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***Digital Discrimination Under Disparate Impact:  
A Legal and Economic Analysis***

George S. Ford, PhD  
Lawrence J. Spiwak, Esq.

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# Phoenix Center Policy Paper No. 61

## *Digital Discrimination Under Disparate Impact: A Legal and Economic Analysis*

George S. Ford, PhD\*  
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*Abstract:* With the Infrastructure Investment and Jobs Act of 2021 providing sufficient funding to deploy broadband to nearly every household in the nation, the Digital Discrimination provisions contained in Section 60506 of the statute are a curiosity. Nonetheless, Congress directed the Federal Communications Commission to write rules implementing the statutory provision. The FCC recently released draft final rules implementing Section 60506 in anticipation of its November 2023 Open Meeting which adopt a somewhat standard disparate impact analysis. In this POLICY PAPER, we conduct an empirical analysis of racial discrimination in broadband access motivated by the caselaw on disparate impact analysis. Using data from the Commission's new broadband fabric data, as recommended by the Commission's draft final rules, we test for differences in broadband availability between predominantly minority and majority census block groups and find no evidence of digital discrimination against minorities. In fact, we find that, if anything, minority groups have better access to broadband than do Whites, on average. Accordingly, a *prima facie* case of disparate impact for "digital discrimination of access" is unlikely to be empirically supported on racial grounds.

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\* Chief Economist, Phoenix Center for Advanced Legal & Economic Public Policy Studies.

† President, Phoenix Center for Advanced Legal & Economic Public Policy Studies. The views expressed in this paper are the authors' alone and do not represent the views of the Phoenix Center or its staff.

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## **I. Introduction**

Ubiquitous broadband deployment has been a federal goal since the enactment of Telecommunications Act of 1996.<sup>1</sup> Billions have been spent to achieve it, yet the availability gap persists. In an attempt to close this gap once and for all, the Infrastructure Investment and Jobs Act of 2021 (“Infrastructure Act”) allocated, among other funds, \$42.5 billion to create the Broadband Equity Access and Deployment (“BEAD”) program, and the federal government has begun sending those funds to state agencies in charge of allocating the funds to unserved and underserved areas. Despite appropriating sufficient funding to ensure (near) universal availability,<sup>2</sup> the Infrastructure Act also includes Section 60506—labeled “Digital Discrimination”—which requires the Federal Communications Commission (“FCC”) to “take steps to ensure that all people of the United States benefit from equal access to broadband internet access service” and to issue rules to prevent “digital discrimination of access based on income level, race, ethnicity, color, religion, or national origin,” all while taking into account the issues of “technical and economic feasibility.”<sup>3</sup> With Congress spending billions for the ostensible purpose of ensuring (near) universal availability in the Infrastructure Act, including a provision in the same statute to ensure equal broadband

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<sup>1</sup> See 47 U.S.C. § 1302(a) (“The Commission ... shall encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans....”)

<sup>2</sup> George S. Ford, PHOENIX CENTER POLICY PERSPECTIVE NO. 21-05, *A Quality Check on Form 477 Data: Errors, Subsidies, and Econometrics* (October 27, 2021) at Table 5 (available at: <https://www.phoenix-center.org/perspectives/Perspective21-05Final.pdf>).

<sup>3</sup> Infrastructure Investment and Jobs Act § 60506, codified at 47 U.S.C. § 1754.

availability among particular groups seems redundant.<sup>4</sup> Nonetheless, Section 60506 is now law and the Commission must develop rules to implement the Act.<sup>5</sup>

In anticipation of its November 2023 Open Meeting, on October 25, 2023, the Commission posted a draft copy of its final order implementing Section 60506.<sup>6</sup> In its *Draft Order*, the FCC defines “digital discrimination of access” for purposes of this proceeding as:

Policies or practices, not justified by genuine issues of technical or economic feasibility, that (1) differentially impact consumers’ access to broadband internet access service based on their income level, race, ethnicity, color, religion or national origin or (2) are intended to have such differential impact.<sup>7</sup>

According to the Commission, this definition will “achieve [Section 60506’s] equal access purposes, the legal standard must address not only business conduct motivated by discriminatory intent, but also business conduct having discriminatory effects.”<sup>8</sup>

The Commission concedes that it does “not expect to encounter many instances of intentional discrimination with respect to deployment and network upgrades, as there is little or no evidence [it],” so digital discrimination will be largely evaluated using the disparate impact analysis where deployment policies and practices inadvertently lead to different treatment.<sup>9</sup> As such, the purpose of this POLICY PAPER is to review the legal framework for disparate impact analysis and then—pursuant to the Commission’s direct instructions in the *Draft Order*<sup>10</sup>—

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<sup>4</sup> C.f., Lawrence J. Spiwak, *Race and Reckoning Come to the Broadband Debate*, Federalist Society Blog (February 22, 2023) (available at: <https://fedsoc.org/commentary/fedsoc-blog/race-and-reckoning-come-to-the-broadband-debate>).

<sup>5</sup> 47 U.S.C. § 1754(b).

<sup>6</sup> *In the Matter of Implementing the Infrastructure Investment and Jobs Act: Prevention and Elimination of Digital Discrimination*, FCC-CIRC2311-01, REPORT AND ORDER AND FURTHER NOTICE OF PROPOSED RULEMAKING (available at: <https://docs.fcc.gov/public/attachments/DOC-397997A1.pdf>) (hereinafter “*Draft Order*”).

<sup>7</sup> *Id.* at ¶ 33.

<sup>8</sup> *Id.* at ¶ 34.

<sup>9</sup> *Id.* at ¶ 38.

