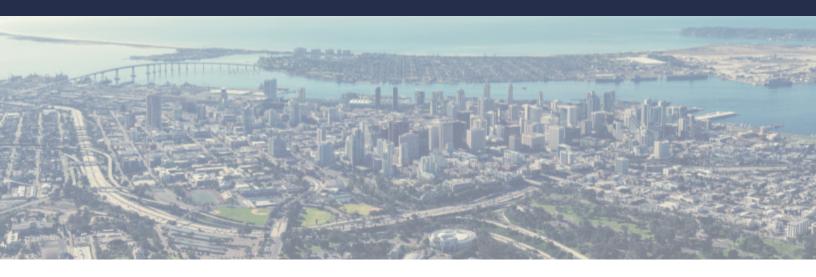
When the pandemic took hold, and households tried to adjust to kids' remote learning and parents' remote work with lagging networks and data caps on wireless plans, existing digital disparities widened. Kids without internet at home resorted to doing schoolwork in a Taco Bell parking lot,<sup>5</sup>

while home internet usage doubled from 2018 to 2021 and the average home internet subscriber's daily data use continues to grow.<sup>6</sup>

The digital divide exists, in part, because of failures to prioritize equity and access in the distribution of technology. Big internet service providers (ISPs), like Verizon, received billions of dollars in subsidies during the pandemic,<sup>7</sup> even as many companies increased executive compensation and dividend payouts to shareholders.<sup>8</sup> While working families are still recovering, Verizon is promising Wall Street investors bigger cash payouts through stock buybacks in the near future.<sup>9</sup>

After promising to address equity in its 5G deployment here, **Verizon has failed to make good on community benefits** while profiting from over a million dollars in subsidies from San Diegans under a public-private partnership deal signed in the final year of the Faulconer era.

The City of San Diego provides a prime example of ISP decision-making that prioritizes profits over people.



## Background: Becoming a "Smart City"

In pre-pandemic April 2019, Mayor Kevin Faulconer signed a Public Private Partnership deal with Verizon, giving the Company discounted rent for use of public assets and shortened permitting timeframes to deploy infrastructure supporting the Company's heavily-marketed 5G wireless network. The deal was initiated and negotiated by a Verizon lobbyist, entirely bypassing City Council and public input. The Faulconer administration only briefly mentioned the deal in 2020 Budget documents, without mentioning Verizon by name: "...the City plans to bolster San Diego's smart city status with a multi-million dollar agreement to accelerate small-cell deployment."

Verizon marketed the deal as "supporting the city's focus on creating a digitally inclusive and connected city that benefits all residents and businesses." However, there were no mechanisms or provisions to ensure an equitable build-out of the network and address the digital divide. San Diego workers weren't considered or prioritized -- the deal lacked any support for local workers in the hiring process or any requirement that Verizon and contractors pay family-supporting wages and benefits. <sup>13</sup>

Faulconer touted the Verizon deal saying it would "increase services and expand our smart cities capabilities, at no additional costs to taxpayers." <sup>14</sup>

Now, however, three years into the 10-year term, the public is slated to provide more than \$1 million in subsidy for Verizon's heavily-marketed 5G network, while the City has been unable to produce records showing the value of any Verizon provided community benefit.

## How the People are Subsidizing Verizon's Deployment

The Verizon deal contemplated that the City would perform a cost study to determine "reasonable costs" related to small cell deployment, which involves installing wireless radios and antennas on street poles and other city infrastructure and connecting it with fiber. The study was performed by an outside firm that charged the City nearly \$20,000, and was completed more than two years after Faulconer signed the deal.

The study found "The annual recurring cost... for a single [small cell] on City-owned property in the ROW [right-of-way] is reasonably approximated to be \$340." The City's reduced fee of just \$100 means the public is subsidizing Verizon's 5G network to the tune of \$240 per year per location, for up to 1,500 locations, for 10 years.

