

# Nixing the Fix: An FTC Report to Congress on Repair Restrictions



**FEDERAL TRADE  
COMMISSION**

May 2021

# Table of Contents

- EXECUTIVE SUMMARY ..... 3
- I. THE ANTI-TYING PROVISION OF THE MAGNUSON MOSS WARRANTY ACT 7
- II. COMPETITION ISSUES RELATING TO REPAIR MARKETS..... 9
  - A. Antitrust Principles Related to Manufacturer Restrictions on Repair ..... 11
  - C. Monopolization Claims Involving Aftermarket Restrictions..... 14
- III. INFORMATION GATHERING PROCESS ..... 16
- IV. TYPES OF REPAIR RESTRICTIONS..... 17
  - A. Physical Restrictions ..... 18
  - B. Unavailability of Parts, Manuals, and Diagnostic Software/Tools ..... 18
    - 1. Unavailability of Parts..... 18
    - 2. Unavailability of Manuals..... 19
    - 3. Unavailability of Diagnostic Software and Tools..... 19
  - C. Designs that Make Independent Repairs Less Safe ..... 19
  - D. Steering Consumers to Manufacturers’ Repair Networks Using Telematics Systems..... 21
  - E. Application of Patent Rights and Enforcement of Trademarks ..... 22
  - F. Disparagement of Non-OEM parts and Independent Repair Services..... 22
  - G. Software Locks, Digital Rights Management, and Technological Protection Measures ..... 23
  - H. End User License Agreements ..... 24
- V. MANUFACTURERS’ EXPLANATIONS FOR REPAIR RESTRICTIONS ..... 24
  - A. Protection of Intellectual Property ..... 24
  - B. Safety ..... 26
  - C. Cybersecurity..... 30
  - D. Liability and Reputational Harm ..... 32
  - E. Design Choices and Consumer Demand Drive the Repairability of the Devices ... 33
  - F. Quality of Service ..... 36
- VI. RIGHT TO REPAIR ADVOCATES’ ARGUMENTS AGAINST REPAIR RESTRICTIONS ..... 38
  - A. Timing of Repairs..... 39
  - B. Price of Repairs ..... 40
  - C. Environmental Harm..... 41
  - D. Small Businesses and Employment..... 42

|  |           |
|--|-----------|
| <b>VII. APPROACHES FOR INCREASING CONSUMER CHOICE IN REPAIR<br/>MARKETS .....</b>  | <b>44</b> |
| <b>A.    FTC Rulemaking or Law Enforcement .....</b>   | <b>44</b> |
| <b>B.    Industry Self-Regulation.....</b>   | <b>45</b> |
| <b>C.    Legislative Approaches .....</b>  | <b>47</b> |
| <b>1.    Existing State Right to Repair Laws and Model Legislation.....</b>  | <b>47</b> |
| <b>2.    The European Approach .....</b>   | <b>48</b> |
| <b>D.    Transparency of Repairability by OEMs/Industry.....</b>   | <b>50</b> |
| <b>VIII. IDENTIFICATION OF ISSUES TO BE CONSIDERED IN ANY ACTION<br/>TAKEN BY INDUSTRY, POLICYMAKERS, OR LEGISLATORS .....</b> | <b>50</b> |
| <b>A.    Types of Products Covered.....</b>  | <b>51</b> |
| <b>B.    Components of Covered Products .....</b>  | <b>52</b> |
| <b>C.    Dollar Threshold and the Duration of Repair Commitments.....</b>  | <b>52</b> |
| <b>D.    Protection of IP rights.....</b>  | <b>53</b> |
| <b>IX. CONCLUSION .....</b>  | <b>54</b> |

## EXECUTIVE SUMMARY

The Federal Trade Commission (“FTC” or “Commission”) submits this report pursuant to Congress’s directive for the Commission to report to the Committees on Appropriations of the House and Senate regarding anticompetitive practices related to repair markets.<sup>1</sup> When directing the Commission to issue this report, Congress noted that it “is aware of the FTC’s ongoing review of how manufacturers—in particular mobile phone and car manufacturers—may limit repairs by consumers and repair shops, and how those limitations may increase costs, limit choice, and impact consumers’ rights under the Magnuson-Moss Warranty Act.” Congress specifically directed the FTC to include recommendations on how to best address these problems.<sup>2</sup>

To fulfill this Congressional directive, the Commission has synthesized the knowledge gained from its July 16, 2019 workshop titled “Nixing the Fix: A Workshop on Repair Restrictions” (the “Workshop”), public comments, responses to a Request for Empirical Research and Data,<sup>3</sup> and independent research. This report examines consumer protection and antitrust issues relating to repair restrictions, with particular emphasis on those imposed by mobile phone and car manufacturers.

Congressional interest in the competition and consumer protection aspects of repair restrictions is timely. Many consumer products have become harder to fix and maintain. Repairs today often require specialized tools, difficult-to-obtain parts, and access to proprietary diagnostic software. Consumers whose products break then have limited choices.

Furthermore, the burden of repair restrictions may fall more heavily on communities of color and lower-income communities.<sup>4</sup> Many Black-owned small businesses are in the repair and maintenance industries,<sup>5</sup> and difficulties facing small businesses can disproportionately affect small businesses owned by people of color.<sup>6</sup> This fact has not been lost on supporters of

---

<sup>1</sup> House Report 116-456 published in the Congressional Record on Dec. 27, 2020 (at <https://www.congress.gov/116/crpt/hrpt456/CRPT-116hrpt456.pdf>) that accompanied H.R. 7668, Financial Services and General Government Appropriations Bill, 2021.

<sup>2</sup> *Id.*

<sup>3</sup> The full docket of public comments and empirical research submissions is available at <https://www.regulations.gov/docket/FTC-2019-0013/document> and <https://www.regulations.gov/document/FTC-2019-0013-0001/comment>. Citations in this report to the public comments or empirical research submitted in connection with the Workshop provide the submitter’s name and whether the document was submitted as a comment or empirical research.

<sup>4</sup> Commissioners Phillips and Wilson note that the claim suggested in this paragraph, *i.e.*, that the burden of repair restrictions at issue in this Report will fall more heavily on minority communities, is not supported by the evidence cited. That may very well be the case, as the Report’s caveats with words like “may” and “can” denote. But the claim is a conclusion drawn by authors of the Report from citations to evidence of other things.

<sup>5</sup> See, e.g., *Interesting Facts & Statistics About Black-Owned Businesses*, <https://www.blackbusiness.com/p/facts-statistics-black-owned-businesses.html> (last visited Mar. 19, 2021) (stating that nearly 38 percent of Black-owned businesses are in health care, social assistance, repair and maintenance, and personal and laundry services).

<sup>6</sup> The pandemic offers a troubling example: “Nationally representative data on small businesses indicate that the number of active business owners fell by 22 percent from February to April 2020 — the largest drop on record. While the overall decline is noteworthy, differences among closure rates across racial and ethnic groups are even more striking. Black businesses experienced the most acute decline, with a 41 percent drop. Latinx business owners

prior right to repair legislation, who have highlighted the impact repair restrictions have on repair shops that are independent and owned by entrepreneurs from underserved communities.<sup>7</sup> Repair restrictions for some products—such as smartphones—also may place a greater financial burden on communities of color and lower-income Americans.<sup>8</sup> According to Pew Research, Black and Hispanic Americans are about twice as likely as white Americans to have smartphones, but no broadband access at home.<sup>9</sup> Similarly, lower-income Americans are more likely to be smartphone-dependent.<sup>10</sup> This smartphone dependency makes repair restrictions on smartphones more likely to affect these communities adversely.

The pandemic has exacerbated the effects of repair restrictions on consumers. As noted by Pew Research, “The pandemic has made living without a computer harder than ever. Employees are working remotely, kids are going to school via laptop, and grandparents are visiting with their grandkids on screens. At the same time, the pandemic has made it harder to get broken devices fixed, as many big chain stores have ceased offering on-site repairs. As a result, people have been forced to send their devices to authorized repair facilities—often waiting weeks for them to be returned.”<sup>11</sup>

The pandemic also has revealed a drastic shortage in the availability of new laptops for students. An Associated Press examination of the availability of school laptops found that the

---

fell by 32 percent and Asian business owners dropped by 26 percent. In contrast, the number of white business owners fell by 17 percent.” Claire Kramer Mills, Ph.D., and Jessica Battisto, *Double Jeopardy: COVID-19’s Concentrated Health and Wealth Effects in Black Communities*, Federal Reserve Bank of New York (Aug. 2020), [https://www.fedsmallbusiness.org/medialibrary/FedSmallBusiness/files/2020/DoubleJeopardy\\_COVID19andBlackOwnedBusinesses](https://www.fedsmallbusiness.org/medialibrary/FedSmallBusiness/files/2020/DoubleJeopardy_COVID19andBlackOwnedBusinesses); *See also* Lydia DePillis, *How the Pandemic Economy Could Wipe Out a Generation of Black-Owned Businesses*, *Pro Publica* (Mar. 4, 2021), <https://www.propublica.org/article/the-pandemics-existential-threat-to-black-owned-businesses> (stating that “[a]s of 2012 — the most recent data the Census Bureau has collected — average annual sales for a Black-owned business came to about \$58,000, compared to nearly 10 times that amount for the average white-owned enterprise” and arguing that “years of compounding disadvantage have been exacerbated by the pandemic”).

<sup>7</sup> *aftermarketNews Staff, Reps. Towns and Sanchez Call Say Right to Repair Needed to Save Independent, Minority-Owned Repair Shops*, (Feb. 16, 2006), <https://www.aftermarketnews.com/reps-towns-and-sanchez-call-say-right-to-repair-needed-to-save-independent-minority-owned-repair-shops-jobs/>.

<sup>8</sup> According to U.S. PIRG, “Repair could reduce household spending on electronics and appliances by 22 percent, which would save an average family approximately \$330 per year.” Alex DeBellis and Nathan Proctor, *Repair Saves Family Big*, U.S. PIRG, 4 (Jan. 2021), [https://uspig.org/sites/pirg/files/reports/RepairSavesFamiliesBig/Repair-Saves-Families-Big\\_USP\\_Jan2021\\_FINAL1a.pdf](https://uspig.org/sites/pirg/files/reports/RepairSavesFamiliesBig/Repair-Saves-Families-Big_USP_Jan2021_FINAL1a.pdf); *see also infra* note 237.

<sup>9</sup> *Mobile Fact Sheet*, Pew Research Center, (June 12, 2019) <https://www.pewresearch.org/internet/fact-sheet/mobile/#who-is-smartphone-dependent>.

<sup>10</sup> According to Pew Research: “With fewer options for online access at their disposal, many lower-income Americans are relying more on smartphones. As of early 2019, 26% of adults living in households earning less than \$30,000 a year are ‘smartphone-dependent’ internet users—meaning they own a smartphone but do not have broadband internet at home. This represents a substantial increase from 12% in 2013. In contrast, only 5% of those living in households earning \$100,000 or more fall into this category in 2019.” Monica Anderson and Madhumitha Kumar, *Digital divide persists even as lower-income American make gains in tech adoption*, Pew Research Center, (May 7, 2019), <https://www.pewresearch.org/fact-tank/2019/05/07/digital-divide-persists-even-as-lower-income-americans-make-gains-in-tech-adoption/>.

<sup>11</sup> Elaine S. Povich, *Pandemic Drives Phone, Computer ‘Right-to-Repair’ Bills*, (Mar. 11, 2021), <https://pewtrusts.org/en/research-and-analysis/blogs/stateline/2021/03/11/pandemic-drives-phone-computer-right-to-repair-bills>.

increased demand for computers and supply chain challenges posed by the pandemic had resulted in laptop shortages in school districts around the country.<sup>12</sup> For instance, California has reported the need for 1 million laptops for students and Alabama was waiting on 33,000 student computers.<sup>13</sup> Kinks in the semiconductor supply chain are now posing an additional threat to the supply of new laptops.<sup>14</sup> Reducing barriers to repair may permit older laptops to be refurbished more easily, thereby expanding the supply of available laptops.

The Commission’s concern with repair restrictions<sup>15</sup> dates back more than forty years, to when the Commission’s then-Chairman testified in favor of the anti-tying provision of the Magnuson-Moss Warranty Act (the “MMWA”).<sup>16</sup> The anti-tying provision, Section 102(c) of the MMWA, prohibits a warrantor of a consumer product from conditioning its warranty on the consumer’s using any article or service which is identified by brand name unless the article or service is provided for free or the warrantor obtains a waiver from the Commission. This provision, for example, bars an automobile manufacturer from voiding a warranty if a consumer has scheduled maintenance performed by someone other than the dealer, prohibits a printer manufacturer from conditioning its warranty on the purchaser’s use of the manufacturer’s branded ink, and forbids a smartphone manufacturer from voiding a warranty when a consumer has a new battery installed at a kiosk at the mall. In short, the anti-tying provision bars manufacturers from using access to warranty coverage as a way of obstructing consumers’ ability to have their consumer products maintained or repaired using third-party replacement parts and independent repair shops.<sup>17</sup> As discussed in Section I, below, the Commission has actively enforced the anti-tying provision of MMWA and will continue to address illegal practices in the marketplace.

In the 44 years since the enactment of the MMWA, technological developments have introduced new challenges that warrant a reconsideration of whether the anti-tying provision has

---

<sup>12</sup> Jocelyn Gecker and Michael Liedtke, *AP Exclusive: US Faces Back-To-School Laptop Shortage*, (Aug. 22, 2020), <https://apnews.com/article/01e9302796d749b6aadc35ddc8f4c946>.

<sup>13</sup> Mackenzie Hawkins, *California is short 1 million laptops and hot spots for kids as it prepares online school*, Sacramento Bee, (July 22, 2020) <https://www.sacbee.com/news/politics-government/capitol-alert/article244418057.html>.

<sup>14</sup> Hyunjoo Jin, Douglas Busvine, and David Kirton, *Analysis: Global chip shortage threatens production of laptops, smartphones and more*, Reuters, (Dec. 17, 2020), <https://www.reuters.com/article/us-chip-shortage-analysis/analysis-global-chip-shortage-threatens-production-of-laptops-smartphones-and-more-idUSKBN28R0ZL>.

<sup>15</sup> We use the term “repair restriction” to refer to any practice that has the effect of limiting consumers’ ability to repair products that they own. In using this term, we focus on the impact of practices that limit consumer choice regarding repairs rather than on the intent of manufacturers. Due to this focus, the report does not delve into the subject of “planned obsolescence”—the argument that manufacturers intentionally design products to fail in order to encourage future replacement purchases.

<sup>16</sup> Then-Chairman Lewis Engman testified:

This provision addresses the anticompetitive practice which the Commission has opposed in numerous court actions wherein a manufacturer uses a warranty unreasonably to tie his supplementary products or services to the warranted product. This leaves the consumer in the undesirable posture of losing his warranty protection if he purchases the supplementary items from another and perhaps less expensive source—even if he does so in complete ignorance of the warranty’s provisions.

Statement of Hon. Lewis A. Engman, Chairman, Federal Trade Commission, included in H. Rep. No. 93-17, at 58 (1973).

<sup>17</sup> Independent repair shops are also referred to as independent service organizations (“ISOs”).

kept pace with the evolving consumer goods repair market. Even when a warranty does not explicitly require that repairs be performed by the original equipment manufacturer (OEM) using OEM parts, many manufacturers restrict independent repair and repair by consumers through:

- Product designs that complicate or prevent repair;
- Unavailability of parts and repair information;
- Designs that make independent repairs less safe;
- Policies or statements that steer consumers to manufacturer repair networks;
- Application of patent rights and enforcement of trademarks;
- Disparagement of non-OEM parts and independent repair;
- Software locks and firmware updates; or
- End User License Agreements.

Manufacturers explain that these repair restrictions often arise from their desire to protect intellectual property rights and prevent injuries and other negative consequences resulting from improper repairs.

The report is divided into nine sections. The first describes Section 102(c) of the MMWA and the Commission's record of enforcing this provision. Section Two provides an analysis of the competition issues related to repair markets. Section Three describes staff's information gathering efforts, including a description of the Workshop and comments. Section Four catalogues the types of repair restrictions employed by manufacturers. Section Five describes the explanations manufacturers offer for repair restrictions. Section Six examines the arguments of repair advocates.

The final sections of this report propose ways to expand consumers' repair and maintenance options. Section Seven describes several approaches that could increase consumers' choice in repair markets. Section Eight focuses on challenging issues that would need to be considered by industry, regulators, and legislators that attempt to expand consumers' repair choices.

Finally, in Section Nine, we conclude by explaining that, based on the record before us, it is clear that repair restrictions have diluted the effectiveness of Section 102(c) and steered consumers into manufacturers' repair networks or to replace products before the end of their useful lives. Based on a review of comments submitted and materials presented during the Workshop, there is scant evidence to support manufacturers' justifications for repair restrictions.<sup>18</sup> Moreover, the specific changes that repair advocates seek to address manufacturer repair restrictions (e.g., access to information, manuals, spare parts, and tools) are well supported by comments submitted for the record and testimony provided at the Workshop. While the car manufacturing industry has taken important steps to expand consumer choice, other industries that impose restrictions on repairs have not followed suit. The Commission will consider reinvigorated regulatory and law enforcement options, as well as consumer education. In addition to the FTC's pursuit of efforts under its authority, the Commission stands ready to work

---

<sup>18</sup> Commissioner Wilson and Commissioner Phillips note that the report excludes from the scope of its coverage an analysis of manufacturers' intellectual property rights, which may provide legitimate justification for some repair restrictions.

with legislators, either at the state or federal level, to ensure that consumers and independent repair shops have appropriate access to replacement parts, instructions, and diagnostic software.

## I. THE ANTI-TYING PROVISION OF THE MAGNUSON MOSS WARRANTY ACT

The Federal Trade Commission enforces the MMWA, a consumer protection law passed in 1975 to clarify how written warranties may be used when marketing products to consumers.<sup>19</sup> The MMWA requires warrantors of consumer products to provide consumers with detailed information about warranty coverage.<sup>20</sup> Section 102(c) of the MMWA prohibits warrantors from conditioning warranty coverage on the consumer's use of an article or service identified by brand, trade, or corporate name, unless the warrantor provides that article or service without charge or the warrantor has received a waiver from the Commission.<sup>21</sup> Companies may seek a waiver of this prohibition if: (1) the warrantor satisfies the Commission that the manufacturers' parts or services are necessary for the product to function, and (2) the waiver is in the public interest.<sup>22</sup> Since 1975, only three waiver requests have been made to the Commission, all of which were denied.<sup>23</sup>

The FTC has issued three Rules under the MMWA, the *Rule on Disclosure of Written Consumer Product Warranty Terms and Conditions* (the Disclosure Rule), 16 C.F.R. pt. 701, the *Rule on Pre-Sale Availability of Written Warranty Terms* (the Pre-Sale Availability Rule), 16 C.F.R. pt. 702, and the *Rule on Informal Dispute Settlement Procedures* (the Dispute Resolution Rule), 16 C.F.R. pt. 703. Unlike many of the FTC's Rules, the FTC lacks the authority to seek civil penalties when enforcing the three Rules it promulgated under the MMWA. Instead, the Commission can obtain an injunction. In addition, the FTC has issued Interpretations of the MMWA—a document that clarifies certain terms and explains some of the provisions of the MMWA.<sup>24</sup> In the Interpretations, the FTC provides guidance on Section 102(c) of the MMWA. As stated in the Interpretations, Section 102(c) applies not only to express statements, but also implied language that a warranty is conditioned on the use of particular products or services. For example, a provision in the warranty such as, "use only an authorized 'ABC' dealer" or "use only 'ABC' replacement parts," is prohibited where the service or parts are not provided free of charge pursuant to the warranty.<sup>25</sup>

---

<sup>19</sup> 15 U.S.C. § 2301 *et seq.*

<sup>20</sup> *Id.*

<sup>21</sup> 15 U.S.C. § 2302(c).