<sup>10</sup> *Id.* at ¶¶ 166-67

to conduct an empirical investigation of the sort traditionally demanded by the courts to support a *prima facie* case of disparate impact using the Commission's new broadband fabric data.<sup>11</sup>

Our methods follow that of an earlier paper by Beard and Ford (2022) that studied fiber deployment and download speeds between minority and white groups, and across income levels, using Form 477 data from 2020.<sup>12</sup> Accounting for economic and technical constraints, Beard and Ford (2022) found no disparity in deployment or speeds along either the racial or income dimensions. We find comparable results for racial discrimination using the more recent deployment data from the broadband fabric. Ignoring technical and economic considerations, minority areas have better access to broadband and are served by more providers, a type of digital discrimination since access is not equal across race. Yet, when accounting for such economic and technical factors using multivariate regression and matching methods, there is no difference in broadband access, or in the number of providers, along the racial dimension. Thus, the traditional threshold question of a *prima facie* case is absent, at least along racial dimensions.<sup>13</sup> We ignore income discrimination since Beard and Ford (2022) demonstrate the difficulty in separating income from economic considerations.

## II. The *Prima Facie* Case for Disparate Impact

In evaluating disparate impact, the Supreme Court has set forth a three-step process.<sup>14</sup> First, a complainant must make a *prima facie* showing of disparate impact. To establish a *prima facie* case, a complainant "has the burden of proving that a challenged practice caused or predictably will cause a discriminatory

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<sup>11</sup> Data available at: <https://broadbandmap.fcc.gov/home>.

<sup>12</sup> T. Randolph Beard and George S. Ford, *Digital Discrimination: Fiber Availability and Speeds by Race and Income*, PHOENIX CENTER POLICY PAPER NO. 58 (September 2022) (available at: <https://phoenix-center.org/pcpp/PCPP58Final.pdf>).

<sup>13</sup> Interestingly, the FCC's *Draft Order* makes no mention of a *prima facie* requirement as part of the Agency's disparate impact inquiry, although it will require complainants to satisfy a "robust causality" test to "require that any determination of liability under our rules that is founded on statistical disparity must include a determination that the disparity is caused by a specific policy or practice of the covered entity under investigation." *Draft Order*, *supra* n. 6 at ¶ 49. Whether the Commission's departure from established disparate impact nomenclature will survive judicial scrutiny we leave to the courts to decide.

<sup>14</sup> The procedure is detailed in *Title VI Legal Manual (Updated)*, Section VII-Proving Discrimination-Disparate Impact, U.S. Department of Justice, Civil Rights Division (undated) (available at: <https://www.justice.gov/crt/fcs/T6manual>).

effect.”<sup>15</sup> If a statistical discrepancy is absent or else caused by factors other than the defendant’s policy, a plaintiff cannot establish a *prima facie* case, and there is no liability. That is, any observed difference in treatment must be causally connected to a particular policy or practice. Second, after a complainant establishes a *prima facie* showing of disparate impact, the burden shifts to the defendant to “prov[e] that the challenged practice is necessary to achieve one or more substantial, legitimate, nondiscriminatory interests.”<sup>16</sup> If a defendant has satisfied its burden at step two, then there is no disparate impact, though a complainant may “prevail upon proving that the substantial, legitimate, nondiscriminatory interests supporting the challenged practice could be served by another practice that has a less discriminatory effect.”<sup>17</sup> The Commission’s *Draft Order* largely adheres to this process (and its *Notice of Proposed Rulemaking* described this very process).<sup>18</sup>

So we return to the threshold question: what evidence is necessary to establish a *prima facie* case of disparate impact?<sup>19</sup> First, the plaintiff must identify a specific policy or practice that causes “a significantly discriminatory impact.”<sup>20</sup> It is inadequate merely to observe differential treatment—that difference must be linked to a particular policy or practice. In the case of broadband deployment, network operators choose to service areas where the expected returns are sufficient to cover the cost of capital; markets with non-negative returns are

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<sup>15</sup> *Texas Dep’t of Housing. & Community Affairs v. Inclusive Communities Project, Inc.*, 576 U.S. 519, 537 (2015) (citing *Griggs v. Duke Power Co.*, 401 U.S. 424, 527 (1971) (citations omitted)).

<sup>16</sup> *Id.*

<sup>17</sup> *Id.*

<sup>18</sup> *Draft Order*, *supra* n. 6 at ¶¶ 49-50, *In the Matter of Implementing the Infrastructure Investment and Jobs Act: Prevention and Elimination of Digital Discrimination*, FCC 22-98, NOTICE OF PROPOSED RULEMAKING, \_\_ FCC Rcd. \_\_ (rel. December 22, 2022) at ¶ 62.

<sup>19</sup> For a further discussion about what constitutes a *prima facie* case, see, e.g., R.G. Schwemm and C. Bradford, *Proving Disparate Impact in Fair Housing Cases After Inclusive Communities*, 19 LEGISLATION AND PUBLIC POLICY 685 (2016) (available at: <https://nyujlpp.org/wp-content/uploads/2016/12/Proving-Disparate-Impact-in-Fair-Housing-Cases-After-Inclusive-Communities-19nyujlpp685.pdf>); G. Rutherglen, *Disparate Impact Under Title VII: An Objective Theory of Discrimination*, 73 VIRGINIA LAW REVIEW 1297-1345 (1987); Title VI Legal Manual: Section VII (undated), U.S. Department of Justice: Civil Rights Division, *supra* n. 14.