As of September 2022, the City has permitted 788 Verizon small cells. If Verizon maintains only its existing 788 small cells, the City of San Diego will subsidize Verizon's 5G deployment by approximately \$1.62 million over the course of the 10-year deal. If Verizon deployed the full 1,500 small cells provided for under the agreement, that subsidy would increase by over a million dollars.

**Cities Preempted:** A 2018 ruling by the Federal Communications Commission (FCC) preempted cities' ability to regulate wireless network deployment in the right of way in two big ways:

- 1. Limiting the pole rental rates cities can charge to a default \$270 per location per year, unless a city can prove that its costs are higher, for example by performing a cost study.
- 2. Imposing "shot clocks" for permit review, processing and approval to 60 days for attachment to an existing pole, and 90 days for installation of a new pole.<sup>18</sup>

This FCC order was seen by many as a corporate giveaway that would further strain local governments already facing tight budgets and staff overload. The terms Faulconer gave Verizon in 2019 were even more of a giveaway:

- Pole rental rates of \$100 per location per year (for up to 1,500 locations);
- 2. 25 day total turn-around for construction permit review, comments, processing and approval, and the City agreed to process an average of 20 wireline permits per week.

## Public Misses Out on Community Benefits

Verizon agreed to deliver several types of in-kind benefits with a total value of \$2,603,961.

Three of the benefits were contingent on both parties meeting benchmarks of 500 approved permits each year for three years. To unlock tangible benefits for the first year, the City would have had to approve the first 500 permits in just 8 months.<sup>19</sup>

Date	# permitted sites required	# sites sought by VZ and permitted by City	Benefit
Dec 31, 2019	500	26	500 smartphones to Police Department; 50 tablets to Fire Department
Dec 31, 2020	1,000	498	Intersection Safety Analytics technology
Dec 31, 2021	1,500	769	Smart Community Traffic Data Service to collect and analyze traffic data
September, 2022		788	

Based on permitting data, it appears that Verizon has not *requested* the number of permits required for the City to meet the benchmarks and unlock the benefits. The deal did not require Verizon to deploy any minimum number of small cell sites, leaving the scale of deployment entirely up to the Company.

## Benefits would have contributed to real public needs

When the deal was signed, Police Chief David Nisleit said, "The San Diego Police Department is excited about our partnership with Verizon." When an official from the San Diego Fire Department reached out to Verizon about the promised communication devices for first-responders, Verizon cited the missed benchmark and, instead, sent price quotes.

**An official from Fire-Rescue wrote to a Verizon representative in April 2020, saying,** "Reaching out to see if you [Verizon] can work with and engage your internal teams regarding the 50 iPad tablets the City of San Diego Fire Dept. is to receive connected with 5G deployments. They have critical immediate needs." Verizon responded, "They are iPads tied to the Number of permits issued. The total needed is 500 and last I was informed two weeks ago we were sub 100..and unfortunately, unless the 500 permits that are agreed upon in the PPP are reached, we are not able to procure the iPads for the Fire Department." The Verizon representative did, however, offer to sell the Fire Department iPads, and sent the City a pricing quote.<sup>21</sup>

Through Mayor Gloria's \$40 million Sexy Streets Initiative<sup>22</sup> and the ongoing Vision Zero Strategic Plan implementation, the City is making major investments in improving pedestrian safety, traffic management, and street maintenance.<sup>23</sup> Verizon has failed to provide the traffic and transportation technology agreed to in the deal that would have supported these important public safety initiatives.