<sup>22</sup> *Id.*

<sup>23</sup> Denial of Waiver of Section 102(c) of the Magnuson-Moss Warranty Act, 41 Fed. Reg. 17821 (Apr. 28, 1976) (waiver requested by Sohmer & Co., Inc., a piano manufacturer); Denial of Waiver of Magnuson-Moss Warranty Act, 41 Fed. Reg. 34368 (Aug. 13, 1976) (waiver requested by Harmsco, Inc., a manufacturer of swimming pool water treatment systems); Denial of Waiver of Section 102(c) of the Magnuson-Moss Warranty Act, 43 Fed. Reg. 1991 (Jan. 13, 1978) (waiver requested by Coleman Co., Inc., a manufacturer of heating and cooling appliances and associated equipment for mobile homes).

<sup>24</sup> 16 C.F.R. pt. 700 (2015).

<sup>25</sup> The Interpretations explain that Section 102(c) does not preclude a warrantor from expressly excluding liability for defects or damage caused by articles or services not provided by the manufacturer. Nor does Section 102(c) bar the warrantor from denying liability where the warrantor can demonstrate that the defect or damage was caused by articles or service not provided by the manufacturer. 16 C.F.R. § 700.10 (2015).



In recent years, the FTC has actively enforced Section 102(c) of the MMWA. For example, in October 2015, the FTC approved a complaint and settlement against BMW for violating the anti-tying provision.<sup>26</sup> In its complaint, the FTC alleged that BMW violated the MMWA by conditioning the warranties it offered on its MINI cars on the use of MINI dealers and genuine MINI parts without providing such parts and services for free or seeking a waiver from the FTC. Subsequently, in April 2018, the FTC announced that staff issued several warning letters to companies marketing automobiles, cellular devices, and video gaming systems in the United States. The letters warned the companies that telling consumers they need to use specified parts or services to keep the warranties intact would violate the anti-tying provision. The letters also placed the companies on notice that violations of the MMWA may result in legal action.<sup>27</sup> The recipients changed their practices in response to the warning letters. A consumer education campaign accompanying the warning letters also promoted awareness about consumers' rights under the MMWA.<sup>28</sup>

The Commission continues to receive reports of companies not complying with the MMWA. In response to staff's call for empirical research and comments related to the Workshop, several organizations reported that warranty tying continues to be prevalent in the marketplace. For example, the Education Fund of U.S. PIRG, the federation of state Public Interest Research Groups (PIRGs), submitted an October 2018 study analyzing warranties from 50 companies.<sup>29</sup> U.S. PIRG concluded that 45 of the 50 companies had warranties that appeared to violate Section 102(c) of the MMWA.<sup>30</sup> Likewise, the Specialty Equipment Market Association (SEMA) submitted a comment stating that it regularly receives complaints that automobile dealerships void automobile warranties if the dealership finds a specialty part (e.g., custom wheels) had been installed on the automobile, regardless of whether the specialty part caused the automobile to malfunction.<sup>31</sup> Other commenters submitted information claiming that certain warrantors either expressly or by implication continue to condition warranty coverage of the use of particular products or services.<sup>32</sup> The Commission takes these allegations seriously and will continue to address illegal practices in the marketplace.

---

<sup>26</sup> *In re BMW of N. Am., LLC*, FTC No. 132-3150, <https://www.ftc.gov/enforcement/cases-proceedings/132-3150/bmw-north-america-llc-matter>.

<sup>27</sup> *FTC Warns Companies that It Is Illegal to Condition Warranty Coverage on the Use of Specified Parts or Services* (Apr. 10, 2018), <https://www.ftc.gov/news-events/press-releases/2018/04/ftc-staff-warns-companies-it-illegal-condition-warranty-coverage>. Some of the warning letters also advised companies to stop placing seals on their products that stated “warranty void if seal removed,” or contained similar language.

<sup>28</sup> See <https://www.ftc.gov/news-events/blogs/business-blog/2018/04/ftc-staff-sends-warranty-warnings>. Notably, however, the Automotive Oil Change Association submitted evidence showing that many consumers are still unaware of their rights under the MMWA. Automotive Oil Change Association comment (“AOCA empirical research”), at 12-14.

<sup>29</sup> U.S. PIRG empirical research. See *Nixing the Fix: A Workshop on Repair Restrictions*, Docket ID FTC-2019-0013, <https://www.regulations.gov/docket?D=FTC-2019-0013>. In this report, we refer to submissions as “comments” or “empirical research” based on how they were submitted to the Commission.

<sup>30</sup> *Id.* at 2-3.

<sup>31</sup> Specialty Equipment Market Association comment (“SEMA comment”), at 2. SEMA urged the Commission to require dealerships to state in writing why the warranty coverage was denied.

<sup>32</sup> E.g., Peter Pronko comment, at 1-2 (arguing that Rolex materials make statements such as, “only official Rolex repair centers are ‘allowed’ to repair and service a Rolex watch” and that repair work done by anyone other than a Rolex facility will void its warranty); Fixit Clinic empirical research, at 3 (describing “stickers or labels that warn or

## II. COMPETITION ISSUES RELATING TO REPAIR MARKETS

The FTC also enforces antitrust laws that, in some circumstances, could make repair restrictions illegal. In antitrust parlance, repair restrictions concern aftermarkets—markets for parts or services that are used after the initial purchase of a product. Products with aftermarkets are very common. Examples range from simple products like razors and razor blades, to operationally or technically complex products and services like software and software updates.<sup>33</sup> The ways that businesses provide products and services in aftermarkets are similarly diverse, and lead to a range of participants and competitive dynamics in different markets.

With respect to repairs, the relationships between market participants fall into three main models.

- Some manufacturers offer repair services for their products themselves, or through a network of affiliates, as the only authorized means of repair.
- In other instances, an original equipment manufacturer (OEM) has no presence in the sale of aftermarket parts or service. In those cases, independent service organizations (ISOs) sometimes provide repair and maintenance services for the products of various manufacturers. In addition, consumers may be able to purchase replacement parts in an aftermarket, perhaps to perform repairs themselves.
- Some OEMs participate in aftermarket service markets in competition with independent repair shops. Where that is the case, a manufacturer may steer aftermarket work toward its own services.

Several scenarios described in this report involve business decisions made by the manufacturer that may restrict repair options by consumers or ISOs and make it difficult or impossible for ISOs to compete in aftermarkets. Tying exists when the sale of one product (the tying product) is conditioned on the purchase of a second product (the tied product) from the same firm.<sup>34</sup> Tying is illegal where the effect is to impair competition and harm consumers in the market for either the tying product or the tied product. For example, an illegal tying claim might allege that a manufacturer unlawfully tied the availability of parts to the purchase of its repair service.

Other scenarios describe different types of conduct that may harm competition when adopted by a firm with market power. For instance, a manufacturer with market power that has refused to provide consumers or aftermarket service providers with key inputs (such as parts, manuals, or diagnostic software and tools) may be subject to antitrust liability for maintaining its monopoly, if the effect of such conduct is to harm competition.<sup>35</sup> Similarly, a manufacturer that

---

imply that a product warranty will be voided if the product is opened or modified by anyone other than the manufacturer or its agent” which “create a chilling effect because just lifting tape damages it and becomes evidence of tamper...”); Automotive Oil Change Association empirical research (“AOCA empirical research”) at 13-14.

<sup>33</sup> These products and practices involve “a multitude of industries and hundreds of billions of dollars of sales.” Joseph P. Bauer, *Antitrust Implications of Aftermarkets*, 52 ANTITRUST BULL. 31, 31 (2007).

<sup>34</sup> See *N. Pac. Ry. Co. v. United States*, 356 U.S. 1, 5-6 (1958).

<sup>35</sup> *Eastman Kodak Co. v. Image Technical Services, Inc.* 504 U.S. 451 (1992) (allowing to proceed beyond summary judgment plaintiffs’ monopolization and attempt to monopolize claims alleging Kodak refused to sell parts for its copies and micrographic equipment to owners that obtained service from ISOs).

has succeeded in limiting the availability of parts through explicit or *de facto* exclusive dealing contracts with preferred service providers may be charged with using such contracts to maintain a monopoly.<sup>36</sup>

Other tactics described by commenters involve allegations of potentially exclusionary conduct, such as making products difficult or impossible to disassemble, in order to maintain market position and exclude aftermarket competitors, or the anti-competitive assertion of patent rights and enforcement of trademarks by manufacturers to restrict repairs not authorized by OEMs. Moreover, the use of embedded software that forces consumers to have the maintenance and repair of their products performed by the manufacturers' authorized service networks may also raise competition issues. Such restrictions may take the form of "software locks" that disable a computerized device repaired outside of the manufacturer's authorized service networks, or the use of firmware updates that limit third-party repairs. In general, the intellectual property laws and the antitrust laws share the common purpose of promoting innovation and competition. However, misuses of intellectual property rights may create barriers to independent repairs, and thereby harm competition.

A manufacturer's explanations for aftermarket restrictions are almost always relevant to a court's assessment of the overall competitive impact of a particular practice.<sup>37</sup> For example, manufacturers may assert that restrictions on competition in aftermarkets are necessary for privacy, data security, efficient design, manufacture, distribution, and safety reasons, and are thus procompetitive. Manufacturers may specifically restrict the options of consumers to repair a product, based on certain asserted explanations, such as enhancing efficiency; quality control; protecting intellectual property rights; or preventing injuries, reputational harms, or other negative consequences resulting from improper repairs. For instance, some manufacturers have asserted that product designs that hamper ISO or consumer repair may prevent injuries while conducting repairs that involve certain dangers, like replacing certain kinds of batteries. Manufacturers also often assert safety and reputational concerns with non-authorized replacement parts or repair services.<sup>38</sup> Justifications need to be scrutinized on a case-by-case basis and should be rejected if found to be a mere pretext for anticompetitive conduct.

The following discussion highlights antitrust principles that courts have applied to antitrust claims involving aftermarkets.

---

<sup>36</sup> *Id.* at 458 (discussing Kodak policies restricting the ability of ISOs to service and provide replacement parts for Kodak copiers and micrographics equipment).

<sup>37</sup> *Id.* at 466-67 ("Legal presumptions that rest on formalistic distinctions rather than actual market realities are generally disfavored in antitrust law. This Court has preferred to resolve antitrust claims on a case-by-case basis, focusing on the 'particular facts disclosed by the record.'") (citations omitted).

<sup>38</sup> Section V of this Report evaluates manufacturers' explanations for repair restrictions and finds that that the record contains scant evidence to support them. As noted below, an antitrust inquiry into a particular manufacturer's repair restrictions would require a fact-specific analysis of the likely competitive effects of the conduct as well as that manufacturer's asserted rationale for the restrictions.

## A. Antitrust Principles Related to Manufacturer Restrictions on Repair

Manufacturer restrictions on aftermarket competition may be subject to claims under Section 1 or Section 2 of the Sherman Act or Section 5 of the FTC Act. Section 1 of the Sherman Act prohibits agreements that restrain competition.<sup>39</sup> Section 2 prohibits monopolization or attempted monopolization by a single entity, as well as by combination or conspiracy.<sup>40</sup> Liability for monopolization requires proof that the defendant possesses monopoly power in a relevant market and has engaged in “the willful acquisition or maintenance of that power as distinguished from growth or development as a consequence of a superior product, business acumen, or historic accident.”<sup>41</sup> Section 5 of the FTC act prohibits unfair methods of competition.<sup>42</sup> Section 5’s unfair methods of competition standard encompasses conduct that violates the Sherman and Clayton Acts, but also prohibits conduct that does not meet the technical requirements of those statutes.<sup>43</sup> Section 3 of the Clayton Act, which prohibits certain contractual arrangements (such as tying or exclusivity arrangements) involving goods (but not services) that may substantially lessen competition or tend to create a monopoly, also may apply.<sup>44</sup>

---

<sup>39</sup> “Every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several States, or with foreign nations, is declared to be illegal.” 15 U.S.C. § 1. Supreme Court jurisprudence has held that the Sherman Act does not prohibit every restraint of trade, only those that are *unreasonable*. Certain acts, such as price fixing, market division, and bid rigging, however, are considered so harmful to competition that courts treat them as “*per se*” violations of Section 1, for which no defense or justification is allowed.

<sup>40</sup> “Every person who shall monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce among the several States, or with foreign nations, shall be deemed guilty of a felony . . . .” 15 U.S.C. § 2.

<sup>41</sup> *United States v. Grinnell Corp.*, 384 U.S. 563, 570-71 (1966); *see also Verizon Commc’ns, Inc. v. Law Offs. of Curtis V. Trinko*, 540 U.S. 398, 407 (2004). A recent FTC decision provides an extended analysis of these requirements. *See In re McWane, Inc.*, 2014-1 Trade Cases ¶ 78670 (F.T.C. Jan. 30, 2014), *aff’d McWane, Inc., v. FTC*, 783 F.3d 814 (11th Cir. 2015), *cert den.* 136 S. Ct. 1452 (2016).

<sup>42</sup> “Unfair methods of competition in or affecting commerce, and unfair or deceptive acts or practices in or affecting commerce, are hereby declared unlawful.” 15 U.S.C. § 45(a)(1). *See FTC v. Actavis, Inc.*, 570 U.S. 136, 145 (2013); *California. Dental Ass’n v. FTC*, 526 U.S. 756, 762 & n.3 (1999).

<sup>43</sup> Congress intended Section 5 to have a broader reach than the existing antitrust laws. *See* Neil W. Averitt, The Meaning of “Unfair Methods of Competition” in Section 5 of the Federal Trade Commission Act, 21 B.C. L. REV. 227, 239-40 (1980) (describing the Supreme Court’s interpretation of Section 5 and its endorsement of the capacity of Section 5 to reach beyond boundaries of other federal antitrust statutes); *FTC v. Indiana Federation of Dentists*, 476 U.S. 447, 454 (1986). *See* Fed. Trade Comm’n, Statement of Enforcement Principles Regarding “Unfair Methods of Competition” Under Section 5 of the FTC Act (Aug. 13, 2015), [https://www.ftc.gov/system/files/documents/public\\_statements/735201/150813section5enforcement.pdf](https://www.ftc.gov/system/files/documents/public_statements/735201/150813section5enforcement.pdf).

<sup>44</sup> “It shall be unlawful for any person engaged in commerce, in the course of such commerce, to lease or make a sale or contract for sale of goods, wares, merchandise, machinery, supplies, or other commodities, whether patented or unpatented, for use, consumption, or resale within the United States or any Territory thereof or the District of Columbia or any insular possession or other place under the jurisdiction of the United States, or fix a price charged therefor, or discount from, or rebate upon, such price, on the condition, agreement, or understanding that the lessee or purchaser thereof shall not use or deal in the goods, wares, merchandise, machinery, supplies, or other commodities of a competitor or competitors of the lessor or seller, where the effect of such lease, sale, or contract for sale or such condition, agreement, or understanding may be to substantially lessen competition or tend to create a monopoly in any line of commerce.” 15 U.S.C. § 14. Clayton Act § 3 applies only when both the tying and tied

## B. Tying Claims Involving Aftermarket Products and Services

Tying is the sale by a firm of one product (the tying product) only on condition that the customer also purchase a second product (the tied product) from the same firm. Manufacturer restrictions on aftermarket parts or services may give rise to a claim of illegal tying. For example, a tying claim might allege that a manufacturer unlawfully tied the availability of replacement parts to the purchase of its repair service. The tie can be explicit (you must buy Product A in order to get Product B), with the manufacturer refusing to sell the products separately, or implied, such as when products are offered only as part of a bundle and not independently.<sup>45</sup>

In many cases prior to the U.S. Supreme Court decision in *Eastman Kodak Co. v. Image Technical Servs., Inc.*, 504 U.S. 451 (1992), discussed in detail below, courts applied a *per se* rule of liability to allegations of tying under Sherman Act § 1 or Clayton Act § 3.<sup>46</sup> Since *Kodak*, however, courts have imposed a number of requirements for a finding of liability in connection with tying restraints, reflecting cases in which the Court has eliminated *per se* analysis for all other vertical restraints.<sup>47</sup> While some decisions continue to describe tying as a potential *per se* violation,<sup>48</sup> courts now routinely require a showing of cognizable harm in the tying product market or the tied product market, leading to an extensive inquiry into market power and economic effects more akin to a rule of reason analysis.<sup>49</sup>

*Kodak* is the leading case to address aftermarket issues.<sup>50</sup> ISOs challenged Kodak's policies restricting ISOs' ability to service and provide replacement parts for Kodak copiers and micrographics equipment. The ISOs serviced Kodak equipment in competition with Kodak itself. Because Kodak refused to sell parts directly to ISOs, many ISOs found it impossible to stay in business. Many equipment owners that preferred ISO service were also forced to obtain service from Kodak. The case focused on the allegation that Kodak refused to sell parts to equipment owners that obtained service from ISOs. In their suit, ISOs alleged that Kodak unlawfully tied the availability of Kodak parts to the purchase of Kodak service in violation of

---

products are "goods, wares, merchandise, machinery, supplies, or other commodities," and thus does not apply when tying arrangements involve intangibles such as services, trademarks, or franchises, among other things. *Id.*

<sup>45</sup> *Suture Express v. Owens & Minor Distribution, Inc.*, 851 F.3d 1029 (10th Cir. 2017), *cert. denied*, 138 S. Ct. 146 (2017).

<sup>46</sup> See *N. Pac. Ry. Co. v. United States*, 356 U.S. 1, 5-6 (1958); *Int'l Salt Co. v. United States*, 332 U.S. 392, 396 (1947) ("It is unreasonable, *per se*, to foreclose competitors from any substantial market.").

<sup>47</sup> See, e.g., *Illinois Tool Works v. Independent Ink, Inc.*, 547 U.S. 28, 35 (2006) ("Over the years . . . this Court's strong disapproval of tying arrangements has substantially diminished."). See also *Leegin Creative Leather Products, Inc. v. PSKS, Inc.*, 551 U.S. 877, 907 (2007) (holding that "[v]ertical price restraints are to be judged according to the rule of reason.").

<sup>48</sup> See, e.g., *Suture Express*, 851 F.3d at 1037; *Cox Enterprises, Inc. v. Cox Communications, Inc.*, 871 F.3d 1093, 1098-1102 (10th Cir. 2017) (discussing the "evolution of tying law" and collecting circuit caselaw).

<sup>49</sup> See, e.g., *Town Sound & Custom Tops, Inc. v. Chrysler Motors*, 959 F.2d 468, 477 (3d Cir. 1992) ("[t]he rule in tying cases is not, however, like other truly *per se* rules in antitrust law."); *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 26 (1984) (holding that analysis of a tying claim still requires inquiry into market power and economic effects of the arrangement). See also *NCAA v. Bd. of Regents*, 468 U.S. 85, 104 n.26 (1984) ("Indeed there is often no bright line separating *per se* from Rule of Reason analysis. *Per se* rules may require considerable inquiry into market conditions before evidence justifies a presumption of anticompetitive conduct.")

<sup>50</sup> *Kodak*, 504 U.S. 451 (1992).

Section 1 of the Sherman Act, and that Kodak monopolized and attempted to monopolize a service aftermarket in violation of Section 2 of the Act.