<sup>20</sup> See, e.g., *Connecticut v. Teal*, 457 U.S. 440, 446 (1982).

served, the others are not absent a subsidy.<sup>21</sup> Profit-loss calculations are both legitimate business practices and presumably neutral to race or income (no “intent”), though there may be a correlation between the traits of a protected class and relevant economic and technical factors. For instance, demand and income are positively correlated, so low-income areas are expected to provide lower and perhaps negative profits. Notably, the “policy” or “practice” cannot be mere profit maximization — as some advocates have proposed<sup>22</sup> — because profit maximization is a legitimate economic objective. As the Supreme Court stated in *Texas Dep’t of Housing. & Community Affairs v. Inclusive Communities Project, Inc.*, “[d]isparate-impact liability mandates the ‘removal of artificial, arbitrary, and unnecessary barriers,’ not the displacement of valid [] policies.”<sup>23</sup> Serving a high-demand, low-cost area more fully than a low-demand, high-cost area is an entirely legitimate business practice,<sup>24</sup> and the Commission has explicitly recognized this principle in the past.<sup>25</sup>

Second, once a particular policy or practice is identified, the plaintiff must establish a *causal relationship* between the policy or practice and the disparate impact. A mere statistical difference in outcomes across minority and majority groups is inadequate — the plaintiff must establish a *direct causal link* between a

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<sup>21</sup> T.R. Beard, G.S. Ford, L.J. Spiwak, and M. Stern, *The Law and Economics of Municipal Broadband*, 73 FEDERAL COMMUNICATIONS LAW JOURNAL 1 (2021) (available at: [http://www.fclj.org/wp-content/uploads/2021/01/73.1.1\\_Municipal-Broadband-Article-Final-Proof.pdf](http://www.fclj.org/wp-content/uploads/2021/01/73.1.1_Municipal-Broadband-Article-Final-Proof.pdf)).

<sup>22</sup> See, e.g., Comments of the Electronic Frontier Foundation, *et al.*, FCC Docket No. 22-69 at p. 15 (“A driving factor of digital discrimination is the three-to-five year return-on-investment (ROI) formulas that major ISPs follow when determining where to invest fiber. \*\*\* This short time frame [] is discriminatory towards lower income households...” (available at: <https://files.fcc.gov/ecfs/download/4b496fda-d216-46f3-ac5ffe6b1739adb4?orig=true&pk=cb77b2ec-1a58-dbc6-139b-ad192cfd5d9b>)).

<sup>23</sup> *Inclusive Communities*, *supra* n. 15, 576 U.S. at 537 (2015) (citing *Griggs v. Duke Power Co.*, 401 U.S. 424, 431 (1971)).

<sup>24</sup> See, e.g., *Bryan v. Koch*, 492 F. Supp. 212, 239 (S.D.N.Y.); *aff’d*, 627 F.2d 612 (2<sup>nd</sup> Cir. 1980) (“reducing expenditures and increasing efficiency” are “legitimate objectives”); *Oviedo Town Center II, LLLP v. City of Oviedo*, 759 Fed Appx. 828, 839 (11<sup>th</sup> Cir. 2018) (“capital recovery” is a legitimate concern).

<sup>25</sup> *In the Matter of Implementation of Section 621(a)(1) of the Cable Communications Policy Act of 1984 as amended by the Cable Television Consumer Protection and Competition Act of 1992*, FCC 06-180, REPORT AND ORDER AND FURTHER NOTICE OF PROPOSED RULEMAKING, 22 FCC Rcd. 5101 (rel. Mar. 5, 2007), *aff’d*, *Alliance for Cmty. Media v. FCC*, 529 F.3d 763 (6<sup>th</sup> Cir. 2008).

particular policy and that *observed* statistical difference in treatment.<sup>26</sup> As the Supreme Court held in *Inclusive Communities*, a plaintiff who fails to “produce statistical evidence demonstrating a causal connection cannot make out a *prima facie* case of disparate impact.”<sup>27</sup> This “robust causality requirement ensures that ‘[r]acial imbalance . . . does not, without more, establish a *prima facie* case of disparate impact’ and thus protects defendants from being held liable for racial disparities they did not create.”<sup>28</sup> The *Draft Order* echoes these two requirements, stating,

... we will require that any determination of differential impact that relies on observed disparity must point to a specific policy or practice that is causing the disparity. A “robust causality requirement” ensures that any statistical imbalance does not alone establish liability and thus protects covered entities “from being held liable for . . . disparities they did not create.” We therefore require that any determination of liability under our rules that is founded on statistical disparity must include a determination that the disparity is caused by a specific policy or practice of the covered entity under investigation.<sup>29</sup>

Also, pursuant to the explicit language of Section 60506, the Commission must also explicitly consider economic and technical factors in its analysis, which the Commission acknowledges throughout the *Draft Order*.<sup>30</sup>

This linkage of a disparity to a policy or practice is important. For instance, an observed disparity in broadband access in a particular area is insufficient evidence

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<sup>26</sup> *Inclusive Communities*, *supra* n. 15, 576 U.S. at 543. See also J.D. Rich, *The Robust Causality Requirement in Disparate Impact Claims Under the Fair Housing Act*, CIVIL RIGHTS INSIDER (2018) (available at: [https://nationalfairhousing.org/wp-content/uploads/2018/07/Robust-Causality-Requirement.Jan.\\_2018.pdf](https://nationalfairhousing.org/wp-content/uploads/2018/07/Robust-Causality-Requirement.Jan._2018.pdf)); *City of Los Angeles v. Well Fargo & Co*, 691 Fed Appx 453 (9th Cir 2017); *City of Los Angeles v. Bank of America Corp.* 691 Fed Appx. 464 (9th Cir. 2017); see also, *Cobb County v. Bank of America Corp.*, 183 F Supp. 3d 1332 (N.D. Ga. 2016).

<sup>27</sup> Also see, e.g., *Hallmark Developers, Inc. v. Fulton Cty.*, 466 F.3d 1276 (11th Cir. 2006); *Huntington Branch, NAACP v. Town of Huntington*, 844 F.2d 926 (2d Cir. 1988).

<sup>28</sup> *Inclusive Communities*, *supra* n. 15, 576 U.S. at 538.

<sup>29</sup> *Draft Order*, *supra* n. 6 at ¶ 49 (citations omitted).

