
**Call Blocking Tools Now Substantially Available to Consumers:
Report on Call Blocking
CG Docket No. 17-59**

A Report of the Consumer and Governmental Affairs Bureau
Federal Communications Commission
June 2020

I. INTRODUCTION

1. Robocalls are calls made through automated equipment.¹ The American public generally associates robocalls with annoying and unwanted calls. Scammers often use robocalls to perpetuate widespread fraud.² The Commission has sought to protect American consumers from illegal and unwanted calls by, among other things, authorizing voice service providers to block such calls as a default before they ever reach consumers.³

2. Since 2017, the Commission has allowed for and encouraged voice service providers to block certain obviously spoofed calls, authorized the creation of a reassigned numbers database so consumers do not get calls intended for others, and taken steps to promote caller ID authentication.⁴ In its *2017 Call Blocking Report and Order*, the Commission authorized voice service providers to block by default at the network level calls using invalid, unallocated, or unused numbers and numbers on a Do-Not-Originate (DNO) list.⁵ In the *2019 Call Blocking Declaratory Ruling*, the Commission offered further protection to consumers and clarified that voice service providers could immediately start offering call-blocking services by default to new and existing customers where the blocking is based on reasonable analytics

¹ Robocalls are calls made with an autodialer or that contain a message made with a prerecorded or artificial voice. See FCC, *Stop Unwanted Robocalls and Texts*, <https://www.fcc.gov/consumers/guides/stop-unwanted-robocalls-and-texts> (last visited May 18, 2020). Helpful robocalls include those from schools notifying parents of school closings or from pharmacies notifying customers that their prescriptions are ready.

² Scammers often use spoofing, i.e., altering the caller ID information that appears on the called party's phone display, to maliciously impersonate businesses or governmental agencies. However, there are legitimate reasons for displaying a different number than the number from which a call is made. For example, businesses may prefer to have their name and main office number on caller ID instead of an employee's name and individual line.

³ See *Advanced Methods to Target and Eliminate Unlawful Robocalls*, CG Docket No. 17-59, WC Docket No. 17-97, Report and Order and Further Notice of Proposed Rulemaking, 32 FCC Rcd 9706 (2017) (*2017 Call Blocking Report and Order*); *Advanced Methods to Target and Eliminate Unlawful Robocalls, Call Authentication Trust Anchor*, CG Docket No. 17-59, WC Docket No. 17-97, Declaratory Ruling and Third Further Notice of Proposed Rulemaking, 34 FCC Rcd 4876, 4886-88, paras. 33-34 (2019) (*2019 Call Blocking Declaratory Ruling*).

⁴ See *Call Authentication Trust Anchor, Implementation of TRACED Act Section 6(a)—Knowledge of Customers by Entities with Access to Numbering Resources*, WC Docket Nos. 17-97, 20-67, Report and Order and Further Notice of Proposed Rulemaking, 35 FCC Rcd 3241 (2020) (*STIR/SHAKEN Order*); *2019 Call Blocking Declaratory Ruling*; *Advanced Methods to Target and Eliminate Unlawful Robocalls*, CG Docket No. 17-59, WC Docket No. 17-97, Second Report and Order, 33 FCC Rcd 12024 (2018) (*Robocall Second Report and Order*); *2017 Call Blocking Report and Order*. The Commission has taken action to address the problem of unwanted calls to reassigned numbers. When a consumer cancels service with a voice service provider, the voice service provider may reassign the number to a new consumer. If a caller is unaware of the reassignment, it might make calls that are unwanted by the new consumer and missed by the previous consumer, while wasting the time and effort of the caller. In December 2018, the Commission authorized the creation of a reassigned numbers database to enable callers to verify whether a telephone number has been permanently disconnected, and is therefore eligible for reassignment, before calling that number, thereby helping to protect consumers with reassigned numbers from receiving unwanted calls. See *Robocall Second Report and Order*, 33 FCC Rcd at 12029-35, paras. 11-27.

⁵ *2017 Call Blocking Report and Order*, 32 FCC Rcd at 9710-21, paras. 10-40. Phone numbers that are only used by their subscribers to receive inbound calls can be placed on a DNO list. These subscribers are generally government and enterprise users with call centers that receive calls on a specific toll-free number that is not used to make outbound calls. When the subscriber's number is spoofed by a robocaller without the subscriber's consent, the calls purporting to be from that number are most likely illegal. *Id.* at 9710, para. 10.

designed to identify unwanted calls.⁶ In addition to default network blocking, permitted by the *2017 Call Blocking Report and Order*, most voice service providers now offer call blocking and labeling services on an opt-in or opt-out basis, generally through a third-party analytics company partner; consumers can also obtain call blocking and labeling services directly from such third-party analytics companies.⁷ Some services now allow consumers to choose which types of incoming calls to block or label.

3. The Commission has also taken aggressive enforcement action against illegal robocallers,⁸ including recent action against gateway providers that facilitated COVID-19-related scam robocalls. In March 2020, the Commission learned that robocall scammers capitalized on public anxiety about the novel coronavirus, flooding American consumers with robocalls advertising nonexistent COVID-19 testing kits or that promised financial relief services, among other things.⁹ On April 3, 2020, and again on May 20, 2020, the Commission (FCC) and the Federal Trade Commission (FTC) jointly sent warning letters to a total of five gateway providers and one originating provider; the letters demanded that the recipient providers cease carrying fraudulent COVID-19-related robocall traffic immediately.¹⁰ The letters warned the providers that if they failed to terminate the offending calls within 48 hours, the FCC would authorize domestic phone companies to block all traffic from their networks. Within 48 hours of the issuance of each letter, each of the six providers responded to confirm that the offending robocall

⁶ *2019 Call Blocking Declaratory Ruling*, 34 FCC Rcd at 4886-88, paras. 33-34; *see, e.g.*, Letter from Joan Marsh, Executive Vice President, AT&T Services, Inc., to Mika Savir, Attorney, FCC Consumer and Governmental Affairs Bureau, CG Docket No. 17-59, at 4-5 (Feb. 28, 2020) (AT&T Letter); Letter from David C. Bartlett, Vice President, Federal Government Affairs, CenturyLink, to G. Patrick Webre, Chief, FCC Consumer and Governmental Affairs Bureau, CG Docket No. 17-59, at 2 (Feb. 28, 2020) (CenturyLink Letter); Letter from Christopher D. Oatway, Associate General Counsel, Verizon, to G. Patrick Webre, Chief, FCC Consumer and Governmental Affairs Bureau, CG Docket No. 17-59, at 2-3 (Feb. 28, 2020) (Verizon Letter).

⁷ *2019 Call Blocking Declaratory Ruling*, 34 FCC Rcd at 4884-90, paras. 26-42. To opt out is to affirmatively choose not to participate. In this context, the consumer is automatically enrolled in the call-blocking service but can elect to not subscribe to that service. In the *2019 Declaratory Ruling*, the Commission also clarified that voice service providers may offer white list programs on an opt-in basis, i.e., blocking calls from numbers not in a consumer's contacts list. *Id.* at 4890-91, paras. 43-46.

⁸ *See, e.g., John C. Spiller; Jakob A. Mears; Rising Eagle Capital Group LLC, et. al.*, Notice of Apparent Liability for Forfeiture, FCC 20-74 (Jun. 10, 2020), <https://docs.fcc.gov/public/attachments/FCC-20-74A1.pdf> (proposing the largest forfeiture in FCC history, \$225,000,000, against persons apparently responsible for making approximately one billion spoofed robocalls in the first four-and-a-half months of 2019 that included prerecorded messages falsely claiming affiliation with major health insurance providers in the United States); *Kenneth Moser dba Marketing Support Systems*, Notice of Apparent Liability for Forfeiture, 34 FCC Rcd 12753 (2019) (proposing a forfeiture of \$9,997,750 for calls made spoofing the telephone number of another telemarketing company, with a prerecorded message containing false statements critical of a state assembly candidate); *Scott Rhodes a.k.a. Scott David Rhodes, Scott D. Rhodes, Scott Platek, Scott P. Platek*, Notice of Apparent Liability for Forfeiture, 35 FCC Rcd 882 (2020) (proposing a forfeiture of \$12,910,000 for spoofed robocalls in six campaigns with hate speech and racist, anti-Semitic, or anti-immigrant language, using spoofed numbers belonging to innocent parties that matched the locality of the called party).

⁹ *See* Tony Romm, 'That can actually kill somebody': Scam robocalls are pitching fake coronavirus tests to vulnerable Americans, WASHINGTON POST (Mar. 19, 2020), <https://www.washingtonpost.com/technology/2020/03/19/robocalls-coronavirus-test/>.

¹⁰ *See* News Release, FCC, FTC Demand Gateway Providers Cut Off Robocallers Perpetrating Coronavirus-Related Scams from United States Telephone Network (Apr. 3, 2020), <https://www.fcc.gov/document/fcc-ftc-demand-gateway-providers-cut-covid-19-robocall-scammers>; News Release, FCC, FTC Demand Robocall-Enabling Service Providers Cut Off Scammers (May 20, 2020), <https://www.fcc.gov/document/fcc-ftc-demand-robocall-enabling-service-providers-cut-scammers>.

traffic had been terminated. These claims were verified by traceback experts at USTelecom.¹¹

4. The Commission receives thousands of informal consumer complaints each year about unwanted calls, including robocalls; it is the Commission's top category of consumer complaints.¹² The Commission received approximately 150,000 such complaints in 2016, 185,000 in 2017, 232,000 in 2018, and 193,000 in 2019.¹³ For 2020, the Commission received approximately 14,000 such complaints in January, 13,500 in February, 10,300 in March, 7,600 in April, 9,000 in May, and 5,800 in June (through June 15, 2020). The FTC also reports a high number of consumer robocall complaints, receiving an average of 315,000 robocall complaints per month in fiscal year 2019.¹⁴ The FTC has noted, however, that robocall complaints filed with that agency were down 68% in April 2020 compared to April 2019, and down 60% in May 2020 compared to May 2019.¹⁵ Third-party analytics companies also track unwanted robocalls. For example, Hiya and YouMail analyze call patterns and publish information about call volumes and trends.¹⁶ Hiya reports that 54.6 billion unwanted robocalls were placed to U.S. mobile phones in 2019.¹⁷ YouMail estimates robocalls at 30.5 billion in 2017, 47.8 billion in 2018, 58.5 billion in 2019, and 19.5 billion so far in 2020.¹⁸

5. The Commission also engages in consumer outreach and education regarding unwanted calls.¹⁹ The Consumer Help Center's robocall page, which contains tips on how consumers can avoid

¹¹ The FCC and FTC also sent letters to USTelecom thanking the Industry Traceback Group for its assistance in identifying the robocalls. *See id.*

¹² FCC, *Consumer Complaint Data Center*, <https://www.fcc.gov/consumer-help-center-data> (last visited June 9, 2020); FCC, *Consumer Complaints Data—Unwanted Calls*, <https://opendata.fcc.gov/Consumer/Consumer-Complaints-Data-Unwanted-Calls/vakf-fz8e> (last visited June 9, 2020).

¹³ FCC, *Consumer Complaint Data Center*, <https://www.fcc.gov/consumer-help-center-data> (last visited June 9, 2020). The government shutdown in January 2019 likely depressed the totals for 2019.

¹⁴ The FTC provides Congress with a biennial report on the operation of the National Do Not Call Registry. FTC, *Biennial Report to Congress under the Do Not Call Registry Fee Extension Act of 2007 at 3* (2019), <https://www.ftc.gov/system/files/documents/reports/biennial-report-congress-under-do-not-call-registry-fee-extension-act-2007-operation-national-do-not/p034305dncreport2019.pdf>. The FTC also tracks consumer complaint data and makes the information available on its Do Not Call (DNC) Reported Calls Data page. FTC, *Do Not Call Reported Calls Data*, <https://www.ftc.gov/site-information/open-government/data-sets/do-not-call-data> (last visited June 9, 2020).

¹⁵ Lois Greisman, FTC, *Robocall Reports Still Down, FTC Still Fighting* (June 15, 2020), <https://www.consumer.ftc.gov/blog/2020/06/robocall-reports-still-down-ftc-still-fighting>; *see also* FTC, *National Do Not Call Registry, All DNC Complaints October 2016-March 2020*, <https://public.tableau.com/profile/federal.trade.commission#!/vizhome/DoNotCallComplaints/Maps> (last visited June 16, 2020).

¹⁶ YouMail and other similar companies extrapolate the data they collect from their user bases to estimate the entire volume of calls in the United States. YouMail, *May 2020 Nationwide Robocall Data*, <https://robocallindex.com/> (last visited June 9, 2020); Hiya, *State of the Call*, <https://hiya.com/state-of-the-call> (last visited June 9, 2020); Press Release, First Orion, *Nearly 50% of U.S. Mobile Traffic Will Be Scam Calls by 2019* (Sept. 12, 2018), <https://firstorion.com/nearly-50-of-u-s-mobile-traffic-will-be-scam-calls-by-2019>.

¹⁷ Hiya, *State of the Call*, <https://hiya.com/state-of-the-call> (last visited June 9, 2020).

¹⁸ YouMail, *Historical Robocalls By Time*, <https://robocallindex.com/history/time> (last visited June 9, 2020).

¹⁹ *See* Government Accountability Office, *Report to Congressional Committees, "Fake Caller ID Schemes, Information on Federal Agencies' Efforts to Enforce the Laws, Educate the Public, and Support Technical Initiatives,"* GAO 20-153, Dec. 2019, <https://www.gao.gov/assets/710/703362.pdf>.

robocalls, is the resources' most visited page, averaging over one million visits annually.²⁰ The Consumer Help Center also contains a variety of content alerting consumers to new and ongoing scams that rely on spoofed robocalls to defraud consumers.²¹ The Commission's outreach efforts on unwanted calls include rural tours²² and partnerships with AARP and the National Asian American Coalition, and focus on vulnerable communities such as older Americans and those who are linguistically isolated. Consumer education materials are available in English, Spanish, Korean, Traditional Chinese, Tagalog, and Vietnamese. Commission staff also has a monthly State and National Action Plan telephone conference with state commissions and the National Association of Regulatory Utility Commissioners; the Enforcement Bureau coordinates every month with the FTC on robocall enforcement; and the Commission's Office of Intergovernmental Affairs works to coordinate FCC speakers for presentations on key FCC policies, consumer education, and enforcement actions. All of these actions assist American consumers in avoiding unwanted calls.

6. The Commission's Consumer and Governmental Affairs Bureau (Bureau) has prepared this initial Staff Report (Report) on the deployment and implementation of call blocking and caller ID authentication, in consultation with the Wireline Competition Bureau and Public Safety and Homeland Security Bureau. This Report responds to the Commission's directive in the *2019 Call Blocking Declaratory Ruling* that the Bureau prepare a report "on the state of deployment of advanced methods and tools to eliminate such calls, including the impact of call blocking on 911 and public safety."²³ The data and information contained in this Report relies on a number of sources, primarily from voice service providers and third-party analytics companies. The Bureau released a public notice requesting information on call blocking issues, including the availability and effectiveness of call blocking tools offered to consumers, the impact of the Commission's actions on illegal calls, and the impact of call blocking on 911 services and public safety.²⁴ We received 36 initial comments and 32 reply comments and responses to letters seeking information from voice service providers, trade associations, analytics companies, and other interested parties. Consistent with the Commission's 2019 directive, the Bureau will issue a second report on these issues in June 2021.²⁵

7. This Report describes call blocking initiatives and progress toward protecting consumers from illegal and unwanted robocalls. This Report also includes information on the state of deployment of caller ID authentication through implementation of the STIR/SHAKEN framework, and contains "snapshots" of deployment and implementation of Commission and industry efforts at the time of release.²⁶ Most voice service providers state that, following the *2017 Call Blocking Report and Order*, they block at the network level calls from telephone numbers on a DNO list and calls that appear to be

²⁰ FCC Consumer Guide, *Stop Unwanted Robocalls and Texts*, <https://www.fcc.gov/consumers/guides/stop-unwanted-robocalls-and-texts> (last visited June 10, 2020).

²¹ FCC, *Scam Glossary*, <https://www.fcc.gov/scam-glossary> (last visited June 16, 2020).

²² FCC, *Rural Tour Highlights—Arizona and New Mexico*, <https://www.fcc.gov/rural-tour-dispatches> (last visited June 16, 2020).