The Court considered whether Kodak's high share of parts sales gave it the market power required to support a tying claim and whether Kodak could monopolize a market limited only to servicing its own brand of equipment. Kodak argued for a substantive legal rule that competition from other suppliers in a market for equipment precluded a finding of monopoly power in any associated aftermarket.<sup>51</sup> It further argued that it could not raise prices for aftermarket parts and service because such an increase would be offset by lost equipment sales as customers purchased equipment with more attractive service costs.<sup>52</sup>

The Court's decision allowed the ISOs' claims to go forward beyond summary judgment. The majority opinion allowed that an OEM in some instances could be a monopolist in aftermarkets relating to its own products. The Court rejected Kodak's proposed rule, holding that, "[l]egal presumptions that rest on formalistic distinctions rather than actual market realities are generally disfavored in antitrust law."<sup>53</sup> Rather, the Court stressed the need to examine the facts at issue in a case,<sup>54</sup> noting that Kodak's service prices had risen and identifying several "lock-in" factors, including the cost of switching from Kodak equipment to a competing brand's equipment and imperfect information about total system costs.<sup>55</sup> The dissent, however, noted that Kodak had changed its policy during the relevant period and argued the case would have been decided differently if the policy had remained the same during that time.<sup>56</sup>

Courts have generally interpreted *Kodak* in one of two related ways.<sup>57</sup> First, they have limited the *Kodak* holding to a situation where a manufacturer has changed a policy regarding the availability of aftermarket market parts after initial purchase by the consumer, injuring customers who (without notice) are locked in and thus cannot switch to the primary market product sold by a different OEM.<sup>58</sup> Second, courts have not analyzed aftermarkets independently from primary markets absent a compelling reason to do so, such as the ability to exercise market power in the aftermarket without fear of offsetting commercial consequences in the primary market.<sup>59</sup> Furthermore, some courts have found little room to impose antitrust liability for a unilateral refusal to deal when intellectual property rights such as patent or

---

<sup>51</sup> *Id.* at 465-66.

<sup>52</sup> *Id.*

<sup>53</sup> *Id.* at 466-67.

<sup>54</sup> *Id.*

<sup>55</sup> *Id.* at 472-80.

<sup>56</sup> *Id.* at 491-93 (Scalia, J., dissenting). The majority suggested that, had customers been aware of Kodak's policy prior to their purchases, a question of fact, it might have decided the case differently. *See id.* at 477 note 24.

<sup>57</sup> *See generally* United States, Roundtable on "Competition in Aftermarkets – Note from the United States," Submission to OECD Competition Committee 7-10 (DAF/COMP/WD(2017)38), <https://www.ftc.gov/system/files/attachments/us-submissions-oecd-2010-present-other-international-competition-fora/aftermarkets.pdf> (collecting cases).

<sup>58</sup> *Alcatel USA, Inc. v. DGI Technologies*, 166 F.3d 772 (5th Cir. 1999) (affirmed summary judgment for defendant as a matter of law where defendant did not change pricing, warranty, or other important terms after customers' initial purchase decision).

<sup>59</sup> *SMS Sys. Servs. v. Digital Equip.*, 188 F.3d 11 (1st Cir. 1999) (competition in the original market disciplined aftermarket pricing).

copyright protect the aftermarket goods.<sup>60</sup> In addition, some courts have viewed certain aftermarket practices as being product improvements.<sup>61</sup> Also, some courts have been reluctant to find that high switching costs can be the basis of a relevant market claim.<sup>62</sup>

Subsequent lower court decisions have limited the reach of the decision and affirmed that “significant or long-lived consumer injury based on monopolized aftermarkets is likely to be rare, especially if equipment markets are competitive.”<sup>63</sup> A number of principles can be derived from these cases. If a purchaser signed a contract containing aftermarket obligations for parts or servicing at the initial sale, courts likely will not find liability if the purchaser had other options. As a corollary, if the purchaser was aware of aftermarket costs at the time of sale, courts may deem that the purchaser engaged in “lifecycle” pricing analysis and that competition for the primary product has disciplined such aftermarket costs. On the other hand, if aftermarket costs were unavailable up front, the courts may find that the purchaser is locked-in and liability is possible. Also, if there has been no change in policy by the manufacturer, the courts are unlikely to find the policy exclusionary.

### C. Monopolization Claims Involving Aftermarket Restrictions

Manufacturer repair restrictions may also raise antitrust claims involving monopolization. Under Section 2 of the Sherman Act, a claim of monopolization requires proof of (1) the possession of monopoly power in the relevant market and (2) “the willful acquisition or maintenance of that power as distinguished from growth or development as a consequence of a superior product, business acumen, or historic accident.”<sup>64</sup> As the Supreme Court underscored in *Spectrum Sports, Inc. v. McQuillan*, 506 U.S. 447, 458 (1993), “[t]he law directs itself not against conduct which is competitive, even severely so, but against conduct which unfairly tends to destroy competition itself.” Accordingly, courts will first determine whether the defendant has monopoly power in a relevant market, and, if it does, whether it acted to maintain or attain its monopoly through anticompetitive conduct.<sup>65</sup>

Under the jurisprudential standards that apply to single-firm conduct, a manufacturer must have market power in a well-defined relevant antitrust market to be subject to antitrust prohibitions on unilateral conduct (or a dangerous probability of acquiring monopoly power). In the context of aftermarkets, a key question regarding product market definition is whether the

---

<sup>60</sup> OECD Note, Competition in Aftermarkets at 9-10 (collecting cases). See *In re Indep. Serv. Org. Antitrust Litig.*, 203 F.3d 1322 (Fed. Cir. 2000) (a company does not violate antitrust law when it refuses to sell or license its copyrighted works as an aftermarket product).

<sup>61</sup> *Queen City Pizza, Inc. v. Domino’s Pizza, Inc.*, 124 F.3d 430, 433 (3d Cir. 1997) (affirming dismissal of monopolization, attempt to monopolize, exclusive dealing, and tying claims brought by franchisees against franchisor regarding standard franchise agreement that promoted uniform standards for ingredients, beverages, and packaging materials); *SMS Sys. Maintenance Servs., Inc. v. Digital Equip. Corp.*, 188 F.3d 11, 13-14, 20-21 (1st Cir. 1999) (affirming summary judgment for manufacturer against ISO claims that integration of three-year warranty with sale of computer systems constituted attempted monopolization).

<sup>62</sup> *Brokerage Concepts, Inc. v. U.S. Healthcare, Inc.*, 140 F.3d 494 (3d Cir. 1998) (rejecting plaintiff pharmacy’s argument that high switching costs were sufficiently high to cause lock-in to a health care plan).

<sup>63</sup> Carl Shapiro, *Aftermarkets and Consumer Welfare: Making Sense of Kodak*, 63 Antitrust L.J. 483, 485 (1995).

<sup>64</sup> *United States v. Grinnell Corp.*, 384 U.S. 563, 570-71 (1966).

<sup>65</sup> *United States v. Microsoft Corp.*, 253 F.3d 34, 79 (D.C. Cir. 2001).

aftermarket constitutes a relevant product market separate from the market for the sale of the product.<sup>66</sup> If a hypothetical monopolist of an aftermarket (that is not a monopolist in the market for the product) could profitably raise prices above the competitive level by at least a small but significant and non-transitory amount, then competition from other aftermarket firms is not sufficient to prevent anticompetitive behavior in the aftermarket. Thus, it is sometimes appropriate to analyze competition in a separate relevant market comprising the aftermarket.

But in many situations, application of general principles of market definition leads to a conclusion that a relevant market is not limited to the product of a single manufacturer, which is consistent with the Supreme Court's discussion of the issue. Rather, relevant product markets typically include the products of multiple manufacturers.<sup>67</sup> In a broader market, a single manufacturer's market share may not be sufficient to establish monopoly power in the relevant market.

Anticompetitive conduct by a monopolist can take many forms.<sup>68</sup> Examples of potentially anticompetitive conduct described elsewhere as undermining competition from non-OEMs include refusals to deal, exclusive dealing, exclusionary design, and aggressive assertion of patent rights.<sup>69</sup> Conduct that can harm competition may fit into one or more categories,<sup>70</sup> but the underlying inquiry is whether the conduct harms consumers.<sup>71</sup>

While the Supreme Court recognizes that a monopolist's refusal to deal with its rivals under narrowly circumscribed circumstances may constitute exclusionary conduct supporting a violation of Section 2,<sup>72</sup> the Court has cautioned against imposing antitrust liability on firms that would require them to do business with other companies, including rivals or potential rivals.<sup>73</sup>

---

<sup>66</sup> A relevant market includes all products "reasonably interchangeable by consumers for the same purposes." *United States v. E.I. du Pont de Nemours & Co.*, 351 U.S. 377, 395 (1956). The Supreme Court has defined monopoly power in a *relevant* market as "the power to control prices or exclude competition," which can be shown through direct evidence or inferred where the defendant has a predominant share of a properly defined relevant market that is protected by entry barriers. *See, e.g., United States v. Dentsply Int'l, Inc.*, 399 F.3d 181, 187 (3d Cir. 2005); *Microsoft*, 253 F.3d at 51.

<sup>67</sup> *See, e.g., Town Sound & Custom Tops, Inc. v. Chrysler Motors*, 959 F.2d 468, 487-94 (3d Cir. 1992).

<sup>68</sup> The FTC has several pending cases challenging a variety of exclusionary conduct to maintain a monopoly in violation of the antitrust laws. *See, e.g., FTC v. Surescripts*, No. 19-1080 (D.D.C.) (complaint filed Apr. 17, 2019) ([https://www.ftc.gov/system/files/documents/cases/surescripts\\_redacted\\_complaint\\_4-24-19.pdf](https://www.ftc.gov/system/files/documents/cases/surescripts_redacted_complaint_4-24-19.pdf)); *FTC et al. v. Vyera Pharmaceuticals, LLC et al.*, No. 20-706 (S.D.N.Y.) (complaint filed Jan. 27, 2020; amended complaint filed Apr. 14, 2020) ([https://www.ftc.gov/system/files/documents/cases/161\\_0001\\_vyera\\_amended\\_complaint.pdf](https://www.ftc.gov/system/files/documents/cases/161_0001_vyera_amended_complaint.pdf)); *FTC v. Facebook*, No. 1:20-cv-03590 (D.D.C.) (complaint filed Dec. 9, 2020) ([https://www.ftc.gov/system/files/documents/cases/051\\_2021.01.21\\_revised\\_partially\\_redacted\\_complaint.pdf](https://www.ftc.gov/system/files/documents/cases/051_2021.01.21_revised_partially_redacted_complaint.pdf)); *FTC v. Endo Pharmaceuticals et al.*, No. 1:21-cv-00217 (D.D.C.) (complaint filed Jan. 25, 2021) ([https://www.ftc.gov/system/files/documents/cases/redacted\\_complaint\\_0.pdf](https://www.ftc.gov/system/files/documents/cases/redacted_complaint_0.pdf))

<sup>69</sup> *See supra* Section II and *infra* Section IV.

<sup>70</sup> *Trinko*, 540 U.S. at 414 ("the means of illicit exclusion, like the means of legitimate competition, are myriad.") (*internal quotes omitted*)

<sup>71</sup> *Microsoft*, 253 F.3d at 58. *See also Nynex Corp. v. Discon, Inc.*, 525 U.S. 128, 135 (1998) (plaintiffs "must allege and prove harm, not just to a single competitor, but to the competitive process, i.e., to competition itself.")

<sup>72</sup> *Aspen Skiing Co. v. Aspen Highlands Skiing Corp.*, 472 U.S. 585, 601-11 (1985); *Otter Tail Power Co. v. United States*, 410 U.S. 366, 378 (1973).

<sup>73</sup> *Trinko*, 540 U.S. at 400-11 (2004) (such limited exceptions reside "at or near the outer boundary of § 2 liability."). *See also United States v. Colgate & Co.*, 250 U.S. 300, 307 (1919).



Likewise, the Court has been reluctant to impose antitrust liability on a defendant where competitors are denied access to an input that is deemed essential, or critical, to competition.<sup>74</sup> In these types of cases, antitrust analysis requires a careful application of general legal principles to the specific factual circumstances and regulatory setting. In addition, as discussed with regard to tying claims analyzed under a rule of reason, defendants in a monopolization case will be allowed to assert and prove that the challenged conduct is procompetitive in its overall effect.<sup>75</sup> In sum, there may be some specific circumstances where the Commission could address repair restrictions as violations of antitrust law. In many instances, however, repair restrictions may reduce consumers' options for obtaining spare parts and repair services in the aftermarket without running afoul of antitrust law.

### III. INFORMATION GATHERING PROCESS

In order to examine the effects of manufacturers' repair restrictions on consumers' repair options, the Commission used a number of its information gathering tools. On March 13, 2019, Commission staff issued a Call for Empirical Research asking members of the public to provide data and research regarding the prevalence of repair restrictions, the impact of such restrictions, and the rationale for such restrictions, among other things.<sup>76</sup> On the same day, staff announced that they were seeking public comments concerning repair restrictions. Staff received 22 responses to its Call for Empirical Research and 68 comments.<sup>77</sup>

The Commission received research submissions and comments from entities and associations representing the full spectrum of interested parties. Commenters included manufacturers and their associations, repair advocates, independent repairers and their associations, and consumers. .

Commission staff also hosted a half-day Workshop to examine further the ways in which manufacturers may limit third-party repairs on July 16, 2019. The Workshop began with opening remarks by Commissioner Christine Wilson,<sup>78</sup> which set the stage for the following panels. The first panel focused on how repair restrictions affect consumers and small businesses, and included presentations by: Walter Alcorn, the Vice President for Environmental Affairs and Industry Sustainability at the Consumer Technology Association, a trade association that

---

<sup>74</sup> Although some lower courts have recognized an "essential facilities" doctrine, the Supreme Court has never recognized such a doctrine, and views it as raising the same concerns as mandating dealing with a competitor. *Trinko*, 540 U.S. at 410-11. See also *Philips N. Am., LLC v. Summit Imaging Inc.*, 2020 WL 6741966 \*6-7 (W.D. Wash. 2020) (dismissing ISO counterclaims against medical equipment manufacturer for monopolization and attempted monopolization, including theories based on refusal to deal and essential facilities).

<sup>75</sup> *Dentsply*, 399 F.3d 191, 196-97 (3d Cir. 2005) (defendant's business justification was pretextual and did not excuse exclusionary practices).

<sup>76</sup> Federal Trade Commission, Call for Empirical Research: Nixing the Fix: A Workshop on repair restrictions, <https://www.ftc.gov/nixing-the-fix-call-for-research> ("Call for Empirical Research").

<sup>77</sup> See Nixing the Fix: A Workshop on Repair Restrictions, Docket ID FTC-2019-0013, <https://www.regulations.gov/docket?D=FTC-2019-0013>. Most of the responses to the Call for Empirical Research did not actually consist of empirical research and were more in the nature of comments.

<sup>78</sup> Statement of Commissioner Christine S. Wilson Regarding FTC's Nixing the Fix: A Workshop on Repair Restrictions, <https://www.ftc.gov/public-statements/2019/07/statement-commissioner-christine-s-wilson-regarding-ftcs-nixing-fix>.

represents the U.S. consumer technology industry; George Borlase, research staff member at the Institute for Defense Analyses Science and Technology Policy Institute; Jennifer Larson, the CEO of Vibrant Technologies, an Eden Prairie, Minnesota-based remarketer of IT hardware; and Theresa McDonough, the owner of Tech Medic, a mobile phone and computer repair shop located in Middlebury, Vermont.

The second panel examined the arguments for and against providing consumers and independent repair shops with the parts, tools and diagnostic software needed to repair products. This panel featured two security experts—Earl Crane, a security advisor with the Security Innovation Center and Gary McGraw, a security researcher with Securerepairs.org, an organization of information (“cyber”) security professionals who support the right to repair. Panelists also included Gay Gordon-Byrne, the executive director of The Repair Association, an association that represents people involved in repair and reuse of technology, and George Kerchner, the executive director of PRBA – The Rechargeable Battery Association (“PRBA”), a trade association that represents the rechargeable power industry.

The final panel explored proposed state legislation and industry initiatives aimed at expanding consumers’ repair choices. Panelists included: Aaron Lowe, senior vice president for regulatory and government affairs at the Auto Care Association, a trade association representing businesses that manufacture, distribute and sell motor vehicle parts, accessories, tools, equipment, materials and supplies, and perform vehicle service, maintenance and repair; two state senators who have sponsored fair repair legislation in their states—the Honorable David Osmeck (a Republican state Senator from Minnesota) and the Honorable Chris Pearson (a Progressive Party state Senator from Vermont); Kyle Wiens, the co-founder and CEO of iFixit, operator of ifixit.com, a wiki-based site that teaches people how to fix products and sells repair parts; and Sarah Faye Pierce, the director of government relations at the Association of Home Appliance Manufacturers.

This report is primarily based on the record we developed using the information gathering tools described above.

#### **IV. TYPES OF REPAIR RESTRICTIONS**

In this section we describe manufacturer practices that right to repair advocates assert have the effect of limiting consumer repair choices. In Section V, we evaluate manufacturers’ explanations for these restrictions. Repair restrictions discussed at the Workshop, described in the empirical research submissions, and delineated in the comments generally fall into eight categories:

- Physical restrictions;
- Unavailability of parts, repair manuals, and diagnostic software and tools;
- Designs that make independent repairs less safe;
- Telematics (i.e., information on the operation and status of a vehicle that is collected by a system contained in the vehicle and wirelessly relayed to a central location, often the manufacturer or dealer of the vehicle);
- Application of patent rights and enforcement of trademarks;

- Disparagement of non-OEM parts and independent repair;
- Software locks, Digital Rights Management and Technical Protection Measures; and
- End User License Agreements.

## **A. Physical Restrictions**

Physical restrictions, which can take a variety of forms, are restrictions that limit the ability to open devices or physically remove and replace component parts. These restrictions were raised at the Workshop and in multiple comments as a common practice that limits consumers' ability to repair products or devices they own.

Repair advocates have identified different ways that manufactures build physical restrictions into their products. Such restrictions include highly specialized nuts and bolts that require unique screw heads to open a device or machine.<sup>79</sup>

Another physical restriction that was discussed in the record was the use of glue to close device cases or chassis or to secure component parts within a device.<sup>80</sup> Repair advocates also raised concerns about the increased use of soldering on motherboards and other technical components. By soldering RAM, storage or other components to a motherboard, manufacturers eliminate the ability of consumers to replace or upgrade individual components of a product.<sup>81</sup>

Finally, commentators highlighted the trend by manufacturers to weld or close the exterior of products. Eliminating the ability to open a device eliminates the ability to repair a product.<sup>82</sup>

## **B. Unavailability of Parts, Manuals, and Diagnostic Software/Tools**

Repairs may be made more difficult or impossible to perform by individuals or independent repairs shops due to their inability to access parts, manuals, and diagnostic software and tools. This section discusses each type of restriction in turn.

### 1. Unavailability of Parts

Some manufacturers make parts available only to their authorized repair networks. For example, LKQ Corporation ("LKQ Corp.") stated that in the automobile industry, where replacement parts have been generally available outside of manufacturers' repair networks, several manufacturers, such as Volvo, limit the availability of key replacement parts to only their authorized repair networks.<sup>83</sup>

---

<sup>79</sup> iFixit empirical research, at 11; Transcript of Workshop ("Transcript"), at 38, <https://www.ftc.gov/news-events/events-calendar/nixing-fix-workshop-repair-restrictions>.

<sup>80</sup> Transcript, at 22; iFixit empirical research, at 12, 21.

<sup>81</sup> Transcript, at 48; iFixit empirical research, at 13-14.

<sup>82</sup> Transcript, at 22.

<sup>83</sup> LKQ Corporation empirical research ("LKQ Corp. empirical research"), at 14.