<sup>30</sup> *Id.*



to support the *prima facie* case. As the Supreme Court further observed in *Inclusive Communities*,

... a plaintiff challenging the decision of a private developer to construct a new building in one location rather than another will not easily be able to show this is a policy causing a disparate impact because such a one-time decision may not be a policy at all.<sup>31</sup>

Indeed, a disparity in broadband access in a single area may simply reflect systematic or idiosyncratic (and perhaps unmeasurable) technical and economic factors—such as demand differences, high pole attachment rates, rights-of-way issues, local government-subsidized broadband networks, distance from a wire center, extremely hard soil, environmentally protected zones, among other considerations—that operate as an impediment to deployment.<sup>32</sup>

A policy or practice, in contrast, will appear as *systematic* differences in access across the entire footprint of a provider for which a uniform set of policies and practices apply. As the Eleventh Circuit observed in *City of Oviedo* where the closing of a public housing facility was challenged,

[t]his kind of citywide comparative analysis would be necessary because, since the policy impacts the whole city, the whole city would need to be evaluated before we could determine that the claimed impact might have disparately fallen on certain insular groups.<sup>33</sup>

In *City of Oviedo*, the policy was that of the city government, whereas for broadband deployment the policy is of a broadband provider. Thus, the area relevant to any disparate impact analysis is the *entire footprint* of the broadband provider over which some uniform set of deployment policies and practices are applied (which are likely to be developed at the corporate level in many cases).<sup>34</sup>

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<sup>31</sup> *Inclusive Communities*, *supra* n. 15, 576 U.S. at 543.

<sup>32</sup> Beard, *et al.*, *The Law and Economics of Municipal Broadband*, *supra* n. 21.

<sup>33</sup> *City of Oviedo*, *supra* n. 24, 759 Fed Appx. At 836.

<sup>34</sup> Such a conclusion is supported by the plain text of Section 60506, which provides that subscribers should benefit from equal access to broadband internet access service *within the service area of a provider of such service*." See Section 60506(a)(1) (emphasis supplied), 47 U.S.C. § 1754(a)(1).

Third, it is not enough that the policy or practice leads to the differential treatment of a protected class; the plaintiff must identify a material harm from the policy or practice, which includes an analysis of alternative sources of broadband access. In *Bryan v. Koch*, for instance, the question at bar was whether a disparate impact occurred when New York City closed a hospital that predominantly served a minority population.<sup>35</sup> As part of the analysis of the *prima facie* case, the ability of affected minorities to obtain services without much inconvenience from a nearby hospital was a relevant question. While the Second Circuit decided the evidence of alternatives was inadequate in this particular case, the court did not reject the argument that alternative sources of service are an important factor. Likewise, in *City of Oviedo*, the Eleventh Circuit confirmed a district court opinion that a disparate-impact claim regarding the closing of public housing failed to make a *prima facie* case because public housing was available elsewhere in the city.<sup>36</sup> In the broadband marketplace, such logic suggests that there is no disparate impact in an area so long as there is at least one provider offering adequate broadband service at market rates and terms, since there is no harm if broadband is available. Thus, caselaw suggests that the relevant empirical question is whether a protected class has access to broadband from any provider on average market terms, not whether any specific provider provides access.<sup>37</sup> Such logic is supported by economic feasibility, since the presence of a provider in a marginal area may discourage additional entry.<sup>38</sup> If a subsidy is required to serve a particular area, then it is certainly infeasible for an additional provider to serve that area without a subsidy.<sup>39</sup> Plainly, any subsidized area should fall into a safe harbor against a digital discrimination claim.

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<sup>35</sup> *Bryan v. Koch*, 627 F.2d 612 (2<sup>nd</sup> Cir. 1980).

<sup>36</sup> *City of Oviedo*, *supra* n. 24.

<sup>37</sup> The Commission appeared to recognize this important point in the *Notice of Proposed Rulemaking* it issued in this docket. See *NPRM*, *supra* n. 18 at ¶ 45 (“For example, does the availability of a comparable service where another service is unavailable mean that a consumer “benefit[s] from equal access” in a given area? Should the availability of one service utilizing a different technology, such as 5G wireless service versus traditional wireline service, impact the analysis where the other is otherwise incomparable or unavailable?”)

<sup>38</sup> See, e.g., J. Sutton, SUNK COSTS AND MARKET STRUCTURE (1991); G.S. Ford, T.M. Koutsky and J. Spiwak, *Competition After Unbundling: Entry, Industry Structure and Convergence*, 59 FEDERAL COMMUNICATIONS LAW JOURNAL 331 (2007); *In the Matter of Rural Digital Opportunity Fund, Connect America Fund*, REPORT AND ORDER, FCC 20-5 (rel. February 7, 2020) (available at: <https://docs.fcc.gov/public/attachments/FCC-20-5A1.pdf>).

<sup>39</sup> Beard, *et al.*, *The Law and Economics of Municipal Broadband*, *supra* n. 21.

Fourth, to support a remedy, the plaintiff must identify an alternative and preferred policy or practice to substitute for the offensive one. Such alternatives must be “equally effective in achieving petitioners’ legitimate employment goals in light of the alternatives’ costs and other burdens.”<sup>40</sup> Thus, the alternative must be a reasonable one and consider the legitimate business goals of the defendant. Absent a reasonable alternative, a *prima facie* case is not made. Under this logic, a complainant must therefore not only identify a problematic policy or practice that has no legitimate technical and economic foundation but also offer a reasonable alternative that respects technical and economic factors.

Due to these considerations, among others, establishing a *prima facie* case of disparate impact is not a trivial endeavor. An empirical review of the caselaw bears this out: since 2018, decisions favored the defendant at a 4-to-1 ratio.<sup>41</sup> By extension, a disparate impact claim for “digital discrimination of access” is difficult to support, though the *Draft Order* makes a claim easy to levy and requires more than a mere difference in access to broadband for protected classes.

### III. A Conceptual Model

From an empirical perspective, the task is to determine whether protected classes have an *equal opportunity to subscribe* to an offered service that provides comparable speeds, capacities, latency, and other quality of service metrics for comparable terms and conditions considering technical and economic considerations. We follow the basic framework of Beard and Ford (2022) to formulate an empirical model.