In addition to the three benchmark-dependent benefits, Verizon agreed to provide two other in-kind benefits, the provision of which were not dependent on any permitting benchmarks, and the first of which Verizon agreed to provide within the deal's first 120 days:

- 1. Pole inventory Verizon agreed to perform an inventory of San Diego's approximately 60,000 public-owned poles and transfer the data to the City's GIS database system. The value of the inventory was to "not exceed [\$1,500,000]."<sup>24</sup>
- **2. Funding for LED luminaires** Verizon was obligated to provide funding for the City to purchase up to 200 LED luminaires that would become city-owned assets. The total cost was to "not exceed [\$400,000]."<sup>25</sup>

After extensive public records requests over a three-year period, across all relevant City departments and administrative offices, the City was unable to produce any documents confirming the value of either the pole inventory or funds to purchase the LED luminaires.<sup>26</sup>



# The Right to True-Up: What Can the People Recoup from Verizon

The City justified the lost leasing revenue in the agreement by accepting in-kind benefits from Verizon instead. The value of the \$170 per pole discount was not meant to be an outright corporate giveaway, rather San Diegans were meant to recoup the costs through the value of the in-kind benefits. The 2019 agreement reads, "In addition to the annual fee [\$100/year/pole], Verizon agrees to provide and deliver the following in-kind considerations with a total value of \$2,603,961."<sup>27</sup>

Given that the value of the subsidy and in-kind benefits depends on the number of poles permitted and the benefits actually provided, the deal also provides for a process to make the City whole, if by the end of the fourth year, the agreement has not resulted in 1,500 permitted sites. The "Right to True-Up" provision requires, if at the end of the fourth year Verizon has not deployed 1,500 sites, that Verizon and the City meet and confer about Verizon's site deployment status and enter into negotiations to extend the benchmark timeframes in order for Verizon to reach 1,500 permitted sites. If the parties are unable to reach a good faith agreement, the agreement lays out a formula to calculate any shortfall amount Verizon owes to the City, or any overpayment amount the City owes to Verizon.

#### The formula contains two variables:

**Annual Per Pole Value:** Determined by the value of the "in-kind consideration actually received" by the City. If Verizon failed to provide any of the benefits, this amount would be \$0. Despite repeated requests, the City is not able to provide documentation about the value of any in-kind benefits. Accordingly it is unclear what the actual value of the in-kind benefits, or "per pole value," is today.

**Number of Approved Sites:** The number of permitted small cell sites by the end of the fourth year of the deal.

If the Annual Per Pole Value is less than \$170 per Approved Site – the amount the City discounted the poles for Verizon's benefit below the FCC's default \$270 pole value – then Verizon owes the City to recoup for the shortfall value.

## For example, if Verizon failed to provide any of the in-kind benefits required in the agreement:

#### The Annual Per Pole Value would be \$0.

 \$0 in-kind contribution confirmed received ÷ 788 Approved Sites ÷ 10 years = \$0 Annual Per Pole Value

#### Accordingly, the Annual Per Pole Shortfall would be \$170.

 \$170 per pole discount value - \$0 Annual Per Pole Value = \$170 Annual Per Pole Shortfall

## Based on the current 788 Approved Sites, if Verizon failed to provide any in-kind benefits, the Total Shortfall value Verizon owes the City would be \$1,339,600.

• \$170 Annual Per Pole Shortfall x 788 Approved Sites x 10 years = \$1,339,600

If Verizon failed to provide any in-kind benefits, the deal will have cost City taxpayers over \$1.3 million. It's unclear what the actual amount is today. With the City unable to produce any documentation regarding the in-kind benefits, further investigation by the City is necessary to determine the real cost of this deal to San Diego taxpayers.

In any event, this deal has subsidized corporate interests at the expense of public coffers, the only question is by how much.

### Verizon's Small Cell Strategy Falls Short

Despite being handed streamlined permitting procedures and faster approval timelines than what was federally required, Verizon has failed to meet all of its own permitting benchmarks set forth in the deal with the City of San Diego. And, though it was Verizon that proposed the ambitious 500 small cells per year over three years timeline, the Company seems to have almost entirely abandoned the small cell strategy in San Diego, seeking just 19 permits this year.