²³ *2019 Call Blocking Declaratory Ruling*, 34 FCC Rcd at 4904, para. 87.

²⁴ *Consumer and Governmental Affairs Bureau Seeks Input for Report on Call Blocking*, CG Docket No. 17-59, WC Docket No. 17-97, Public Notice, 34 FCC Rcd 12470 (CGB Dec. 20, 2019). A list of commenters is attached in Appendix A.

²⁵ *2019 Call Blocking Declaratory Ruling*, 34 FCC Rcd at 4904, para. 87.

²⁶ *Id.* at 4904, para. 89.

from invalid, unallocated, or unused numbers.²⁷ Following the *2019 Call Blocking Declaratory Ruling*, many voice service providers also offer additional blocking or labeling services, generally through a third-party analytics company. In some cases, the voice service provider partners with the third-party analytics company; in other cases, the voice service provider instructs the customer how to sign up for the service directly through the third-party analytics company's website. Finally, many voice service providers offer specific caller ID and blocking services through their websites.²⁸

II. BACKGROUND

8. Unwanted robocalls are a significant consumer problem. Many consumers have stopped answering their wireline and wireless telephones because of the enormous volume of unwanted calls.²⁹ In addition to being annoying and used to perpetrate fraud, robocalls can disrupt emergency medical communications and tie up emergency lines to 911 call centers, also known as Public Safety Answering Points (PSAPs).³⁰ Understanding this, the Commission has made stopping unlawful robocalls its highest consumer protection priority.³¹

9. The Commission has taken a multi-pronged approach in combating unwanted calls. In addition to its internal policy-making and enforcement activities, the Commission's Enforcement Bureau coordinates with the FTC and Department of Justice on robocall enforcement, and the Commission's Office of Intergovernmental Affairs coordinates activities with state commissions and the National Association of Regulatory Utility Commissioners. The Commission also conducts consumer education and outreach, including posting information on its website to provide consumers with tips on avoiding robocall scams.³² Most recently, the Commission posted information to educate consumers about new COVID-19-related robocall scams.³³

²⁷ *2017 Call Blocking Report and Order*, 32 FCC Rcd at 9710-21, paras. 10-40. Phone numbers that are only used by their subscribers to receive inbound calls can be placed on a DNO list. These subscribers are generally government and enterprise users with call centers that receive calls on a specific toll-free number that is not used to make outbound calls. When the subscriber's number is spoofed by a robocaller without the subscriber's consent, the calls purporting to be from that number are most likely illegal. *Id.* at 9710, para. 10.

²⁸ A summary of the blocking and labeling offerings is listed in Appendix B.

²⁹ Hiya also provides data on call answer rates, indicating that consumers are most likely to answer their phones when the number calling is saved to the phone's contacts or identified as a business, and are least likely to answer calls from unidentified numbers and those marked as spam. Hiya, *State of the Phone Call 2019* at 4 (2019), <https://assets.hiya.com/public/pdf/HiyaStateOfTheCall2019.pdf?v=ff6a3203004af7328a696e57bcb949dd>. Hiya's data indicates that the average answer rate for incoming calls is 47%. This jumps to 71% for calls from numbers saved in contacts, with the rate dropping slightly to 65% for calls that are identified as a business where the number is not saved in contacts. Consumers only answer their phone 9% of the time when the call is marked as "spam" and 18% of the time when the call is not identified. *Id.* Consumers are also more likely to remain on the phone when the call is from a number in their contacts, with an average five minute 28 second call duration, or identified as a business, with an average two minute 58 second duration. In contrast, customers spend an average of 45 seconds on the line for calls marked "spam" and 30 seconds on the line for unidentified calls. *Id.* at 5.

³⁰ See *STIR/SHAKEN Order*, 35 FCC Rcd at 3264, para. 50 (discussing impact of robocalls on emergency and healthcare communications).

³¹ FCC, *Stop Unwanted Robocalls and Texts*, <https://www.fcc.gov/consumers/guides/stop-unwanted-robocalls-and-texts?from=home#call-blocking-resources> (last visited June 9, 2020); FCC, *The FCC's Push to Combat Robocalls & Spoofing*, <https://www.fcc.gov/about-fcc/fcc-initiatives/fccs-push-combat-robocalls-spoofing> (last visited June 9, 2020).

³² FCC, *Consumer Help Center*, <https://www.fcc.gov/consumers> (last visited June 9, 2020).

³³ FCC, *COVID-19 Consumer Warnings and Safety Tips*, <https://www.fcc.gov/covid-scams> (last visited June 9, 2020).

10. Call blocking is one way for voice service providers to reduce unwanted calls. Call blocking is “stopping calls outright so that they do not ring a phone, routing the calls directly to voicemail without ringing the phone, or some other treatment, such as interactive voice response session or voice call screening.”³⁴ Voice service providers or third-party analytics companies accomplish this by stopping robocalls before they reach the called party. The consumer can also set call blocking of specific numbers through settings on their wireless device.³⁵ Call labeling is another tool to assist consumers. Most voice service providers and analytics companies offer the service. Call labeling displays categories for potentially unwanted or illegal calls such as “spam” or “scam likely” on the device’s screen, so the called party can decide whether to answer the call.

11. The Commission’s *2017 Call Blocking Report and Order* was an important step in preventing robocalls because it gave voice service providers the option of blocking illegal robocalls under certain circumstances—those purporting to be from telephone numbers on a DNO list and calls that appear to be from invalid, unallocated, or unused numbers.³⁶ Previously, the Commission had determined that call blocking was an unjust and unreasonable practice under section 201(b) of the Communications Act of 1934, as amended (Communications Act).³⁷ But with the promulgation of the *2017 Call Blocking Report and Order*, a voice service provider that blocks calls in accordance with its rules does not violate the Commission’s call completion rules.³⁸ The Commission has made clear “that voice service providers may implement network-based blocking (i.e., blocking without consumer choice) only in ‘specific, well-defined circumstances.’”³⁹

12. Following the *2017 Call Blocking Report and Order*, voice service providers have blocked by default at the network level calls using invalid, unallocated, or unused numbers and numbers on a DNO list.⁴⁰ In the *2019 Call Blocking Declaratory Ruling*, the Commission clarified that voice service providers could immediately start offering call-blocking services by default to new and existing customers based on reasonable analytics designed to identify unwanted calls.⁴¹

13. The Commission defines call blocking as “stopping calls outright so that they do not ring a phone, routing the calls directly to voicemail without ringing the phone, or some other treatment, such as interactive voice response session or voice call screening.”⁴² According to CTIA, the wireless industry

³⁴ *2019 Call Blocking Declaratory Ruling*, 34 FCC Rcd at 4884 n.47.

³⁵ See, e.g., *Add a Block-Call & Message Blocking-My Verizon Website*, <https://www.verizonwireless.com/support/knowledge-base-200867/> (last visited June 9, 2020); *Block Unwanted Wireless Calls and Messages*, <https://www.att.com/support/article/wireless/KM1009412/> (last visited June 9, 2020).

³⁶ *2017 Call Blocking Report and Order*, 32 FCC Rcd 9706.

³⁷ See, e.g., *Connect America Fund, A National Broadband Plan for Our Future, Establishing Just and Reasonable Rates for Local Exchange Carriers, High-Cost Universal Service Support, Developing an Unified Intercarrier Compensation Regime, Federal-State Joint Board on Universal Service, Lifeline and Link-Up, Universal Service Reform-Mobility Fund*, Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd 17663, 17903, para. 734 (2011) (“The Commission has a longstanding prohibition on call blocking.”); *Establishing Just and Reasonable Rates for Local Exchange Carriers; Call Blocking by Carriers*, WC Docket No. 07-135, Declaratory Ruling and Order, 22 FCC Rcd 11629 (WCB 2007).

³⁸ *2017 Call Blocking Report and Order*, 32 FCC Rcd at 9709-10, paras. 9-10.

³⁹ *2019 Call Blocking Declaratory Ruling*, 34 FCC Rcd at 4884, para. 23 (citing *2017 Call Blocking Report and Order*, 32 FCC Rcd at 9709, para. 9).

⁴⁰ See, e.g., AT&T Letter at 4-5; CenturyLink Letter at 2; Verizon Letter at 2-3.

⁴¹ *2019 Call Blocking Declaratory Ruling*, 34 FCC Rcd at 4886-88, paras. 33-34; see, e.g., AT&T Letter at 4-5; CenturyLink Letter at 2; Verizon Letter at 2-3.

⁴² *2019 Call Blocking Declaratory Ruling*, 34 FCC Rcd at 4884, n.47.

blocks more than one million illegal robocalls every day.⁴³ Voice service providers currently have implemented default network blocking for apparently fraudulent calls, e.g., calls from invalid numbers, from numbers that are unallocated or not assigned, and DNO numbers.⁴⁴ Generally, the voice service provider sends an intercept message or code to the calling party after the default block.

14. In a further measure to combat unwanted robocalls, the Commission clarified, in the *2019 Call Blocking Declaratory Ruling*, that voice service providers could immediately offer call blocking services by default to new and existing customers so long as an opportunity to opt out from the service is provided. Such call blocking programs could be based on reasonable analytics designed to identify unwanted calls.⁴⁵ In addition to default network blocking, most voice service providers offer call blocking and labeling services on an opt-in or opt-out basis, through a third-party analytics company partner. Consumers can also obtain call blocking and labeling services directly from such third-party analytics companies. These services allow the consumer to configure call blocking and call labeling for their incoming calls.

15. Congress recently passed a landmark anti-robocall law, the Pallone-Thune Telephone Robocall Abuse Criminal Enforcement and Deterrence Act (TRACED Act).⁴⁶ The TRACED Act gives the Commission additional tools to combat robocalls. The Commission has already taken several steps to implement the TRACED Act, including establishing a traceback consortium, requiring voice service providers to implement caller ID authentication technology on their networks by June 30, 2021, establishing the Hospital Robocall Protection Group,⁴⁷ initiating a proceeding pertaining to one-ring scam⁴⁸ calls, and implementing stronger enforcement provisions for illegal robocalls with intent and illegally spoofed calls.⁴⁹

16. Illegal caller ID spoofing, i.e., falsifying the caller ID information that appears on the called party's phone with the intent to defraud, cause harm, or wrongfully obtain anything of value,⁵⁰ can often

⁴³ See *CTIA Consumer Resources—How to Stop Robocalls*, <https://www.ctia.org/consumer-resources/how-to-stop-robocalls> (last visited June 9, 2020).

⁴⁴ In the *2017 Call Blocking Report and Order*, the Commission adopted rules to allow voice service providers to block calls from telephone numbers on a DNO list and calls that appear to be from invalid, unallocated, or unused numbers. *2017 Call Blocking Report and Order*, 32 FCC Rcd at 9710-21, paras. 10-40.

⁴⁵ *2019 Call Blocking Declaratory Ruling*, 34 FCC Rcd at 4886-88, paras. 33-34.

⁴⁶ Pallone-Thune Telephone Robocall Abuse Criminal Enforcement and Deterrence Act, Pub. L. No. 116-105, 133 Stat. 3274 (2019) (TRACED Act). The TRACED Act was adopted on Dec. 30, 2019.

⁴⁷ The Commission is charged with establishing the Hospital Robocall Protection Group in section 14 of the TRACED Act, and is in the process of doing so. See *FCC Announces the Establishment of the Hospital Robocall Protection Group and Seeks Nominations for Membership*, Public Notice, 35 FCC Rcd 2895 (CGB 2020).

⁴⁸ In the one-ring scam, consumers in the United States receive a call from a foreign country, and, after one ring, the scammer hangs up, causing the consumer to call back and incur significant phone charges. See FCC Consumer Guide, “*One Ring*” Phone Scam (May 15, 2019), <https://www.fcc.gov/consumers/guides/one-ring-phone-scam>.

⁴⁹ *STIR/SHAKEN Order; Implementing Section 13(d) of the Pallone-Thune Telephone Robocall Abuse Criminal Enforcement and Deterrence Act (TRACED Act)*, EB Docket No. 20-22, Report and Order and Further Notice of Proposed Rulemaking, 35 FCC Rcd 3113 (2020) (*Traceback Consortium Order*) (as required by the TRACED Act, the Commission adopted rules for a registration process for a consortium to conduct private-led traceback initiatives); *FCC Announces the Establishment of the Hospital Robocall Protection Group and Seeks Nominations for Membership*, Public Notice, 35 FCC Rcd 2895 (CGB 2020); *Protecting Consumers from One-Ring Scams*, CG Docket No. 20-93, Notice of Proposed Rulemaking, FCC 20-57 (rel. Apr. 28, 2020) (seeking comment on rules to prevent one-ring scams); *Amendment of Section 1.80 of the Commission's Rules*, Order, DA 20-460 (rel. May 1, 2020) (adopting stronger enforcement provisions for illegal robocalls).

be the key to a robocall scam’s success.⁵¹ Congress passed the 2009 Truth in Caller ID Act to “address the growing problem of caller ID spoofing done for fraudulent or harmful purposes.”⁵² One tool to combat illegal caller ID spoofing is caller ID authentication, which allows voice service providers to verify that the caller ID information transmitted with a particular call matches the caller’s number, which in turn helps to determine whether the call should be blocked or labeled.⁵³ Section 4 of the TRACED Act directs the Commission to require voice service providers to “implement the STIR/SHAKEN authentication framework” in the Internet Protocol (IP) portions of their networks, and “take reasonable measures to implement an effective call authentication framework” in the non-IP portions of their networks no later than June 30, 2021.⁵⁴ STIR/SHAKEN, also sometimes referred to as SHAKEN/STIR, is a framework developed for IP networks by industry technologists to authenticate caller ID in order to determine if a call is spoofed.⁵⁵

17. Once a provider has implemented STIR/SHAKEN standards, it can attest to all IP-based calls that originate on or transit its network by adding a Session Initiation Protocol (SIP) header containing specific information which is then transmitted with the call to the terminating provider.⁵⁶ The terminating voice service provider uses this additional information to verify that the caller ID information transmitted with a call matches the caller’s number.⁵⁷ STIR/SHAKEN allows providers to transmit calls with three levels of attestation. Specifically, a voice service provider can indicate that (i) it can confirm the identity of the subscriber making the call, and that the subscriber is using its associated telephone number (“A” or “full” attestation); (ii) it can confirm the identity of the subscriber but not the telephone number (“B” or “partial” attestation); or merely that (iii) it is the point of entry to the IP network for a call that originated elsewhere, such as a call that originated abroad or on a domestic network that is not STIR/SHAKEN-enabled (“C” or “gateway” attestation).⁵⁸ Many large voice service providers have started implementing STIR/SHAKEN.⁵⁹

18. Since the Commission’s Notice of Inquiry, which sought comment on how to expedite caller

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⁵⁰ Spoofing is when a caller deliberately falsifies the information transmitted to the caller ID display to disguise their identity. More information about spoofing can be found at FCC Consumer Guides, *Caller ID Spoofing*, <https://www.fcc.gov/consumers/guides/spoofing-and-caller-id> (last visited June 9, 2020).

⁵¹ *2017 Call Blocking Report and Order*, 32 FCC Rcd at 9707, para. 3.

⁵² 47 U.S.C. § 227(e).

⁵³ FCC, *Combatting Spoofed Robocalls with Caller ID Authentication*, <https://www.fcc.gov/call-authentication> (last visited June 9, 2020).

⁵⁴ TRACED Act, § 4(b)(1)(A), (B). In addition, the TRACED Act provides that “[t]he Commission shall prohibit providers of voice service from adding any additional line-item charges to consumer or small business customer subscribers for the effective call authentication technology required.” TRACED Act, § 4(b)(6).

⁵⁵ *2019 Call Blocking Declaratory Ruling*, 34 FCC Rcd at 4883, para. 21. SHAKEN, or Signature-based Handling of Asserted information using toKENS, and STIR, or Secure Telephony Identity Revisited, uses public key cryptography to provide assurances that certain information about the transmitted caller ID is accurate. *Id.*

⁵⁶ *Id.*

⁵⁷ *Id.*

⁵⁸ *STIR/SHAKEN Order*, 35 FCC Rcd at 3245, para. 8.

