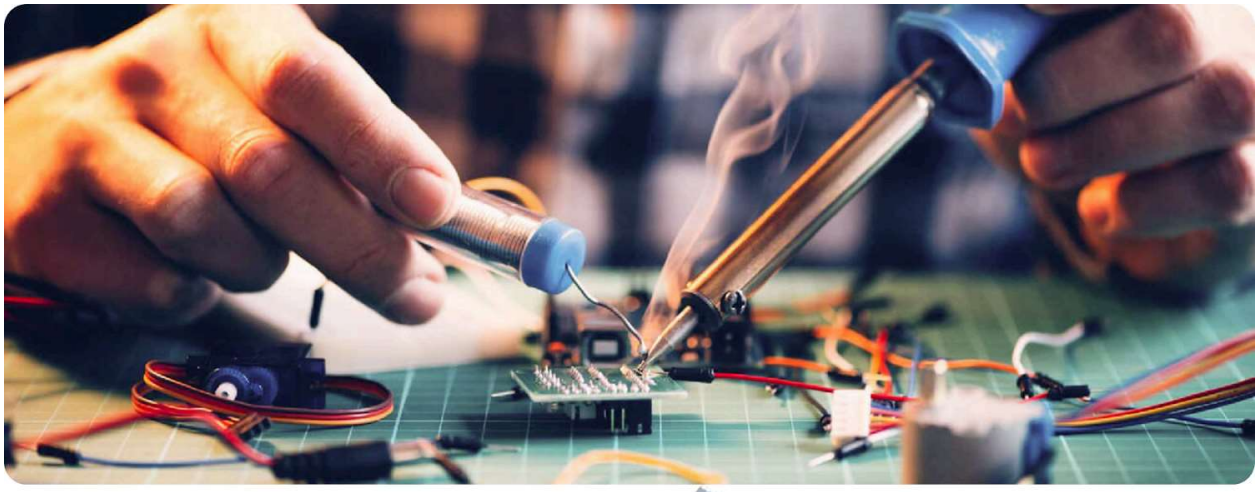


# Authorized Electronics Repair Access in Alaska

ALASKA ENVIRONMENT RESEARCH & POLICY CENTER

# Authorized Electronics Repair Access in Alaska

## It's a Desert

Written by:
Dyani L. Chapman, Alaska Environment Research & Policy Center State Director

# Acknowledgements

Alaska Environment Research and Policy Center thanks our individual contributors for their generous support of our work. The authors bear responsibility for any factual errors. Policy Recommendations are those of Alaska Environment Research & Policy Center.



Alaska Environment Research & Policy Center is a statewide non-profit environmental 501(c)(3) organization. We are dedicated to protecting Alaska's air and water, healthy ecosystems and wildlife, and ensuring a livable climate. We investigate problems, craft solutions, educate the public and decision makers, and help Alaskans make their voices heard in local, state, and national debates over the quality of our environment and our lives. For more information about Alaska Environment Research and Policy Center or to download an electronic copy of this report, please visit alaskaenvironment.org/center

# Table of Contents

# Executive Summary

Electronics have become integral to modern life, with the global consumer electronics market projected to reach $977 billion in 2025 and continuing to grow.[1] While these advancements bring convenience and improved quality of life, they also contribute to a mounting environmental challenge: electronic waste (e-waste).[2] In Alaska, where rural communities face unique logistical and environmental challenges, the e-waste issue is particularly pronounced.[3]

This report examines the growing reliance on electronics in Alaska, the associated e-waste problem, and the unique barriers to repair access. It highlights the following key points:

- **E-Waste Growth and Environmental Impact**: Each American generates an average of 47 pounds of e-waste annually.[4] Toxic chemicals in e-waste are of particular concern in Alaska's rural communities, where unlined landfills and open burning exacerbate environmental risks.[5]
- **Authorized Repair Accessibility Challenges**: Alaska is an "authorized repair desert," with many residents living hundreds of miles from authorized repair centers for major brands like Apple, Lenovo, Samsung, LG, Maytag, and John Deere.[6,7,8,9,10,11,12] Rural Alaskans face even greater barriers due to high shipping costs and extended shipping times.[13,14]
- **Independent Repair Limitations**: Across the U.S., limited access to repair parts, tools, and manuals hampers independent repair efforts.[15,16,17,18] In Alaska, these limitations are compounded by geographic isolation.
- **Economic Barriers to Repair**: Repair costs for popular electronics like smartphones are often quite expensive, incentivizing wasteful purchasing behaviors when paired with trade in deals or multiple broken features.[19]

## Recommendations

To address the e-waste problem and improve access to repair in Alaska, the report advocates the following actions:

1. **Pass Right-to-Repair Legislation**: Require manufacturers to provide parts, tools, and schematics at reasonable costs.
2. **Support Local Repair Businesses**: Encourage policies and consumer behaviors that bolster local repair services.