Manufacturers' control of spare parts makes it a challenge for individuals and independent repair shops to replace consumable parts that are likely to need replacement during the course of a product's useful life, such as mobile phone batteries.<sup>84</sup> Moreover, manufacturers' control of spare parts may result in consumers' needing to replace appliances and other products simply because they cannot obtain a spare part.<sup>85</sup>

## 2. Unavailability of Manuals

Independent repair shops and repair advocates state that some manufacturers do not release service manuals that would be needed to fix otherwise repairable products.<sup>86</sup> Service manuals provide instructions and guidance on how to fix components that may be broken or not functioning properly, or techniques for troubleshooting other issues. Without these manuals, independent repair providers claim that making repairs can be very difficult or impossible. Furthermore, in certain instances, manufacturers threaten to sue or sue entities who publish repair manuals or diagnostic codes.<sup>87</sup>

## 3. Unavailability of Diagnostic Software and Tools

Diagnostic software and firmware are often necessary today to make repairs because they help repair shops diagnose problems with devices.<sup>88</sup> Repair advocates have indicated that some manufacturers limit the availability of such software and in other instances institute code that prevents ISOs from developing alternative diagnostic software.<sup>89</sup>

### **C. Designs that Make Independent Repairs Less Safe**

The primary safety concern of independent repair raised by manufacturers and right to repair advocates relates to the challenges of replacing lithium ion cells. Lithium ion cells power numerous devices, ranging from small consumer electronics to automobiles. Two common types of lithium ion cells are pouches—thin and flexible polymer cells that are found in electronic

---

<sup>84</sup> Transcript, at 23.

<sup>85</sup> Transcript, at 155-156.

<sup>86</sup> Transcript of Judiciary Comm. Meeting, 104th Leg., 2nd Sess. 22 (Neb. 2016) at 22 (2-25-2016), <https://www.nebraskalegislature.gov/FloorDocs/104/PDF/Transcripts/Judiciary/2016-02-25.pdf> ("Nebraska Transcript").

<sup>87</sup> Electronic Frontier Foundation, Defend Your Right to Repair!, <https://www.eff.org/issues/right-to-repair>. Kyle Wiens stated at the Workshop that he "... learned that there had actually been several people that had posted [an Apple] service manual online, but that they had gotten [Digital Millennium Copyright Act] copyright take-down complaints from Apple saying, we don't want you to share this information. And since then, I learned that that's a trend across the board." Transcript, at 165.

<sup>88</sup> Motor and Equipment Manufacturers Association empirical research ("MEMA empirical research"), at 15; International Association of Medical Equipment Remarketers and Servicers, Inc. empirical research ("IAMERS empirical research"), at 2-3; Nebraska Transcript, at 21.

<sup>89</sup> Jennifer Larson stated that she wants access to information authorized dealers get: diagnostics and firmware patches. Transcript, at 66; Nebraska Transcript, at 21; Transcript, at 138 (noting that it is difficult for independent repair shops to fix products when required software patches are not readily available).

devices—and cylindrical cells that look like extra-large AA batteries and are used in rechargeable power tools and electric cars.<sup>90</sup>

Lithium ion cells differ from common household batteries (e.g., AA, AAA, C and D) in three important ways. First, lithium ion cells are generally manufactured to accommodate the specific power demands of a particular device.<sup>91</sup> Each device may present its own unique power demands. Thus, a polymer cell from one model's phone may not necessarily work in another model even if they are the same size. Second, lithium ion cells need to be handled carefully in order to avoid a thermal runaway event that could lead to a chemical fire.<sup>92</sup>

Third, for common household batteries, the size and shape of the battery—its form factor—indicates that it can be used in a device that accepts a battery of that particular size and shape. The common cylindrical version of a lithium ion cell, however, comes in a form factor called “18650” which refers to the cylinder's dimensions—18mm in diameter x 65.0mm in length. Unlike the common household batteries, which come in different shapes and sizes, and are labeled by type, lithium ion batteries are the same size and shape (e.g. 18650 form factor) regardless of internal chemistry, and are not labeled by type or internal chemistry. As Kerchner of the PRBA explained at the Workshop while holding up two different 18650 cells:

So, for example, these two cells look exactly the same. They have the same dimensions. They're 18650, 18 millimeters in diameter, 65 millimeters in length. This cell could have been designed to power a notebook. This cell could have been designed to power a power tool. If you mix these up, while they are the same size, and you put these batteries with these cells together, that's where we're concerned on some of the safety issues when consumers or repair facilities are unaware of the difference between these individual cells. . . . And that's important to recognize, that when you're going in and you're repairing products and you're not aware of the differences between the different cell chemistries -- and there are about six different lithium ion chemistries in the world today that are used, both for consumer and industrial products. There's different chemistries. There are different designs to power certain products. And without that knowledge, there's a lot of safety concerns that we, as an industry, have.<sup>93</sup>

As such, although they are the same size and shape, one 18650 cell may have a dramatically different internal chemistry from another. Yet an individual or independent repair shop may not be able to distinguish among 18650 cells because the cylinders' labels do not

---

<sup>90</sup> Transcript, at 83.

<sup>91</sup> Transcript, at 83.

<sup>92</sup> A thermal runaway event is “a repeating cycle in which excessive heat causes more heat until the operation ceases or an explosion occurs.” “Thermal Runaway,” PCMag Encyclopedia, [www.pcmag.com/encyclopedia/term/thermal-runaway](http://www.pcmag.com/encyclopedia/term/thermal-runaway).

<sup>93</sup> Transcript, at 85-86.

contain information pertaining to the cells' internal chemistries or the products for which they were designed.<sup>94</sup> The use of 18650 cells with the same form factor but different internal chemistries creates the risk that a replacement 18650 will have a different internal chemistry from the original 18650, placing individuals and independent repair shops at risk of inadvertently causing thermal runaway events.

The use of glue to fasten polymer cells into mobile phones and other devices also increases the risk that the cells will be punctured when they are removed by individuals and independent repair shops that do not have access to specialized solvents or tools.<sup>95</sup> These practices reduce the ability of individuals and independent repair shops to remove and install appropriate replacement lithium ion cells in consumer devices.

#### **D. Steering Consumers to Manufacturers' Repair Networks Using Telematics Systems**

Many modern vehicles come equipped with telematics that monitor the status of the car and relay that information to a central location.<sup>96</sup> Numerous commenters asserted that these telematics systems serve as a relatively new way of limiting independent repair access and consumer choice in the auto repair industry. As LKQ Corp. and MEMA described in their submissions, telematics systems, which "provide remote, real-time communications between a vehicle and a remote third party," are currently only accessible by the vehicle manufacturers.<sup>97</sup> This exclusive possession of information by manufacturers, LKQ Corp. asserted, limits consumers and independent repair shops because:

Vehicle manufacturers retain exclusive insight in vehicle operations and diagnostics systems[, v]ehicle manufacturers control the telematics system for marketing purposes. Information and advertisements sent by the vehicle manufacturer can appear on the information display[, and f]ollowing an accident, vehicle manufacturers can steer the consumer, perhaps unwittingly and at the time when they are most vulnerable, to a dealership or loyal repair facility....<sup>98</sup>

The Auto Care Association also asserted that if every manufacturer creates a unique system for accessing telematics vehicle repair data, "it will be difficult for aftermarket tools to

---

<sup>94</sup> The labels on the 18650s seen by staff simply stated "18650."

<sup>95</sup> "[W]hen crushed, punctured, ripped or dropped, lithium-ion batteries can produce what the industry euphemistically calls a 'thermal event.' It happens because these batteries short circuit when the super-thin separator between their positive and negative parts gets breached." Geoffrey A. Fowler, The explosive problem with recycling iPads, iPhones and other gadgets: They literally catch fire, The Washington Post, Sept. 11, 2018, <https://www.washingtonpost.com/technology/2018/09/11/explosive-problem-with-recycling-ipads-iphones-other-gadgets-they-literally-catch-fire/>.

<sup>96</sup> Telematics enable manufacturers to provide beneficial services to consumers such as, parking assist, vehicle maintenance warnings, and navigation and emergency support.

<sup>97</sup> LKQ empirical research, at 18; MEMA empirical research, at 14-15.

<sup>98</sup> LKQ empirical research, at 18-19; MEMA empirical research, at 14-15.

navigate the system and repair shops could have difficulty cost effectively providing service for their customers.”<sup>99</sup>

### **E. Application of Patent Rights and Enforcement of Trademarks**

Intellectual property rights foster innovation by protecting significant investments in research and development. Two commenters raised intellectual property laws as lessening competition or creating restrictions in the repair marketplace. First, the International Institute for Industrial Environmental Economics identified patent and trademark laws as “barriers for consumers and the repair sector to buy, sell and carry out repairs,” in both the United States and the European Union.<sup>100</sup> The submission noted that patent and trademark laws create barriers in conducting repairs not authorized by the OEM, the importing, selling, distribution, or manufacturing of tools, and the manufacturing, selling, and importing of spare parts.<sup>101</sup>

Second, the Automotive Body Parts Association (“ABPA”) asserted that car manufacturers’ use of intellectual property laws results in rising costs for repairs and repair parts.<sup>102</sup> In its empirical research submission, the ABPA alleged that “[t]he misuse of design patents on repair parts to block competition from producing equivalent parts is creating an environment with less competition and a significant pricing increase in the marketplace.”<sup>103</sup> In its post-Workshop comments, the ABPA also asserted that original equipment manufacturers are attempting to disrupt supply chains for aftermarket parts, thus reducing competition for original parts, by increasingly alleging trademark infringement at the point of entry when aftermarket collision repair parts are imported into the US.<sup>104</sup>

### **F. Disparagement of Non-OEM parts and Independent Repair Services**

According to right to repair advocates, another tactic used to restrict independent repair is OEM efforts to promote their own parts and affiliate repair networks. A number of commenters also raised concerns about OEMs disparaging the quality of aftermarket parts and independent repairs.<sup>105</sup> The record most strongly reflects this with respect to the automobile industry. For example, the Auto Care Association cited a bulletin released by Honda “disparaging the use of non-original equipment (OE) parts” and a bulletin from Kia “that warned against the use of an aftermarket oil filter.”<sup>106</sup> Safelite AutoGlass, the “nations [sic] largest purchaser of Original Equipment Equivalent (OEE) replacement vehicle glass,” reported that vehicle manufacturers

---

<sup>99</sup> Auto Care Association comment, at 3.

<sup>100</sup> International Institute for Industrial Environmental Economics empirical research, at 4-6.

<sup>101</sup> *Id.*

<sup>102</sup> Automotive Body Parts Association, *Consumer Issues in the Collision Repair Industry* (“ABPA presentation”), at 18-19, <https://www.regulations.gov/comment/FTC-2019-0013-0088>.

<sup>103</sup> Automotive Body Parts Association empirical research, (“ABPA empirical research”) at 1.

<sup>104</sup> ABPA presentation at 13.

<sup>105</sup> Of course, if a company had appropriate substantiation for a claim that its product or service was superior, that claim would not violate Section 5 of the FTC Act.

<sup>106</sup> Auto Care Association comment, at 4. *See also* MEMA empirical research, at 11-13 (arguing that several automobile manufacturers disparage non-OEM parts in order to “cast doubt on legitimate competitors and encourage consumers and repairers to return to new car dealers for replacement parts.”).

have cast “any OEE products or non-dealership repair services as dangerous for the driver,” and that individual vehicle owners “will turn away from the aftermarket and head to the new vehicle dealer to ensure that their warranty and safety not be jeopardized.”<sup>107</sup>

### **G. Software Locks, Digital Rights Management, and Technological Protection Measures**

Software locks, digital rights management (“DRM”) tools or technological protection measures (“TPMs”) are access control technologies implemented by OEMs. While manufacturers argue that these measures are necessary to protect proprietary hardware and copyrighted technologies, repair advocates argue such tactics lock ISOs and consumers out of basic repairs. Embedded software may force consumers to have the maintenance and repair of their products performed by the manufacturers’ authorized service networks. Furthermore, according to iFixit, “if you replace the screen on your iPhone—even if it’s with a brand new OEM screen off of another identical iPhone—certain features like TrueTone won’t work correctly.”<sup>108</sup>

McDonough explained that Apple synchronizes some iPhone parts to the device’s logic board, making the part repairable only by Apple.<sup>109</sup> Although McDonough said she does not believe this practice is widespread in the marketplace, she fears that other manufacturers will engage in a similar practice in the future, making it impossible for individuals and independent repair shops to make certain repairs to electronic devices.<sup>110</sup>

According to LKQ, such a future is already occurring in the automotive industry through “VIN burning”—the practice of limiting a control module to function with a single vehicle identification number. With VIN burning, a manufacturer can constrain a part to function with only a single car. Using the part on another vehicle would be blocked by the vehicle’s embedded software.<sup>111</sup> This practice is reportedly being used by General Motors as well as a number of European luxury brands.<sup>112</sup> At least one manufacturer has also adopted a cybersecurity gateway to reduce the risk of vehicle hacking, but repair advocates argue the manufacturer has implemented the gateway in a manner that prevents legitimate third party repairs.<sup>113</sup>

Larson, whose company is a seller of refurbished computer servers, explained at the Workshop that some manufacturers also limit third-party repairs through firmware updates to products. For example, she stated that manufacturers of servers, such as IBM, refuse to provide firmware updates unless owners of equipment purchase maintenance contracts. Without the

---

<sup>107</sup> Safelite AutoGlass comment, at 1, 3.

<sup>108</sup> iFixit empirical research, at 15.

<sup>109</sup> Transcript, at 24.

<sup>110</sup> *Id.*

<sup>111</sup> LKQ empirical research, at 4-6.

<sup>112</sup> *Id.* at 4. Although manufacturers did not explain the rationale for VIN burning, we note this practice may have benefits (such as reducing the marketability of stolen airbags and other components). However, any such benefits could likely be achieved without imposing a substantial burden on independent repair.

<sup>113</sup> *Id.* at 16-18.



firmware updates, many of the used servers that her company acquires cannot be resold.<sup>114</sup> Businesses that want to purchase such an aftermarket server would need to purchase a service contract from the manufacturer in order to obtain the firmware update.<sup>115</sup> Timothy Pearson, a manager in a secure computer design and manufacturing firm, has similarly found that certain vendors require all firmware components to be signed with their vendor key in order for the firmware to execute.<sup>116</sup>

## H. End User License Agreements

Both manufacturers and right to repair advocates acknowledge that many products now consist of physical goods and embedded software that the manufacturer licenses to the consumer under the terms of an End User License Agreement (“EULA”). As Walter Alcorn of the Consumer Technology Association explained: “It used to be, before software was embedded in these devices, ownership was very cut and dry . . . . You owned it or you didn’t. But now with software, that has become a little bit more complicated.”<sup>117</sup>

According to Gordon-Byrne, a study conducted by the Repair Association showed that, “Basically, 100% of manufacturers have restrictions on repair in every one of their [EULAs].”<sup>118</sup> For this study, the Repair Association reviewed the EULAs of 52 products, including mobile phones, enterprise and personal computers, smart TVs, and agricultural equipment. The study found that the EULAs restrict repairs by prohibiting modifications of software for any purpose, prohibiting de-compiling or reverse engineering of software.<sup>119</sup>

## V. MANUFACTURERS’ EXPLANATIONS FOR REPAIR RESTRICTIONS

Manufacturers have offered numerous explanations for repair restrictions. In this section, we list and evaluate their explanations. We note that this section examines the broad effects of repair restrictions concerning all types of products and across multiple industries.<sup>120</sup>

### A. Protection of Intellectual Property

Manufacturers often rely on intellectual property law to protect their substantial investment in the development of the products they create. Repair advocates argue that the assertion of copyright, trademark, and patent rights impedes independent repair. As explained below, at present, the assertion of IP rights does not appear to be a significant impediment to independent repair.

---

<sup>114</sup> Transcript, at 16.

<sup>115</sup> *Id.*

<sup>116</sup> Timothy Pearson comment, at 1.

<sup>117</sup> Transcript, at 40.

<sup>118</sup> Transcript, at 76.

<sup>119</sup> Repair Association empirical research, at 4-6. According to the Repair Association, some EULAs specifically prohibit the circumvention of technological protection measures even though the Copyright Office has provided exemptions to the Digital Millennium Copyright Act that allow for the circumvention of TPMs to diagnose, maintain or repair motorized land vehicles, smart phones, home appliances and home systems. *Id.* See *infra* Section V.A.

<sup>120</sup> Any law enforcement action concerning a manufacturer’s repair restrictions would need to focus on the particular manufacturer’s repair restrictions and explanations for the restrictions.

Manufacturers of products with embedded software rely on copyright law to protect their code from being copied. Some manufacturers also secure design or utility patents for products they offer or for their component parts. Manufacturers may also invoke copyright or trade secret law to prevent the public disclosure of their repair protocols and manuals.<sup>121</sup>

Manufacturers argue that vigorous assertion of their intellectual property rights sustains the health of the vibrant and innovative technology industry<sup>122</sup> and fosters innovation.<sup>123</sup> They argue providing individuals and independent repair shops with access to proprietary information, parts, tools, and equipment without the contractual safeguards currently in place between manufacturers and affiliated service providers would place sensitive protected intellectual property and trade secrets at significant risk<sup>124</sup> and force them “to reveal sensitive technical information about their products, including source code, tools, and trade secrets.”<sup>125</sup>

Specifically, as to copyright law, manufacturers of video games and gaming consoles assert that repair restrictions in the form of technological protection measures (“TPMs”) are needed to protect video games from being pirated. According to the Electronic Software Association (ESA), which “represents the major game console manufacturers and almost all of the major video game publishers in the United States,” “some game console repairs may require replacing hardware components or parts of components, and some of these hardware fixes may require” circumvention of a console’s anti-piracy TPMs.<sup>126</sup> Other game console repairs may require components of the console to be “re-authenticated” to restore the console to a functional state. This “re-authentication” enables console makers to ensure that the repairs did not compromise the TPMs.<sup>127</sup> According to Microsoft, “unfettered access to diagnostic and proprietary hardware tools increases the potential for malicious actors to circumvent anti-piracy controls.”<sup>128</sup>

As to patents, the National Association of Manufacturers explains that, although “the purchaser of a patented product is entitled to repair and replace worn or broken parts, patent owners generally have the right to dispose of their patented property as they wish, including by deciding to sell” (or not sell) their products to whomever they choose.<sup>129</sup> They assert that any requirement that a company must make available patented replacement parts for repair would be contrary to the statutorily protected right of a patent holder to exclude others from making, using, or selling their patented invention.<sup>130</sup>

---

<sup>121</sup> See, e.g., Kyle Wiens (@kwiens), Twitter (June 11, 2020, 1:39 PM), <https://twitter.com/kwiens/status/1271134890872856577>, (Letter from STERIS Corp. to Kyle Wiens demanding removal of ventilator repair manuals from iFixit.com’s web site).

<sup>122</sup> Joint Comment of Association of Home Appliance Manufacturers et al. (“Joint Comment”), at 4.

<sup>123</sup> National Association of Manufacturers comment (“NAM comment”), at 2.

<sup>124</sup> Joint Comment, at 4.

<sup>125</sup> CompTIA comment, at 10. We note that manufacturers generally discussed trade secrets, but did not provide any explanation of the types of trade secrets that might be implicated in the repair context.

<sup>126</sup> Entertainment Software Association empirical research (“ESA empirical research”), at 3.

<sup>127</sup> *Id.* at 3-4.

<sup>128</sup> Microsoft Corporation comment (“Microsoft comment”), at 10.

<sup>129</sup> NAM comment, at 1.