⁵⁹ See, e.g., AT&T, *AT&T Activates Call Validation Displays*, (Dec. 18, 2019), https://about.att.com/story/2019/call_validation_displays.html; Verizon, *Helping our Customers Block Robocalls*, <https://www.verizon.com/about/responsibility/robocalls> (last visited June 9, 2020); T-Mobile, *Mobile Security*, <https://www.t-mobile.com/customers/mobile-security> (last visited June 9, 2020).

ID authentication development and implementation,⁶⁰ the Commission has taken steps to promote caller ID authentication. The North American Numbering Council (NANC), in a May 2018 report prepared in response to a request by the Commission’s Wireline Competition Bureau, recommended that representatives from various industry stakeholders comprise a board overseeing the Governance Authority,⁶¹ and that “individual companies capable of signing and validating [Voice over Internet Protocol] calls using SHAKEN/STIR should implement the standard within a period of approximately one year after completion of the NANC [Call Authentication Trust Anchor] report.”⁶²

19. Further, starting in November 2018, the Commission called on major voice service providers to implement a robust caller ID authentication framework by the end of 2019.⁶³ In June 2019, the Commission proposed to mandate STIR/SHAKEN if major voice service providers failed to implement the standard by the end of that year.⁶⁴ In December 2019, Congress passed the TRACED Act. In March 2020, the Commission adopted a Report and Order and Further Notice of Proposed Rulemaking that requires all originating and terminating voice service providers to implement the STIR/SHAKEN framework in the IP portions of their networks by June 30, 2021.⁶⁵ The Commission also offered proposals and sought comment on further efforts to promote caller ID authentication and implement section 4 of the TRACED Act, and on implementing section 6(a) of the TRACED Act, which concerns access to numbering resources.⁶⁶

III. CALL BLOCKING

20. Following the Commission’s rulemaking actions to protect consumers from illegal and unwanted robocalls, voice service providers and third-party analytics companies are offering their customers a variety of options for call blocking and labeling. While the specific programs differ from provider to provider, the Commission’s actions have resulted in greater choice and control for consumers.

A. Availability of Call Blocking Solutions to Consumers

1. Voice service providers’ blocking services

21. In addition to default blocking, many voice service providers, including all the larger voice service providers listed in Appendix B, offer consumers various call blocking tools from third-party analytics companies, e.g., AT&T’s Call Protect, Verizon’s Call Filter, T-Mobile’s Scam ID and Scam

⁶⁰ *Call Authentication Trust Anchor*, WC Docket No. 17-97, Notice of Inquiry, 32 FCC Rcd 5988 (2017) (*Call Authentication NOI*).

⁶¹ Call Authentication Trust Anchor Working Grp., N. Am. Numbering Council, Report on Selection of Governance Authority and Timely Deployment of SHAKEN/STIR at 7 (2018), http://nanc-chair.org/docs/mtg_docs/May_18_Call_Authentication_Trust_Anchor_NANC_Final_Report.pdf (2018 NANC Working Group Report).

⁶² 2018 NANC Working Group Report at 17.

⁶³ Press Release, FCC, Chairman Pai Calls on Industry to Adopt Anti-Spoofing Protocols to Help Consumers Combat Scam Robocalls (Nov. 5, 2018), <https://www.fcc.gov/document/chairman-pai-demands-industry-adopt-protocols-end-illegal-spoofing>; see also Press Release, FCC, Chairman Pai: Caller ID Authentication Is Necessary for American Consumers in 2019 (Feb. 13, 2019), <https://docs.fcc.gov/public/attachments/DOC-356187A1.pdf>.

⁶⁴ *2019 Call Blocking Declaratory Ruling*, 34 FCC Rcd at 4898-4902, paras. 71-82.

⁶⁵ *STIR/SHAKEN Order*, 35 FCC Rcd at 3252-68, paras. 24-56.

⁶⁶ *Id.* at 3268-96, paras. 57-130.

Block, and Sprint's⁶⁷ Call Screener, all for wireless customers.⁶⁸ AT&T partners with Hiya for anti-robocall Call Protect service.⁶⁹ T-Mobile partners with First Orion.⁷⁰ Sprint, U.S. Cellular, Verizon, and other voice service providers partner with TNS to provide anti-robocall tools.⁷¹ CenturyLink, Cox, and Comcast offer their customers a third-party call-blocking program from the third-party analytics company Nomorobo.⁷² Consumers can also download apps from third-party analytics companies to label or block calls, so they have blocking options that go beyond what their own voice service provider offers.

22. The table in Appendix B summarizes the call blocking services voice service providers and third-party analytics companies currently offer. The voice service providers included are AT&T, Verizon, CenturyLink, Frontier, T-Mobile, Sprint, Comcast, Cox, and Charter.⁷³ All of these voice service providers offer free blocking services and have partnerships with third-party analytics companies. We have also included estimates in Appendix B for the number of blocked calls, if this information was provided.⁷⁴ Consumers can configure their blocking options with call blocking tools offered by their voice service provider or third-party analytics companies to block more or fewer calls. There is no across-the-board definition of an illegal or unwanted call; the Commission has allowed the blocking of illegal or unwanted calls without adopting a narrow definition of such calls and has left granular decision

⁶⁷ On April 1, 2020, T-Mobile and Sprint completed their merger. See Press Release, T-Mobile Completes Merger With Sprint to Create the New T-Mobile, (Apr. 1, 2020), <https://investor.t-mobile.com/news-and-events/t-mobile-us-press-releases/press-release-details/2020/T-Mobile-Completes-Merger-with-Sprint-to-Crete-the-New-T-Mobile/default.aspx>. Currently, the Sprint brand still exists, as part of T-Mobile. See *We're Bringing Sprint into the Family*, <https://www.t-mobile.com/brand/t-mobile-sprint-merger-updates> (last visited June 9, 2020).

⁶⁸ The Commission does not regulate third-party analytics companies and therefore does not have information on how many consumers subscribe to these services. Those companies are not exempt from the FTC's plenary jurisdiction, however, and are subject to the laws and regulations that the FTC enforces.

⁶⁹ CTIA Comments at 9; see AT&T, *Block Robocalls and Other Unwanted Calls*, <https://www.att.com/help/robocalling.html> (last visited June 9, 2020); *AT&T Call Protect Expands Service*, (July 9, 2019) https://about.att.com/story/2019/att_call_protect.html.

⁷⁰ CTIA Comments at 10; Letter from Charles Morgan, CEO and Chairman, First Orion, to G. Patrick Webre, Chief, FCC Consumer and Governmental Affairs Bureau, CG Docket No. 17-59, at 1 (Feb. 28, 2020) (First Orion Letter).

⁷¹ CTIA Comments at 9; see Verizon, *How to Block Numbers, Calls, Ads, Text Messages & Emails*, <https://www.verizonwireless.com/support/block-numbers> (last visited June 9, 2020); *Verizon Offers New Ways to Battle Robocalls* (Mar. 28, 2019), <https://www.verizon.com/about/news/verizon-offers-new-ways-battle-robocalls>; *Stop Unwanted Calls, Identify and Block Spam with Sprint Call Screener*, <https://www.sprint.com/en/shop/services/screener.html> (last visited June 9, 2020).

⁷² Cox Comments at 1 (noting that, at no cost to customers, Cox provides Nomorobo service to residential customers); see CenturyLink, *How to Block Unwanted Calls on your Landline*, <https://www.centurylink.com/home/help/home-phone/calling-features/block-unwanted-calls-from-your-home-phone.html> (last visited June 9, 2020); *Call Types That Can Be Blocked with Xfinity Voice*, <https://www.xfinity.com/support/articles/restricting-calls> (last visited June 9, 2020); *How to Stop Unsolicited Robocalls to Your Home*, <https://www.xfinity.com/support/articles/nomorobo> (last visited June 9, 2020); Nomorobo service is offered at no charge to VoIP customers and at \$1.99 per device, per month, for mobile phones. See *Nomorobo*, <https://www.nomorobo.com> (last visited June 9, 2020).

⁷³ See Appendix B.

⁷⁴ Calls that are unanswered or blocked by consumers may be unwanted but legal calls, such as telemarketing calls.

making about blocking up to the voice service providers as long as they employ reasonable analytics.⁷⁵

23. Voice service providers and third-party analytics companies filed comments describing their blocking and labeling services. Here, we summarize the information described in their comments and letters.

24. *AT&T*. AT&T offers call blocking options for wireless and wireline customers.⁷⁶ AT&T has a network-based provider-initiated default call blocking program, run by AT&T's global fraud team.⁷⁷ This provider-initiated program for wireline and wireless customers uses network intelligence and fraud investigators to target suspected illegal high-volume callers.⁷⁸ This program allows AT&T to identify illegal robocalls and create a robocall report that is continuously updated by AT&T.⁷⁹ AT&T investigates each number before it blocks calls.⁸⁰ Using analytics, AT&T blocks calls originating from unassigned or invalid numbers, and inbound-only lines, and blocks high-volume, short-duration calls from suspect telephone numbers.⁸¹ AT&T has blocked almost six billion such calls since 2016.⁸² AT&T assigns DNO markers to calls with spoofed numbers.⁸³ When a blocked line calls a Mobility, U-verse, Prepaid, or Cricket customer, the calling party will hear an intercept announcement, which includes a toll-free number to call if they believe they were blocked in error.⁸⁴

25. In addition to the default network-based blocking, AT&T offers a call blocking service marketed as "Call Protect," through third-party analytics company Hiya, for post-paid wireless accounts, and has blocked or labeled nearly 1.3 billion suspected fraud calls and over three billion other calls since launching the blocking service in 2016.⁸⁵ In 2019, AT&T began offering Call Protect on an opt-out basis.⁸⁶ Call Protect automatically blocks suspected fraud calls and labels suspect calls.⁸⁷ The base-level Call Protect is free, however AT&T also offers Call Protect Plus, for \$3.99 per month.⁸⁸ The paid-tier service has enhanced caller ID, reverse number look up, and custom call blocking.⁸⁹ AT&T recently added new features to Call Protect for all customers that can be added on an opt-in basis such as automatically blocking calls identified as spam risk and sending calls not in a user's address book to

⁷⁵ See *2019 Call Blocking Declaratory Ruling*, 34 FCC Rcd at 4886-88, paras. 34-35. For descriptions of such calls, see, e.g., FCC, *Consumer Guide: Stop Unwanted Robocalls and Texts* (Feb. 5, 2020), https://www.fcc.gov/sites/default/files/stop_unwanted_robotcalls_and_texts.pdf; FTC, *Robocalls*, <https://www.consumer.ftc.gov/articles/0259-robocalls> (last visited June 9, 2020).

⁷⁶ AT&T Comments at 2-7.

⁷⁷ AT&T Letter at 4-5.

⁷⁸ *Id.*

⁷⁹ *Id.*

⁸⁰ *Id.*

⁸¹ AT&T Comments at 8.

⁸² *Id.*

⁸³ *Id.*

⁸⁴ AT&T Letter at 5.

⁸⁵ AT&T Comments at 3; AT&T Letter at 2.

⁸⁶ AT&T Comments at 3.

⁸⁷ AT&T Letter at 1-2.

⁸⁸ AT&T Comments at 4.

⁸⁹ AT&T Comments at 5; AT&T Letter at 2.

voicemail.⁹⁰ Fewer than 100,000 customers have opted in to the direct-to-voicemail feature, and a significant number later deactivated it.⁹¹ Fewer than 1% opted out of Call Protect altogether.⁹² AT&T also allows customers to report the phone number of unwanted calls.⁹³ Calling parties can provide feedback at <http://www.att.com/reviewmycalllabel>, which links to Hiya's portal.⁹⁴

26. AT&T's VoIP customers can opt in to Call Protect, at no charge, and it automatically blocks calls from known scammers and sends an alert if a call is from a suspicious caller.⁹⁵ AT&T has blocked over 46 million incoming calls and provided 36 million spam warnings.⁹⁶ AT&T also sells a wireline phone with call blocking capabilities, that works on all wireline networks.⁹⁷ This telephone automatically blocks robocalls from ringing and allows customers to blacklist, i.e., list those names and numbers they want blocked, up to 1,000 names and numbers.⁹⁸ Such blocked callers receive an intercept message and must press a key or leave their name before the call can go through.⁹⁹ Customers have purchased approximately one million AT&T Smart Call Blocker phones.¹⁰⁰

27. *Bandwidth.* Bandwidth, predominately a wholesale service provider to IP-based communications service providers, does not offer blocking tools directly to end user consumers.¹⁰¹ Bandwidth can, however, block voice traffic that originates from invalid numbers and has a spam messaging filter.¹⁰² Bandwidth has an on-board screening process to prevent potential robocalling companies from becoming Bandwidth customers.¹⁰³ Bandwidth regularly analyzes network traffic for unlawful robocall campaigns and blocks calls when appropriate.¹⁰⁴ Bandwidth can detect unlawful robocall campaigns and works to stop such activities.¹⁰⁵ Bandwidth states that the risks for overly-broad blocking, i.e., false positives, are significant.¹⁰⁶

⁹⁰ AT&T Comments at 6-7.

⁹¹ AT&T Letter at 2. In 2019, AT&T had 155.7 million wireless customers. See Q1 2019 AT&T Earnings: Investor Briefing (Apr. 24, 2019), <https://investors.att.com/~media/Files/A/ATT-IR/financial-reports/quarterly-earnings/2019/1q-2019/1Q19%20Investor%20Briefing.pdf>.

⁹² AT&T Letter at 2.

⁹³ AT&T, *Report Unwanted Calls & Texts*, <https://www.att.com/esupport/report-call-or-text.html> (last visited June 9, 2020).

⁹⁴ AT&T Letter at 3.

⁹⁵ AT&T Comments at 5; AT&T Letter at 3.

⁹⁶ AT&T Comments at 5; AT&T Letter at 3.

⁹⁷ AT&T Comments at 5-6.

⁹⁸ *Id.* at 6.

⁹⁹ *Id.*

¹⁰⁰ AT&T Letter at 4.

¹⁰¹ Letter from David Morken, CEO and Co-Founder, Bandwidth, to G. Patrick Webre, Chief, FCC Consumer and Governmental Affairs Bureau, CG Docket No. 17-59, at 1 (Feb. 28, 2020) (Bandwidth Letter).

¹⁰² Bandwidth Letter at 1.

¹⁰³ *Id.* at 2.

¹⁰⁴ *Id.*

¹⁰⁵ *Id.*

¹⁰⁶ *Id.*

28. *CenturyLink*. At the network level, by default, CenturyLink blocks fraud calls, DNO calls, call back numbers used in scams, and certain numbers associated with robocall scams.¹⁰⁷ CenturyLink offers third-party blocking service Nomorobo for all consumer VoIP customers.¹⁰⁸ For TDM customers, CenturyLink offers various screening tools.¹⁰⁹ CenturyLink also offers an expanded caller ID service, including “Caller ID with Privacy+”, that blocks calls without caller ID unless the caller provides a name; “Anonymous Call Rejection” that blocks calls from private or anonymous numbers; and “Call Rejection” and “Enhanced Call Rejection” that block calls from specific numbers.¹¹⁰ “Do Not Disturb” and “Call Curfew” block incoming calls during specified hours. These end-user blocking tools are opt-in.¹¹¹

29. *Charter*. Charter states that all of its call-blocking services are free features.¹¹² Charter’s customers can sign up for Nomorobo, at no charge; approximately 9% of Charter’s residential subscribers have activated this service.¹¹³ Charter also offers customers, through its website, the ability to accept selected callers, block unwanted callers, and block anonymous calls.¹¹⁴ By the end of 2020, Charter plans to allow its customers to opt in to white list call blocking.¹¹⁵ Charter also plans to alert its customers via caller ID that a call is suspicious.¹¹⁶ Charter also intends to implement additional network-level blocking capabilities for invalid, unassigned, and DNO telephone numbers.¹¹⁷ With respect to its wireless service, Charter’s customers can block calls using tools available through the mobile phone’s operating system.¹¹⁸ Charter is currently in discussions with third-party analytics companies regarding additional blocking solutions.¹¹⁹ Charter is starting an initial seed data collection for the Reassigned Number Database.¹²⁰

¹⁰⁷ CenturyLink Letter at 2.

¹⁰⁸ *Id.* This service is offered at no charge. See *Nomorobo*, <https://www.nomorobo.com> (last visited June 9, 2020).