3. **Promote Repair Clinics**: Host community events where volunteers teach basic repair skills to reduce waste and build local resilience.
4. **Include Repair Education in Schools**: Include electronics repair in school curriculums to foster a culture of repair and expand repair skills.
5. **Encourage Durable Design**: Advocate for products designed with longevity and repairability in mind.
6. **Implement Repairability Scores**: Label products with repairability scores to help consumers make informed choices, particularly in rural areas.

By addressing these challenges, Alaska can reduce its environmental impact, support local economies and resiliency, and ensure greater access to essential electronic devices. This report calls for collaborative efforts between policymakers, businesses, and communities to create a sustainable repair ecosystem for all Alaskans.

# Introduction

Electronics are commonplace and ubiquitous in most people's lives. The global market for just consumable electronics is projected up to $977 billion in 2025, and expected to rise 2.9% per year over the next few years.[20]

- Approximately 98% of adults in the United States now own a cellphone and 95% of households have at least one computer.[21,22]
- Around 84% of homes in Alaska have a washing machine.[23]
- Over 99% of American households have at least one refrigerator, and 60% of homes in Alaska have a standalone freezer.[24,25]
- Small appliances like air fryers, microwaves, vacuum cleaners, and hair dryers are becoming more and more common.[26]
- The average American household has 24 electronic devices and in 2021 spent an average of $1767 on new electronics.[27]

Rural Alaska does have some households without personal computers and some common appliances.[28,29] However, consumer electronic use and appliance use is on the rise off of the road system in Alaska as well. More efficient clothes dryers have made washaterias more economical and more practical.[30] Improved and improving access to the internet has made personal computers more practical.[31,32] This is improving quality of life and opportunity for many Alaskans.

While there are certainly benefits coming from some of this growth in electronics, there are also downsides. Electronic waste (e-waste) is one of the fastest growing wastestreams in the world.[33] The average American is producing 47 pounds of e-waste per year and e-waste can threaten both the environment and public health when inadequately managed.[34,35] Electronics contain dangerous chemicals like cadmium, lead, mercury, flame retardants, polybrominated diphenyl ethers and more that can cause health problems for humans, plants, soil, wildlife, and microbial species.[36] When we landfill, dump, or burn electronics, those chemicals pollute soil, leach into groundwater, and cause air pollution.[37] This is of special concern for many rural communities in Alaska because the landfills are unlined and 73% of them burn without emissions controls to reduce volume.[38]

There is a backhaul program–Backhaul Alaska– in place to bring broken electronics out of rural Alaska to reduce the associated health and environmental harms.[39] The pilot version was launched in 2018 and collected e-waste along with some other hazardous waste from 26 communities.[40] The program aims to expand to all of rural Alaska by the end of 2030.[41] This is vital because many landfills are close to or at maximum capacity, and not suited to hazardous materials, including electronic waste.[42] While the program is more efficient and cost effective than individual communities attempting to appropriately dispose of their electronic waste, it is still difficult to fund the use barges and planes to ship waste out of rural Alaska, and will need an ongoing effort.[43]

While unlined rural landfills are one of the worst places for e-waste to end up, and the Backhaul Alaska program is a boon for the state, getting e-waste out of rural Alaska doesn't entirely resolve the problem. We know a large portion of e-waste isn't getting recycled: In 2022, only 22.3% of the world's e-waste was collected for formal recycling and actually recycled.[44] The valuable minerals in electronics are often encased in worthless plastic containing flame retardants.[45] This makes it challenging and dangerous to separate out the recyclable components from the non-recyclable components.[46] Moving e-waste from one place to another can mean just passing a problem from one community to another instead of actually resolving the issue.

One of the most effective ways to reduce the production of e-waste is to use each electronic device for longer, and buy new less often. The average person in the United States buys a new phone every two to three years, considers a new computer every three to five years, and puts in a new appliances every six to 40 years.[47,48,49] Some farmers buy new tractors and combines every single year.[50] Some of this purchasing behavior can be attributed to people seeking improvements in technology, but many people replace devices because they break or stop working as effectively: batteries start dying more quickly, screens crack, charging ports become misshapen. Repair is the obvious solution and could

save the average family $382 per year, but can sometimes seem inconvenient or be less viable than replacement.[51,52] Manufacturers of electronics often withhold the spare parts, tools, and schematics necessary to repair devices, giving them a monopoly on repairs. They can then set the prices as they see fit, and make a new purchase more appealing.