The demand for service in area  $i$  is  $D(X_i, r_i)$  and the cost of providing service is  $C(Z_i, r_i)$ , where  $X_i$  are demand drivers,  $Z_i$  are cost factors, and  $r_i \in [0,1]$  indicates membership in a protected class for the neighborhood in question, where for example  $r_i = 1$  represents an area with an entirely Minority population. Provider profit from offering service in the neighborhood is written as:

$$\pi(D(X_i, r_i), C_i(Z_i, r_i)). \quad (2)$$

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<sup>40</sup> *Wards Cove Packing Co. v. Atonio*, 490 U.S. 642 (1989).

<sup>41</sup> D.L. Callies and D.B. Simon, *Fair Housing and Discrimination After Inclusive Communities*, 33 PROBATE & PROPERTY 43-48 (May/June 2019) (available at: [https://www.americanbar.org/groups/real\\_property\\_trust\\_estate/publications/probate-property-magazine/2019/may-june/fair-housing-and-discrimination-after-inclusive-communities](https://www.americanbar.org/groups/real_property_trust_estate/publications/probate-property-magazine/2019/may-june/fair-housing-and-discrimination-after-inclusive-communities)).

The outcome of interest is whether broadband service is available at area  $i$ . Denote the probability that area  $i$  has broadband as  $Y_i$ , where:

$$Y_i = Y_i\left(\pi(D(X_i, r_i), C_i(Z_i, r_i)), r_i^*\right), \quad (3)$$

where  $r_i^* \in \{0, 1\}$  indicates the predominance of a protected class, *i.e.*,  $r_i^* = 1$  if and only if  $r_i > r_0$ , where  $r_0$  is the relevant cutoff for, say, Minority presence. Given this formulation, one can say that discrimination is occurring when:

$$Y_i\left(\pi(D(X_i, r_i), C_i(Z_i, r_i)), r_i^* = 1\right) < Y_i\left(\pi(D(X_i, r_i), C_i(Z_i, r_i)), r_i^* = 0\right). \quad (4)$$

An important element of this test is that  $r_i$  enters Expression (4) in three ways. First, the implied test for discrimination is based on  $r_i$  via  $r_i^*$ . Second,  $r_i$  enters the demand function directly. A failure to account for  $r_i$  in the demand function leads to a biased measure of discrimination, which is important since minorities households have, on average, a lower adoption rate for fixed broadband in the home (a positive bias). Third,  $r_i$  enters the cost function. Minorities tend to live in urban areas where costs are typically lower than in less-populated areas, and such cost differences need to be considered in the analysis to avoid a biased measure of discrimination (a negative bias). Our empirical approach aims to account for demand and cost differences, thereby addressing this misspecification and eliminating (or attenuating) bias in the measure of Digital Discrimination.

Given the requirements for a *prima facie* case of disparate impact, the most sensible comparison is the availability rate for all providers collectively between predominantly minority and predominantly white areas. Following the precedent of *Bryan v. Koch, supra*, the presence of any broadband provider offering acceptable services at market terms and conditions is all that is required; there is no harm if service is available. The analysis, therefore, cannot focus on a single provider or a single area, since the presence of another provider implies the affected group has a suitable alternative and a single area need not reflect corporate practices or policy. Also, the presence of a provider in an area may discourage additional entry due to the lack of profitability from sharing a market.

We note that the caselaw seems at odds with the *Draft Order's* peculiar (and unclear) definition of economic and technical feasibility.<sup>42</sup> The FCC's proffered definition of "technical feasibility" is a "a policy or practice" that is "reasonably

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<sup>42</sup> *Draft Order, supra* n. 6 at ¶ 66.

achievable as evidenced by prior success by covered entities under similar circumstances or demonstrated technological advances clearly indicating that the policy or practice in question may reasonably be adopted, implemented, and utilized,” and the FCC’s proffered definition of “economic feasibility” is a “policy or practice” that is “reasonably achievable as evidenced by prior success by covered entities under similar circumstances or demonstrated new economic conditions clearly indicating that the policy or practice in question may reasonably be adopted, implemented, and utilized.”<sup>43</sup>

The Commission’s definitions, which are unclear at best, appear to conflate economic and technical conditions with policy or practices. For example, a firm may require job applicants to be tested based on their reaction times and the results affect hiring or promotion decisions. Such a policy might discriminate against older workers.<sup>44</sup> If fast reaction times are unnecessary, then a disparate impact exists. Here, the policy or practice is the reaction-time test and the economic condition is the age distribution of the applicant pool. For broadband services, policies and practices are the rules or algorithms that make up the deployment calculus (or profit-loss assessment). These algorithms translate exogenous technical and economic conditions into deployment decisions. A disparate impact may arise when such algorithms inadvertently and unnecessarily lead to deployment differences for a protected class. The *Draft Order*’s definition of these terms confuses technical and economic conditions with the policy and practices that translate these conditions into action—disparate impact focuses on the policies and practices, while the conditions determine whether such policies and practices are reasonable.

#### IV. Data

Broadband deployment and provider count data are constructed data from the FCC’s broadband map based on the location fabric for December 2022.<sup>45</sup> Only data for fixed-line services are included in this analysis: cable, fiber, and copper. Data for the Geosynchronous Orbit Satellite (“GSO”) providers, which the Commission indicates have 100% coverage, are used to identify all locations. While these

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<sup>43</sup> *Draft Order*, *supra* n. 6 at ¶ 66.

<sup>44</sup> This example is borrowed from: *What Is The Difference Between Disparate Impact and Disparate Treatment Discrimination?* Raynes & Lawn Trial Lawyers (October 19, 2020) (available at: <https://rayneslaw.com/what-is-the-difference-between-disparate-impact-and-disparate-treatment-discrimination>).