¹⁰⁹ CenturyLink’s screening tools include the “No Solicitation” service, which plays an automated message asking solicitors to hang up and tells legitimate callers to press a specific key, and the “Security Screen” service that requires callers with blocked, unidentified, toll-free, or long distance numbers to enter their 10-digit number before the call will connect. CenturyLink Letter at 2; CenturyLink, *How to Block Unwanted Calls on Your Landline*, <https://www.centurylink.com/home/help/home-phone/calling-features/block-unwanted-calls-from-your-home-phone.html> (last visited June 9, 2020).

¹¹⁰ CenturyLink Letter at 2-3.

¹¹¹ *Id.* at 3.

¹¹² Charter Comments at 3.

¹¹³ *Id.* at 2-3; Spectrum, *How to Use Nomorobo to Block Robo Callers*, <https://www.spectrum.net/support/voice/block-robo-callers/?redirected=true> (last visited June 9, 2020).

¹¹⁴ Charter Comments at 2; Spectrum, *Ways to Block Unwanted Calls*, <https://www.spectrum.net/support/voice/ways-block-unwanted-calls/?redirected=true> (last visited June 9, 2020). Charter plans on providing call blocking to residential voice subscribers, by combining call pattern data analytics with STIR/SHAKEN authentication information to automatically identify and block nuisance and fraud callers. Charter Comments at 2.

¹¹⁵ *Id.* at 3.

¹¹⁶ *Id.*

¹¹⁷ *Id.* at 3, 5.

¹¹⁸ *Id.* at 4.

¹¹⁹ *Id.*

¹²⁰ *Id.* at 5.

Once this database is launched, callers will be able to verify whether a number has been reassigned before calling that number.¹²¹

30. *Comcast*. At the network level, Comcast employs robocall mitigation techniques and, without charge, blocks calls from the DNO list and from invalid or unallocated numbers.¹²² Comcast blocked, at the network-level, over 158 million robocall attempts in December 2019.¹²³ Comcast offers free “Anonymous Call Rejection” as an opt-in feature, but plans on offering this to all Xfinity Voice subscribers as an opt-out feature in the future.¹²⁴ Anonymous Call Rejection blocked nearly 37 million calls in December 2019.¹²⁵ Comcast offers Selective Call Rejection or Call Screening, on an opt-in basis and without charge, allowing customers to block a list of up to 25 phone numbers. Comcast estimates that over five million calls were blocked using this tool in December 2019.¹²⁶ Comcast offers Nomorobo to residential voice customers on an opt-in basis, without charge.¹²⁷ This service blocks approximately 25 to 30 calls per month, per subscriber.¹²⁸ Comcast estimates that in December 2019 it blocked approximately 210 million call attempts across all of these blocking methods.¹²⁹ In addition to the above described services offered to Comcast VoIP customers, Comcast also offers a wireless service, Xfinity Mobile, to its Internet customers and the Comcast’s Xfinity Mobile customers can download, without charge, the Hiya app to block fraudulent and unwanted calls.¹³⁰

31. *Cox*. Cox provides network-based blocking, or “Edge Blocking,” to block DNO, invalid, and unallocated telephone numbers.¹³¹ Edge Blocking includes blocking inbound calls that purportedly originate from 10-digit numbers that are not valid North American Numbering Plan (NANP) numbers and that contain NXX codes that have not been allocated.¹³² Cox offers “Anonymous Call Rejection”, which allow customers to reject calls from callers with blocked caller ID, and Selective Call Rejection, which allows customers to create a list of calls to be blocked.¹³³ Both of these tools are standard features offered with Cox’s voice service.¹³⁴ Both of these features provide calling parties an intercept message when

¹²¹ Charter Comments at 5.

¹²² Comcast Comments at 3; Letter from Tony Werner, President, Technology, Product, Xperience, Comcast Cable, to Marlene H. Dortch, Secretary, FCC, CG Docket No. 17-59, at 1 (Feb. 28, 2020) (Comcast Letter).

¹²³ Comcast Comments at 4; Comcast Letter at 2.

¹²⁴ Comcast Comments at 4-5; Comcast Letter at 2.

¹²⁵ Comcast Comments at 5; Comcast Letter at 2.

¹²⁶ Comcast Comments at 5; Comcast Letter at 2.

¹²⁷ Comcast Comments at 6; Comcast Letter at 2; Xfinity, *How to Stop Unsolicited Robocalls to Your Home*, <https://www.xfinity.com/support/articles/nomorobo> (last visited June 9, 2020).

¹²⁸ Comcast Comments at 6; Comcast Letter at 2.

¹²⁹ Comcast Letter at 3.

¹³⁰ Comcast Comments at 6; Comcast Letter at 2; see Daniel Frankel, *Comcast Enables Robocall Blocking for Xfinity Mobile*, Multichannel News (June 25, 2019), <https://www.multichannel.com/news/comcast-enables-hiya-robocall-blocking-on-xfinity-mobile>; Xfinity, *How Do I Block Robocalls?*, <https://www.xfinity.com/mobile/support/article/how-to-block-robocalls> (last visited June 9, 2020).

¹³¹ Cox Comments at 2; Cox Letter at 2.

¹³² Cox Comments at 2; Cox Letter at 2.

¹³³ Cox Comments at 2; see Cox, *Using Selective Call Rejection*, <https://www.cox.com/business/support/using-selective-call-rejection.html> (last visited June 9, 2020).

¹³⁴ Letter from Jennifer Hightower, Senior Vice President and General Counsel, Cox, to G. Patrick Webre, Chief, FCC Consumer and Governmental Affairs Bureau, CG Docket No. 17-59, at 1 (Feb. 28, 2020) (Cox Letter).

their calls are blocked.¹³⁵ This blocking service is provided through Nomorobo and automatically identifies and blocks unwanted and illegal calls and sends an intercept message to the calling party when calls are blocked.¹³⁶ Cox blocks approximately 15% of incoming call attempts to residential customers through a combination of Edge Blocking, Anonymous Call Rejection, Nomorobo, and Selective Call Rejection.¹³⁷ Edge Blocking accounts for 65% of the call attempts blocked and Anonymous Call Rejection accounts for 29% of the blocked calls.¹³⁸

32. *Frontier.* At the network level, Frontier blocks numbers on the DNO list by default.¹³⁹ Frontier offers anonymous call rejection, selective call rejection, and selective call acceptance, without charge.¹⁴⁰ Frontier offers an advanced caller ID alert to screen likely robocalls with Neustar Robocall Mitigation technology.¹⁴¹ Frontier customers are able to make use of Nomorobo's free VoIP product.¹⁴²

33. *Sprint.* Sprint currently blocks calls identified by the DNO program, invalid, and unallocated numbers at the network level.¹⁴³ At the device level, Sprint offers free call blocking with TNS's Call Screener, installed on Android devices and available for download on iOS devices.¹⁴⁴ Call Screener Basic, a free version, allows customers to identify and block calls determined to be high risk by TNS.¹⁴⁵ Blocked calls are sent directly to voicemail.¹⁴⁶ The premium version of Call Screener, Call Screener Plus, offers additional displays and options for \$2.99 per month.¹⁴⁷ Callers that believe their calls are inaccurately blocked or labeled can provide feedback to TNS through their robocall feedback website.¹⁴⁸ Sprint does not offer white list blocking, but notes that it is available on iPhones and some Android

¹³⁵ Cox Letter at 1.

¹³⁶ Cox Comments at 1; Cox Letter at 2.

¹³⁷ Cox Comments at 3.

¹³⁸ *Id.*

¹³⁹ Frontier Letter at 2.

¹⁴⁰ *Id.*

¹⁴¹ Frontier Letter at 2; *see Robocaller Alert on Your Caller ID*, <https://frontier.com/helpcenter/categories/phone/calling-features/robocaller-alert> (last visited June 9, 2020).

¹⁴² Frontier Letter at 2; *see How to Block Telemarketing Calls*, <https://frontier.com/helpcenter/categories/phone/calling-features/block-telemarketing-calls> (last visited June 9, 2020).

¹⁴³ Sprint Comments at 4-5; Letter from Charles W. McKee, Vice President, Government Affairs, Sprint Corporation, to G. Patrick Webre, Chief, FCC Consumer and Governmental Affairs Bureau, CG Docket No. 17-59, at 2 (Feb. 28, 2020) (Sprint Letter).

¹⁴⁴ Sprint Comments at 1; Sprint Letter at 1.

¹⁴⁵ Sprint Letter at 1.

¹⁴⁶ Sprint Comments at 2; Sprint Letter at 1.

¹⁴⁷ Sprint Comments at 2-3; Sprint Letter at 1-2.

¹⁴⁸ Sprint Comments at 4; Sprint Letter at 2. TNS's website permits feedback from consumers and enterprises. *Welcome to TNS' Robocall Feedback Website!*, <https://reportarobocall.com/trf> (last visited June 9, 2020). TNS encourages callers and consumers to provide feedback through this portal. TNS Letter at 4 & n.8.

devices.¹⁴⁹ Sprint also allows account holders to block select calls.¹⁵⁰

34. *TDS Telecom*. TDS Telecom supports the availability of third-party anti-robocall tools and has been working to implement network-level tools to identify and, if necessary, block calls in the TDM and IP aspects of their network.¹⁵¹ TDS Telecom will likely implement call labeling and blocking on an opt-out basis.¹⁵²

35. *T-Mobile*. T-Mobile first offered network-based “Scam ID” and “Scam Block” robocall labeling and blocking in March 2017.¹⁵³ Every post-paid customer has Scam ID (labeling); Scam Block (blocking) is opt-in.¹⁵⁴ T-Mobile has identified over 21 billion scam calls and blocked over five billion of those calls.¹⁵⁵ These network-based tools use artificial intelligence, machine learning, and call behavior as part of the reasonable analytics to detect and label likely scams.¹⁵⁶ T-Mobile also offers a premium call control and caller ID service, “Name ID”, which allows a customer to block individual numbers and perform a reverse look up.¹⁵⁷

36. *U.S. Cellular*. U.S. Cellular offers the TNS Call Guardian application for Android and iOS devices.¹⁵⁸ U.S. Cellular does not know how many subscribers are using Call Guardian.¹⁵⁹ U.S. Cellular also offers network-based call labeling for VoLTE subscribers, using STIR/SHAKEN information as input to its call analytics data base.¹⁶⁰ The paid version of Call Guardian can block individual numbers or all calls identified as high risk and/or medium risk.¹⁶¹ According the U.S. Cellular, only 0.2% of blocked incoming calls are false positive.¹⁶²

37. *Verizon*. Verizon, through its network-level default blocking, has blocked millions of calls where the calling party’s number is invalid or unassigned, or where the block was authorized by the called party.¹⁶³ Verizon sends Release Code 603 (“denied”) for all calls blocked in the network.¹⁶⁴ At the device

¹⁴⁹ Sprint Letter at 3.

¹⁵⁰ *Block, Restrict, or Allow Voice Calls Using My Sprint*, <https://www.sprint.com/en/support/solutions/services/block-restrict-or-allow-voice-calls-using-my-sprint.html> (last visited June 9, 2020).

¹⁵¹ Letter from Ken Paker, Sr. Vice President and CTO, and Andrew Peterson, Sr. Vice President, TDS Telecommunications LLC, to Marlene H. Dortch, Secretary, FCC, CG Docket No. 17-59, at 1 (Feb. 28, 2020) (TDS Letter).

¹⁵² TDS Letter at 1.

¹⁵³ T-Mobile Comments at 2-3.

¹⁵⁴ *Id.* at 3.

¹⁵⁵ *Id.*

¹⁵⁶ *Id.*

¹⁵⁷ *Id.* at 3-4. This service is included in some plans and available for \$4/month for customers on other plans. *Id.* at 4.

¹⁵⁸ Letter from Grant B. Spellmeyer, Vice President, U.S. Cellular, to G. Patrick Webre, Chief, FCC Consumer and Governmental Affairs Bureau, CG Docket No. 17-59, at 2 (Feb. 28, 2020) (U.S. Cellular Letter).

¹⁵⁹ U.S. Cellular Letter at 3.

¹⁶⁰ *Id.* at 2.

¹⁶¹ *Id.* at 3.

¹⁶² *Id.* at 4.

¹⁶³ Letter from Christopher D. Oatway, Associate General Counsel, Verizon, to G. Patrick Webre, Chief, FCC Consumer and Governmental Affairs Bureau, CG Docket No. 17-59, at 2-3 (Feb. 28, 2020) (Verizon Letter).

level, tens of millions of Verizon Wireless customers use the free “Call Filter” blocking tool, provided by Verizon through third-party analytics company TNS.¹⁶⁵ The Call Filter app offers customers options to adjust what types of calls will be blocked and to opt out of the service.¹⁶⁶ Customers can configure the app to meet their preferences.¹⁶⁷ The app’s default setting blocks high risk (potential fraud) calls, but customers can also adjust what types of calls are blocked, such as medium risk (potential spam) and/or lower risk (possible nuisance) calls, as well as all international calls, to protect against the one-ring scam.¹⁶⁸ Wireless Call Filter customers can use the contacts list on their smart phones as a white list to prevent those contacts from being blocked.¹⁶⁹ Verizon sends all calls blocked by the Call Filter app directly to the Verizon customer’s voicemail.¹⁷⁰ Verizon seeks feedback about false positives from customers and calling parties on its website.¹⁷¹

38. In addition to the network-level blocking described above, Verizon’s wireline voice customers with caller ID are offered “Spam Alerts” labeling service at no charge.¹⁷² It displays “SPAM?” before a caller’s name if the calling number matches certain criteria designed to identify likely spam.¹⁷³ Verizon Fios customers can use the “Do Not Disturb” feature at no extra charge to block all incoming calls except for those that the customer exempts from the customer’s list of contacts.¹⁷⁴ Most of Verizon’s customers can also sign up for Nomorobo’s free blocking service.¹⁷⁵ Verizon estimates that it has blocked hundreds of millions of calls.¹⁷⁶

39. At the network level, Verizon blocks DNO numbers, i.e., calls from over 1,600 numbers that federal agencies do not use for outbound calls and that fraudsters spoof in order to impersonate those agencies.¹⁷⁷ Verizon worked with the Social Security Administration on a DNO program that blocked more than 10 million calls in three months.¹⁷⁸ Verizon also invites calling parties and consumers to identify calls that were incorrectly identified.¹⁷⁹ Calling parties can also tell Verizon about their calling campaigns so that Verizon’s third-party vendor can take that information into account when analyzing

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¹⁶⁴ Verizon Letter at 4.

¹⁶⁵ Verizon Comments at 1-2; Verizon Letter at 1, 6.

¹⁶⁶ Verizon Letter at 2.

¹⁶⁷ *Id.*

¹⁶⁸ *Id.*; see also FCC Consumer Guide, “One Ring” Phone Scam (May 15, 2019), <https://www.fcc.gov/consumers/guides/one-ring-phone-scam>.

¹⁶⁹ Verizon Letter at 5.

¹⁷⁰ *Id.* at 3.

¹⁷¹ *Id.* The website is *Verizon Spam Feedback*, <https://www.voicespamfeedback.com/vsf> (last visited June 9, 2020).

¹⁷² Verizon, *Stop Unwanted Calls*, <https://www.verizon.com/support/consumer/homephone/calling-features/stop-unwanted-calls> (last visited June 9, 2020).

¹⁷³ Verizon Letter at 2.

¹⁷⁴ *Id.* at 5.

¹⁷⁵ Verizon Comments at 2.

¹⁷⁶ *Id.* at 3.

¹⁷⁷ *Id.*

¹⁷⁸ *Id.*

¹⁷⁹ *Id.* at 4.

calls.¹⁸⁰ Verizon has a honeypot program, i.e., decoy phone numbers to attract robocallers, to collect data on robocalls; it uses the information to help identify and categorize mass calling campaigns.¹⁸¹

40. *Vonage*. Vonage offers residential customers two opt-in blocking tools, “Anonymous Call Block” and “Selective Call Block”, at no charge.¹⁸² Approximately 20% of Vonage customers have enabled these features.¹⁸³ Anonymous Call Block informs callers with blocked caller ID that the call cannot be completed until they unblock the caller ID.¹⁸⁴ “Selective Call Block” allows customers to block up to 50 numbers; the caller will receive a message that the called party is unavailable.¹⁸⁵ Vonage offers business customers Call Blocking, which blocks particular numbers or area codes and anonymous numbers, and Spam Shield, which labels calls that match a number associated with telemarketing, robocalls, and scams, as “Suspected Spam.”¹⁸⁶ Vonage is planning on offering a call labeling service, Neustar Robocall Mitigation, which will label a high risk call as “Spam?” in the telephone display.¹⁸⁷ This service will also allow customers to white list numbers.¹⁸⁸

2. Third-party analytics companies’ blocking services

41. Several third-party analytics companies that provide blocking services submitted information about their services, including estimates of the number of robocalls or unwanted calls that they have blocked. Although these companies use different definitions of “robocall” and provide their services for different platforms, their data provides useful information on call blocking. Analytics companies may both partner with voice service providers and offer their services directly to the general public.