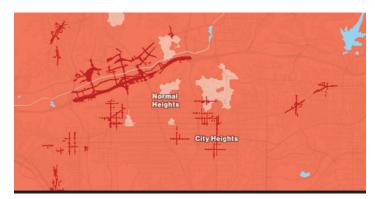
In some cases, despite DSD fulfilling the requirements and issuing permits, Verizon still failed to deploy approved small cells and the permits were closed-out, costing the City resources and failing to improve networks for San Diego residents and businesses. CWA members surveyed 144 permitted sites between August 2020 and April 2022 but found that at the time of surveying, 49% had no small cell antenna, despite DSD meeting the approval requirements. Verizon's actions may impair other carriers' ability to improve

networks for San Diegans, by reserving poles and taking them off the market, but failing to deploy infrastructure on the reserved poles.

## Verizon's 5G Not Delivering Digital Equity Promises

Verizon began marketing San Diego as a 5G city more than two years ago, in May 2020, and launched the 5G Home internet service in March 2021.<sup>28</sup> However, the coverage area was limited to a very small number of intersections concentrated in commercial areas, entirely leaving out the most under-connected communities.

Worse, a November 2021 technical analysis of Verizon's 5G network asmarketed found that access in the limited coverage areas was unreliable. The study, conducted by EJL Wireless, found that even slight movement quickly downgraded the 5G UWB network to slower networks and wouldn't reconnect to the UWB network once downgraded -- even when the device was pointed directly at the cell site. In many locations where Verizon advertised the 5G UWB, researchers could not connect to the network at all.<sup>29</sup>



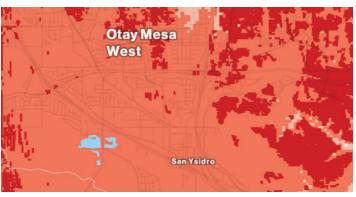


When Verizon began marketing San Diego as a "5G City" in May 2020, the Company's 5G network only covered the areas in dark red on the above maps. Coverage remained in these limited areas for more than two years; Image captured June 10, 2022 from Verizon's 5G coverage website.

In January 2022, Verizon greatly expanded its 5G network in hundreds of cities across the country, as new 5G spectrum was made available. Despite a majority of spectrum licenses Verizon purchased covering the San Diego market being available at that time, Verizon didn't upgrade San Diegans' access for more than six months, and during that time the network stayed contained in approximately the same limited areas where it was available in 2020.

When Verizon finally chose to upgrade the 5G network in San Diego, the Company entirely left out the notoriously under-connected San Ysidro community.<sup>30</sup> Further, a review of the largest affordable housing buildings in each of the nine Council districts (by number of affordable units) found just one building had access to 5G Home internet, one other building had access to 4G LTE Home internet, but only on certain floors, and the remaining

7 buildings, representing more than 2,500 units, didn't have access to any Verizon home internet service.<sup>31</sup>

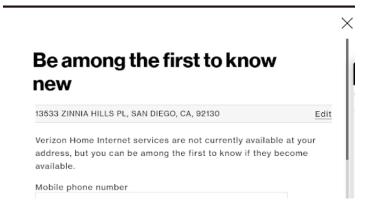




When Verizon finally invested in expanding 5G coverage across San Diego, the Company left San Ysidro without coverage. 5G coverage is indicated by the dark red in the above map. San Ysidro remains without coverage as of October 20, 2022.

#### 4G LTE Home is not sufficient home broadband

Importantly, Verizon describes 4G LTE Home speeds as "able to handle download speeds between 5 and 12 Mbps...and upload speeds between 2 and 5 Mbps," speeds that are significantly below the official FCC broadband definition of 25 Mbps/3 Mbps set in 2015, and dramatically below the 100 Mbps speeds expected for federally-funded broadband projects under various programs. 33



Customers are able to enter their address on the Verizon website in order to see what Verizon services are available. This is the message residents receive when Verizon does not serve an address with home broadband. This address is the largest affordable housing building in Council District 1. Image captured October 22, 2022 from Verizon's Home internet address search.