<sup>45</sup> *Supra* n. 11.

broadband data are location specific, they must be aggregated to the census block group level to join with demographic data.<sup>46</sup> At the block group level, broadband availability,  $B$ , is a share of locations with broadband service available from any fixed-line provider at a specific download/upload speed threshold. Three speed levels are considered: 100/20 Mbps, 500/50 Mbps, and 900/100 Mbps. The last group is defined at the 900/100 level rather than the typical 1000/100 Mbps level since some broadband providers indicate speeds between 900 and 1000 Mbps and those speed levels are functionally equivalent and reflect reporting choices more than service-level differences. The provider count variable,  $N$ , is the most frequently observed number of providers (the mode) at locations within the block group.<sup>47</sup> The availability variable  $B$  is on the unit interval while the provider count  $N$  is an integer count variable.

Demographic data are drawn from Safegraph's Open Data files, which are derived from the Census Bureau's American Community Survey ("ACS"). Additional census data are obtained from the Missouri Census Data Center including a crosswalk of 2010 to 2020 census block groups. This crosswalk is used to merge CostQuest's estimate of deployment costs, which is based on 2010 cartography, to the 2020 census cartography in the new broadband data.<sup>48</sup>

## V. Empirical Strategy

Our empirical strategy consists of several steps. First, we define predominance groups along the racial dimension so that broadband access can be compared between predominately minority and white areas. Second, we address economic feasibility by constructing demand and cost variables using factor analysis. Third, we use a matching method to ensure that the distributions of demand and cost are similar between the predominance groups. Fourth, we use the matched data to quantify any significantly discriminatory impact that may exist using regression analysis.

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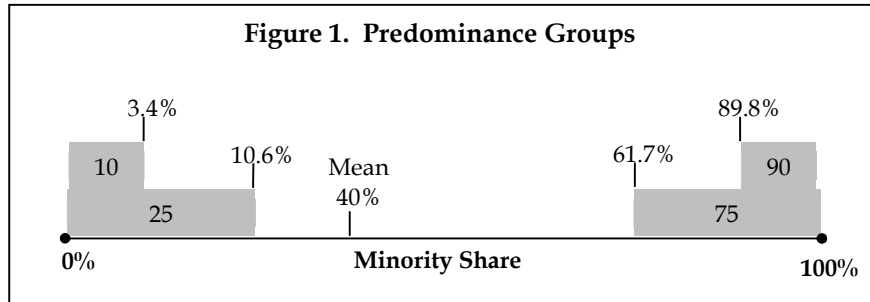
<sup>46</sup> Mixing data of different aggregation levels risks biased coefficients. See, e.g., G. S. Ford, *Challenges In Using The National Broadband Map's Data*, PHOENIX CENTER POLICY BULLETIN No. 27 (March 2011) (available at: <https://www.phoenix-center.org/PolicyBulletin/PCPB27Final.pdf>).

<sup>47</sup> In the case of a tie, the maximum mode is chosen. Choosing the minimum mode or the mean number of providers has almost no effect on the statistical results.

<sup>48</sup> G.S. Ford, *Quantifying the Overstatement in Broadband Availability from the Form 477 Data: An Econometric Approach*, PHOENIX CENTER POLICY PERSPECTIVE No. 19-03 (July 11, 2019) (available at: <https://www.phoenix-center.org/perspectives/Perspective19-03Final.pdf>).

### A. Predominance Groups

The minority population share variable is the sum of the population shares of all non-white persons, which has a mean of about 40%. To create a strong contrast along the race dimension, two predominance groups are created with cutoffs based on quartiles and deciles: (1) the first and fourth quartile of the minority share variable (less than 10.6% white and more than 61.7% minority); and (2) the first and tenth decile of the minority share variable (less than 3.4% white and more than 89.8% minority). The samples are labeled 25:75 and 10:90. The predominance groups are illustrated in Figure 1. Defining the groups in this way creates minority and white samples of approximately equal size. Any block group with middling minority shares are excluded from the analysis.



The full sample—excluding Alaska and Hawaii and missing data—is 235,626 census block groups representing 112.7 million locations. The quartile sample includes 114,495 block groups (and half the sample locations and population) and the decile sample includes 45,775 block groups (and 20% of the sample locations and population).

### B. Economic and Technical Considerations

Based on the conceptual framework, the goal is to compare areas with similar demand and costs (and thus profit). Technical considerations are largely cost based, so are the near equivalent of economic considerations. On average, predominantly minority communities are unlike predominantly white communities in many dimensions. Minorities, for instance, tend to live in areas with higher population density and thus lower costs, and minorities have a lower adoption rate for fixed broadband services.<sup>49</sup> Following Beard and Ford (2022),

<sup>49</sup> Beard and Ford (2022), *supra* n. 12; G.S. Ford, *Race and Broadband Adoption: A Decomposition Analysis*, PHOENIX CENTER POLICY BULLETIN No. 52 (May 2021) (available at: <https://www.phoenix-center.org/PolicyBulletin/PCPB52Final.pdf>). .

factor analysis is used to construct demand and cost variables. For demand, the factor ( $D$ ) is based on the share of households subscribing to fixed broadband service, the share of households subscribing to mobile broadband service, the share of persons with a tertiary education, and the share of households with a computer. Since subscriptions to broadband service is affected by availability, the demand factor is created using a sample where broadband is available (at the 10 Mbps level or higher) to at least 80% of households. A single factor is indicated, and the Kaiser-Meyer-Olkin value is 0.811, which is considered “meritorious.”<sup>50</sup> For the cost factor ( $C$ ), the variables include two cost groups from the CostQuest data, a rural indicator variable, the share of the population in a block group that lives in a census place, and the natural log of population density. Again, a single factor is indicated, and the Kaiser-Meyer-Olkin value is 0.857. To interpret the coefficients on these factors, larger values of the factors are set to indicate higher demand and higher costs.