Case Study:
Apple estimates that before shipping, a screen replacement for an iPhone 12 through 16 base model will cost $279, more than a quarter of the cost of a new iPhone 16 ($799), and the Pro Max version will run between $329-$379, more than a third of the cost of a new iPhone 16 pro.[53] This doesn't account for trade in deals with phone carriers. If a screen is cracked and a battery is becoming unreliable in the cold (an estimated $99/fix), the repair work from an authorized provider will cost almost half of what a new phone would cost, it's easy to see why someone might decide an upgrade is the best choice.[54] If someone lived in rural Alaska, and the closest repair option was in Anchorage or Seattle, and a repair meant a few weeks of shipping and associated fees, the decision to buy new becomes even more likely.

## Is independent repair currently sufficient?

### Personal Devices

A 2017 survey of independent repair providers found that about a quarter of unsuccessful laptop and smartphone repairs, around half of unsuccessful repairs of TVs, monitors, digital cameras and gaming consoles, and approximately a third of unsuccessful repairs of PCs, pocket computers, printers, and projectors were due to unavailable parts, tools, or manuals.[55]

### Agricultural Equipment:

Agricultural equipment manufacturers often place barriers that frustrate independent repair.[56] Tractors and other farm equipment has become higher tech in the last few of decades.[57] Much of the equipment runs on software and includes software locks.[58] For instance, when something breaks on a tractor, a sensor might indicate there is a problem and can put the tractor into limp mode where there is only sufficient power to move the tractor, but not to do work.[59] There is software that tells technicians what the problem is and acts as a "key" to the digital lock to turn off limp mode once the repair is made. If the software isn't available, it can be hard to determine what repair is needed and even if that repair is made, the lock can't be turned off.[60] Farmers can either bring their equipment to an authorized repair provider or have a technician come to them. Some farmers have resorted to

using pirated software to fix their equipment.[61] Recently, John Deere has come to an understanding with the National Farm Bureau to improve independent repair access, but the response leaves gaps.[62]

### Appliances

Insufficient access to repair materials for independent repair shops is well documented. In 2023, U.S PIRG and iFixit conducted a survey to better understand access to repair manuals and schematics for major appliance brands. Out of 50 appliance companies, 86% did not provide repair service manuals to individuals seeking them.[63] Independent professionals also experience poor access to service manuals with 89.1% of surveyed technicians reporting insufficient access and 92.5% struggling to find necessary schematics.[64] The manuals and schematics independent repair providers do find are often through informal sources which can be out of date.[65]

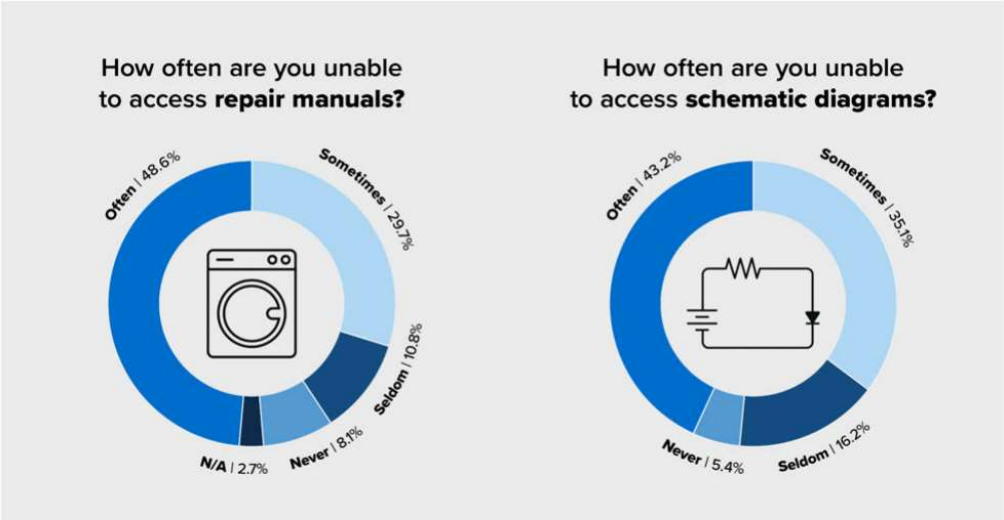



*Diagram by iFixit| CC-BY-4.0*

# Alaska is an authorized repair desert

This survey aims to provide an assessment of the challenges faced by Alaskans in accessing authorized repair services for their electronics. A selection of major phone, computer, appliance and equipment manufacturers were considered.