## Recommendations

## The City should conduct a review of the deal and recoup lost revenue through "Right To True-Up" negotiations.

Analysis of the first three years of Verizon's deal with the City of San Diego demonstrates that this deal has been a failure on all counts. Not only is the City measurably subsidizing the build-out of Verizon's 5G network -- it is doing so without evidence that the Company provided the promised community benefits, and without evidence that Verizon is making meaningful progress to close the City's digital divide.

The City should conduct a formal, transparent review of the 2019 Verizon partnership agreement.

Beginning in January 2023, the deal provides the City the opportunity to bring Verizon to the table to negotiate regarding the Right to True-Up provision. Performing a review will inform and prepare the City for those negotiations.

## The review should include a thorough investigation to answer the following questions:

- Did Verizon provide the required in-kind benefits that were not dependent on the City meeting permitting benchmarks -- the pole inventory and funding for the purchase of luminaires and if so, what was the value of the benefits?
- What is the final demonstrated value that Verizon provided in in-kind benefits to San Diegans, under the terms of the deal? Was the value below the agreed-upon value of \$2,603,961?
- Did Verizon hire San Diego-based contractors to construct the 5G network? Has the deployment, so far, benefited local workers and families?
- How do the City's Chief Operations Officer and the departments impacted by the deal intend to approach the upcoming Right to True-Up negotiations?

City Council should also establish a regular monitoring process through the end of the deal's term in 2029. The Faulconer Administration agreed to Verizon's backroom corporate giveaway deal without consulting Council or the public and stakeholders. In order for San Diegans to ensure a fair deal moving-forward, information about how Verizon is working in the right-of-way and interacting with our communities under the deal must be made public and accessible. Council and the public need open and accessible opportunities to provide feedback on the impact of this deal on our communities.

The Contractor Transparency Amendment, passed by Council and signed by Mayor Gloria in August 2022 requiring construction and right-of-way permit holders to disclose the subcontractors they are using to complete permitted work, will support the on-going monitoring process.

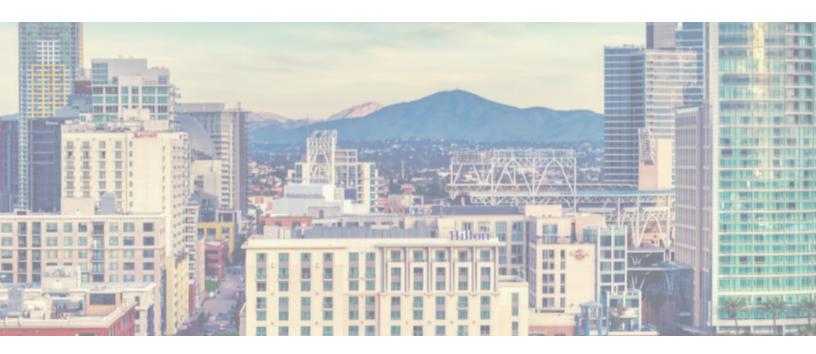
The ordinance also requires contractors to certify that their employees are adequately trained and have workers compensation coverage. At least three Verizon subcontractors identified in the field are not headquartered in San Diego and CWA has documented labor law violations by Verizon subcontractors in California.

## Review the City's Approach to Private-Public Partnerships

## San Diego workers must be centered in the review

and monitoring process to understand if Verizon supported local workers for this massive construction project to-date, and provide guidance on a local-hire priority for City partnerships and procurement moving-forward.

On multiple counts, this "partnership" amounted to a sweetheart giveaway of public resources for corporate benefit. Unfortunately, the deal was not subject to any scrutiny by the public or City Council until after it was executed. The City should consider what measures it can take to ensure that future administrations are not able to engage in these kinds of irresponsible corporate deals at the cost of San Diego taxpayers, and that "private-public partnerships" will actually benefit the public.



## Conclusion

Cities are resilient, and are adjusting to new post-pandemic social and economic realities. Part of the adjustment includes a renewed focus on the imperative of enforcing corporate accountability to make sure communities get their fair share from major corporations' use of public assets and spaces through public-private partnerships and other agreements.