42. *Call Control*. Third-party analytics company Call Control estimates that over half the calls made in the United States are unwanted by subscribers and states that consumers are conditioned not to answer their phones unless they recognize the caller ID of the calling party.¹⁸⁹ Call Control estimates that it has blocked over one billion calls.¹⁹⁰ Call Control contends that American consumers receive approximately 2,000 robocalls per second, and have reported 5.2 billion robocalls in January 2019.¹⁹¹ Call Control offers software to block robocalls. At the device level, the company developed smartphone applications for Android and iOS, as well as a service for landlines that features a block list that is dynamically updated through the internet.¹⁹² Call Control can also integrate into a business phone system, and when a call is made into the customer’s network, it can check the incoming caller against a set of

¹⁸⁰ *Id.*

¹⁸¹ *Id.* at 5.

¹⁸² Letter from Randy K. Rutherford, Chief Legal Officer, Vonage, to Marlene H. Dortch, Secretary, FCC, CG Docket No. 17-59, at 1-2 (Feb. 28, 2020) (Vonage Letter).

¹⁸³ Vonage Letter at 2.

¹⁸⁴ *Id.* at 1.

¹⁸⁵ *Id.* at 1-2.

¹⁸⁶ *Id.* at 2.

¹⁸⁷ *Id.*

¹⁸⁸ *Id.*

¹⁸⁹ Call Control Comments at 3.

¹⁹⁰ Call Control, *Get in Touch with Us*, <https://www.callcontrol.com/contact> (last visited June 9, 2020).

¹⁹¹ Call Control, *How Many Robocalls Are Received in the US Every Second?*, (Mar. 8, 2019), <https://blog.callcontrol.com/post/183318053268/how-many-robocalls-are-received-in-the-us-every>.

¹⁹² Call Control Comments at 1

rules and its database to make call handling and routing decisions.¹⁹³ For example, when an unwanted call is made to the business, Call Control can hang up or send it to a voicemail system for review.¹⁹⁴

43. *First Orion*. First Orion offers a variety of call blocking and call labeling tools. The most widely used, and free to consumers, are Scam ID and Scam Block, currently deployed with T-Mobile.¹⁹⁵ First Orion also currently offers blocking and labeling services to Tracfone and Boost Mobile.¹⁹⁶ There are nearly 65 million Scam ID subscribers and approximately seven million have opted into Scam Block.¹⁹⁷ Name ID is subscription-based and offers services such as caller ID with the calling party's name, Personal Number Blocking, Category Blocking and Disposition, and Phone Number Look-up.¹⁹⁸ In addition, First Orion offers these opt-in applications directly to consumers.¹⁹⁹ The applications offer varying degrees of call labeling, call blocking, caller ID, and number look-up.²⁰⁰ First Orion has technology that identifies invalid numbers to support scam detection.²⁰¹ First Orion also offers calling parties tools that they use to inform called parties, on a verified basis, who is calling them.²⁰² The Call Management opt-in tool has invalid and DNO numbers that are identified and blocked; numbers that are either labeled "scam likely" or blocked; and other calls such as telemarketing that can be sent directly to voicemail or answered.²⁰³ The T-Mobile First Orion Scam ID service has identified over 22 billion scam calls since 2017; 25-30% of overall traffic is identified as a scam call, which is over 225 million calls per week.²⁰⁴ First Orion does not send the calling party an intercept message when calls are blocked.²⁰⁵ First Orion supports calltransparency.com, which allows callers to register their outbound numbers and can help prevent erroneous labeling or blocking.²⁰⁶ In addition, callers and consumers can raise issues of erroneous blocking or labeling on the First Orion or T-Mobile websites.²⁰⁷

44. *Hiya*. Hiya offers call blocking for mobile phones.²⁰⁸ Hiya currently provides fraud and

¹⁹³ *Call Control for Enterprises*, <https://www.callcontrol.com/networks> (last visited June 9, 2020).

¹⁹⁴ *Id.*

¹⁹⁵ First Orion Comments at 3.

¹⁹⁶ *Id.* at 4.

¹⁹⁷ *Id.*

¹⁹⁸ *Id.*

¹⁹⁹ Letter from Charles Morgan, CEO and Chairman, First Orion, to G. Patrick Webre, Chief, FCC Consumer and Governmental Affairs Bureau, CG Docket No. 17-59, at 1 (Feb. 28, 2020) (First Orion Letter).

²⁰⁰ *Id.* at 2.

²⁰¹ *Id.*

²⁰² *Id.*

²⁰³ *Id.* at 2-3.

²⁰⁴ *Id.* at 3.

²⁰⁵ *Id.*

²⁰⁶ *Id.*; see Call Transparency, *Improve Your Calling Experience*, <https://calltransparency.com> (last visited June 9, 2020).

²⁰⁷ First Orion Letter at 3-4.

²⁰⁸ Hiya, *About*, <https://hiya.com/about> (last visited June 9, 2020).

spam detection services through AT&T's Call Protect, Samsung's Smart Call, and Hiya's own app.²⁰⁹ Hiya estimates that 54.6 billion unwanted robocalls were made to mobile phones in the United States in 2019, with consumers receiving on average 14 spam calls per month.²¹⁰ Hiya calculates this number based on extrapolating the total number of unwanted robocalls from Hiya users as compared to the entirety of mobile phone subscribers in the United States.²¹¹ Hiya estimates that in 2019 it protected more than 100 million consumers from fraud and nuisance calls and analyzed more than 145 billion calls worldwide.²¹² Hiya alerted users to more than five billion spam calls and helped block nearly 800 million such calls.²¹³ Since 2016, Hiya has blocked or labeled nearly 1.3 billion suspected fraud calls and over three billion other suspect calls for AT&T's Call Protect service.²¹⁴ Hiya's false positive rate for Call Protect is a fraction of one percent, based on reports by users.²¹⁵ Hiya, through AT&T, has offered its service on an opt-out basis after June 2019, blocking invalid and DNO numbers, and calls identified as fraud through analytical intelligence.²¹⁶

45. *Innovative Systems*. Third-party analytics company Innovative Systems offers a call blocking tool for landline voice service providers called "Terminating Call Manager." The service is currently available on 207 rural landline voice service provider's networks, and can be offered on an opt-in or opt-out basis.²¹⁷ At the network level, calls that appear to be spoofed are blocked; at the device level, calls are compared to a known caller list and a blocked caller list.²¹⁸ Callers will receive a Challenge Announcement indicating that the called party does not accept telemarketer calls, or a Call Blocking Announcement.²¹⁹ Innovative Systems also updates the list of numbers to be blocked weekly, from a list of nuisance callers from the Commission's Consumer Complaints database.²²⁰ Innovative Systems states that this service should have a very low probability of false positives, because the Challenge Announcement allows callers to complete the call.²²¹

46. *Neustar*. Neustar offers Robocall Mitigation, a tool that applies analytics to compute a per-call score and enables wireline and wireless voice service providers to choose how or whether to deliver the call.²²² Neustar considers telephone number characteristics (e.g., invalid, unallocated, unassigned),

²⁰⁹ Letter from Kush Parikh, Chief Operating Officer, Hiya, to Mika Savir, Attorney, FCC Consumer and Governmental Affairs Bureau, CG Docket No. 17-59, (Feb. 28, 2020) (Hiya Letter); see *Smart Call, Powered by Hiya, Helps Samsung Users Identify Unknown Callers and Stay Protected Against Phone Spam*, <https://hiya.com/it/products/smart-call> (last visited June 9, 2020).

²¹⁰ Hiya Letter at 2; *State of the Call End of Year Report 2019*, <https://hiya.com/state-of-the-call> (last visited June 9, 2020).

²¹¹ *State of the Phone Call End of the Year Report 2019*, <https://assets.hiya.com/public/pdf/HiyaStateOfTheCall2019.pdf?v=ff6a3203004af7328a696e57bcb949dd> (last visited June 9, 2020).

²¹² Hiya Letter at 2.

²¹³ *Id.*

²¹⁴ *Id.* at 3.

²¹⁵ *Id.* at 4.

²¹⁶ *Id.* at 4-5.

²¹⁷ Innovative Systems Comments at 1.

²¹⁸ *Id.* at 2.

²¹⁹ *Id.*

²²⁰ *Id.*

²²¹ *Id.* at 3.

call patterns, call volumes, and seasonality to detect unusual or unexpected call patterns.²²³ A voice service provider can use reasonable analytics to provide information to consumers so that they can decide whether to take the call.²²⁴ Neustar also allows verified enterprises to register legitimate outbound calling numbers so they will not be inadvertently labeled or blocked.²²⁵ Neustar also works with voice service providers and enterprise partners to improve and update the DNO list.²²⁶

47. *Nomorobo*. Unlike most of the other third-party analytics companies, Nomorobo (for VoIP landlines) uses a feature known as Simultaneous Ring.²²⁷ When simultaneous ring is enabled, the subscriber's phone will ring on more than one number at the same time.²²⁸ The first device to pick it up gets the call—when the Nomorobo number is enabled as a simultaneous ring number it is the first number to screen the call.²²⁹ The call goes through to the subscriber's number if it is a legitimate call.²³⁰ If the call is an illegal robocall, Nomorobo intercepts the call and hangs up.²³¹ Nomorobo stopped over 512 million robocalls in 2019.²³² Nomorobo estimates that approximately 36% of all calls were robocalls in 2019, down from 41% in 2018.²³³ According to Nomorobo, the reduction in robocalls from 2018 to 2019 was due to the FTC's enforcement actions against robocallers, retailers helping prevent victims from buying gift cards for scammers, and widespread adoption of robocall blocking tools.²³⁴

48. Nomorobo offers free robocall blocking for VoIP landlines and charges \$1.99 per month for robocall blocking for mobile phones.²³⁵ For VoIP landline customers, blocked callers receive a call

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²²² Neustar Reply Comments at 3.

²²³ *Id.*

²²⁴ *Id.* at 3-4.

²²⁵ *Id.* at 7.

²²⁶ *Id.*

²²⁷ Nomorobo, *How Does It Work on Landlines?*, <https://nomorobo.zendesk.com/hc/en-us/articles/200536477-How-does-it-work-on-Landlines-> (last visited June 16, 2020).

²²⁸ *Id.*

²²⁹ *Id.*

²³⁰ *Id.*

²³¹ *Id.*

²³² Nomorobo, *Robocalls: 2019 Year in Review*, <https://www.nomorobo.com/2019> (last visited June 16, 2020).

²³³ *Id.*

²³⁴ *Id.* The FTC and Consumer Reports also observe a decline in robocalls. See Lois Greisman, FTC, *Robocall Reports Still Down, FTC Still Fighting* (June 15, 2020), <https://www.consumer.ftc.gov/blog/robocall>; Lois Greisman, FTC, *The FTC Keeps Attacking Robocalls* (Apr. 3, 2020), <https://www.consumer.ftc.gov/blog/2020/04/ftc-keeps-attacking-robocalls>; Octavio Blanco, *Finally Some Good News About Robocalls*, Consumer Rep. (July 12, 2019), <https://www.consumerreports.org/robocalls/good-news-about-robocalls>.

²³⁵ Nomorobo, *Robocalls: 2019 Year in Review*. Nomorobo explains: “After you've enabled and verified Nomorobo on your phone, just use your phone like normal! The only thing that you should do is to wait for the second ring to answer the phone (Nomorobo needs the first ring to detect robocallers). If you only hear one ring and then it stops, you know a robocaller was just blocked. If the phone continues ringing, you should answer it.” <https://nomorobo.zendesk.com/hc/en-us/articles/200536477-How-does-it-work-on-Landlines-> (last visited June 9, 2020).

intercept message.²³⁶ Wireless customers' blocked calls go directly to voicemail.²³⁷ Nomorobo provides instructions for its customers to correct erroneous blocking.²³⁸ Nomorobo states that as of April 30, 2020, its call blocking offering had stopped 1,601,173,021 robocalls.²³⁹

49. *RoboKiller*. RoboKiller, a robocall-blocking app for mobile phones from TelTech, estimates that 3.02 billion robocalls were made in May 2020.²⁴⁰ RoboKiller uses an algorithm based on audio-fingerprinting, audio analysis, machine learning, and user feedback, which it states is more effective than a caller-ID-based solution.²⁴¹ Teltech's RoboKiller app automatically blocks spam calls and prevents them from ringing on the called parties' phone, even if the number is spoofed.²⁴²

50. *TNS*. TNS offers a robocall detection service, Call Guardian.²⁴³ Call Guardian is available to wireless, VoIP, and landline service providers.²⁴⁴ For the first half of 2019, Call Guardian scored 30% of calls as high-risk or nuisance calls, which is approximately 200 million unwanted or illegal calls per day.²⁴⁵ Over half of those calls, approximately 100 million per day, were fraudulent or scam-related.²⁴⁶ For 2019, unwanted calls, including nuisance, spam, and fraudulent calls, increased by 49% to 106.8 billion calls.²⁴⁷ TNS stated that only 12% of negatively scored calls originated with numbers associated with Tier 1 carriers, although those carriers originate over 70% of all calls.²⁴⁸ TNS estimates that high risk calls from toll-free numbers increased 22% from the first quarter of 2019 to the second quarter of 2019.²⁴⁹ In addition, neighbor spoofing, i.e., using a spoofed number that appears to be local to the called party, and snowshoe spoofing²⁵⁰ have increased. TNS has also seen an increase in the instances where a

²³⁶ Nomorobo Reply Comments at 1. For a more detailed description of the intercept message Nomorobo sends to the blocked callers, see Nomorobo, *Why Am I Getting Calls from 608-371-6666*, <http://www.6083716666.com> (last visited June 9, 2020). Nomorobo explains: "When we block a call we give them a 'message' saying Nomorobo has blocked the call. If the caller enters the Captcha code, we push the call through to you. If not, the call is terminated." See <https://nomorobo.zendesk.com/hc/en-us/articles/205761825-What-happens-when-a-call-is-blocked-on-a-landline-> (last visited June 9, 2020).

²³⁷ Nomorobo Reply Comments at 1.

²³⁸ *Id.* For instructions, see *How Can I Allow a Call Nomorobo is Blocking to Ring Through?*, <https://nomorobo.zendesk.com/hc/en-us/articles/205063319-How-can-I-allow-a-call-Nomorobo-is-blocking-to-ring-through-> (last visited June 9, 2020).

²³⁹ See Nomorobo, <https://www.nomorobo.com> (last visited June 16, 2020).

²⁴⁰ RoboKiller, *2020 U.S. Robocall Insights*, <https://www.robokiller.com/robocall-insights> (last visited June 16, 2020).

²⁴¹ Teltech Comments at 1.

²⁴² *Id.*

²⁴³ Letter from Paul Florack, Vice President, Product Management, Transaction Network Services, Inc., to G. Patrick Webre, Chief, FCC Consumer and Governmental Affairs Bureau, CG Docket No. 17-59, at 1 (Feb. 28, 2020) (TNS Letter).

²⁴⁴ TNS Letter at 2.

²⁴⁵ TNS Comments at 8; TNS Letter at 3.

²⁴⁶ TNS Comments at 8.

²⁴⁷ TNS Letter at 3.

²⁴⁸ TNS Comments at 9.

²⁴⁹ *Id.* at 10.