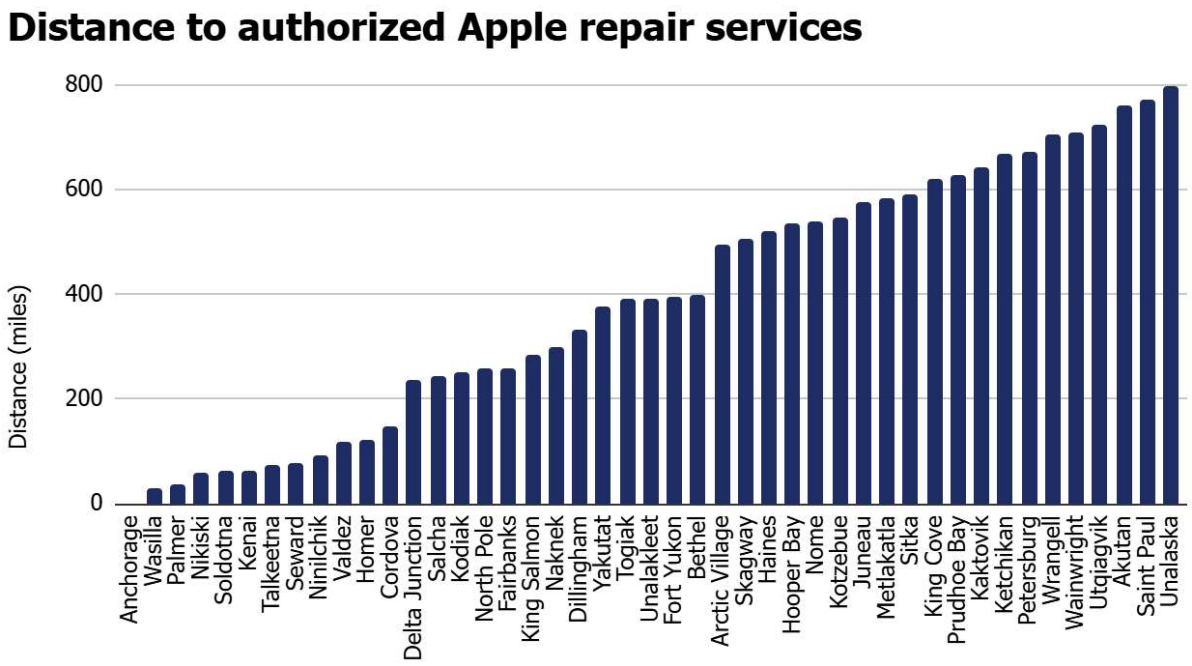
- The only authorized repair service for Apple products, LG appliances, and Samsung appliances in the state is in Anchorage.[66]

- Deere has service in Fairbanks, Wasilla, Anchorage, and Soldotna, but no options off of the railbelt.[67]
- There are no authorized service providers for Samsung phones or Lenovo computers in Alaska.[68]

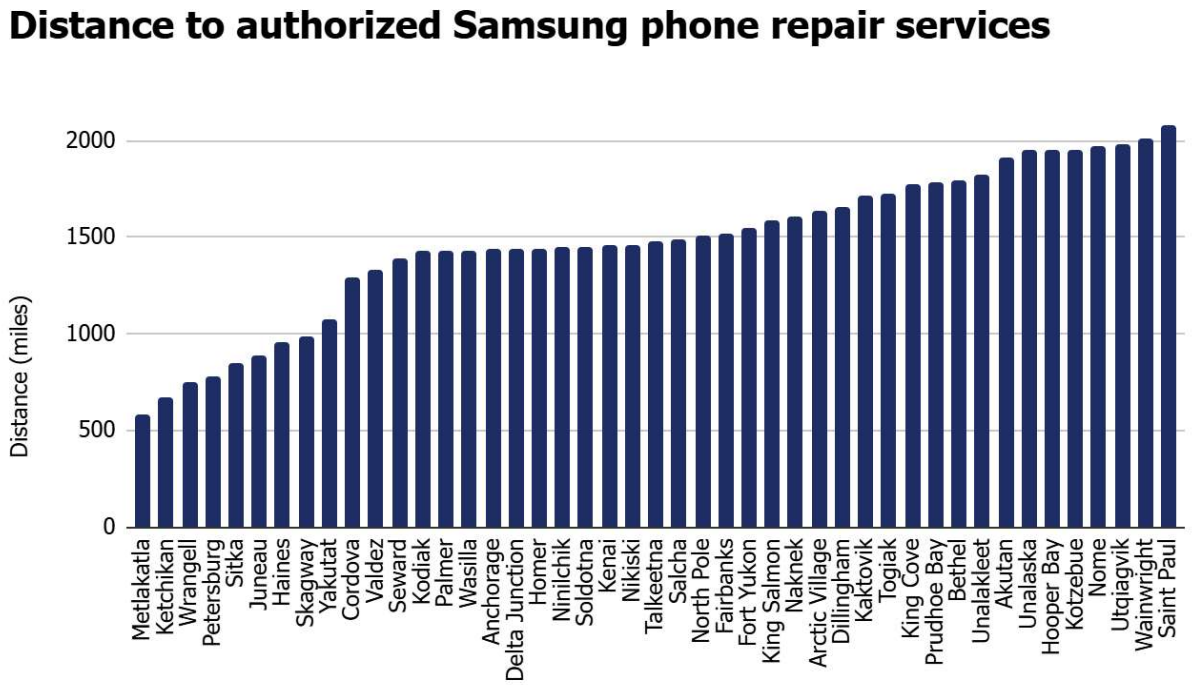
Even the largest population center in the state has limited options, and much of the state has no easily accessible authorized repair options.[69] If no authorized repair is available locally, there are three options.