<sup>130</sup> *Id.*

A full discussion of the interplay between intellectual property and repair is beyond the scope of this report.<sup>131</sup> Nonetheless, while it is clear that manufacturers' assertion of intellectual property rights can impede repairs by individuals and independent repair shops, in many instances intellectual property rights do not appear to present an insurmountable obstacle to repair. For instance, as to copyright law, Section 117(c) of the Copyright Act provides that an owner or lessee of a machine may make a copy of a computer program for purposes of maintenance or repair.<sup>132</sup> Moreover, in its most recent exemptions to the Digital Millennium Copyright Act's anti-circumvention provisions,<sup>133</sup> the Librarian of Congress has permitted the circumvention of TPMs to diagnose, maintain, or repair motorized land vehicles, smart phones, home appliances and home systems.<sup>134</sup> As to trade secrets, information that manufacturers already share with authorized repair centers may not qualify for trade secret protection. With regards to other possible trade secrets, model right to repair legislation exempts trade secrets from disclosure. With respect to patent law, patents could potentially impact competitive markets for repair parts if there are valid and enforced patents protecting component parts; however, only two commenters noted that manufacturers' assertion of patent rights impedes independent repair.<sup>135</sup> Thus, it is not clear that manufacturers are readily turning to patent law to prevent independent repair shops from obtaining spare parts.<sup>136</sup>

## B. Safety

Manufacturers argue that repair restrictions protect repair workers and consumers from injuries that could result from fixing a product or using an improperly repaired product. According to manufacturers, safety risks are mitigated when repairs are performed by authorized repair persons because their contracts with such persons ensure that they have been properly trained and "have the necessary skills to safely and reliably repair products to OEM specifications and standards with OEM-quality parts."<sup>137</sup>

Individuals and independent repair shops, manufacturers assert, are unlikely to be aware of the dangers inherent in some repairs and may be injured as a result. For instance, GE Appliances explained that an untrained person attempting to repair a microwave oven could be injured because, "internal microwave oven capacitors can discharge current even when not

---

<sup>131</sup> Commissioner Wilson and Commissioner Phillips note that it is difficult to conduct a full weighing of the cost and benefits of repair restrictions without an analysis of the intellectual property rights of manufacturers.

<sup>132</sup> 17 U.S.C. § 117(c).

<sup>133</sup> 17 U.S.C. § 1201.

<sup>134</sup> 37 C.F.R. § 201.40 (2019). The Digital Millennium Copyright Act prohibits circumvention of technological measures that control access to copyrighted work, but provides the Librarian of Congress with the authority to create temporary exemptions to this prohibition. One commenter has noted, "While the 2018 exemptions are exciting news for the repair movement and provide individual consumers with greater freedom. . . a major downside is that these exemptions are temporary." Leah Chan Grinvald & Ofer Tur-Sinai, *Intellectual Property Law and the Right to Repair*, 88 Fordham L. Rev. 63, 105 (2019). Another limitation of the exemptions is that repair shops that circumvent digital locks could possibly be liable for violating the DMCA's anti-trafficking provisions if they use repair manuals provided by third parties online. *Id.* at 106.

<sup>135</sup> See *supra* at Section IV.E.

<sup>136</sup> If assertion of patent rights were to become a significant obstacle to independent repair, Congress could consider how to strike the appropriate balance between incentivizing innovation through patent law and ensuring competitive repair markets.

<sup>137</sup> Joint Comment, at 3.

energized because they retain a powerful charge for some time even after unplugged.”<sup>138</sup> The National Association of Manufacturers (“NAM”) similarly explained that many consumer electronic products “contain parts that may pose serious safety risks to the physical well-being of consumers when repaired by anyone but an authorized expert.”<sup>139</sup> The Computing Technology Industry Association (“CompTIA”) explained that the presence of high-energy lithium batteries in products compounds these safety risks because “[i]mproper alterations or handling of such high-risk components could potentially lead to serious injuries such as burns or blindness.”<sup>140</sup>

Manufacturers further assert that unauthorized repair presents a safety risk for a device’s user, not just its repairer. CompTIA stated that an improperly repaired device could harm a consumer long after the repair, noting that “an Internet-connected smoke detector, carbon monoxide detector, or fire alarm that has not been repaired properly could easily malfunction.”<sup>141</sup> PRBA described how an improperly repaired device could even injure numerous people in the vicinity of the device, quoting a report from the Australian Transport Safety Bureau about a 2011 incident involving a mobile phone that experienced a thermal runaway on an airplane:

*The report from the investigation included the following: “The technical examinations found that a small metal screw had been misplaced in the battery bay of the mobile telephone; the screw puncturing the battery casing and causing an internal short circuit leading to heating and thermal runaway. It was probable that the screw had been misplaced during an earlier repair carried out on the telephone. That repair had not been conducted by an authorized service provider. **This investigation highlights the risks associated with the use of non-authorized agents for the repair of lithium battery-powered devices....**”<sup>142</sup>*

The Association of Home Appliance Manufacturers also described additional safety concerns in connection with service technicians entering a person’s home.<sup>143</sup> For example, AHAM noted that property damage may result if services are not performed correctly, and that manufacturers “generally have processes and procedures in place that track repairs completed through their service networks.” AHAM also noted that “in addition to the numerous technical and safety certifications service technicians must hold, manufacturers require complete background checks and drug screening for all technicians working for affiliated servicers” and that this “provides a layer of security to customers as well as a layer of traceability for manufacturers.”<sup>144</sup> By contrast, AHAM stated that

---

<sup>138</sup> GE Appliances comment, at 2.

<sup>139</sup> NAM comment, at 3.

<sup>140</sup> CompTIA comment, at 4.

<sup>141</sup> *Id.*

<sup>142</sup> PRBA – The Rechargeable Battery Association empirical research (“PRBA empirical research”), at 3 (emphasis added by PRBA).

<sup>143</sup> Association of Home Appliance Manufacturers comment (“AHAM comment”), at 2.

<sup>144</sup> *Id.* at 12.

There is a risk with unaffiliated and untrained service technicians. Because they have not availed themselves of the available training, this type of service technician may not be familiar with the appliance at hand or the software manufacturers provide for service technicians to repair products correctly and safely. As a result, there could be greater risk of an improper diagnosis, use of incorrect or substandard parts or even, unknowingly, counterfeit parts. The repercussions not only jeopardize the life of the product but may also leave the consumer worse off than before either with a new malfunction or a product rendered unsafe due to a repair conducted improperly or with the wrong parts. For example, a product could experience a major malfunction following the attempted repair causing fire, flooding or other potential hazards (and property damage).

Safety considerations are a critical part of any discussion about repairs. Concerns about the safety of users, repair personnel and the public, however, should not automatically justify restricting repairs to authorized repair networks without further analysis.<sup>145</sup> Upon closer review, some of the safety considerations cited give pause. First, other than citing to the mobile phone thermal runaway occurring in Australia in 2011,<sup>146</sup> manufacturers provided no data to support their argument that injuries are tied to repairs performed by consumers or independent repair shops. This is so despite the fact that the Call for Empirical Research specifically asked for data concerning “[t]he risks posed by repairs made by consumers or independent repair shops”<sup>147</sup> and several manufacturers and their associations submitted comments and were provided the opportunity to participate in the Workshop. Nor have manufacturers provided factual support for their statements that authorized repair persons are more careful or that individuals or independent repair shops fail to take appropriate safety precautions, or that independent repair workers who enter homes pose more of a safety risk to consumers than authorized repair workers.<sup>148</sup>

---

<sup>145</sup> By not making parts and manuals available to individuals and independent repair shops, and not including information in these manuals about the dangers of particular repairs, manufacturers may be exacerbating the very safety concerns they have raised.

<sup>146</sup> Mobile phones that catch on fire on airplanes are a serious safety concern. But, the record at hand does not support the proposition that phones repaired by individuals or independent repair shops are more likely to result in thermal runaway events than phones repaired by manufacturers. In fact, new phones have been known to have unsafe designs that result in spontaneous thermal runaway events. Samsung Recalls Galaxy Note 7 Amid Explosion Worries, <https://www.forbes.com/sites/ianmorris/2016/09/01/samsung-galaxy-note-7-recall-exploding/?sh=2003b75a152f>. In 2016, the FAA advised consumers to refrain from turning on or charging Samsung Galaxy 7 devices or to stow them in checked baggage. *See* Federal Aviation Administration, FAA Statement on Samsung Galaxy Note 7 Devices (last modified Sept. 8, 2016), <https://www.faa.gov/news/updates/?newsId=86424>.

<sup>147</sup> Call for Empirical Research, <https://www.ftc.gov/nixing-the-fix-call-for-research>.

<sup>148</sup> In the context of medical devices, where the potential risks of improperly repaired machinery are especially acute, IAMERS stated that “there is no significant safety problem related to servicing maintenance and repair by independent services,” noting that a 2018 FDA report “evaluated medical device reports [“MDRs”] pertaining to events allegedly involving third party servicing. Significantly, of the 4,301 MDRs identified (as discussed by the FDA) only three contained sufficient information to conclude that servicing caused or contributed to death. Moreover, the FDA noted that it was unable to establish a conclusive relationship between device third party entity servicing and the subsequent adverse event.” IAMERS comment at 2. We note that the FDA concluded that they “believe the currently available objective evidence is not sufficient to conclude whether or not there is a widespread

Second, according to Vermont State Senator Pearson, manufacturers' safety arguments are difficult to square with the experience of repair in the automotive sector:

The security and safety issues we heard earlier today were similar to what we heard during the [Vermont legislative] task force. And to me, the arguments are largely bogus, and they fall apart. When we think about motor vehicles, I think we would all agree an automobile is one of the more dangerous products that we own and we control. To say that consumers should not be permitted to take electronics to a repair shop is basically insisting that our cars have to be repaired at the dealer.

We've rejected this argument as a society, and this has to do with a ton of steel that we're hurtling down the road, you know. We'd be wise to do the same when it comes to lightweight electronics, heavy washing machines, everything in between.<sup>149</sup>

Gay Gordon-Byrne of the Repair Association also noted that, "taking an alternator out of a car and putting it up on a hoist and dropping it on my foot is pretty dangerous" compared to opening up the back of a computer and putting in a new motherboard or replacing a screen.<sup>150</sup> The automotive sector demonstrates that consumers and independent repair shops are able to repair cars every day even though cars are a diverse group of complex machines that contain gasoline and battery acid and have hundreds of moving parts. With appropriate parts, repair information, and training, consumers and independent repair shops would similarly be capable of safely repairing other products.

Third, manufacturers can choose to make products safer to repair when considering a product's design.<sup>151</sup> For instance, making lithium ion cellular pouches easily replaceable would decrease the likelihood of puncture during replacement and thus thermal runaways. As Theresa McDonough explained:

[T]his is an issue that companies have created themselves. If you don't want us being injured by repairing the battery, which is going to go, then why glue them in? Why not have them easily removable like they used to be?<sup>152</sup>

---

public health concern related to servicing of medical devices, including by third party servicers, that would justify imposing additional/different burdensome regulatory requirements at this time." FDA Report on the Quality, Safety and Effectiveness of Servicing Medical Devices, at 23 (2018), <https://www.fda.gov/media/113431/download> (last visited Mar. 18, 2021).

<sup>149</sup> Transcript, at 156-57.

<sup>150</sup> *Id.* at 146.

<sup>151</sup> *Id.* at 28.

<sup>152</sup> *Id.* at 23-24.

Similarly, by refusing to supply replacement parts outside of their authorized repair networks, right to repair advocates assert that manufacturers increase the dangers associated with independent repair. According to Gordon-Byrne, consumers often want original parts but cannot get them and therefore turn to substitutes where the quality is variable.<sup>153</sup> Furthermore, manufacturers could control the risks associated with repairs by including warnings in their repair manuals about ways to mitigate the dangers of particular repairs and making the manuals available to individuals and independent repair shops.

The failure to label 18650 cells serves as a prime example of a manufacturer practice that increases the safety risks of independent repair. As noted in Section IV.C., all 18650 cells have the same dimensions, but they can have different chemistries. Replacing one 18650 with another cell of the same size but different chemistry could result in a thermal runaway event. This risk could be significantly reduced if the chemistry of an 18650 appeared on its label and manufacturers identified the particular 18650 chemistries used in their devices.<sup>154</sup> Indeed, such disclosure would impose an arguably minimal burden on manufacturers and would likely serve a valuable purpose.

### C. Cybersecurity

Manufacturers also assert that repair restrictions protect consumers from cybersecurity risks. Microsoft explained that consumers face significant risks when they provide a device containing sensitive personal information to an independent repair shop because the device may contain a user's pictures, sensitive documents, financial records, emails, passwords, and personal contacts.<sup>155</sup> Similarly, CompTIA explained that many manufacturers' remote diagnostic tools provide access to the entire device, including software, data, and other files. Providing diagnostic access to individuals or independent repair shops, according to CompTIA, may enable a repairer to identify consumer specific information such as how often a device is used, when the device is used, IP addresses, and other information, which could then be commingled with personally identifiable information.<sup>156</sup>

Furthermore, Microsoft noted that individuals and independent repair shops that conduct repairs could compromise the embedded hardware security technology that manufacturers use to protect user data and ensure that device integrity is maintained during boot up.<sup>157</sup> NAM explained that individuals and independent repair shops can introduce new security risks by inadvertently disabling key hardware security features or preventing firmware or software from accepting or installing updates.<sup>158</sup> AHAM similarly noted that "[s]ervicing a "smart" appliance may require accessing the appliance's electronic hardware circuitry, including chip-sets, firmware, security key pairings and/or proprietary technical configurations.... Tampering, whether intentional or unintentional, in this area can result in leaving the appliance vulnerable to

---

<sup>153</sup> *Id.* at 105-06.

<sup>154</sup> According to PRBA, there are currently six different chemistries used in 18650 cells. Transcript, at 85-86.

<sup>155</sup> Microsoft comment, at 9.

<sup>156</sup> CompTIA comment, at 5.

<sup>157</sup> Microsoft comment, at 8-9.

<sup>158</sup> NAM comment, at 3.

hacking and the downloading of malware.”<sup>159</sup> CompTIA stated that for connected devices, the harms resulting from insecure repairs can injure third parties. They noted that “[w]ith more than 20 billion connected products by 2020, including appliances, thermostats, fire alarms, automobiles, etc.,” the insecure repair of a device can place numerous other connected devices and the data they hold at risk because “[w]ith access to technical information, criminals could more easily circumvent security protections, harming not only the product owner but also everyone who shares their network.”<sup>160</sup>

Authorized repair professionals, according to the manufacturers, conduct repairs without compromising the privacy of device users or introducing security risks. AHAM explained that certified service technicians train to understand appliances’ functionality, perform repairs that do not introduce vulnerabilities, and are contractually accountable for their work.<sup>161</sup> The Consumer Technology Association (“CTA”) posited that prohibiting individuals and independent repair shops from fixing products is in keeping with the FTC’s guidance regarding manufacturers’ responsibility for product security over its lifetime, because the FTC’s 2015 Internet of Things staff report and its Start with Security guidance recommend that companies retain service providers that are capable of maintaining reasonable security, engage in reasonable oversight of these service providers, and monitor products throughout their life cycle.<sup>162</sup> As CTA’s Walter Alcorn put it, “if manufacturers are required to provide all the software and the ability to repair, to change products, well, that pretty much goes out the window.”<sup>163</sup> Security consultant Earl Crane similarly remarked at the Workshop that “mandating design decisions runs in direct contradiction of policies that focus on manufacturer accountability.”<sup>164</sup>

The record contains no empirical evidence to suggest that independent repair shops are more or less likely than authorized repair shops to compromise or misuse customer data. Furthermore, although access to certain embedded software could introduce new security risks, repair advocates note that they only seek diagnostics and firmware patches.<sup>165</sup> Furthermore, according to Gay Gordon-Byrne, replacing a part on a device with an identical OEM part or functionally equivalent aftermarket part is unlikely to create a cybersecurity risk.<sup>166</sup>

Providing individuals and independent repair shops with the diagnostic software to fix devices and with firmware patches is fully consistent with Commission staff’s 2015 Internet of Things report and its subsequent Start with Security guidance. Manufacturers can provide others with access to the same parts and tools that they provide to their authorized service providers. And, by providing such access to individuals and independent repair shops, manufacturers would have greater confidence in the repair activities that occur outside of their authorized networks. As noted above in connection with safety concerns, with appropriate parts and repair

---

<sup>159</sup> AHAM comment, at 13.

<sup>160</sup> CompTIA comment, at 6.

<sup>161</sup> AHAM comment, at 13.

<sup>162</sup> Consumer Technology Association comment (“CTA comment”), at 3-4.

<sup>163</sup> Transcript, at 44.

<sup>164</sup> *Id.* at 91.

<sup>165</sup> *Id.* at 66.

<sup>166</sup> *See, e.g.*, Transcript at 118 (swapping out a memory card that is the same brand as the original memory card does not create a cybersecurity risk).



information, the record supports arguments that consumers and independent repair shops would be equally capable of minimizing cybersecurity risks, as are authorized repairers.

#### **D. Liability and Reputational Harm**

Many OEMs have argued that manufacturers will face liability or reputational harm if independent repair shops make faulty repairs, and such a burden is an unfair consequence of lifting repair restrictions. For example, CTA stated that OEMs suffer “reputational risk and the expense of defending lawsuits that result from improperly repaired devices or use of defective aftermarket parts.”<sup>167</sup> Similarly, in the joint comment submitted by several organizations representing manufacturers, OEMs stated that while affiliated repair networks serve to protect brand investment, “[i]nitial press coverage of failures of consumer devices seldom, if ever, attempts to determine whether the device had been repaired by an independent service provider or refurbished with parts that did not meet OEM standards. Follow-up coverage may ultimately identify inferior third-party repairs and parts as the culprit, but this is likely to do little to overcome the initial impression made on consumers.”<sup>168</sup> Similarly, CompTIA stated in its comment:

If an OEM’s brand and warranty are to stand behind repair work and assume product liability, it is only reasonable that the repair facility demonstrates competency and reliability. Without the training and other quality assurance requirements of affiliated service provider networks—implemented through enforceable legal contracts that ensure compliance and accountability that protect consumers—manufacturers would not be able to stand behind their work, warranties, technical support, ongoing training, and business support.<sup>169</sup>

CompTIA also raised a concern that manufacturers may not be willing to design products in particular ways due to liability considerations if “insecure repair mandates” were put in place.<sup>170</sup> For example, CompTIA stated that “a manufacturer may be required to revisit [new, innovative, and lightweight designs, which enable recent mobile uses such as secure payment, navigation, and video conferencing] because of long-term repair or liability considerations.”<sup>171</sup>

In addition, AHAM noted in its comment that affiliated third party or local servicers undergo substantial product training and certification and that the certification is, in part, to uphold brand reputation.<sup>172</sup> AHAM also stated that a benefit of authorized repair in contrast to independent repair is that manufacturers have procedures in place to track repairs completed through their networks. This in turn helps ensure that “liability claims and determinations can be more easily assessed, especially in cases where the source of the repairs cannot be readily

---

<sup>167</sup> CTA comment, at 5.

<sup>168</sup> Joint Comment, at 4-5.

<sup>169</sup> CompTIA comment, at 8.

<sup>170</sup> *Id.* at 9.

<sup>171</sup> *Id.* at 9.

<sup>172</sup> AHAM comment, at 10-11.

identified. Moreover, manufacturers will have [a] record of the repairs, which can assist in insurance claims and / or criminal investigations.”<sup>173</sup>

By contrast, Workshop panelist Kyle Wiens stated that manufacturers are creating liability for themselves by withholding information from third parties on how to fix products.<sup>174</sup> In addition, AOCA argued that manufacturers simply use aftermarket parts and service providers as scapegoats for issues that arise with OEM-branded parts and service. For example, AOCA asserted that automakers engage in this type of restriction when they issue:

a Technical Service Bulletin (TSB) directing its authorized dealers to treat certain aftermarket parts as the *de facto* cause of problem engine symptoms that can be caused by a variety of factors including engine defects. The dealers forgo technical analysis and instead repeat the maintenance process for which the aftermarket part was employed—this time using the automaker’s recommended brand part. The automaker and dealer have not proven the particular aftermarket part caused the problem engine symptom as required by MMWA, yet the consumer gets charged for the mandatory maintenance including when it doesn’t solve the problem engine symptom.<sup>175</sup>

Other than these assertions of liability exposure and reputational harm, the record is sparse. In the Request for Empirical Research, staff requested data and research about “[t]he liability faced by manufacturers when consumers or independent repair workers are injured while repairing a product.”<sup>176</sup> Staff also sought data on “[t]he liability faced by manufacturers when consumers are injured after using or coming into contact with a product that has been repaired improperly by a consumer or independent repair shop.”<sup>177</sup> Staff additionally requested this data in individual meetings with manufacturers and trade associations. Manufacturers provided no empirical evidence to support their concerns about reputational harm or potential liability resulting from faulty third party repairs.