### C. A Matched Sample

The means and variances of  $D$  and  $C$  are materially different between the two groups. Table 1 summarizes the Standardized Differences and Variance Ratios for the unmatched samples. For all three variables, the Standardized Differences are quite large (0.25 is considered “large”) and the Variance Ratios are often far from 1.0.<sup>51</sup> Minority areas tend to have lower demand and lower costs, and these differences are sufficiently large to cause concern for regression analysis.<sup>52</sup> Clearly, the technical and economic feasibility differs between the two groups, and this must be accounted for in the analysis.

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<sup>50</sup> A description of the statistic is provided in *Kaiser-Meyer-Olkin (KMO) Test for Sampling Adequacy*, Statistics How To (last visited September 20, 2023) (available at: <https://www.statisticshowto.com/kaiser-meyer-olkin>).

<sup>51</sup> G.W. Imbens and J.M. Wooldridge, *Recent Developments in the Econometrics of Program Evaluation*, 47 JOURNAL OF ECONOMIC LITERATURE 5–86 (2009).

<sup>52</sup> See, e.g., S.M. Iacus, G. King, and G. Porro, *A Theory of Statistical Inference for Matching Methods in Causal Research*, 27 POLITICAL ANALYSIS 46–68 (2019).



**Table 1. Standardized Differences Between Groups**

	Unbalanced Sample				Balanced Sample	
	Minority	White	Stan. Diff.	Variance Ratio	Stan. Diff.	Variance Ratio
25:75						
<i>D</i>	-0.635	-0.150	0.44	1.42	0.00	1.00
<i>C</i>	-0.536	0.758	1.36	0.30	0.00	1.00
Locations	362.0	564.1	0.81	0.85	0.00	1.00
10:90						
<i>D</i>	-1.035	-0.324	0.65	1.29	0.00	1.00
<i>C</i>	-0.634	0.998	1.79	0.22	0.00	1.00
Locations	321.2	551.5	1.01	0.63	0.00	1.00

To compare areas with similar demand and costs, matching is conducted using Entropy Balancing where control units are matched to treated units based on *D*, *C*, and market size as measured by the number of locations in the block group.<sup>53</sup> In the matched sample, the Standardized Differences are zero and the Variance Ratios are 1.0. The means of the minority group in the matched sample are identical to the unmatched sample, and the means for the white group in the matched sample are nearly identical to the means for the minority sample. The balancing approach creates block group weights which are used in weighted regression.

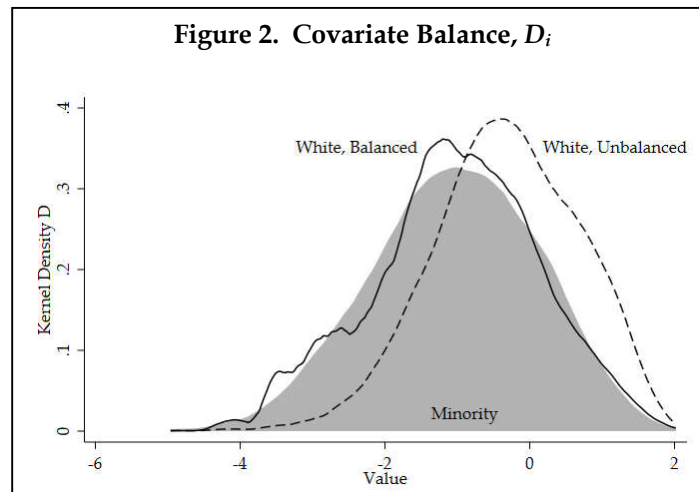


Figure 2 illustrates the distributions of the demand factor ( $D_i$ ) for the 10:90 grouping. The shaded area is the distribution for the minority group. The dashed

<sup>53</sup> J. Hainmueller, *Entropy Balancing: A Multivariate Reweighting Method to Produce Balanced Samples in Observational Studies*, 20 POLITICAL ANALYSIS 25-46 (2012).

line outlines the distribution for the white group prior to balancing, where the two distributions are unlike and the Standardized Difference is 0.65, which is well above the 0.25 threshold of “large.” The solid line is the matched distribution, which is almost identical to the distribution for the minority group (a Standardized Difference near zero). The matching algorithm works as intended.

#### D. Model Specification

Broadband availability is bound on the unit interval, so the model is estimated by Fractional Regression (“FR”) with a Logit link. As the number of providers is a count variable, the provider-count model is estimated by Poisson Regression (“PR”). The general specification of the regression model is,

$$Y_i = \delta M_i + \beta_0 + \beta_1 D_i + \beta_2 C_i + \varepsilon_i, \quad (5)$$

where  $Y_i$  measures either broadband availability or the number of providers,  $M_i$  is an indicator for a predominately minority census block group, and  $\varepsilon_i$  is an econometric disturbance term. The  $\delta$  coefficient is of primary interest and measures the means difference between the minority and white groups. The  $\beta_1$  coefficient is expected to be positive while the  $\beta_2$  coefficient should be negative. Since the coefficients of these models are not directly interpretable, the average marginal effects (“AME”) are provided in their place, where these effects are interpreted in the same manner as Least Squares Regression. For instance, a coefficient of 0.01 on the  $M$  variable indicates broadband availability is higher in minority block groups by one percentage point. Standard errors are clustered at the state level.

## VI. Results

Table 2 summarizes the location-weighted means of broadband availability and provider count for the predominance groups across the speed thresholds. For all speed levels and predominance groups, the predominantly minority areas have higher availability and more providers. At first glance, therefore, it appears that minority groups have better broadband access options than do whites, suggesting differential treatment in race. These differences are in part due to the urban-rural differences between the groups, where minorities tend to live in more urban areas where costs are typically lower. However, these unconditional means from an unmatched sample are biased measures of the differences in that ignore economic and technical feasibility. The differences do suggest, however, that the technical and economic feasibility requirements of Section 60506 will not understate differences in access between minorities and whites.