²⁵⁰ *Id.* at 11. Snowshoe robocallers spoof several numbers in low volumes in an attempt to avoid detection.

bad actor spoofs the toll-free and local numbers of major corporations.²⁵¹ TNS's service, offered to various voice service providers, such as Verizon, Sprint, and US Cellular, is deployed at the network level, with options to either block at the network level, send the call directly to the consumer's voicemail, or to deliver the call to the consumer with a label.²⁵² Cequent, a subsidiary of TNS, offers an app for mobile devices that provides additional labeling information, including a risk meter, intent of caller, and name of caller.²⁵³ According to a survey done by TNS, 78% of respondents wanted to only automatically block scam/fraud calls and 69% of respondents would rather have nuisance calls sent to voicemail instead of blocked.²⁵⁴ Over half, 54%, preferred to screen their own calls.²⁵⁵

51. *TransNexus*. TransNexus provides software to perform call analytics to identify and prevent unwanted robocalls.²⁵⁶ The software products analyze traffic to monitor call activity and block or divert suspicious calls.²⁵⁷ The TransNexus software also provides a reputational service to look up the reputation of the calling party and, if the reputation score exceeds a threshold, block or divert the call.²⁵⁸ The software can also blacklist callers and shield consumers from calls from high risk numbers.²⁵⁹ The TransNexus software uses STIR/SHAKEN to help with caller ID authentication.²⁶⁰ Services can be opt-in or opt-out; e.g., blacklisting, i.e., blocking numbers from a list of known robocallers, is generally opt-out and blocking calls with a poor reputation would generally be opt-in.²⁶¹

52. *YouMail*. YouMail offers call blocking for mobile and landline users based on a rating system, and has a robocall index of nationwide robocall data, per month, on its website.²⁶² YouMail estimates that Americans received 58.5 billion robocalls in 2019.²⁶³ According to YouMail, in December 2019, 4.6 billion robocalls were made nationwide; 26.2 million robocalls were made to Washington, D.C.; 144.6 million robocalls were made to New York City; and 138.7 million robocalls were made to Los Angeles.²⁶⁴ YouMail also breaks down the robocalls by telephone number used, place of origin,

²⁵¹ *Id.* at 11-12.

²⁵² *Id.* at 5.

²⁵³ *Id.*

²⁵⁴ *Id.* at 7.

²⁵⁵ *Id.*

²⁵⁶ TransNexus Comments at 1-2.

²⁵⁷ *Id.*

²⁵⁸ *Id.*

²⁵⁹ *Id.*

²⁶⁰ *Id.*

²⁶¹ *Id.* at 2.

²⁶² YouMail, *Robocall Index*, <https://robocallindex.com> (last visited June 10, 2020); YouMail, *Block Calls at the Source*, <https://www.youmail.com/home/feature/stop-robocalls> (last visited June 10, 2020).

²⁶³ Mike Snider, *Robocalls Rang Up a New High in 2019. Two or More Daily Is Average in Some States*, USA Today (Jan. 15, 2020), <https://www.usatoday.com/story/tech/2020/01/15/robocalls-americans-got-58-5-billion-2019/4476018002/>.

²⁶⁴ YouMail, *December 2019 Washington, DC Robocall Data*, <https://robocallindex.com/washington-dc/2019/december?searchTerm=Washington,%20DC> (last visited June 10, 2020); YouMail, *December 2019 New York, NY Robocall Data*, <https://robocallindex.com/new-york-ny/2019/december?searchTerm=New%20York,%20NY> (last visited June 10, 2020); YouMail, *December 2019 Los Angeles, CA Robocall Data*, <https://robocallindex.com/los-angeles-ca/2019/december?searchTerm=Los%20Angeles,%20CA> (last visited June 10, 2020).

carrier, caller ID used, and type of caller.²⁶⁵

3. Device manufacturers' blocking services

53. *Apple*. Device manufacturer Apple's iPhones have an opt-in "Silence Unknown Callers" feature that blocks phone numbers that are not saved in the user's contacts and that the user has not previously contacted.²⁶⁶ The blocked call will appear in the recent calls list, but the user will not be notified when the call is made.

54. *Google*. Google Pixel phones have a "Call Screen" feature, which gives users the option to have the operating system ask who is calling and why, and see a real-time transcript of the caller's response, before deciding whether to take the call.²⁶⁷ Google offers several free, opt-in, call-blocking tools, such as the Phone App for Android, which provides visual warnings about a potential spam caller, enables users to block specific numbers, and allows users to report spam callers.²⁶⁸ Users can block unwanted calls and have them sent directly to voicemail.²⁶⁹ This builds on an existing "suspected spam caller" warning feature within Android operating systems.²⁷⁰ Google Voice users can also use a call management tool to block unwanted calls.²⁷¹

55. *Samsung*. Samsung partners with Hiya to offer a call-blocking solution called Smart Call.²⁷² This service labels potentially unwanted calls so the called party can block the call and report it as spam.

B. Assessment of the Number of Subscribers Availing Themselves of Available Call-Blocking Tools

56. Most of the larger voice service providers offer default network-based blocking to block apparently fraudulent calls. In addition to network-based blocking, voice service providers offer other blocking and labeling options, consumers can subscribe directly to services from third-party analytics companies, and some blocking options are installed by the manufacturer on consumers' devices.

57. Commenters have not provided estimates of the number of subscribers using such call-blocking tools. Commenters have, however, provided general estimates of the number of blocked calls. For example, AT&T estimates that it has blocked almost six billion calls through its network-based default blocking since 2016.²⁷³ In addition to default network blocking, AT&T has blocked or labeled nearly 1.3 billion suspected fraud calls and over three billion other calls since 2016, through AT&T Call Protect.²⁷⁴ Verizon estimates that it has blocked millions of calls with network-level default blocking.²⁷⁵

²⁶⁵ YouMail also categorizes calls as scams, telemarketing, alerts and reminders, and payment reminders. Of these four categories, the last two may not be unwanted calls.

²⁶⁶ Apple, *Detect and Block Spam Phone Calls*, <https://support.apple.com/en-us/HT207099> (last visited June 10, 2020).

²⁶⁷ *Id.*

²⁶⁸ Letter from Darah Franklin, Counsel, Google LLC, to G. Patrick Webre, Chief, FCC Consumer and Governmental Affairs Bureau, CG Docket No. 17-59, at 1 (Feb. 28, 2020) (Google Letter).

²⁶⁹ Google Letter at 1.

²⁷⁰ *Id.*

²⁷¹ *Id.* at 2.

²⁷² Samsung, *Smart Call Can Easily Report or Block Spam Calls*, <https://www.samsung.com/global/galaxy/apps/smart-call/> (last visited June 15, 2020).

²⁷³ AT&T Comments at 8.

²⁷⁴ *Id.* at 3; AT&T Letter at 2.

²⁷⁵ Verizon Letter at 2-3.

Comcast estimates that it blocked over 158 million robocall attempts in December 2019.²⁷⁶ Third-party analytics companies also offer estimates of the number of calls blocked. For example, Call Control advertises that it has blocked over one billion calls.²⁷⁷ Nomorobo estimates that it blocked over 512 million robocalls in 2019.²⁷⁸ Although we do not have enough specific information to conclude how many calls are blocked or labeled, it is clear that voice service providers and analytics companies are blocking and labeling billions of unwanted calls to American consumers each year.

C. Effectiveness of Call Blocking Tools

58. Apart from fraudulent calls, which unquestionably should be blocked, whether a call should be blocked depends on the consumers' preferences. For example, some consumers may want all calls, other than those from their contacts, sent to their voicemail. Others may want only fraudulent calls blocked while preferring to screen the remaining calls and choose whether to answer them or let them go to voicemail. Voice service providers have described that they have default network-based blocking of fraudulent calls.²⁷⁹ In addition, many voice service providers offer, through third-party analytics companies, call blocking and labeling of suspicious calls.²⁸⁰ While it is difficult to evaluate effectiveness, one voice service provider, AT&T, reported that an additional blocking feature had fewer than 100,000 customers opting in for the direct-to-voicemail feature, and a significant number of customers subsequently deactivated the feature.²⁸¹ TNS, an analytics company, reports that according to its survey, 78% of respondents wanted to automatically block scam and fraud calls and 69% would rather have nuisance calls sent to voicemail.²⁸²

1. False-positive blocks

59. Companies have described a false-positive block as when a call is erroneously blocked. Voice service providers and third-party analytics companies strive to block unwanted calls with minimal instances of false positives. For example, to prevent erroneous blocks, AT&T investigates each number before blocking it at the network level.²⁸³ AT&T uses a team of fraud investigators to target suspected illegal high-volume calling events.²⁸⁴ The investigators and network analytics team develop a suspected robocall report, which is updated on a virtually continuous basis.²⁸⁵ This allows AT&T to investigate each suspicious pattern of calls; the investigation includes calling each suspicious number.²⁸⁶ AT&T also provides an outgoing message to the blocked caller, with a toll-free number to call.²⁸⁷ Also, many call blocking features send blocked calls directly to voicemail, which allows the consumer to retrieve the message and return the call, if desired.

²⁷⁶ Comcast Comments at 4; Comcast Letter at 2.

²⁷⁷ Call Control, *Get in Touch with Us*, <https://www.callcontrol.com/contact> (last visited June 9, 2020).

²⁷⁸ Nomorobo, *Robocalls: 2019 Year in Review*, <https://www.nomorobo.com/2019> (last visited June 9, 2020).

²⁷⁹ See, e.g., AT&T Letter at 4-5; Verizon Letter at 2-3; CenturyLink Letter at 2; Frontier Letter at 2.

²⁸⁰ See, e.g., AT&T Comments at 3 (now offered on an opt-out basis); Verizon Letter at 1-2; CenturyLink Letter at 2; Frontier Letter at 2.

²⁸¹ AT&T Letter at 2.

²⁸² TNS Comments at 7.

²⁸³ AT&T Letter at 4.

²⁸⁴ *Id.*

²⁸⁵ *Id.* at 4-5.

²⁸⁶ *Id.* at 5.

²⁸⁷ AT&T Comments at 9 (the outgoing message is in English and Spanish, for blocked callers to Mobility, U-verse, Prepaid, or Cricket customers).

60. Commenters representing industries that make a lot of outbound calls assert that the rate of erroneously blocked calls is much higher than voice service providers indicate.²⁸⁸ Part of this false-positive block, however, may result from consumers choosing not to answer calls from numbers they do not recognize and allowing the call to go to voicemail instead, an option offered by voice service providers.²⁸⁹

61. AT&T estimates that its false-positive rate is far lower than one percent.²⁹⁰ TNS contends that only 0.2% of the calls it has rated turned out to be false positives, based on customer feedback.²⁹¹ First Orion estimates that false positives and false negatives are a fraction of one percent of all analyzed calls.²⁹² Nomorobo states that its false-positive rate for landline calls in January 2020 was 0.21%; in 2019 the false-positive rate ranged from 0.03% (June) to 0.18% (December).²⁹³

62. Commenters representing industries that make a lot of outbound calls are concerned about what they describe is the number of false-positive blocks, or adversely labeled calls, arising from use of call-blocking tools.²⁹⁴ Encore contends that in one study, 45% of the calling numbers were labeled severe or high risk, even though all the callers had consent to call the consumers.²⁹⁵ According to RTI, the Commission must address the harm occurring from over-blocking legitimate calls, including calls from the federal government and its contractors.²⁹⁶ ACA International contends that in a survey by an independent firm, 21% of lawful calls were blocked, over 25% of calls that were not blocked were labeled, and of those, 24% were mislabeled.²⁹⁷ Although ACA International argues that this survey is evidence of erroneous blocking, the blocking may have been consistent with consumers' chosen blocking options. ACA International contends that the Commission should rescind the *2019 Call Blocking Declaratory Ruling* or limit blocking to unlawful calls.²⁹⁸

63. Several commenters give examples of what they contend is erroneous blocking or labeling. TNS contends that healthcare providers have found it difficult to send routine appointment reminders to existing patients.²⁹⁹ AICC argues that it has received reports from a number of alarm companies that calls from central alarm stations have been blocked or mislabeled as fraud.³⁰⁰ Another alarm company reported

²⁸⁸ See, e.g., PACE Comments at 2-3; Encore Comments at 1-6; TNS Reply Comments at 3-4.

²⁸⁹ For example, AT&T's Call Protect allows users to send calls directly to voicemail, AT&T Letter at 2; Verizon's Call Filter app sends blocked calls to voicemail, Verizon Letter at 3; Verizon's landline customers with caller ID have Spam Alerts robocall labeling so the called party can choose not to answer the robocall, Verizon Letter at 2; Nomorobo's mobile users can send calls directly to voice mail, <http://nomorobo.com/ios> (last visited June 9, 2020).

²⁹⁰ AT&T Comments at 9.

²⁹¹ TNS Comments at 13; TNS Letter at 4.

²⁹² First Orion Comments at 8; First Orion Letter at 4.

²⁹³ Nomorobo Reply Comments at 5-6.

²⁹⁴ PACE Comments at 2-3; Encore Comments at 1-6; ACA International Comments at 2; Sirius XM Reply Comments at 6; CUNA Reply Comments at 1-2; TNS Reply Comments at 3-4; ACI Reply Comments at 1-2.

²⁹⁵ Encore Comments at 2.

²⁹⁶ RTI Reply Comments at 12.

²⁹⁷ ACA International Reply Comments at 1-2. The survey was conducted measuring outbound calls from accounts receivable management numbers to mobile phones and cable telephony providers; the calls were blocked or labeled by the voice service providers or third-party apps downloaded by consumers. The survey did not state whether blocked calls were sent to voicemail.

²⁹⁸ *Id.* at 11.

²⁹⁹ TNS Reply Comments at 3.

to AICC that it is fairly common for its subscribers to report that a central alarm station call shows up as spam on caller ID.³⁰¹ Twilio contends that a real estate agent who contacted existing clients using the same number for outbound calls experienced call blocking, apparently due to the large number of outbound calls.³⁰² Similarly, DoorDash’s calls were erroneously blocked or mislabeled, apparently because the calls were short in duration.³⁰³ PagerDuty, a company that sends a large volume of short communications to its clients, states that it had its calls blocked or mislabeled.³⁰⁴ According to NAFCU, one credit union calculated that over 100,000 calls were blocked between September 2019 and November 2019 by two service providers.³⁰⁵ NAFCU explains that a high volume of short duration calls from a toll-free number could generate blocking, but this could also be the calling pattern for fraud notifications from a credit union.³⁰⁶ Ad Hoc suggests that the Commission limit call blocking to calls that fail the STIR/SHAKEN protocol; originate from unassigned, invalid, unallocated, or inbound-only numbers; or fail acceptable analytics specified by the Commission.³⁰⁷

2. Redress, or correcting false positives

64. Commenters have concerns with their ability to obtain redress from voice service providers when their outbound calls to consumers are blocked, i.e., to get erroneous blocks and labels corrected. Under the TRACED Act, no later than one year after the statute’s enactment, i.e., no later than December 30, 2020, the Commission shall ensure that redress options are available at no charge.³⁰⁸ Commenters contend that voice service providers, or their third-party analytics companies, have imposed significant fees to correct erroneous blocking.³⁰⁹ Americollect states that Nomorobo does not permit reports of erroneous blocking except by callers with paid Nomorobo accounts.³¹⁰ One voice service provider’s call blocker requested a \$500 monthly fee to remove labels and blocks.³¹¹ NAFCU states that one service provider allows businesses to register their phone numbers, but after a 30-day trial period they are required to have a paid subscription in order to continue using the service.³¹²

3. Notice from voice service providers when calls are blocked

65. Commenters suggest that voice service providers use an intercept announcement for calls that are blocked.³¹³ AT&T, however, already provides an intercept announcement for network-blocked calls

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³⁰⁰ AICC Reply Comments at 3.

³⁰¹ *Id.*

³⁰² Twilio Reply Comments at 6.

³⁰³ *Id.* at 7.

³⁰⁴ *Id.*

³⁰⁵ NAFCU Comments at 3.

³⁰⁶ *Id.*

³⁰⁷ Ad Hoc Comments at 4.

³⁰⁸ Section 10(b) of the TRACED Act adds new section (j) Robocall Blocking Service to section 227 of the Act and provides that the Commission shall ensure that robocall blocking services “are provided with transparency and effective redress options . . . with no additional charge to callers for resolving complaints related to erroneously blocked calls.” 47 U.S.C. § 227(j)(1)(A), (B).

³⁰⁹ ACA International Comments at 3-4.

³¹⁰ Americollect Comments at 2.

³¹¹ ACA International Comments at 5.

³¹² NAFCU Comments at 3.

and Verizon sends a Release Code 603 for such network-blocked calls.³¹⁴ Nomorobo sends an intercept message for blocked VoIP landline calls.³¹⁵ Additionally, many of the call blocking apps, e.g., Verizon's Call Filter, send the blocked call directly to voicemail, so the called party has the opportunity to hear the caller's message and return the call. An intercept message could, therefore, be confusing to the calling party.