1. Smaller items can be shipped to an authorized repair provider.
2. Alternatively, an authorized technician can be sent to the device- this is common for larger devices like appliances or tractors.
3. The third option is replacement or doing without.

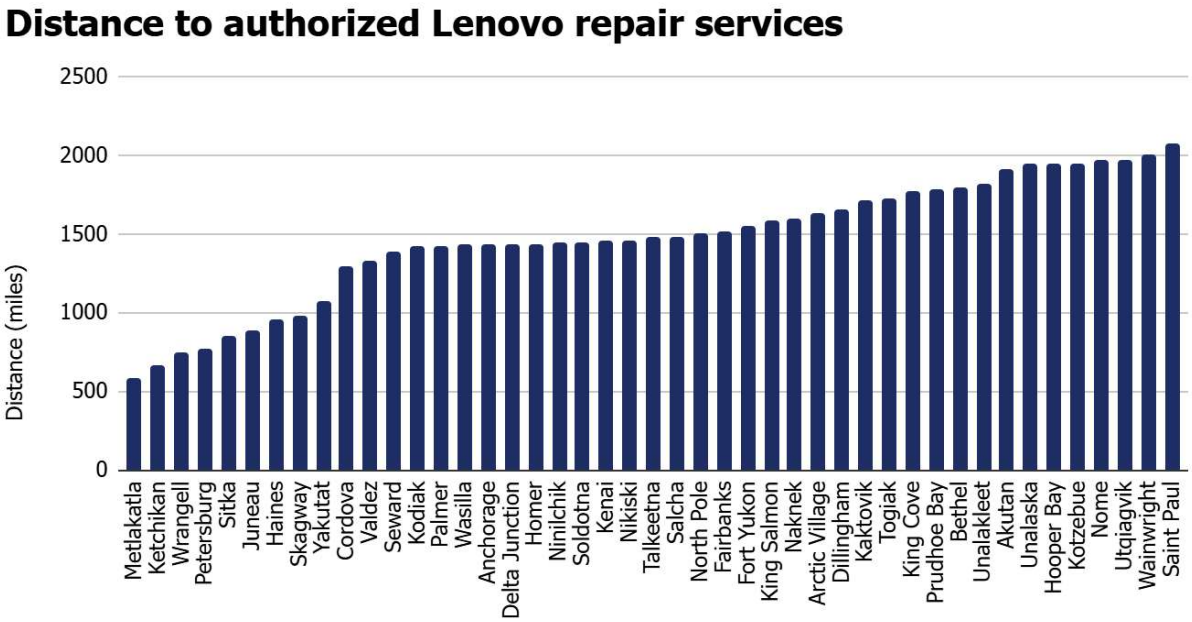
Shipping or sending in an authorized repair technician to a remote location can be expensive and time consuming, especially in Alaska.[70] For example, the United States Postal Service includes Alaska in its 16 day service standard for packages.[71] More rapid transport will cost significantly more.[72]