**Table 2. Mean Availability and Provider Count, Unmatched Sample**

	100/20 Mbps [25:75]	100/20 Mbps [10:90]	500/50 Mbps [25:75]	500/50 Mbps [10:90]	900/100 Mbps [25:75]	900/100 Mbps [10:90]
<b>Availability</b>						
White	0.798	0.760	0.413	0.378	0.347	0.314
Minority	0.949	0.963	0.537	0.550	0.507	0.528
<b>Providers</b>						
White	1.149	1.044	0.482	0.431	0.376	0.331
Minority	1.590	1.643	0.686	0.722	0.629	0.681
Obs.	117,811	47,127	117,811	47,127	117,811	47,127

Turning to the regression results, the estimates for broadband availability are summarized in Table 3 for three broadband service speed levels and the two predominance groups (six models). All six regression models are statistically significant and the signs on the *D* and *C* variables are as expected, both being statistically different from zero at the 5% level or better in all models. The deployment of broadband services appears consistent with rational business decisions.

**Table 3. Broadband Availability**

	100/20 Mbps [25:75]	100/20 Mbps [10:90]	500/50 Mbps [25:75]	500/50 Mbps [10:90]	900/100 Mbps [25:75]	900/100 Mbps [10:90]
<i>M</i>	-0.0111 (-0.78)	0.0033 (0.15)	-0.0193 (-0.52)	-0.0140 (-0.29)	0.0187 (0.66)	0.0278 (0.79)
<i>D</i>	0.041*** (3.81)	0.050** (3.96)	0.038*** (4.25)	0.037** (3.75)	0.039*** (5.49)	0.033*** (4.31)
<i>C</i>	-0.123*** (-10.14)	-0.134*** (-9.46)	-0.125*** (-10.19)	-0.139*** (-8.77)	-0.138*** (-10.80)	-0.151*** (-9.38)
Obs.	114,495	45,775	114,495	45,775	114,495	45,775
$\chi^2$	621***	207***	111***	61***	115**	54***
Pred. Mean						
White	0.854	0.830	0.445	0.405	0.368	0.323
Minority	0.842	0.833	0.425	0.391	0.386	0.351

Stat. Sig. \*\*\* 1% \*\* 5% \* 10%

Turning the coefficient of primary interest, the  $\delta$  coefficients on the minority group indicator *M* are all small and none are statistically different from zero. The t-statistics are all quite small. Once economic considerations are included in the analysis, predominantly minority areas have the same broadband availability as do predominantly white areas, irrespective of how those groups are defined.

Thus, as required by Section 60506, minority groups have an equal opportunity as whites to subscribe to broadband; a primary requirement of a *prima facie* case is unmet. The predicted means of availability are provided at the bottom of the table, and it is clear they are almost identical in most cases. The largest differences, observed for the highest speed levels, favor minority groups.

<b>Table 4. Broadband Providers</b>						
	100/20 Mbps [25:75]	100/20 Mbps [10:90]	500/50 Mbps [25:75]	500/50 Mbps [10:90]	900/100 Mbps [25:75]	900/100 Mbps [10:90]
<i>M</i>	-0.0070 (-0.15)	0.0247 (0.43)	-0.0168 (-0.31)	0.0052 (0.07)	0.0393 (0.92)	0.0657 (1.14)
<i>D</i>	0.081*** (3.42)	0.072*** (2.73)	0.052*** (2.84)	0.050** (2.50)	0.053*** (3.68)	0.045*** (2.84)
<i>C</i>	-0.420*** (-16.16)	-0.406*** (-14.33)	-0.217*** (-8.75)	-0.220*** (-7.11)	-0.236*** (-8.38)	-0.246*** (-6.67)
Obs.	114,495	45,775	114,495	45,775	114,495	45,775
$\chi^2$	496***	284***	120***	54***	193***	62***
Pred. Mean						
White	1.319	1.246	0.550	0.504	0.429	0.381
Minority	1.312	1.271	0.533	0.509	0.468	0.446
Stat. Sig. *** 1% ** 5% * 10%						

The results for the broadband provider count are summarized in Table 4. Again, the *D* and *C* coefficients are correctly signed and statistically different from zero across the board. As with broadband availability, the minority and white groups have the same number of providers, on average. The  $\delta$  coefficients are typically small in relation to the means (at the bottom of the table) and none is statistically different from zero. Again, the largest differences are for the 900/100 Mbps speeds where minorities are slightly favored, though the difference is statistically zero.

## VII. Conclusion

With the Infrastructure Act providing sufficient funding to deploy broadband to nearly every household in the nation, the Digital Discrimination provisions contained in Section 60506 of the Infrastructure Act are a curiosity. Nonetheless, the FCC is required to take it seriously and implement rules to ensure equal access to broadband for protected classes. The Commission's *Draft Order* lays out an onerous regulatory regime and adopts an adversarial tone, despite the Commission never lifting a finger to attempt to quantify the magnitude of the potential problem. The *Draft Order* also confuses technical and economic conditions with the policies and practices that are the target of disparate impact

analysis. Technical and economic conditions are not policies and practices, they are those exogenous factors that determine whether a policy and practice is reasonable.

In this POLICY PAPER, we review relevant caselaw on disparate impact, using the standard approach outlined in caselaw to guide our empirical analysis of broadband access. As directed by the Commission, we use data from the Commission's new broadband fabric data and test for differences in broadband availability between predominantly minority and majority census block groups, where availability is measured as the share of homes with access and the number of providers. Ignoring economic and technical factors, minority areas have greater access to broadband (in both dimensions). Once accounting for economic and technical considerations, as required by statute, we find no relationship between race and availability or provider count. Consequently, not only are the Digital Discrimination provisions of the Infrastructure Act unnecessary given the deployment subsidies sufficient to serve nearly all households (assuming an efficient spend of these funds, which increasingly appears questionable), it seems unlikely that a threshold requirement of a *prima facie* case of disparate impact—a difference in access—can be empirically supported under current caselaw.