### **E. Design Choices and Consumer Demand Drive the Repairability of the Devices**

OEMs and the industry trade groups representing them argue that consumer demand and design decisions to service that demand, as well as consumer safety, are the drivers behind various physical repair restrictions. For instance, in its comment, CTA stated that:

OEMs [] invest in improvements to their product designs in response to consumer preferences. Such improvements may, however, involve trade-offs. For example, customer preferences for a lighter device may require the use of materials that are not as durable, or

---

<sup>173</sup> *Id.* at 12.

<sup>174</sup> Transcript, at 197 (referring to the release of forklift repair manuals to limit legal liability).

<sup>175</sup> AOCA empirical research, at 3.

<sup>176</sup> Call for Empirical Research, <https://www.ftc.gov/nixing-the-fix-call-for-research>.

<sup>177</sup> *Id.*

the desire for a smaller product profile may dictate that a component be glued rather than mechanically fastened with a space-eating bracket. These design choices may impact the ease or difficulty with which a device, or a component thereof, can be repaired or replaced; a challenge faced by all repair providers, whether affiliated with an OEM or not.<sup>178</sup>

When asked during the Workshop whether methods that some call repair restrictions, like the use of epoxy to glue parts together, are actually just design decisions that are necessary in order to meet consumer demand, Alcorn of CTA said that there was a lot of concern among OEMs about “the wrong battery being put in upon replacement, which creates safety problems. Thermal events, I think as some people call them. But then the other issue, which is a significant issue, is consumer demand.... consumer demand is something that these manufacturers spend an awful lot of time and money trying to figure out and they compete fiercely for that.”<sup>179</sup>

Microsoft made a similar argument, saying that consumer demand and “market requirements” may have an incidental effect on the ease of device repairability.<sup>180</sup> However, these “design features,” it argued, must be considered in the full context of why they were implemented, and not just as “‘repair restrictions’ in isolation.”<sup>181</sup> Microsoft cited its choice to use adhesive to secure batteries and design display panels as an example of one such “design feature.” It asserted that the use of adhesive, over screws, makes for a sounder, more durable and damage resistant device that can better survive “inadvertent drops or mishandling,” while “also meet[ing] consumer demand for a high-quality, tactile, and ‘solid’ product feel by preventing internal components from rattling with the casing.”<sup>182</sup>

Right to repair advocates argue that consumers care about repairability, in addition to aesthetic design, but do not have the necessary information at the point of sale to purchase products that are repairable. McDonough stated at the Workshop, “I can confidently say that all of my customers have no idea whether or not their devices are repairable. So many times I’ve heard, ‘had I known I couldn’t fix it I would not have purchased it.’”<sup>183</sup> Nathan Proctor also stated in his remarks that “I think the problem is the point of sale, is just—consumers don’t have enough information ... people are trying to crowdsource that information, but that’s a problem now .... You can’t say the consumers don’t want it because I hear those complaints all the time.”<sup>184</sup>

The arguments made in submissions to the docket and at the Workshop on this point, by manufacturers and right to repair advocates alike, were almost entirely anecdotal in nature. Researchers, however, have studied this issue. First, a 2018 paper examining “whether repairability and functional durability affects reuse [of smartphones] via secondary markets,”

---

<sup>178</sup> CTA comment, at 5-6

<sup>179</sup> Transcript, at 60-61.

<sup>180</sup> Microsoft comment, at 1.

<sup>181</sup> *Id.* at 1.

<sup>182</sup> *Id.* at 5-6.

<sup>183</sup> Transcript, at 25.

<sup>184</sup> *Id.* at 59.

stated that “despite consumers’ proclaimed interest in repairability, evidence suggests that they might be content with product lifespans, and not genuinely interested in fixing their devices.”<sup>185</sup> Citing to “the limited market success of ... phones that are specifically optimized to allow unlimited repair and upgrades,” the authors state that “it remains unclear whether consumers truly value the ability to repair and upgrade devices.”<sup>186</sup> However, the study’s authors also noted:

[A]lthough repairability scores varied among the different phone models examined... it is possible that consumers were unaware of the fact that some phones are easier to repair than others. Since repairability scores are not commonly advertised, it remains unclear whether given sufficient information regarding product repairability and functional durability in general, economic lifespan of more functionally durable models would increase. Future work should examine the effect of making repairability information more salient to consumers.<sup>187</sup>

A second study, from the 2017 Product Lifetimes and the Environment (“PLATE”) conference found that the appearance of electronic goods was only “moderately” important to consumers,<sup>188</sup> as opposed to longevity and reliability, which were “extremely” important.<sup>189</sup> Another paper out of the 2017 PLATE conference, authored by employees of environmental ministries or attached agencies in Austria, Belgium, France, Germany, and Italy, looked at the planned obsolescence of products and concluded that “[m]anufacturers and consumers interact with one another and influence product development and consumption patterns. The lack of information concerning durable and repairable products causes an asymmetry in the market balance and leaves consumers unable to make the best buying decisions regarding to their own needs.”<sup>190</sup>

Apple’s experience with its battery replacement program also suggests that, given a choice between a low-cost repair and buying a new mobile phone, many consumers will opt for

---

<sup>185</sup> Tamar Makov et al. *What Affects the Second-Hand Value of Smartphones: Evidence from eBay*, at 4 (June 2018) (internal citations omitted), <https://onlinelibrary.wiley.com/doi/abs/10.1111/jiec.12806> (examining listings on eBay during two ten-day periods in 2015-2016 for Samsung and Apple mobile devices and finding that repairability of device did not affect depreciation of device’s value).

<sup>186</sup> *Id.*

<sup>187</sup> *Id.* at 15.

<sup>188</sup> The consumers in this study were from the United Kingdom.

<sup>189</sup> A. Gnanapragasm et al., 2017, Consumer perspectives on product lifetimes: a national study of lifetime satisfaction and purchasing factors. IN: Bakker, C.A. and Mugge, R. (eds.) PLATE: Product lifetimes and the environment: Conference Proceedings of PLATE 2017, 8-10 November 2017, Delft, the Netherlands. Amsterdam: IOS Press, pp. 144-148, at 146. Notably, this point was echoed by Microsoft in its comment: “Our customers demand mobile products that are thin and light, durable and long lasting, and have the maximum possible usage times.” Microsoft comment, at 5.

<sup>190</sup> E. Ober et al., Planned obsolescence: the government’s choice?, PLATE: Product lifetimes and the environment: Conference Proceedings of PLATE 2017, 8-10 Nov. 2017, Delft, the Netherlands, Amsterdam: IOS Press, pp. 315-318, at 318 (2017). While this report does not reach planned obsolescence, the paper by Ober et al. nonetheless contained relevant information and insights into the issues that are addressed by this report.

the low cost repair. In early 2018, after Apple was found to be slowing down certain models of iPhones in order to compensate for degrading batteries, the company reduced the price of out-of-warranty battery replacements for iPhone 6 and later models. Under the program, Apple reduced the price for a battery replacement from \$79 to \$29.<sup>191</sup> Subsequently, in a January 2, 2019 letter to investors, Apple’s CEO explained that iPhone sales were lower than anticipated due to, among other things, “some customers taking advantage of significantly reduced pricing for iPhone battery replacements.”<sup>192</sup>

Whether consumers are willing to trade repairability of devices for other design features is a question that remains open.<sup>193</sup> Further research is required to understand the tradeoffs consumers are willing to make when fully informed about repairability.<sup>194</sup>

## F. Quality of Service

Manufacturers argue that authorized repair facilities provide superior service compared to the service provided by independent repair facilities. Most of the support for this argument is anecdotal and relates to concerns about independent repair facilities that do not meet safety standards and do not conduct repairs properly.<sup>195</sup> For example, in a joint comment, several associations representing OEMs stated:

Customers can be sure that a manufacturer’s repair network will conduct repairs using properly trained and vetted professionals that have the necessary skills to safely and reliably repair products to OEM specifications and standards with OEM-quality parts.... Without contracts, consumers that do not choose manufacturer-affiliated repair services are exposed to the potential for unsafe or unreliable repair that could lead to frustrating, or even dangerous, results.... And where in-home repairs are concerned, OEMs require, by contract, that repairs be conducted by properly trained

---

<sup>191</sup> *A Message to Our Customers about iPhone Batteries and Performance*, Apple, (Dec. 28, 2017), <https://web.archive.org/web/20180208010741/https://www.apple.com/iphone-battery-and-performance/>.

<sup>192</sup> *Letter from Tim Cook to Apple investors*, Apple, (Jan. 2, 2019), <https://www.apple.com/newsroom/2019/01/letter-from-tim-cook-to-apple-investors/>. Apple reportedly anticipated replacing 1-2 million iPhone batteries under its battery replacement program, but ended up replacing over 11 million batteries. Killian Bell, *Apple wildly underestimates demand for cheap iPhone batteries*, Cult of Mac, (Jan. 15, 2019), <https://www.cultofmac.com/600738/apple-wildly-underestimates-demand-iphone-battery-replacements/>.

<sup>193</sup> It is also possible that this is a false choice. For instance, even if the use of adhesives rather than screws makes a product more aesthetically pleasing, a manufacturer could provide instructions and supplies for dissolving the glue to individuals and independent repair shops.

<sup>194</sup> The impact of repairability scores will soon be tested in France, where a new law requires manufacturers of certain consumer products to label the products with such a score. Repairability Index, Ministère De La Transition Écologique, (Feb. 10, 2020), <https://www.ecologie.gouv.fr/indice-reparabilite>; Law No. 2020-105 Regarding a Circular Economy and the Fight Against Waste (Feb. 10, 2020).

<sup>195</sup> When asked at the Workshop if the CTA has studied whether authorized repair providers perform higher quality or more secure repairs compared to independent repair providers, Walter Alcorn said he was not aware that anyone has studied that question. Transcript, at 53-54.

individuals who have been subject to appropriate background checks.<sup>196</sup>

In a separate comment, CompTIA stated that:

Affiliated repair networks guarantee that repairs meet OEM standards. Repair personnel must undergo rigorous training, resulting in a professional who is technically proficient and repairs that meet strict quality control measures.<sup>197</sup>

In addition, Sarah Faye Pierce from AHAM stated that unauthorized repair personnel may be untrained and uncertified and thus “may not understand how to properly repair the product to ensure it continues to meet or exceed the safety standards, particularly, a connected product, which then raises cybersecurity issues. All of this puts consumers in jeopardy. A product that once was safe could be rendered unsafe by an improper repair or unintentional use of a counterfeit part.”<sup>198</sup>

Similarly, Microsoft stated in its comment that when repairing devices, Microsoft or its authorized repair providers, “use replacement batteries that meet Microsoft specifications to avoid problems caused by subpar or counterfeit replacement batteries, they meet strict quality and safety standards to ensure proper repair, and they follow specific repair procedures to avoid creating potential safety risks caused by damaged batteries or improperly installed batteries.”<sup>199</sup> Microsoft, without citing specific examples or numbers, stated that it frequently received devices returned due to failures caused by third-party repairs.<sup>200</sup> Microsoft also noted that off-specification power supply units, which do not meet Microsoft’s quality standards, caused at least 12 “serious overheating incidents” resulting in device damage.<sup>201</sup>

Two submitters provided information they stated showed the superior service provided by authorized repairers. First, the PRBA cited the 2011 incident mentioned above, in which a loose screw inside a phone damaged the phone’s battery, which resulted in a thermal runaway.<sup>202</sup> The Australian Transport Safety Bureau issued a report following the incident and noted that the screw was probably misplaced when the phone was previously repaired, and that the repair was not conducted by an authorized service provider.<sup>203</sup>

Second, a 2019 survey of equipment dealers conducted by the Equipment Dealers Association (“EDA”) and Association of Equipment Manufacturers (“AEM”) showed that of responding dealers who had modified equipment come into their dealership for service in the prior 24 months, 45% reported that the modifications included those “which removed, impaired

---

<sup>196</sup> Joint comment, at 3-4.

<sup>197</sup> CompTIA comment, at 7.

<sup>198</sup> Transcript, at 163. AHAM, in its comment, echoes the statements made by Pierce. AHAM comment, at 1-3.

<sup>199</sup> Microsoft comment at, 6-7

<sup>200</sup> *Id.* at 7.

<sup>201</sup> *Id.*

<sup>202</sup> PRBA empirical research, at 3.

<sup>203</sup> *Id.*

or disabled Federally-required emissions control equipment,” 54% reported that the modifications included those which removed, impaired or disabled OEM safety features, and 62% reported that the modifications included those which “could reduce reliability, durability or resale value of the equipment.”<sup>204</sup> This study, however, is inapposite because it concerns modifications to equipment as opposed to repairs.<sup>205</sup>

By contrast, advocates for the right to repair submitted evidence that consumers are generally satisfied with repairs made by independent repair shops. For example, Consumer Reports cited survey results indicating that “consumers who used independent repair shops were more satisfied with the repairs than those who used factory service.”<sup>206</sup> The Auto Care Association noted in its submission that 70-75% of consumers use independent repair shops due mostly to trust, convenience, and price.<sup>207</sup>

In addition, repair providers and advocates question the value of OEM repairer certifications. For example, Workshop panelist Jennifer Larsen stated that although her business’s technicians are not certified by any one OEM, they “go to training like certified technicians.” She also noted that “any good business owner who wants to keep their brand and reputation is going to make sure they have technicians that can repair appropriately.”<sup>208</sup>

These concerns generally mirror those discussed above in connection with safety and cybersecurity risks. The record does not establish that repairs conducted by independent repair shops would be inferior to those conducted by authorized repair shops if independent repair shops were provided with greater access to service manuals, diagnostic software and tools, and replacement parts as appropriate.

## **VI. RIGHT TO REPAIR ADVOCATES’ ARGUMENTS AGAINST REPAIR RESTRICTIONS**

Consumer advocates offer many reasons why they believe repair restrictions should be curtailed. They argue that repair restrictions prevent timely repairs, raise the prices consumers must pay for repairs, result in harm to the environment, and threaten small and local businesses. This section addresses these arguments and provides an evaluation of each one.

---

<sup>204</sup> Equipment Dealers Association & Association of Equipment Manufacturers empirical research (“EDA & AEM empirical research”).

<sup>205</sup> Conversations with representations with EDA and AEM confirm the limitations of the study. The representatives indicated that their members are concerned that individuals purposefully make such modifications, not to repair the products, but to intentionally alter the safety and emission standards for purposes unrelated to repair.

<sup>206</sup> Consumer Reports empirical research, at 2 (citing *Should you Repair or Replace that product?*, (January 2014), <https://www.consumerreports.org/cro/magazine/2014/02/repair-or-replace/index.htm>).

<sup>207</sup> Auto Care Association comment, at 1. Aaron Lowe from the Auto Care Association was a panelist at the Workshop and reiterated that approximately 70% of car owners use independent repair shops after a car’s warranty expires. Transcript, at 157.

<sup>208</sup> Transcript, at 55-56. Workshop panelist McDonough stated that although she is not certified by an OEM, she thinks she knows most of what she would learn from an OEM training because she does the work every day. Transcript, at 54-55.

## A. Timing of Repairs

Multiple Workshop panelists argued that allowing or providing for repair only through authorized repair networks or through the manufacturer can lead to repair taking too long to actually be a feasible option for consumers. Vermont State Senator Pearson, for example, stated that when his iPhone's camera broke, "according to Apple, nobody in Vermont could fix it. They wanted me to send it to them."<sup>209</sup> However, because he also runs a consulting business from his phone, mailing it away for repair would have had the effect of closing his business for a week and so "[i]t was a non-starter."<sup>210</sup>

The Commission also received comments and empirical research lamenting protracted repairs for military equipment<sup>211</sup> and tractors.<sup>212</sup> For example, a comment submitted by Major Lucas Kunce and Captain Elle Ekman, two active duty Marine Officers commenting in their personal capacity, stated that, "Marines are less capable of repairing equipment in extreme circumstances because [the contracts between the manufacturer and military do not allow them] to repair the equipment during regular operations and do not have the tooling, diagnostic equipment or diagrams, or hands-on experience."<sup>213</sup> Using Medium Tactical Vehicle Replacements as an example, Major Kunce and Captain Eckman stated that, "the restrictions [on who can repair the vehicles] mean limiting the capability, flexibility, and experience of Marines who will be needed to conduct these repairs if they are ever in a hostile, kinetic arms, or D-Day-like situation."<sup>214</sup> They explained that "[t]his warranty and repair contract was similar in many ways to those in the civilian or commercial world."<sup>215</sup> In addition, during the 2016 right to repair hearing held by the Nebraska legislature's Committee on Judiciary, Kenny Roelofsen, a representative of an agricultural replacement company, testified that "if [a tractor is] down for one or two days during planting season or during harvest season, they're wasting money... if the only person who can repair that equipment is the OEM, then if they have a tech that's already out. They don't have another tech to get out there and essentially plug in a USB port and fix their tractor, then they're out. So they're essentially tying up all the market into a monopoly to themselves, not allowing competition which drives prices up."<sup>216</sup>

The record contains scant rebuttal from manufacturers to the argument that a more open repair ecosystem would allow consumers to have their goods repaired more quickly or repair them in a timely manner themselves.

---

<sup>209</sup> Transcript, at 154.

<sup>210</sup> *Id.*

<sup>211</sup> See Major Lucas Kunce and Captain Elle Ekman comment ("Major Kunce & Captain Ekman comment").

<sup>212</sup> Certain models of tractors would be subject to the MMWA's anti-tying provision in those instances when they are normally used for personal, family, or household purposes. 15 U.S.C. 2301(1).

<sup>213</sup> Major Kunce & Captain Ekman comment, at 6.

<sup>214</sup> *Id.* at 7.

<sup>215</sup> *Id.*

<sup>216</sup> Nebraska Transcript, at 18-19.



## B. Price of Repairs

Right to repair advocates argue that repair restrictions increase the cost of repair.<sup>217</sup> Several commenters argued that if independent repairers were given access to OEM manuals, tools, and replacement parts, repair costs would be lower due to more competition in the repair market. For example, the International Association of Medical Equipment Remarketers and Services, Inc., (“IAMERS”) noted that “some independent servicers maintain diagnostic imaging equipment for \$150-\$250 per hour. When compared to manufacturer servicing at rates reportedly ranging from \$500-\$600 per hour (with a four hour minimum), independent servicing may offer a cost-effective alternative to hospitals and healthcare organizations in need of reducing costs.”<sup>218</sup> According to right to repair advocates, however, many independent repair shops do not have access to replacement parts, diagnostics, and other resources that would enable them to complete the repairs in a cost-effective manner.<sup>219</sup>

For example, right to repair advocates maintain that where non-manufacturer replacement parts do not exist or their use is not feasible (i.e., because the product will no longer function if a non-OEM part is used), manufacturers have effective monopolies on the repair of their product, allowing for repair costs to be more expensive than they could or should be. ABPA argued in its comment that “car companies are trying to create a product monopoly by leveraging new technological advantages gained through telematics from the cars and software partnerships with large industry players to eliminate parts competition. The result is higher parts pricing – leading to increase in repair costs....”<sup>220</sup> LKQ Corp. similarly pointed to the use of technology in cars to stop independent repair shops from using salvaged parts in the repair process: “With increasing frequency, vehicle manufacturers embed software restricting the reuse, repair and remanufacturing of an electronic control module or computer. This limits repair options to new OEM replacement parts only.”<sup>221</sup> Within the aftermarket industry, dealer prices for OEM parts are almost always the highest. Alternative parts, including remanufactured or salvage control modules, sell at a fraction of dealer prices.”<sup>222</sup> Ultimately, none of the comments or empirical research submitted before or after the Workshop rebuts the right to repair advocates’ argument that repair restrictions increase the price consumers pay for repairs.<sup>223</sup>

---

<sup>217</sup> See, e.g., Rob Beschizza, *Fix a laptop screen? That’ll cost more than a new laptop*, (Sept. 15, 2020 8:30 AM), <https://boingboing.net/2020/09/15/fix-a-laptop-screen-thatll.html>.