Verizon -- working through a lobbyist with the industry-favoring Faulconer administration -- secured a giveaway deal to quickly and cheaply deploy the 5G network, and fell short of network access and distribution expectations. San Diegans are on the hook for on-going corporate subsidies to the tune of millions of dollars, and there is no evidence Verizon provided any agreed-upon community benefits. It is still unclear if local workers benefited from the 5G network deployment jobs, or if the contractors were paid family-supporting wages with good working conditions, but contractors spotted by local CWA members were out-of-town or had records of poor working conditions.

#### **Endnotes**

- Freeman, Mike, San Diego and Verizon strike deal to deploy more smart cities infrastructure, provide foundation for 5G networks, San Diego Tribune, April 8, 2019 https://www.sandiegouniontribune.com/business/technology/story/2019-04-08/san-diego-to-streamline-small-cell-permitting-in-deal-with-verizon-laying-groundwork-for
- 2 Lopez-Villadana, Andrea, *No connection? San Diego uses public spaces to bridge digital divides in neighborhoods*, San Diego Tribune, August 7, 2021 https://www.sandiegouniontribune.com/communities/san-diego/story/2021-08-07/no-connection-san-diego-uses-public-spaces-to-bridge-digital-divides-in-neighborhoods
- 3 US Census, American Community Survey, Table S2801: TYPES OF COMPUTERS AND INTERNET SUBSCRIPTIONS; 2021: ACS 1-Year Estimates https://data.census.gov/cedsci/table?q=broadband&q=1600000US0666000&tid=ACSST1Y2019.S2801
- 4 Lopez-Villadana, Andrea, No connection? San Diego uses public spaces to bridge digital divides in neighborhoods, San Diego Tribune, August 7, 2021 https://www.sandiegouniontribune.com/communities/san-diego/story/2021-08-07/no-connection-san-diego-uses-public-spaces-to-bridge-digital-divides-in-neighborhoods
- Copitch, Josh, Photo showing 2 Salinas girls doing homework outside Taco Bell goes viral, *KSBW*, August 28, 2020, https://www.ksbw.com/article/photo-showing-2-salinas-girls-doing-homework-outside-taco-bell-goes-viral/33834659
- Open Vault, Broadband Insights Report (OVBI) 4Q21, https://openvault.com/wp-content/up-loads/2022/03/OVBI\_4Q21\_Report\_FINAL-1.pdf
- 7 Emergency Broadband Benefit and Affordable Connectivity Program; https://www.fcc.gov/acp
- 8 Kinder, Molly, Katie Bach, and Laura Stateler, *Profits and the pandemic: As shareholder wealth soared, workers were left behind*, Brookings Institute, April 2022 https://www.brookings.edu/wp-content/uploads/2022/04/Pandemic\_Profits\_report.pdf
- 9 Verizon Investor Day presentation, Slides 7 and 74, March 3, 2022 https://www.verizon.com/about/sites/default/files/2022-05/Investor-Day-2022-Presentation\_rvl.pdf
- 10 Communications Workers of America, Connectivity or Corporate Giveaway? *New Report Reveals the Shortcomings of San Diego's 5G Partnership with Verizon*, June 25, 2020, https://fair5g.org/system/files/san\_diego\_5g\_built\_wrong.pdf
- 11 Mayor Kevin Faulconer, San Diego City Adopted Budget Fiscal Year 2020, https://www.sandiego.gov/sites/default/files/fy20ab\_v1cityprofile.pdf
- 12 Verizon, San Diego Mayor Faulconer & Verizon announce multi-million dollar agreement to accelerate small cell, fiber and smart city deployments, April 8, 2019 https://www.verizon.com/about/news/san-diego-mayor-faulconer-verizon-announce-multi-million-dollar-agreement-accelerate-small-cell
- Communications Workers of America, *Connectivity or Corporate Giveaway? New Report Reveals the Shortcomings of San Diego's 5G Partnership with Verizon*, June 25, 2020, https://fair5g.org/system/files/san\_diego\_5g\_built\_wrong.pdf