4. Point of contact for false-positive blocks

66. Commenters suggest that there should be a uniform mechanism for callers to immediately notify service providers of erroneous blocking.³¹⁶ At this time, voice service providers and analytics companies allow parties to report incorrectly identified calls on their websites:

- AT&T—call 800-337-5373 (prompt 1), email dl-GFMObusinessfra@att.com, or contact Hiya through its website, <https://hiyahelp.zendesk.com/hc/en-us/requests/new>.³¹⁷ Calling parties can also provide feedback at <http://www.att.com/reviewmycalllabel>, which links to Hiya's portal.³¹⁸
- CenturyLink—email robocall.reporting@centurylink.com, or contact Nomorobo, www.nomorobo.com/contact and choose "Report a Number."³¹⁹
- First Orion—contact through website at www.calltransparency.com.³²⁰
- Frontier—email nospam@fr.com, or contact Nomorobo.³²¹
- Hiya—contact through website at <https://hiyahelp.zendesk.com/hc/en-us/requests/new>. Hiya provides a service for legitimate businesses to register, through connect.hiya.com.³²²
- Nomorobo—contact through website at www.nomorobo.com/contact and choose "Report a Number." Nomorobo has a white list feature to which subscribers can add numbers in

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³¹³ PACE Comments at 3; CBA Comments at 2; ABA Comments at 4-5; Encore Comments at 7; Encore Reply Comments at 3-4; ACA International Comments at 9 (recommending an intercept announcement and a SIP signaling error code); Noble Comments at 10; Noble Reply Comments at 3 (same); INCOMPAS Comments at 4 (same); Sirius XM Reply Comments at 6 (same). PACE notes that legal calls are often mislabeled as scam or spam, most likely due to crowd-sourced data and analytics algorithms. PACE Comments at 4. NORC contends that the Commission should have defined safeguards to allow legitimate callers to challenge incorrect blocks immediately so that they can be resolved without delay. NORC Comments at 8; NAFCU Comments at 4.

³¹⁴ AT&T's network-based call blocking program, which was run by AT&T's global fraud team initially, was implemented on the wholesale IP platform and subsequently expanded to the wireless network. AT&T Letter at 4-5.

³¹⁵ These Nomorobo-blocked calls, like the network-blocked AT&T and Verizon calls, would not reach the subscriber.

³¹⁶ Encore Comments at 8-9; Encore Reply Comments at 4; ACA International Comments at 9; NAFCU Comments at 2; PRA Comments at 4; Ad Hoc Comments at 5-7; Sirius XM Reply Comments at 4. Encore suggests that voice service providers unblock legitimate calls within 24 hours. Encore Reply Comments at 5.

³¹⁷ USTelecom Reply Comments at 7; CTIA Reply Comments at 14.

³¹⁸ AT&T Letter at 3.

³¹⁹ USTelecom Reply Comments at 7.

³²⁰ First Orion Comments at 8.

³²¹ USTelecom Reply Comments at 7.

³²² Hiya Letter at 4; see Hiya, *I Want to Change or Remove the Caller ID Information or Spam Rating of a Number*, <https://hiyahelp.zendesk.com/hc/en-us/articles/115014815387-I-want-to-change-or-remove-the-caller-ID-information-or-Spam-Rating-of-a-number> (last visited June 9, 2020).

order to prevent erroneous blocking.³²³

- Sprint—call 888-211-4727 or contact TNS at <https://reportarobocall.com/trf/>.³²⁴
- T-Mobile—contact through <https://feedback.fosrvt.com/> or through First Orion at <https://calltransparency.com>.³²⁵
- TNS—TNS provides a portal on its website for identifying inaccuracies, through its robocall feedback website, <https://reportarobocall.com/trf/>, and it allows companies to subscribe to alerts to inform them when the number is classified as a spammer, spoofer, scammer, or robocaller.³²⁶
- US Cellular—contact through website at <https://www.uscellular.com/support/robocall/index.html>.³²⁷
- Verizon—contact through either <http://www.voicespamfeedback.com> or <http://www.spamalerts.verizon.com>.³²⁸
- Windstream—email WINDSTREAM.NetworkAbuse@windstream.com.³²⁹

D. White List Programs and Critical Calls List

67. Commenters are divided on whether the Commission should develop a white list of critical numbers.³³⁰ The Commission may address this issue in a future proceeding.³³¹ CTIA observes that a database of white-listed numbers would be a target for bad actors to spoof and otherwise exploit.³³² Other commenters suggest a white list of legitimate callers to ensure that their calls are not blocked or mislabeled.³³³

IV. STATE OF DEPLOYMENT OF CALLER ID AUTHENTICATION

68. According to the *2019 Call Blocking Declaratory Ruling*, this report should also include information on the state of deployment of caller ID authentication through implementation of the STIR/SHAKEN framework, and contain “snapshots” of deployment and implementation of Commission and industry efforts at the time of release.³³⁴ As a result of the March 2020 *Report and Order and Further*

³²³ *How Can I Allow a Call Nomorobo Is Blocking to Ring Through?*, <https://nomorobo.zendesk.com/hc/en-us/articles/205063319-How-can-I-allow-a-call-Nomorobo-is-blocking-to-ring-through-> (last visited June 9, 2020).

³²⁴ CTIA Reply Comments at 14.

³²⁵ T-Mobile Comments at 6; CTIA Reply Comments at 14.

³²⁶ TNS Comments at 14.

³²⁷ CTIA Reply Comments at 14.

³²⁸ USTelecom Reply Comments at 7.

³²⁹ *Id.*

³³⁰ Charter Comments at 6; Comcast Comments at 10-11; T-Mobile Comments at 9; First Orion Comments at 10; TNS Comments at 17.

³³¹ In the Further Notice of Proposed Rulemaking attached to the *2019 Call Blocking Declaratory Ruling*, the Commission sought comment on requiring any voice service provider that offers call blocking to maintain a Critical Calls List of numbers it may not block, including outbound PSAP numbers and government emergency numbers. *2019 Call Blocking Declaratory Ruling*, 34 FCC Rcd at 4896, para. 64.

³³² CTIA Reply Comments at 10.

³³³ PRA Comments at 4; Sirius XM Reply Comments at 7; Encore Reply Comments at 4-5.

³³⁴ *2019 Call Blocking Declaratory Ruling*, 34 FCC Rcd at 4904, para. 89.

Notice of Proposed Rulemaking, voice service providers generally must implement STIR/SHAKEN by June 30, 2021. We have summarized major voice service provider progress as of the end of 2019, which the Commission evaluated in the March 2020 *Report and Order and Further Notice of Proposed Rulemaking*, and additional progress by voice service providers since the end of 2019.

A. Implementation by Voice Service Providers as of the End of 2019

69. In the Commission’s March 2020 *Report and Order and Further Notice of Proposed Rulemaking*, it reported on the status of STIR/SHAKEN implementation among 14 major voice service providers as of the end of 2019.³³⁵ This snapshot of implementation as of the end of 2019 divided those 14 voice service providers into three categories: (1) voice service providers that upgraded their networks to support STIR/SHAKEN and began exchanging signed traffic with other voice service providers; (2) voice service providers that upgraded their networks to support STIR/SHAKEN but had not yet begun exchanging signed traffic with other voice service providers; and (3) voice service providers that had achieved limited, if any, progress towards upgrading their networks to support STIR/SHAKEN.

70. *Voice Service Providers That Had Upgraded Their Networks and Were Exchanging Signed Traffic by the End of 2019.* By the end of 2019, AT&T, Bandwidth, Charter, Comcast, Cox, T-Mobile, and Verizon announced that they had upgraded their networks to support STIR/SHAKEN.³³⁶ AT&T, for example, confirmed that it “authenticates all calls on its network that originate from [Voice over LTE] and consumer VoIP customers” and “estimates that approximately 90 percent of its wireless customer base (prepaid and postpaid) and more than 50 percent of its consumer wireline customer base are SHAKEN/STIR capable.”³³⁷ Charter stated that it “fulfilled [its] commitment to complete the implementation of the STIR/SHAKEN framework by the end of [2019].”³³⁸ Similarly, Comcast reported that “virtually all calls originating from a Comcast residential subscriber and terminating with a Comcast residential subscriber are fully authenticated through the STIR/SHAKEN protocol.”³³⁹ Cox reported that it “has deployed SHAKEN/STIR to over 99% of [its] residential customers enabling Cox to sign originating and terminating calls.”³⁴⁰ T-Mobile stated that it was “the first wireless provider to fully implement STIR/SHAKEN standards on [its] network” and is “capable of signing and authenticating 100% of SIP traffic that both originates and then terminates on [its] network.”³⁴¹ According to Verizon, it

³³⁵ *STIR/SHAKEN Order*, 35 FCC Rcd at 3249-3251, paras. 18-21.

³³⁶ See Letter from Linda S. Vandeloop, Assistant Vice President, Regulatory Affairs, AT&T Services, Inc., to Marlene H. Dortch, Secretary, FCC, WC Docket No. 17-97, at 1 (filed Feb. 5, 2020) (*AT&T Ex Parte*); Letter from Greg Rogers, Head of Global Policy and Regulatory Affairs, Bandwidth, to Marlene H. Dortch, Secretary, FCC, CG Docket No. 17-59, WC Docket No. 17-97, at 1 (Jan. 31, 2020) (*Bandwidth Ex Parte*); Letter from Audrey Connors, Senior Director, Government Affairs, Charter Communications, to Hon. Ajit V. Pai, Chairman, FCC, WC Docket No. 17-97, at 1 (filed Dec. 13, 2019) (*Charter Ex Parte*); Letter from Beth Choroser, Vice President, Regulatory Affairs, Comcast Corporation, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 17-97, CG Docket No. 17-59, at 2 (filed Jan. 31, 2020) (*Comcast Ex Parte*); *Cox Ex Parte* at 1; Letter from Cathleen A. Massey, Vice President, Federal Regulatory Affairs, T-Mobile, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 17-97, at 1 (filed Jan. 30, 2020) (*T-Mobile Ex Parte*); Letter from Joe Russo, Senior Vice President, Network Operations, Verizon, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 17-97, at 1 (filed Feb. 7, 2020) (*Verizon Ex Parte*).

³³⁷ *AT&T Ex Parte* at 1.

³³⁸ *Charter Ex Parte* at 1.

³³⁹ *Comcast Ex Parte* at 2 (also explaining that “virtually all calls originating from a Comcast residential subscriber and bound for customers of other voice providers are signed with a STIR/SHAKEN-compliant header when the call is initiated”).

³⁴⁰ *Cox Ex Parte* at 1.

³⁴¹ *T-Mobile Ex Parte* at 1.

“finished deploying STIR/SHAKEN to its wireless customer base (which constitutes more than 95% of [its] total traffic) in March 2019,” “is devoting substantial resources to deploying STIR/SHAKEN to wireline customers that receive service on IP platforms capable of being upgraded with the STIR/SHAKEN protocol,” and expects “to achieve deployment of STIR/SHAKEN to Fios Digital customers later this year.”³⁴²

71. These voice service providers, however, were exchanging only a limited amount of authenticated traffic with other voice service providers as of the end of 2019.³⁴³ For instance, Comcast has begun to exchange authenticated calls with AT&T and T-Mobile,³⁴⁴ and explained that, as of December 2019, approximately 14.25% of all calls “originating on other voice providers’ networks and bound for Comcast residential subscribers had a STIR/SHAKEN-compliant header and were verified by Comcast.”³⁴⁵ T-Mobile explained that it is also authenticating some traffic exchanged with AT&T, Comcast, and Inteliquent.³⁴⁶ According to AT&T, it “exchanges approximately 40 percent of its SHAKEN/STIR consumer VoIP traffic with one terminating service provider.”³⁴⁷ Verizon stated that it was signing “under half of [its] outbound traffic” with one provider as of the end of 2019, and that “for the other three partners,” its production levels were under 5%.³⁴⁸ Cox explained that it is “exchanging authenticated traffic with four carriers resulting in over 14% of all calls on Cox’ residential IP network being verified.”³⁴⁹ Charter stated that it is “exchanging signed and authenticated customer call traffic end-to-end with Comcast.”³⁵⁰ Bandwidth is also in early stages of exchanging traffic and “has designed, tested and deployed the capability to exchange some of its production traffic with Verizon Wireless directly utilizing ‘self-signed’ certifications that are in keeping with the STIR/SHAKEN framework.”³⁵¹

72. *Voice Service Providers That Had Upgraded Their Networks But Had Not Begun Exchanging Signed Traffic by End of 2019.* By the end of 2019, other voice service providers—namely Frontier, U.S. Cellular, and Vonage—performed necessary network upgrades, but were only beginning the negotiating and testing phase of exchanging authenticated traffic with other voice service providers.³⁵² Frontier reported that it “established the capability to authenticate and sign calls” and is in the negotiating and testing phase regarding authenticating traffic exchanged with other voice service providers.³⁵³ Sprint reported that it “deployed the core STIR/SHAKEN capability in its network” and was testing the

³⁴² Verizon *Ex Parte* at 1.

³⁴³ See AT&T *Ex Parte*; Bandwidth *Ex Parte*; Comcast *Ex Parte* at 1-2; T-Mobile *Ex Parte* at 2; Verizon *Ex Parte* at 2.

³⁴⁴ Comcast *Ex Parte* at 1-2.

³⁴⁵ *Id.* at 2.

³⁴⁶ T-Mobile *Ex Parte* at 2.

³⁴⁷ AT&T *Ex Parte* at 2.

³⁴⁸ Verizon *Ex Parte* at 2.

³⁴⁹ Cox *Ex Parte* at 1.

³⁵⁰ Charter *Ex Parte* at 1.

³⁵¹ Bandwidth *Ex Parte* at 1.

³⁵² See Letter from Diana Eisner, Director, Federal Regulatory, Frontier Communications, to Marlene H. Dortch, Secretary, FCC, WC Docket No 17-97 at 1 (filed Feb. 21, 2020) (Frontier *Ex Parte*); Letter from Charles W. McKee, Vice President, Government Affairs, Sprint Corporation, to Marlene H. Dortch, Secretary, FCC, CG Docket No. 17-59, WC Docket No. 17-97 at 1 (filed Feb. 13, 2019) (Sprint *Ex Parte*); U.S. Cellular *Ex Parte* at 1; Vonage *Ex Parte* at 1.

³⁵³ Frontier *Ex Parte* at 1.

exchange of authenticated traffic with Comcast and T-Mobile.³⁵⁴ In 2019, U.S. Cellular “successfully implemented the STIR/SHAKEN technology in its network” and is currently “in various stages of the [interconnection agreement] process with three of the four national wireless carriers . . . including, the successful exchange of traffic on a test basis with at least one of . . . those carriers.”³⁵⁵ Vonage reported that it was testing with “its two largest peering partners” and had “reached out to twenty additional carriers to implement outbound and inbound testing schedules.”³⁵⁶

73. *Voice Service Providers That Had Indicated Limited Network Upgrade Progress by the End of 2019.* An additional category of voice service providers—including CenturyLink, TDS, and Google—indicated limited progress in making the necessary network upgrades.³⁵⁷ CenturyLink, for instance, stated that as of late 2019 it had “taken the steps necessary to prepare its network for SHAKEN/STIR deployment” and is currently conducting testing for wider deployment on its IP networks.³⁵⁸ TDS, meanwhile, reported that it had completed work in 2019 to evaluate, select, and lab-test a vendor solution to allow it to integrate STIR/SHAKEN in the IP portions of its network.³⁵⁹ It is in the process of developing implementation plans, but because many of its interconnection points with other providers are not IP-enabled, it “forecast[s] that only a small percentage of traffic will be exchanged in IP when SHAKEN/STIR is initially deployed in the TDS IP network.”³⁶⁰ Google provided limited detail about the status of implementation but stated that it “remains committed to implementing SHAKEN/STIR and . . . ha[s] taken considerable steps toward doing so.”³⁶¹

B. Implementation Progress Since the End of 2019

74. Since the end of 2019, several major voice service providers have announced further progress in STIR/SHAKEN implementation. In February 2020, T-Mobile announced that it began exchanging authenticated traffic with Sprint.³⁶² On March 25, 2020, Bandwidth announced that it has begun exchanging authenticated traffic with T-Mobile.³⁶³ The STIR/SHAKEN Governance Authority reports that 58 voice service providers have begun registration to participate in STIR/SHAKEN through the governance system and that 22 of these providers have completed registration and been approved.³⁶⁴

³⁵⁴ Sprint *Ex Parte* at 1.