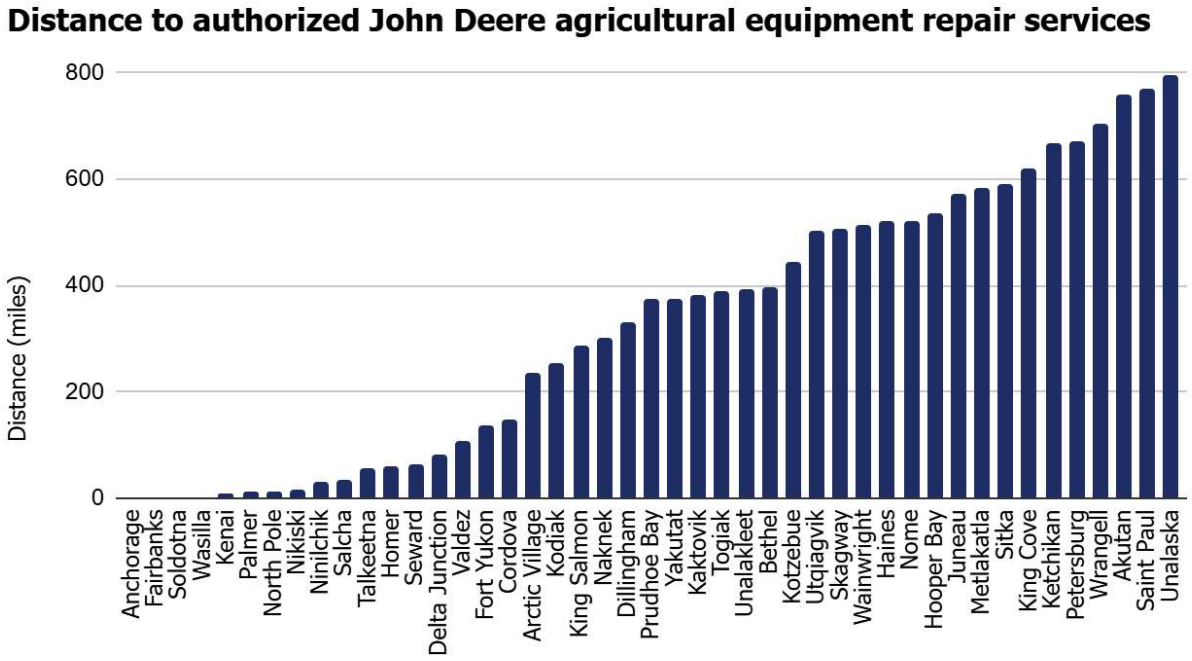

More than a third of Alaskans (including all residents of Fairbanks and Juneau) live more than 100 miles from an authorized repairer of Apple products.[73,74]



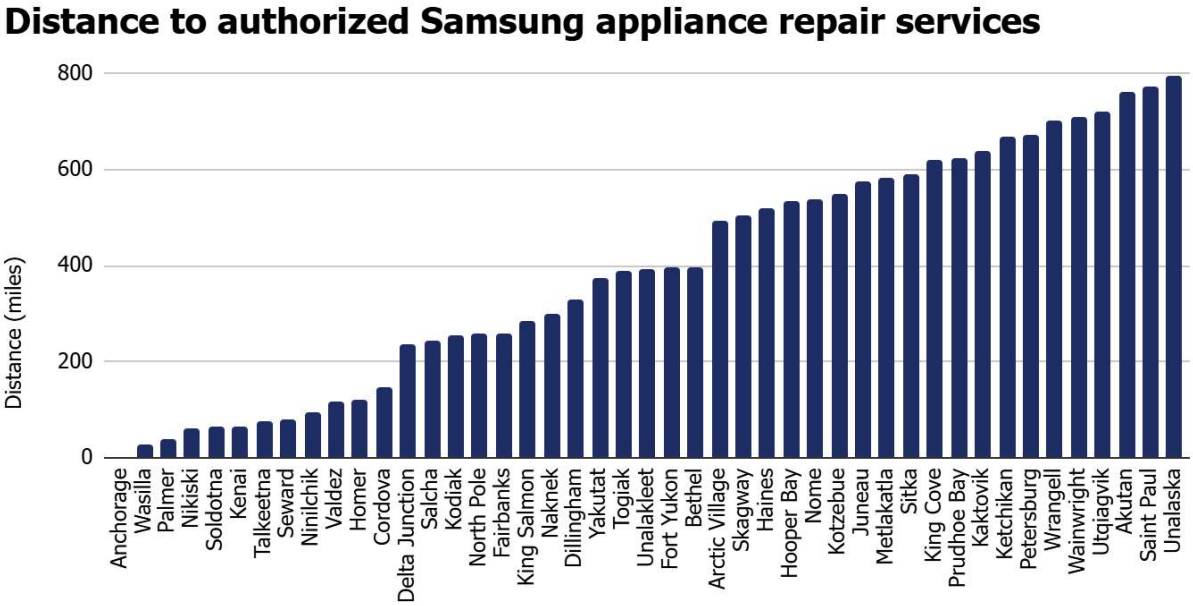

100% of Alaskans live more than 500 miles from an authorized repair provider for Samsung phones. The closest option in the U.S with a major airport is in Seattle.[75]