- 14 Freeman, Mike, San Diego and Verizon strike deal to deploy more smart cities infrastructure, provide foundation for 5G networks, San Diego Tribune, April 8, 2019 https://www.sandiegouniontribune.com/business/technology/story/2019-04-08/san-diego-to-streamline-small-cell-permitting-in-deal-with-verizon-laying-groundwork-for
- Master Use and Occupancy Agreement between the City of San Diego and Verizon Wireless for Small Cell Installations on Various Poles, Section 5 ANNUAL FEE; Signed April 3, 2019
- 16 City of San Diego Public Records Request #21-3253
- 17 City of San Diego Public Records Request #20-5148
- 18 FCC Orders: WT Docket No. 17-79; WC Docket No. 17-84
- 19 The deal was signed in April 2019. The first benchmark required 500 approved permits by YE 2019.
- Verizon, San Diego Mayor Faulconer & Verizon announce multi-million dollar agreement to accelerate small cell, fiber and smart city deployments, April 8, 2019 https://www.verizon.com/about/news/san-diego-mayor-faulconer-verizon-announce-multi-million-dollar-agreement-accelerate-small-cell
- 21 City of San Diego Public Records Request #20-1691
- Aarons, Jared, In Depth: *Mayor Gloria's infrastructure plan calls for "Sexy Streets" across San Diego*, San Diego 10News, May 25, 2022 https://www.10news.com/news/local-news/in-depth-mayor-glorias-infrastructure-plan-calls-for-sexy-streets-across-san-diego
- 23 City of San Diego, Vision Zero Strategic Plan 2020-2025, https://www.sandiego.gov/sites/default/files/vision-zero-strategic-plan-2020-2025.pdf
- 24 Memorandum of Understanding between the City of San Diego and Verizon Wireless, Exhibit E In-Kind Considerations, Signed April 3, 2019
- 25 Memorandum of Understanding between the City of San Diego and Verizon Wireless, Section 1.2 Obligations of Verizon, Subsection d.i.
- 26 City of San Diego Public Records Request #22-1946. A representative from the City stated that the pole inventory had been performed, but was unable to provide any supporting documentation regarding the value of the inventory.
- 27 Memorandum of Understanding between the City of San Diego and Verizon Wireless, Exhibit E In-Kind Considerations, Signed April 3, 2019
- Verizon, Verizon 5G Ultra Wideband service available in more cities, 11/20/2020 https://www.verizon.com/about/news/verizon-5g-ultra-wideband-service-available-more-cities; Verizon, On heels of C-Band results, Verizon expands 5G Home Internet to 10 more cities, 3/21/2021 https://www.verizon.com/about/news/c-band-verizon-expands-5g-home-internet
- 29 EJL Wireless Research, 5G UWB (mmWave) Wireless Networks Analysis: San Diego, CA and Chula Vista, CA. November 2021 https://www.fair5g.org/system/files/5g\_study\_san\_diego\_ejl\_wireless\_1.pdf
- Verizon 5G Coverage Map https://www.verizon.com/coverage-map/, as of October 2022;

Benton Institute for Broadband and Society, As telephone companies tout the switch to 5G, these San Diego residents still lack reliable cell service, March 7, 2022 https://www.benton.org/blog/telephone-companies-tout-switch-5g-these-san-diego-residents-still-lack-reliable-cell-service

- 31 CWA retrieved information regarding the largest affordable housing buildings using data from the San Diego Housing Commission, and identified what type of Verizon service was available at each address using Verizon's Address Search. See https://www.sdhc.org/housing-opportunities/affordable-rentals/rent-from-sdhc/; https://www.verizon.com/coverage-map/.
- Verizon, 4G LTE Speeds vs. Your Home Network, May 26, 2020; https://www.verizon.com/articles/4g-lte-speeds-vs-your-home-network/
- USDA Reconnect requires 100/100 Mbps; IIJA BEAD requires 100/20 Mbps; ARPA requires 100/20 Mbps