<sup>218</sup> IMAERS empirical research, at 1-2.

<sup>219</sup> Where non-manufacturer parts are available, competition can reign in cost, as historically exemplified by the auto industry. For example, the ABPA stated in its empirical research submission that “[f]or more than 60 years, the alternative collision parts industry has been offering quality alternative parts to consumers, typically 15-50% less expensive than car company non patented repair parts.” ABPA empirical research, at 2. Citing an APICIA Micra Report, ABPA notes that competition in parts had reduced the cost of auto OEM parts by approximately 8%. ABPA Presentation; IAMERS empirical research, at 2-3; Auto Care Association comment, at 3.

<sup>220</sup> ABPA empirical research, at 1.

<sup>221</sup> LKQ empirical research, at 4.

<sup>222</sup> *Id.*, at 5.

<sup>223</sup> We note that the higher cost of repairs disproportionately burdens Americans in financial distress. According to the Federal Reserve, only 48 percent of adults with a family income of less than \$40,000 reported that they could cover a \$400 emergency expense completely using cash or its equivalent. *Update on the Economic Well-Being of U.S. Households: July 2020 Results*, <https://www.federalreserve.gov/publications/2020-update-economic-well-being-of-us-households-overall-financial-security.htm> (last visited Mar. 8, 2021). The Federal Reserve’s data also

### C. Environmental Harm

Right to repair advocates argue that manufacturers' repair restrictions contribute to environmental and electronic waste. Manufacturers dispute this assertion.

Right to repair advocates argue that such restrictions are contributing to the amount of e-waste, which the U.S. Environmental Protection Agency ("EPA") considers to include the subset of discarded, donated, or recycled electronics that end up in a landfill or an unprotected dump site in the US or abroad.<sup>224</sup> For example, according to LKQ Corp., and as described above, automobile manufacturers engage in VIN burning, which contributes to electronic waste because parts cannot be reused.<sup>225</sup> By contrast, LKQ Corp. alleged that remanufactured parts save up to 85% of material and energy costs relative to producing a comparable new product.<sup>226</sup> Workshop panelists Theresa McDonough, Jennifer Larson, and Nathan Proctor similarly stated that repair restrictions contribute to e-waste.<sup>227</sup> Proctor stated that Americans dispose of 416,000 cell phones each day.<sup>228</sup>

Alcorn of the CTA, however, disputed that statistic, arguing it was more than 15 years old, and stated that the CTA conducts consumer recycling and reuse surveys every couple of years in part to find out what consumers do with their old devices. According to the CTA, the "vast majority of consumers that removed a mobile device from their household in the year leading up to the study did so by trading it in for a new device, donating it, or recycling it."<sup>229</sup>

Like the CTA, several organizations representing manufacturers stated that manufacturer repair restrictions do not contribute to e-waste because manufacturers have implemented protocols and procedures to reduce e-waste. Specifically, CompTIA, citing a Rochester Institute of Technology study and a 2016 EPA report, stated that e-waste is in a period of steep decline because manufacturers have developed robust policies and programs to ensure that they are continuously improving the sustainability of their products for their whole lifecycle.<sup>230</sup> And CompTIA stated that existing policies around e-waste and "green procurement" promote repair

---

shows that race and ethnicity are correlated with the way consumers are able to cover a \$400 emergency repair, with 47 percent of Black adults and 55 percent of Hispanic adults able to cover such a cost with cash or its equivalent compared with 77 percent of White adults. *Id.*

<sup>224</sup> See *Cleaning up Electronic Waste (E-Waste)*, U.S. EPA, <https://www.epa.gov/international-cooperation/cleaning-electronic-waste-e-waste> ("EPA considers e-waste to be a subset of used electronics and recognizes the inherent value of these materials that can be reused, refurbished or recycled to minimize the actual waste that might end up in a landfill or improperly disposed in an unprotected dump site either in the US or abroad.") (last visited Mar. 22, 2021); according to U.S. PIRG, "The average family generates 176 pounds of electronic waste each year, and the United States generates some 6.9 million tons nationally." Alex DeBellis and Nathan Proctor, *Repair Saves Family Big*, U.S. PIRG, (Jan. 2021), <https://uspirg.org/feature/usp/repair-saves-families-big>.

<sup>225</sup> LKQ empirical research, at 6.

<sup>226</sup> *Id.*

<sup>227</sup> Transcript, at 25, 62-65.

<sup>228</sup> *Id.* at 33

<sup>229</sup> CTA comment, at 6. CTA also referenced a CTA study claiming that only 1% of respondents throw away their phones. *Id.*

<sup>230</sup> CompTIA comment, at 11. Neither the Rochester Institute of Technology study nor the EPA report appear to support a conclusion that e-waste peaked in 2013-2014 and is in a period of steep decline.

and reuse without the consumer safety, security, or business concerns raised by insecure repair mandates.<sup>231</sup> Similarly, in a joint comment submitted to the Commission, several organizations representing manufacturers argued that member organizations ensure that repairs are conducted to manufacturer requirements and thus maximize products' useful life and "contribute significantly to e-waste reduction by returning products to service, thereby diverting products from end-of-life management."<sup>232</sup>

Regardless of whether the total amount of e-waste is on the rise or decline,<sup>233</sup> extending the life of consumer products unquestionably delays these products' entry into the waste stream and reduces the amount of energy used to generate replacement products. A study conducted by the European Environmental Bureau found that a 1-year lifetime extension of all smartphones in the EU would prevent the release of 2.1 million metric tons of carbon dioxide per year by 2030, the equivalent of taking more than a million cars off the roads for a year. And extending the lifetime of all washing machines, notebooks, vacuum cleaners, and smartphones in the EU by just one year would reduce around 4 million metric tons of carbon dioxide annually by 2030, the equivalent of taking more than 2 million cars off the roads for a year.<sup>234</sup> Additionally, the EPA encourages improved life cycle management of electronics, through "source reduction of materials used, increasing reuse, refurbishing, extending the life of products, and recycling of electronics," to reduce the total quantity of domestic and global waste.<sup>235</sup> And, EPA encourages manufacturers to create products for longevity, durability, reusability and recyclability. The EPA also recommends that consumers do their part to prevent waste by recycling, donating functional, used electronics for reuse, and buying products with environmental concerns in mind.<sup>236</sup> Increasing repair options for consumers is harmonious with the responsibilities identified by the EPA (longer-living devices, giving consumers more ability to maintain those devices, and allowing for educated consumer purchases) and is likely to further decrease the production of e-waste.

#### **D. Small Businesses and Employment**

Right to repair advocates argue that repair restrictions negatively impact not only consumers, but independent repair shops and the individuals those shops employ, by limiting the

---

<sup>231</sup> CompTIA comment, at 12-13.

<sup>232</sup> Joint comment, at 5-6.

<sup>233</sup> According to a 2020 report issued by the United Nations, the world generated 44.4 million metric tons (Mt) of e-waste in 2014, 53.6 Mt in 2019, and is projected to produce 74.7 Mt by 2030, almost doubling in only 16 years. The UN concludes that, "The growing amount of e-waste is mainly fueled by higher consumption rates of [electrical and electronic equipment], short life cycles, and few repair options." Vanessa Forti et al., *The Global E-waste Monitor 2020*, [http://ewastemonitor.info/wp-content/uploads/2020/07/GEM\\_2020\\_def\\_july1\\_low.pdf](http://ewastemonitor.info/wp-content/uploads/2020/07/GEM_2020_def_july1_low.pdf) (last visited Mar. 22, 2021).

<sup>234</sup> *Coolproducts don't cost the Earth – Report*, European Environmental Bureau, (Sept. 18, 2019), <https://eeb.org/library/coolproducts-report/>.

<sup>235</sup> U.S. EPA, *Basic Information about Electronics Stewardship*, <https://www.epa.gov/smm-electronics/basic-information-about-electronics-stewardship> (last visited Mar. 22, 2021).

<sup>236</sup> *Id.*

ability of independent businesses to compete with the OEMs and their authorized repair providers.<sup>237</sup>

For example, manufacturers argue that the “authorized repair” infrastructure many manufacturers have in place provides small businesses with a chance to compete for consumers’ business in the repair space. For example, AHAM submitted a survey of member companies regarding their authorized repair networks: “Of the 20,000 servicers (repairers), over 87 percent are authorized local independent brand/maker affiliated service providers.... This demonstrates that the ‘barriers’ to repair for independent repair shops are imaginary— independent repair shops with the desire to repair home appliances can do so if they meet the requirements, such as training and certification.”<sup>238</sup> CompTIA stated in its comment, “affiliated repair providers, many of which are small businesses, work with manufacturers to provide competitive, quality, cost-effective, and convenient services for consumers.... The market already provides a wide range of consumer choice for repair with varying levels of quality, price and convenience without any regulatory mandates.”<sup>239</sup>

CompTIA predicted that movement toward a more open repair ecosystem would in fact harm small businesses and competition because it would provide “favorable treatment to one group of businesses at the expense of others by undercutting and minimizing the significant investments entrepreneurs and small businesses across the nation have made to become affiliated repair network providers. The mandate would infringe on a manufacturer’s ability to establish contractual relationships with these small businesses.”<sup>240</sup> In effect, AHAM and CompTIA argue that, to the extent small businesses engage in and want to compete for repair business, they should become authorized or affiliated repair providers. By doing so, they will have access to the parts, tools, and information that they seek through their right to repair advocacy.

Right to repair advocates argue that independent repair has many benefits for consumers. For example, when asked during the Workshop what was wrong with requiring consumers to go to an authorized repair facility if the gasket on their refrigerator door breaks, Kyle Wiens asserted that authorized repair restricts the ability of the market to respond to consumer demand appropriately and absorb demand that manufacturers are not always able to meet.<sup>241</sup> Aaron Lowe argued that having independent repairers in addition to authorized repair “keeps everybody competitive, keeps everybody honest. It makes people better at what they do. It makes people better repairers.”<sup>242</sup> The Repair Association’s Gordon-Byrne stated at the Workshop that “right to repair allows for competition. It doesn’t guarantee anyone will win. It doesn’t guarantee that

---

<sup>237</sup> ABPA empirical research, at 2; Transcript, at 47. We note that manufacturers and affiliated repair shops employ thousands of people as well. We have not evaluated the effect of repair restrictions on overall employment, but note that repair restrictions likely result in lower employment by local or independent repair shops. As noted above, many Black-owned small businesses are in the repair and maintenance industries, and difficulties facing small businesses can disproportionately affect small businesses owned by people of color. *See supra* notes 5 & 6.

<sup>238</sup> AHAM comment, at Exh. A pp. 5-6.

<sup>239</sup> CompTIA comment, at 6.

<sup>240</sup> CompTIA comment, at 9.

<sup>241</sup> Transcript, at 177.

<sup>242</sup> *Id.* at 174.

a lousy repair shop will stay in business, and it doesn't mean that a lousy dealership will stay in business. It just means opportunity.”<sup>243</sup>

The submissions to the docket and discussion at the Workshop catalogued a variety of benefits independent repair provides to consumers, including access to local and timely repair,<sup>244</sup> competition in the cost of repairs, and access to repairs that manufacturers do not offer.<sup>245</sup> In addition, as Theresa McDonough explained at the Workshop, “I’ve read some of the requirements that these companies have. You have to have a line of credit. You have to have a certain amount of employees...the bar is very high. And for a small business, when you live in a state of 600,000 people, I just don’t see it beneficial to spend that sort of money on a certification...”<sup>246</sup> Finally, movement towards a more open repair system does not necessitate giving manuals, tools, and parts away for free, nor does it necessitate doing away with certifications or trainings that businesses can advertise to potential customers.

## **VII. APPROACHES FOR INCREASING CONSUMER CHOICE IN REPAIR MARKETS**

### **A. FTC Rulemaking or Law Enforcement**

The Commission has a number of authorities it can and should deploy to address repair restrictions and help open repair markets. First, the Commission will enforce existing requirements under MMWA, where appropriate. Comments submitted by PIRG and others raise serious concerns about the extent to which manufacturers are complying with the MMWA.<sup>247</sup>

In addition, in some instances, a manufacturer’s use of a repair restriction could be challenged as an unfair practice under Section 5 of the FTC Act if the repair restriction causes substantial injury (e.g., monetary harm or unwarranted health and safety risks) that is not outweighed by countervailing benefits to consumers or competition that the practice produces, and the injury could not have been reasonably avoided by consumers. Moreover, as explained in Section II, there may be some specific circumstances in which the Commission could address repair restrictions as violations of antitrust law.

Alternatively, the Commission could engage in rulemaking to declare certain types of repair restrictions illegal. The Commission could revise its Interpretations of the MMWA to make clear that certain repair restrictions could violate the MMWA’s anti-tying provision. Such an amendment would put all parties on notice that certain repair restrictions that have the effect

---

<sup>243</sup> *Id.* at 134.

<sup>244</sup> *See Id.* At 155-56; *See* discussion *infra* Section V.

<sup>245</sup> *See* iFixit empirical research, at 9.

<sup>246</sup> Transcript, at 55. *See also*, Mike Peterson, *Lawyers Say Apple’s Independent Repair Program Contract is ‘Crazy,’ Onerous*, iDropNews (Feb. 6, 2020), <https://www.idropnews.com/news/lawyers-say-apples-independent-repair-program-contract-is-crazy-onerous/129006/> (for example, “the contract stipulates repair technicians may be subject to ‘unannounced audits and inspections by Apple’ ... And if independent repair shops leave the program, the contract actually includes a term that gives Apple the right to ‘continue inspecting repair shops for up to five years’ after it ends.”).

<sup>247</sup> *See supra* Section I.

of limiting consumer repair choices are illegal. A revised Interpretation of the MMWA, however, is not a panacea. First, it would only strengthen repair rights for products that are sold with a written warranty and only during the duration of the warranty period. Thus, manufacturers could entirely avoid the anti-tying provision by refraining to offer written warranties. Second, consumers would be left without repair rights during the time period when they are most likely to use them—after the warranty has expired. Finally, because the MMWA only applies to consumer products, a revised Interpretation would not address repair restrictions imposed on owners of products that fall outside the scope of the MMWA.<sup>248</sup>

The Commission could also pursue a rulemaking under the FTC Act. Any such rulemaking would require a complex assessment of the variety of repair restrictions, their widespread use by multiple industries, the rationale for the restrictions, and the interplay of repair restrictions with statutorily created intellectual property rights. Given, however, the breadth of concern about and potential harm to consumers and markets from widespread repair restrictions and the inefficiency of *ex post* enforcement, the Commission may decide it is worth the investment of its energy and attention to pursue rulemakings in this area.

## **B. Industry Self-Regulation**

While industry self-regulation can be beneficial, the broad range of industries and products involved would make it a challenge to create and implement a single self-regulatory scheme. And, aside from the auto industry, no other manufacturing sectors have successfully created and implemented one.

For any manufacturing sector interested in creating a self-regulatory mechanism for expanding repair options, the experience of the automobile industry provides some guidance. In January 2014, two car manufacturer trade groups and two trade groups representing independent repair shops and manufacturers of aftermarket parts entered into a Memorandum of Understanding (“MOU”) that had the effect of creating a broad, if not complete, right to repair in the automotive industry across the United States.<sup>249</sup>

The MOU came about after Massachusetts passed its own automotive right to repair law. In an effort to prevent the passage of state bills around the country that all contained differing requirements,<sup>250</sup> manufacturers agreed to sell the diagnostic and repair information that manufacturers make available to their dealers to car owners and independent repair shops.<sup>251</sup> In

---

<sup>248</sup> See, *supra*, note 212.

<sup>249</sup> See Memorandum of Understanding (“MOU”), (Jan. 15, 2014), <https://web.archive.org/web/20180310231358/https://www.autocare.org/workarea/DownloadAsset.aspx?id=1440&gmssopec=1>. Members of the manufacturer trade groups individually executed letters of endorsement to signify their agreement to comply with the MOU. *Id.* at 1. Every car manufacturer but Tesla has signed on to the MOU. See Transcript, at 179.

<sup>250</sup> See Gabe Nelson, *Automakers agree to ‘right to repair deal,’* Automotive News (Jan. 25, 2014), <https://www.autonews.com/article/20140125/RETAIL05/301279936/automakers-agree-to-right-to-repair-deal>.

<sup>251</sup> MOU, at 1.

exchange, the repair-side trade groups agreed to not fund or otherwise support any new state right to repair legislation.<sup>252</sup>

The MOU has been raised as a model of self-regulation that could apply in the broader right to repair context.<sup>253</sup> Kyle Wiens of iFixit stated at the Workshop, for example, that the MOU is “the direction that we need to go in. And it’s a question of. . .do you need the regulatory framework. Can you do it in a voluntary fashion.”<sup>254</sup>

In addition, a broader right to repair self-regulatory agreement that would cover all products presents significant complications. Aaron Lowe of the Auto Care Association expressed his view at the Workshop that the MOU was generally successful because the auto industry is discrete, such that the parties are identifiable and could be brought to the table to negotiate.<sup>255</sup> As demonstrated by the Nixing the Fix docket and the far-ranging discussion at the Workshop, numerous industries (e.g. mobile devices, home appliances, tractors, medical devices and equipment) as well as component parts (e.g. batteries) are implicated by repair issues.

Moreover, any self-regulatory agreement would also need to be flexible enough to change or grow as the industry and products covered by that agreement change. For example, Aaron Lowe explained at the Workshop that the automobile MOU, while initially a sufficiently comprehensive agreement, does not necessarily extend in its current form to telematics.<sup>256</sup> Relatedly, on November 3, 2020, Massachusetts voters passed a ballot initiative that extends the state’s 2013 Motor Vehicle Right to Repair Law to telematics. The new law would require, starting with model year 2022, “manufacturers of motor vehicles sold in Massachusetts to equip any such vehicles that use telematics systems . . . with a standardized open access data platform,” that would enable vehicle owners to authorize “independent repair facilities (those not affiliated with a manufacturer) and independent dealerships . . . to retrieve mechanical data from and send commands to, the vehicle for repair maintenance, and diagnostic testing.”<sup>257</sup>

As the MOU illustrates, self-regulation can help address concerns about repair restrictions in discrete markets. But, no industry sector other than the automotive industry has worked to open repair markets through a self-regulatory framework. Ways to stimulate self-regulation in markets beyond the automotive sector, however, merit further consideration.

---

<sup>252</sup> *Id.*

<sup>253</sup> The Equipment Dealers Association and Association of Equipment Manufacturers, trade groups representing manufacturers of agricultural and off-road equipment, also engaged in self-regulation concerning repair issues. They released a “Statement of Principles” on right to repair detailing the steps they would take to expand the right to repair in their industry. See Press Release, *AEM, EDA Announce Statement of Principles on ‘Right to Repair,’* Association of Equipment Manufacturers, (Feb. 1, 2018), <https://www.aem.org/news/aem-eda-announce-statement-of-principles-on-right-to-repair/>.

<sup>254</sup> Transcript, at 180.

<sup>255</sup> *Id.* at 183-184.

<sup>256</sup> *Id.* at 179.

<sup>257</sup> See Final Summary for 19-06 Initiative Law to Enhance, Update and Protect the 2013 Motor Vehicle Right to Repair Law, <https://www.mass.gov/info-details/ballot-initiatives-submitted-for-the-2020-biennial-statewide-election-proposed-laws#19-06-initiative-law-to-enhance,-update-and-protect-the-2013-motor-vehicle-right-to-repair-law-> (last visited Sept. 23, 2020).