³⁵⁵ U.S. Cellular *Ex Parte* at 1.

³⁵⁶ Vonage *Ex Parte* at 1.

³⁵⁷ See CenturyLink *Ex Parte* at 1-2; TDS *Ex Parte* at 1.

³⁵⁸ CenturyLink *Ex Parte* at 2.

³⁵⁹ TDS *Ex Parte* at 1.

³⁶⁰ *Id.*

³⁶¹ Letter from Darah Franklin, Counsel, Google, LLC, to G. Patrick Webre, Bureau Chief, Consumer and Government Affairs Bureau, FCC, CG Docket No. 17-59, WC Docket No. 17-97 at 2 (filed Feb. 28, 2020) (Google *Ex Parte*) (noting that Google “began a SHAKEN/STIR implementation with Comcast in December 2019, and that we are working toward a similar integration with another major voice service provider this year.”).

³⁶² See Press Release, T-Mobile, Cross-Network STIR/SHAKEN Rollout Helps Stop Number-Spoofing, Keeping Consumers Safer from Scammers (Feb. 4, 2020), <https://www.t-mobile.com/news/tmobile-sprint-callerverified>.

³⁶³ See Press Release, Bandwidth, Bandwidth Announces Successful STIR/SHAKEN Interop with T-Mobile (Mar. 25, 2020), <https://www.prnewswire.com/news-releases/bandwidth-announces-successful-stirshaken-interop-with-t-mobile-301029410.html>.

³⁶⁴ ATIS, STI-GA NANC Update at 2 (May 5, 2020), <http://nanc-chair.org/docs/200505STIGANANCUpdate.pdf>; see also iconectiv, *Authorized Service Providers*, <https://authenticate.iconectiv.com/authorized-service-providers-authenticate> (last visited May 5, 2020) (listing approved voice service providers).

75. While the Commission’s March 2020 *Report and Order and Further Notice of Proposed Rulemaking* reported on implementation progress made by 14 major voice service providers, other voice service providers and intermediate providers announced progress towards STIR/SHAKEN implementation. For example, on October 9, 2019, Peerless Network, a provider of telecommunications services for enterprise and wholesale customers, announced that it had upgraded its network to be STIR/SHAKEN compliant.³⁶⁵ On November 21, 2019, Inteliquent, a network-based communications enabler offering voice and messaging services to wireless, cable, carrier, and communication service providers, announced that it completed end-to-end STIR/SHAKEN call verification across three networks.³⁶⁶ On February 26, 2020, Brightlink, a provider of multi-cloud management software offering voice and messaging communication applications and analytics, announced that it “now has STIR/SHAKEN authentication across its entire network.”³⁶⁷ On February 27, 2020, Ytel, a software company which provides a communication platform allowing developers and businesses to build SMS and voice capabilities into various applications, announced that it “successfully completed one of the first STIR/SHAKEN signed and verified calls from [its] network.”³⁶⁸ On April 8, 2020, Twilio, a cloud communications platform that enables phones, VoIP, and messaging to be embedded into web, desktop, and mobile software,³⁶⁹ announced that it had begun signing enterprise calls using STIR/SHAKEN protocols.³⁷⁰ On May 26, 2020, Quality Voice & Data, a cloud-based telecom switching and VoIP services provider announced that it now meets requirements necessary to provide STIR/SHAKEN call attestation for its customers.³⁷¹

V. IMPACT ON 911 AND PUBLIC SAFETY

76. NENA notes that, as a general matter, 911 call centers, particularly their administrative lines, are subject to receiving robocalls.³⁷² While they further state they there is no nationwide tally of robocalling affecting PSAPs, they recite several instances in which particular PSAPs have been subject to multiple robocalls over a short period of time, and note that this can be particularly problematic during periods of high call volume such as large-scale emergencies.³⁷³ NENA suggests that at worst such

³⁶⁵ See Press Release, Peerless Network, Peerless Network Delivers, Exceeds SHAKEN/STIR Requirements (Oct. 9, 2019), <https://www.peerlessnetwork.com/peerless-network-delivers-exceeds-shaken-stir-requirements>.

³⁶⁶ See Press Release, T-Mobile, T-Mobile, Comcast and Inteliquent Deliver Industry First in War Against Illegal Call Spoofing (Nov. 21, 2019), <https://www.t-mobile.com/news/tmobile-comcast-inteliquent>.

³⁶⁷ Press Release, PR Newswire, Brightlink Takes on Robocalling with STIR/SHAKEN Solution (Feb. 26, 2020), <https://finance.yahoo.com/news/brightlink-takes-robocalling-stir-shaken-150000143.html>.

³⁶⁸ Press Release, PRWeb, Ytel Completes One of the First STIR/SHAKEN Calls from CPaaS Platform (Feb. 27, 2020), https://www.prweb.com/releases/ytel_completes_one_of_the_first_stir_shaken_calls_from_cpaaS_platform/prweb16942695.htm.

³⁶⁹ See Twilio, *About*, <https://www.twilio.com/company> (last visited May 4, 2020).

³⁷⁰ See Press Release, Business Wire, Twilio Begins Signing Enterprise Calls Using SHAKEN/STIR Protocols to Help Stop Illegal Robocalls for Business Users (April 8, 2020), <https://finance.yahoo.com/news/twilio-begins-signing-enterprise-calls-130000912.html>.

³⁷¹ See Press Release, PRNewswire, Quality Voice & Data Attains Authorized SHAKEN Service Provider Status (May 26, 2020), <https://www.prnewswire.com/news-releases/quality-voice--data-attains-authorized-shaken-service-provider-status-301064069.html>.

³⁷² NENA Comments at 1.

³⁷³ *Id.* at 1-2.

unwanted calls could lead to delays in responder dispatch.³⁷⁴

77. With respect to additional impacts on 911, several commenters report that they are unaware of any instances in which their blocking programs have blocked an emergency call, or that they otherwise do not block either calls made to a PSAP or a call back from a PSAP to a 911 caller.³⁷⁵ For example, Sprint states that it has not observed any evidence that 911 and public safety calls are being blocked, and that such calls are unlikely to match the calling patterns used by illegal callers.³⁷⁶ Some carriers also state that they are taking measures to mitigate any possible call blocking. Charter states that it is putting measures in place to prevent subscribers from inadvertently using a call-blocking feature to block calls from a PSAP,³⁷⁷ while T-Mobile and First Orion state that they update numbers belonging to emergency call centers or other public safety entities to prevent inadvertent blocking of call-back calls.³⁷⁸ Nomorobo further explains that it would be unlikely that a call made by a PSAP would be blocked because call blocking technology relies on high volume and content analysis.³⁷⁹

78. Nevertheless, call blocking, whether inadvertent or otherwise, remains a concern for public safety commenters.³⁸⁰ As Teltech explains, this can be problematic when, in an emergency situation, a PSAP is disconnected from the caller and the number used by the PSAP to call back the 911 caller is unknowingly blocked.³⁸¹ NENA similarly notes that it has anecdotal evidence of PSAP outgoing calls being blocked when a PSAP is seeking to re-establish contact with a caller when a 911 call is dropped.³⁸² TNS states that it has seen instances where outbound calls from an emergency services center contained an invalid telephone number, which could affect whether the call is accepted.³⁸³ In an effort to address these problems, TNS states that TNS and Verizon have reached out to NENA to work with the 911 community to obtain information from PSAPs about the numbers they use.³⁸⁴ ATIS also observes that the industry is working on ways to mitigate impacts of call blocking on 911 by cryptographically signing the header field to allow a receiving entity to verify that the traffic is authorized 911 public safety traffic.³⁸⁵

VI. CONCLUSION

79. Billions of dollars are lost to fraud due to unwanted scam calls.³⁸⁶ The Commission has devoted significant resources to fighting illegal and unwanted calls. Nevertheless, robocalls remain a substantial consumer problem. The Commission has taken enforcement action against robocallers for

³⁷⁴ *Id.* at 2.

³⁷⁵ Verizon Letter at 5-6; TNS Comments at 17; TNS Letter at 5; Hiya Letter at 5; Cox Comments at 4; T-Mobile Comments at 8-9; Nomorobo Reply Comments at 3.

³⁷⁶ Sprint Comments at 5; Sprint Letter at 3.

³⁷⁷ Charter Comments at 5-6.

³⁷⁸ T-Mobile Comments at 9; First Orion Comments at 9.

³⁷⁹ Nomorobo Reply Comments at 3.

³⁸⁰ *See, e.g.*, NENA Comments at 3 (“Given the life-threatening implications of any PSAP call backs being blocked, we urge the Commission and voice service providers to ensure that any action to reduce robocalls will not result in inadvertently or purposefully blocking calls from PSAPs.”).

³⁸¹ Teltech Comments at 3; *see also* First Orion Letter at 5.

³⁸² NENA Comments at 2.

³⁸³ TNS Comments at 17; TNS Letter at 5.

³⁸⁴ TNS Comments at 18.

³⁸⁵ ATIS Comments at 3-4.

³⁸⁶ *STIR/SHAKEN Order*, 35 FCC Rcd at 3242, para. 1.

violations of the Truth in Caller ID Act,³⁸⁷ authorized voice service providers to block certain calls that are likely to be unlawful,³⁸⁸ and mandated that voice service providers implement the STIR/SHAKEN call authentication framework.³⁸⁹ The industry has also taken strong action to provide tools for consumers to block unwanted and illegal calls. This first Report provides a summary of voice service providers' and analytics companies' actions to prevent illegal and unwanted calls. Pursuant to the *2019 Call Blocking Declaratory Ruling*, the Commission will issue a second Report to follow up on the call blocking data discussed here.³⁹⁰ The Commission remains committed to working with the industry and other government agencies to eliminate the scourge of illegal robocalls.

³⁸⁷ See, e.g., *Roesel Forfeiture Order*, 33 FCC Rcd 9204; *Abramovich Forfeiture Order*, 33 FCC Rcd 4663.

³⁸⁸ *2019 Call Blocking Declaratory Ruling*, 34 FCC Rcd at 4886-88, paras. 33-34; *2017 Call Blocking Report and Order*, 32 FCC Rcd 9706.

³⁸⁹ *STIR/SHAKEN Order*, 35 FCC Rcd at 3252, para. 24.

³⁹⁰ *2019 Call Blocking Declaratory Ruling*, 34 FCC Rcd at 4904, paras. 87-90.

APPENDIX A

List of Commenters

Commenters (filed Jan. 29-30, 2020)

Commenter	Abbreviated Name
ACA International	ACA International
Ad Hoc Telecom Users Committee	Ad Hoc
Alliance for Telecommunications Industry Solutions	ATIS
Americollect	Americollect
American Bankers Association	ABA
AT&T Services, Inc.	AT&T
Call Control LLC	Call Control
Charter Communications, Inc.	Charter
Comcast Corporation	Comcast
Competitive Carriers Association	CCA
Consumer Bankers Association	CBA
Consumer Reports, National Consumer Law Center, Consumer Action, Consumer Federation of America, National Association of Consumer Advocates, and Public Citizen	Consumer Joint Commenters
Cox Communications, Inc.	Cox
Credit Union National Association	CUNA
CTIA-The Wireless Association	CTIA
Encore Capital Group, Inc.	Encore
First Orion Corp.	First Orion
INCOMPAS	INCOMPAS
Innovative Systems LLC	Innovative Systems
Insights Association	Insights
Kansas Department of Health and Environment	Kansas Dept. of Health
National Association of Federally-Insured Credit Unions	NAFCU
National Opinion Research Center	NORC
NENA: The 9-1-1 Association	NENA
Noble Systems Corporation	Noble
Numeracle, Inc.	Numeracle
PRA Group, Inc.	PRA

Professional Association for Customer Engagement	PACE
Sprint Corporation	Sprint
Telnyx LLC	Telnyx
Teltech	Teltech
T-Mobile USA, Inc.	T-Mobile
Transaction Network Services, Inc.	TNS
TransNexus	TransNexus
USTelecom—The Broadband Association	USTelecom
Verizon and Verizon Wireless	Verizon

Reply Commenters and responses to letters (filed February 27-28, 2020)

Commenter	Abbreviated Name
ACA International	ACA International
Alarm Industry Communications Committee	AICC
American Consumer Institute Center for Citizen Research	ACI
American Financial Services Association	AFSA
AT&T Services, Inc.	AT&T
Bandwidth, Inc.	Bandwidth
CenturyLink, Inc.	CenturyLink
Charter Communications, Inc.	Charter
Cloud Communications Alliance	Cloud Communications
CTIA-The Wireless Association	CTIA
Comcast Corporation	Comcast
Cox Communications, Inc.	Cox
Credit Union National Association	CUNA
Encore Capital Group, Inc.	Encore
First Orion Corp.	First Orion
Frontier Communications	Frontier
Google LLC	Google
Hiya	Hiya
Neustar, Inc.	Neustar
Noble Systems Corporation	Noble

RTI International	RTI
Telephone Science Corporation d/b/a Nomorobo	Nomorobo
Sirius XM Radio, Inc.	Sirius XM
Sprint Corporation	Sprint
TCN, Inc.	TCN
TDS Telecommunications LLC	TDS Telecom
Transaction Network Services, Inc.	TNS
Twilio, Inc.	Twilio
US Cellular Corp.	US Cellular
USTelecom—The Broadband Association	USTelecom
Verizon and Verizon Wireless	Verizon
Vonage	Vonage

APPENDIX B

Summary of Blocking and Labeling Options Offered

Voice service provider	Blocking/labeling services offered	Estimate on number of calls blocked or labeled	Default, opt in, or opt out
AT&T—Wireless	Network-level blocking Call Protect or Call Protect Basic, free Call Protect Plus	Call Protect and Call Protect Plus, since 2016, blocked fraudulent calls or labeled suspicious calls; nearly 1.3 billion suspected fraud and over 3 billion other calls blocked or labeled.	Default Call Protect is opt out, since 2019 Call Protect Plus is opt in
AT&T—VoIP	Network-level blocking Digital Phone Call Protect, free	Blocked over 46 million and spam warnings for 36 million	Default Opt in
CenturyLink—wireline	Network-level blocking VoIP customers can sign up for free Nomorobo blocking service Other end user options for some customers		Default End-user blocking is opt in
Charter—wireline	Network-level blocking Customers can sign up for Nomorobo blocking service, free.		Default Opt in
Comcast—wireline	Network-level blocking Anonymous Call Rejection, Selective Call Rejection, free Customers can sign up for Nomorobo blocking service, free	Over 158 million calls blocked in Dec. 2019 Anonymous Call Rejection blocked nearly 37 million calls in Dec. 2019. Selective Call Rejection blocked over five million calls in Dec. 2019.	Default Anonymous Call Rejection is opt in, but will be offered opt out Selective Call Rejection is opt in Nomorobo is opt in

Comcast—wireless	Customers can download Hiya app to block calls.		
Cox—wireline	Edge Blocking, free Anonymous Call Rejection, Selective Call Rejection, free Customers can sign up for Nomorobo blocking service, free.	14.6% of calls are blocked through one of these tools; Edge blocking is 65% of the blocked calls and Anonymous call rejection is 29%t.	Opt out network blocking Opt in
Frontier—wireline	Network-level blocking Anonymous Call Rejection, Selective Call Rejection, Selective Call Acceptance, free Advanced Caller ID VoIP customers can sign up for free Nomorobo		Default Opt in Opt in Opt in
Sprint—wireless	Network-level blocking Call Screener, free Call Screener Plus Block Calls, through “My Sprint” account		Default Call Screener is opt out for Android, opt in for iOS Opt in Opt in
T-Mobile—wireless	Scam ID, free Scam Block, free Name ID, free for some plans	Since 2017, identified over 21 billion scam calls and blocked over 5 billion of those calls.	Scam ID is opt out for post-paid customers Scam Block is opt in
Verizon—wireless	Network-level blocking Call Filter, free	Since 2017, blocked hundreds of millions of calls.	Default Call Filter is opt out
Verizon—wireline	Network-level blocking Spam Alert, free VoIP customers can sign up for Nomorobo blocking service, free	Since 2017, blocked hundreds of millions of calls	Default