## C. Legislative Approaches

This Section examines legislative approaches for expanding repair options. The state laws, model state legislation and European approaches described below show the variety of legislation that has been proposed to open repair markets. Section VIII of his Report identifies issues legislators should consider when drafting right to repair laws.

### 1. Existing State Right to Repair Laws and Model Legislation

A limited right to repair already exists in at least three states. Rhode Island has the most expansive such law, requiring manufacturers to “have adequate service information and replacement parts available to warranty stations and independent service facilities,<sup>258</sup> to effect repair and restore to operating condition.” Rhode Island requires that manufacturers make the service information and parts available for at least four years after the date of last sale of any given model or type.<sup>259</sup> This requirement applies to manufacturers of all new consumer products, regardless of the cost of the products and even when the manufacturer does not make any express warranties regarding the product.

Indiana has a similar law, but it applies only to manufacturers who make an express warranty in connection with the sale of an audio or visual entertainment product costing \$50 or more. Manufacturers of such products must “make available to service representatives or independent service facilities adequate service information and replacement parts” for at least seven years after the date the product model or type was manufactured.<sup>260</sup>

Similar to Indiana’s law, California’s Song-Beverly Act requires manufacturers who make an express warranty when selling an electronic or appliance product to make available to service and repair facilities sufficient service literature and repair parts. For products with a wholesale price of between \$50 and \$99.99, this duty to provide service literature and repair parts lasts for three years from the date a product model or type was manufactured. For products with a wholesale price of \$100 or more, the duty lasts for seven years.<sup>261</sup>

In addition to the laws in these three states, right to repair bills have been introduced in at least 20 state legislatures in the last few years. Although some of these bills differ in their coverage and exemptions, they generally track model legislation advanced by the Repair

---

<sup>258</sup> The law does not require manufacturers to make the information and parts available directly to consumers.

<sup>259</sup> R.I. Gen. Laws § 6A-2-329(5).

<sup>260</sup> Ind. Code Ann. § 26-2-6-2.

<sup>261</sup> Cal. Civ. Code § 1793.03. This particular provision of the Song-Beverly Act requires manufacturers to make service literature and parts available to “service and repair facilities,” while other provisions of the Song-Beverly Act apply to “authorized service and repair facilities.” *See, e.g.*, Cal. Civ. Code § 1793.2(a)(3) (requiring manufacturers to “[m]ake available to authorized service and repair facilities sufficient service literature and replacement parts to effect repairs during the express warranty period”). In an unpublished opinion, however, the Ninth Circuit ruled that the duty imposed by 1793.03 only requires manufacturers to make service literature and replacement parts available to authorized service and repair facilities, despite the qualifier “authorized” not being included in that provision. *Bahr v. Canon USA, Inc.*, 656 F. App’x. 276 (9th Cir. 2016).



Association.<sup>262</sup> This model legislation would require manufacturers of digital electronic equipment<sup>263</sup> to make available to any independent repair provider, or to the owner of digital electronic equipment manufactured by or on behalf of, or sold by, the manufacturer, on fair and reasonable terms, documentation, parts, and tools, inclusive of any updates to information or embedded software. A manufacturer would only need to make parts available to independent repair providers and owners if the part was available to the manufacturer's authorized repair networks.

The model legislation also requires a manufacturer to make available to the owner and to independent repair providers, on fair and reasonable terms, any special documentation, tools, and parts needed to reset an electronic security lock or other security-related function when equipment has been disabled during the course of diagnosis, maintenance, or repair.<sup>264</sup>

The model legislation explicitly states that it should not be construed to require a manufacturer to divulge a trade secret to an owner or an independent service provider except as necessary to provide, on fair and reasonable terms, documentation, parts, and tools. The model further states that the legislation should not be construed to require a manufacturer or an authorized repair provider to give to an owner or independent repair provider access to information, other than documentation, that is provided by the manufacturer to an authorized repair provider.<sup>265</sup>

## 2. The European Approach

The European Union has adopted a number of regulations aimed at increasing consumer repair options in the home appliance industry, which went into effect on March 1, 2021. Unlike the model state legislation, which would require a manufacturer to make available to individuals and independent repair shops those parts that the manufacturer provides to its authorized repair network, the EU prescribes the types of parts and time period during which the parts must be made available:

- Refrigerators for a minimum of seven years (ten years for door gaskets)<sup>266</sup>;

---

<sup>262</sup> In this report we analyze the version of the Repair Association's model right to repair legislation existing at the time of the Workshop. *Model State Right-to-Repair Law*, [www.repair.org](http://www.repair.org) (saved Nov. 18, 2019).

<sup>263</sup> The model legislation defines "digital electronic equipment" to mean "any product that depends for its functioning, in whole or in part, on digital electronics embedded in or attached to the product."

<sup>264</sup> The model legislation would require a manufacturer to make documentation, parts and tools available "to any independent repair provider, or to the owner," while any special documentation, tools, and parts needed to reset an electronic security lock or other security-related function must be provided to the "owner and to independent repair providers." Thus, a manufacturer could satisfy the first requirement by providing documentation, tools and parts to independent repair providers, while refusing to provide these items to owners.

<sup>265</sup> The model legislation would not apply to manufacturers of automobiles, but it would apply to all other products, whether for consumer or business use.

<sup>266</sup> Commission Regulation, (EU) 2019/2019 laying down eco-design requirements for refrigerating appliances pursuant to Directive 2009/125/EC of the European Parliament and of the Council and repealing Commission Regulation (EC) No 643/2009 (European Union), <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R2019&from=EN>.

- Household washing machines and household washer-dryers for a minimum of ten years<sup>267</sup>;
- Household dishwashers for a minimum of ten years (seven years for some parts for which access can be restricted to professional repairers)<sup>268</sup>; and
- Electronic displays for a minimum of seven years.<sup>269</sup>

The EU regulations distinguish between repairs that can be commonly performed by purchasers and repairs that should be performed by professional repair workers. The washing machine regulation, for instance, requires manufacturers to make available to individuals and professional repairers the following parts: door, door hinge and seals, other seals, door locking assembly and plastic peripherals such as detergent dispensers. The regulation, however, requires manufacturers to make other parts available only to repair professionals.<sup>270</sup>

The regulations also require manufacturers to ensure that spare parts can be replaced using commonly available tools and without causing permanent damage to the appliance. Moreover, manufacturers must provide a list of spare parts and the procedure for ordering the parts on a free website available to the public. While these regulations apply to the home appliance industry, on March 1, 2020, the European Commission announced that it will be introducing proposed legislation that will create a right to repair for electronics and other products.<sup>271</sup>

---

<sup>267</sup> Commission Regulation (EU) 2019/2023, laying down eco-design requirements for household washing machines and household washer-dryers pursuant to Directive 2009/125/EC of the European Parliament and of the Council and amending Commission Regulation (EC) No. 1275/2008 and repealing Commission Regulation No. 1015/2010 (European Union), <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R2023&from=EN>.

<sup>268</sup> Commission Regulation (EU) 2019/2022, laying down eco-design requirements for household dishwashers pursuant to Directive 2009/125/EC of the European Parliament and of the Council and amending Commission Regulation (EC) No. 1275/2008 and repealing Commission Regulation No. 1016/2010 (European Union), <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R2022&from=EN>.

<sup>269</sup> Commission Regulation (EU) 2019/2021, laying down eco-design requirements for electronic displays pursuant to Directive 2009/125/EC of the European Parliament and of the Council and amending Commission Regulation (EC) No. 1275/2008 and repealing Commission Regulation No. 642/2009 (European Union), <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R2021&from=EN>.

<sup>270</sup> Those parts include motor and motor brushes; transmission between motor and drum; pumps; shock absorbers and springs; washing drum, drum spider and related ball bearings (separately or bundled); heaters and heating elements, including heat pumps (separately or bundled); piping and related equipment including all hoses, valves, filters and aquastops (separately or bundled); printed circuit boards; electronic displays; pressure switches; thermostats and sensors; and software and firmware including reset software.

<sup>271</sup> European Commission, Circular Economy Action Plan: For a cleaner and more competitive Europe, [https://ec.europa.eu/environment/circular-economy/pdf/new\\_circular\\_economy\\_action\\_plan.pdf](https://ec.europa.eu/environment/circular-economy/pdf/new_circular_economy_action_plan.pdf).

## D. Transparency of Repairability by OEMs/Industry

One objective of the Workshop was to learn whether consumers understand the existence and effects of repair restrictions.<sup>272</sup> At the Workshop, several panelists agreed that repairability should be a factor for consumers to consider when making purchasing decisions.<sup>273</sup> Currently, however, right to repair advocates argue that “consumers lack information at the point of purchase about repairability.”<sup>274</sup> Similarly, Dr. McGraw stated that among other things, repairability is one thing that consumers are “woefully misinformed about.”<sup>275</sup>

Panelists and commenters discussed the idea of a “repairability score” or repairability rating to better inform consumers about the repairability of products.<sup>276</sup> For example, Workshop panelist Minnesota Senator Osmek suggested that a “repair score” could help consumers “make the decision on what they want in a device.” He went on to say that if consumers “want to have a repairable device, they will look for a high repairable score.”<sup>277</sup> At least one non-OEM company is doing this to a certain extent; iFixit rates products “for ease of disassembly and repair” to provide consumers “with an educated guess of repair difficulty before they buy the product.” iFixit stated in its empirical research submission that it considers things like, “how time-consuming is [the product] to open? Can broken components be replaced individually, or will you have to swap out more expensive larger modules? Are the components that are most likely to fail easily accessible by consumers?”<sup>278</sup>

As Dr. Crane stated, “it would be great if we could get people to make consumer-based buying choices because of the security of the device or the repairability of the device in addition to the features of the device...”<sup>279</sup> Consumers can only make buying choices based on repairability if they are aware of how easily a product can be fixed.<sup>280</sup>

## VIII. IDENTIFICATION OF ISSUES TO BE CONSIDERED IN ANY ACTION TAKEN BY INDUSTRY, POLICYMAKERS, OR LEGISLATORS

The expansion of consumers’ repair options, whether through industry initiatives or through regulations or legislation, raises numerous issues that will warrant examination. In this section, we identify some of the most significant of these issues—the types of products that should be covered by expanded repair rights, the treatment of component parts, dollar and

---

<sup>272</sup> See Call for Empirical Research, <https://www.ftc.gov/nixing-the-fix-call-for-research>.

<sup>273</sup> According to Dr. Earl Crane, “consumers should have a choice between a repairable device, a secure device, or a securely repairable device...” Transcript, at 94.

<sup>274</sup> Transcript, at 58.

<sup>275</sup> *Id.* at 97.

<sup>276</sup> *Id.* at 25. See also Andrew Keates comment (“I believe a repair-ability rating would be a useful addition to product labeling.... I would certainly give preference to buying a product with a high repair-ability score.”).

<sup>277</sup> Transcript, at 152.

<sup>278</sup> iFixit empirical research, at 20.

<sup>279</sup> Transcript, at 116.

<sup>280</sup> Furthermore, if a self-regulatory or legislative body were to consider creating a repairability scoring regime, it should also consider having a parallel durability scheme because repairability only tells half the story. Products that rarely break down but that are costly to repair may be more desirable to some consumers than products that break more frequently but are easier to repair. Repairability and durability, however, are not necessarily opposite sides of the same coin. A durable product could also be easy to repair.

duration thresholds for repair requirements, and the coexistence of repair rights and manufacturers' intellectual property rights.

### A. Types of Products Covered

Any action taken by industry or policymakers will need to define what types of products will be included and whether any products should be explicitly excluded. For example, should any action only apply to consumer products or products with a computer chip? Or, should industrial equipment be excluded?

Some industries, such as the video gaming and medical device industries, argue that they are unique and should be excluded from any action. According to the ESA, "video game consoles are unique in the repair context" in part because console makers "use [technological protection measures] in order to enhance the safety and integrity of their consoles."<sup>281</sup> Similarly, medical device manufacturers argue that their products are "categorically different than consumer goods in that they are heavily regulated products which have direct impact on patient care and safety."<sup>282</sup> As discussed at the Workshop, there is no consensus about whether such exclusions are appropriate. For instance, Minnesota Senator Osmek has safety concerns about including medical equipment in his state's right to repair legislation, although he also expressed an interest in discussing whether such an exclusion should be absolute.<sup>283</sup> Vermont Senator Pearson, on the other hand, noted that he has not been persuaded by the arguments made by the medical device and video gaming industries that they should be excluded from right to repair efforts.<sup>284</sup>

When deciding the scope of expanded repair rights, policymakers should think about whether the rights should be limited to consumer goods or include capital items.<sup>285</sup> Given the complexity and variation among products, it seems unlikely that there is a one-size fits all approach that will adequately address this issue.

---

<sup>281</sup> Entertainment Software Association comment, at 5. See Section V.(A), above for our analysis of this repair restriction used by video game console manufacturers.

<sup>282</sup> Medical Imaging & Technology Alliance empirical research, at 1.

<sup>283</sup> Senator Osmek stated, "Maybe there's some things in a hospital that should be fixable by the custodial staff, and there probably—I don't know. But let's talk through those. Up until this point in time, I haven't gotten that far." Transcript, at 194.

<sup>284</sup> *Id.* at 193. Senator Pearson stated, "The hospital up the street from me is a level one trauma center, a teaching hospital. The techs there sent me a letter and said, I'm so glad you're doing this. We are barred from repairing so much of the equipment in the hospital. It costs us tons of money. We have the ability to do it, but we're not allowed to. It cost us money. It takes more time because we've got to wait for the authorized repair dealer to get there." *Id.* at 192-93. In 2018, the Food and Drug Administration concluded that, "the objective evidence indicates that many OEMs and third party entities provide high quality, safe, and effective servicing of medical devices." FDA Report on the Quality, Safety and Effectiveness of Servicing of Medical Devices (May 2018), <https://www.fda.gov/media/113431/download>.

<sup>285</sup> Policymakers could specify whether repair rights apply to, for example, farming equipment such as tractors, medical devices, or other classes of products that may have characteristics both of consumer goods and of capital items.

## **B. Components of Covered Products**

Any action taken by industry or policymakers will likely include a requirement that manufacturers make replacement parts available for purchase by consumers or independent repair facilities. But what constitutes a replacement part and to what degree will manufacturers be required to make components of parts available?

This question was touched on briefly in the Workshop by the Repair Association's Gordon-Byrne, who said that, under the model legislation at least, manufacturers are only required to make available to consumers what they make available to their authorized or affiliated repair providers.<sup>286</sup> In certain instances, this makes sense. For example, if a single component of a computer's motherboard breaks, and a consumer determines that they want to attempt to replace that single component, the manufacturer would be required to make such a component available to consumers or independent repairers so long as it made the components available to its authorized or affiliated repairers. But what should be required of manufacturers who provide to their affiliated repairers components of parts that could potentially be dangerous when provided to consumers or independent repairers? Should they be required to provide those components to all who determine that they would like to undertake a more detailed repair themselves? As discussed above, while concerns about repairer and public safety must be analyzed before they are accepted as a justification for restricting consumer and independent repair, this is an important issue to consider in crafting any right to repair action.

## **C. Dollar Threshold and the Duration of Repair Commitments**

Self-regulatory or legislative efforts to expand consumer repair choices also may want to consider an appropriate monetary threshold for repair rights and the length of time manufacturers should be required to facilitate independent repairs. The MMWA, the existing Rhode Island, Indiana and California right to repair laws, and the EU's new regulations regarding home appliance repairs spell out price thresholds and duration requirements for repair rights.<sup>287</sup> Model right to repair legislation takes a different tack, requiring manufacturers to provide individuals or independent repair shops with access to the same information and parts that the manufacturer provides to its authorized repair networks.<sup>288</sup> Each approach presents challenges.

Creating a price threshold that is too low could impose significant burdens on manufacturers of products that are designed for single use or are unlikely to be repaired because of their low cost. As the CTA's Walter Alcorn noted at the Workshop, some consumer electronic products are so inexpensive that nobody would expect to be able to fix them:

For example, these days you can go into a gas station and buy a cable to basically attach your iPhone to the car. You paid \$5 for that. I don't think anybody is expecting the manufacturer to provide

---

<sup>286</sup> Transcript, at 101.

<sup>287</sup> See *supra*, Section VII.C.

<sup>288</sup> *Model State Right-to-Repair Law*, [www.repair.org](http://www.repair.org) (saved Nov. 18, 2019).

diagnostics to the consumer so they can fix the cable. You're lucky if it works, but you know that going in.<sup>289</sup>

The type of price—wholesale or retail—would also need to be considered when setting a threshold for repair rights. The MMWA's threshold is based on the cost paid by the consumer, while California's Song-Beverly Act's threshold is based on the wholesale price to the retailer. If a threshold is based on consumers' expectations regarding repairability, the threshold should reflect the cost paid by the consumer. Moreover, consumers would have no insight into the wholesale price of a product. Therefore, they would have no way of knowing whether they had a right to repair the item if the threshold were based on the wholesale price. On the other hand, the retail price may not be within the manufacturers' vision, resulting in some manufacturers being unexpectedly subject to repair requirements if a retailer sells their product at a price higher than the established threshold.

Determining the appropriate duration for repair rights presents similar challenges. Consumers likely expect different types of products to be more durable than other types of products. Moreover, some products, because of how they are intended to be used, may not last as long as other products. The appropriate duration for repair rights will likely vary based on the type of product.<sup>290</sup>

The model right to repair legislation avoids the issues of a price threshold and duration requirement by limiting a manufacturer's obligations to providing individuals or independent repair shops with access to the same information and parts that the manufacturer provides to its authorized repair networks. This approach has the benefit of letting manufacturers determine which, if any, of their parts should be repairable. Yet, it could incentivize manufacturers to stop offering to repair products, making it more difficult for consumers to have their products fixed.<sup>291</sup> Self-regulatory or legislative bodies interested in expanding consumer repair choices will need to determine whether the model's approach or a more price and duration-prescriptive approach is appropriate.

#### **D. Protection of IP rights**

As discussed above, IP rights play a valuable role in encouraging and rewarding innovation. Several different governmental entities and laws grant and regulate IP rights. For example, the USPTO grants patent and trademark registrations and the US Copyright Office, an arm of the Library of Congress, registers copyrights. In addition, both state and federal law govern trade secrets. Accordingly, any action taken by industry or regulators to enable

---

<sup>289</sup> Transcript, at 41.

<sup>290</sup> We believe that the CTA's Walter Alcorn has identified a central consideration for determining appropriate price and duration thresholds: At what price point do consumers view a product as single use and disposable versus a product that they anticipate should be repairable? Likewise, as to the appropriate duration for repair rights, how long do consumers expect the product to last? While individuals may have different views on these issues, self-regulatory or legislative bodies can strive to create thresholds based on the views of reasonable consumers.

<sup>291</sup> On the other hand, requiring manufacturers to maintain a stock of replacement parts for a specific duration could possibly chill innovation. For instance, such a requirement could cause some manufacturers to limit the number of new models in order to limit the number of repair parts that must be maintained.

independent repair should seek input from such entities and other stakeholders and be mindful of existing law and policy supporting IP protection.

## **IX. CONCLUSION**

The debate around repair restrictions illustrates the limitations of MMWA's anti-tying provision in repair markets. While the anti-tying provision gives consumers the right to make repairs on their own or through an independent repair shop without voiding a product's warranty, repair restrictions have made it difficult for consumers to exercise this right. Although manufacturers have offered numerous explanations for their repair restrictions, the majority are not supported by the record.

The auto industry has shown that in certain contexts, self-regulation can significantly increase consumers' repair options. But other industries have not adopted similar self-regulation.

To address unlawful repair restrictions, the FTC will pursue appropriate law enforcement and regulatory options, as well as consumer education, consistent with our statutory authority. The Commission also stands ready to work with legislators, either at the state or federal level, in order to ensure that consumers have choices when they need to repair products that they purchase and own.



**FEDERAL TRADE  
COMMISSION**

May 2021