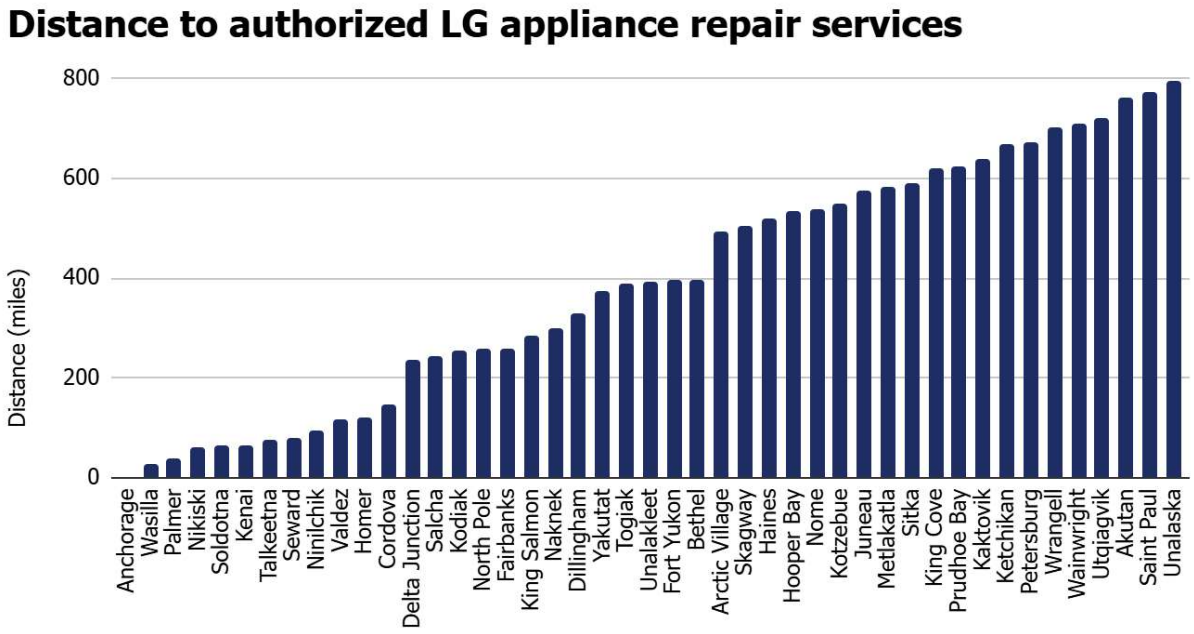

100% of Alaskans live more than 500 miles from an authorized service provider for Lenovo computers. The closest option in the U.S with a major airport is in Seattle.[76]



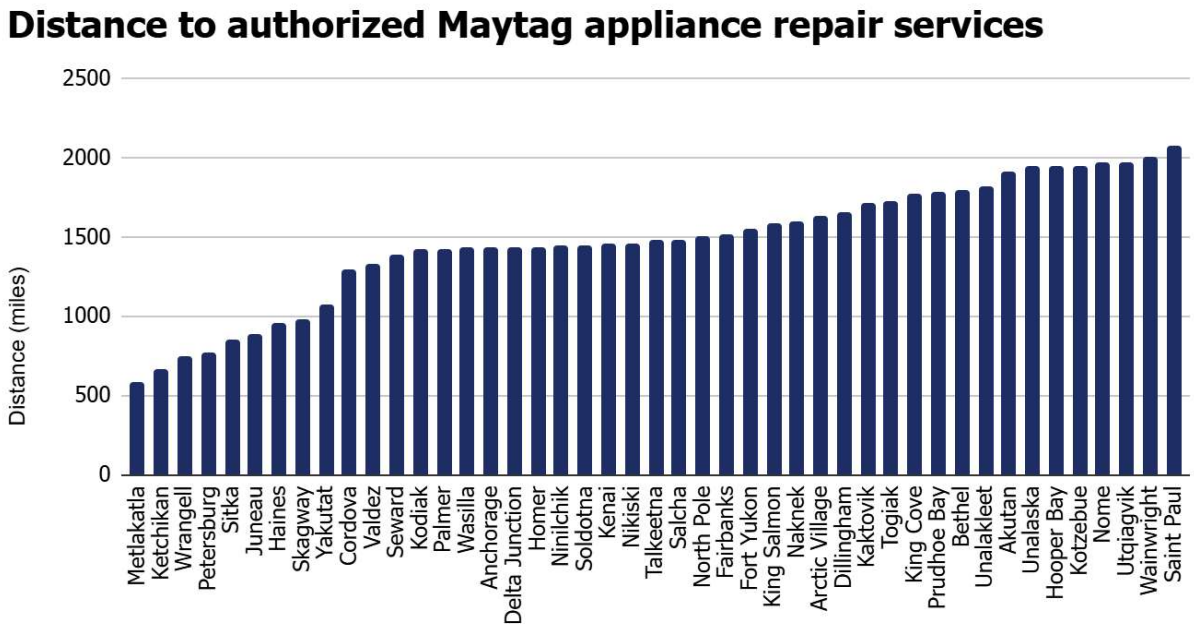

Almost a quarter of Alaskans live more than 100 miles from an authorized Deere service provider.[77]




More than a third of Alaskans live more than 100 miles from an authorized repairer of Samsung appliances.[78]




More than a third of Alaskans live more than 100 miles from an authorized repairer of LG appliances.[79]




100% of Alaskans live more than 500 miles from an authorized Maytag service provider. The closest option in the U.S with a major airport is in Seattle.[80]

# Methodology:

The following methodology outlines the steps taken to gather and analyze data:

1. **Service Locator Tools** Service locator tools on the official websites of five major brands—Samsung, Apple, Lenovo, LG, and John Deere —were used to identify authorized repair locations.[81] These tools provided the locations of businesses with official authorized repair for each brand for selected products within Alaska and the contiguous United States.[82] Maytag's service locator was linked to specific products, so the closest authorized repair service location was confirmed via their website chat function.[83]
    - These brands were chosen as a sample of some of the most popular manufacturers of cell phones, computers, appliances, and agricultural equipment.
2. **Distance Calculation:** Distances from various communities in Alaska to authorized repair centers were calculated as follows:
    - **Road-Accessible Locations**: For communities connected by the year-round road system, the distance to the nearest authorized repair center was calculated "as the crow flies," measuring the straight-line distance using gps-coordinates.net.
    - **Off-Road System Locations**: For communities not connected by the year-round road system, distances were calculated using gps-coordinates.net to the nearest major city with a large regional airport—either Anchorage, Fairbanks, or Seattle. This adjustment reflects the practical travel logistics, as technicians or residents would typically fly through these hubs, even if other cities such as Soldotna or Wasilla were geographically closer.
3. **Out-of-State Repair Centers** If no authorized repair centers were identified within Alaska for a given brand, distances were calculated to the nearest U.S. repair center with proximity to a major airport. The closest major airport used as a reference point was Seattle-Tacoma International Airport (SEA) in Washington State.
4. **Community Selection** A representative sample of Alaskan communities was chosen for this analysis, encompassing both road-accessible and off-road system locations in each major region of the state. This ensures a comprehensive understanding of repair accessibility across the state.
5. **Data Limitations**
    - The analysis assumes that repair technicians would utilize major regional airports for travel to off-road system locations and that items being mailed would also go through a major transportation hub.

- The calculated distances are straight-line measurements and do not account for actual travel routes or modes of transportation, which could significantly impact real-world accessibility.
- Availability of service locator tools and their accuracy depend on the respective brands' online databases, which may not reflect the most current information, and could include errors.

This methodology aims to provide a clear and accurate assessment of the challenges faced by Alaskans in accessing authorized repair services for their electronics.

# Recommendations:

## Pass Right to Repair Legislation

Comprehensive independent repair options are key to ensuring Alaskans have consistent affordable access to important electronic devices and to reduce e-waste pollution and the associated public health and environmental consequences. The Alaska legislature should pass legislation that requires manufacturers of electronics to make the spare parts, tools, and schematics necessary to repair available at a fair and reasonable cost to individuals and independent repair businesses.

## Support Local Repair Businesses

Local policies and individuals should support their local repair businesses. Access to repair options has compromised the culture of repair, and encouraged folks to develop habits of buying new. When individuals and local policies support local repair shops, they can thrive, provide additional local community resiliency, and keep resources within the community.

## Form Repair Clinics

Repair clinics are local events where folks with some basic repair skills volunteer as coaches to help individuals fix things that have broken. Repair clinics are especially effective when some communal tools can be provided. This promotes sustainability, local resiliency, STEM skills, helps families save money, and reduces waste of all kinds.

## Include Basic Electronics Repair in School Curriculums

Including basic electronics repair skills in shop classes or science curriculum is practical, educational, and can help ensure more communities have local repair options whether that be individual repair, local repair businesses or repair clinics.

## Encourage Companies to Design Products to Last

Not all products are designed to be repairable even when tools, parts, and information are available. Batteries can be glued in, delicate plastic pieces can be irreplaceable, and software support can end. Companies should be encouraged to design products to last longer and to be made with repair in mind, such as by including a label on a product with how repairable it is. Such repair scores are already available in Europe for many products.

# Notes


1. Statista, *Consumer Electronics- Worldwide*, (fact sheet), accessed 07 January 2025, archived at https://web.archive.org/web/20250107205314/https://www.statista.com/outlook/cmo/consumer-electronics/worldwide#volume

2. World Health Organization, *Electronic Waste (e-waste)*, (fact sheet), 01 October 2024.

3. Green Star of Interior Alaska, *Rural Backhaul Program*, accessed 07 January 2025.

4. Global E-Waste Statistics Partnership (GESP), United States of America, 2022.
5. See 3.
6. GPS Coordinates, https://www.gps-coordinates.net/, accessed November 2024.
7. Apple, *Find Authorized Repair and Service Locations*, accessed November 2024.
8. Lenovo, *Find a Lenovo Service Provider*, accessed November 2024.
9. Samsung, *Find a Samsung Service Center Near Me*, accessed November 2024.
10. LG, Find Service Center, accessed November 2024.
11. John Deere, *Find a Dealer Near You*, accessed November 2024.
12. Maytag, Repair or Replace, accessed November 2024.
13. FreightRun, *Freight Shipping to Alaska*, accessed January 2025.
14. United States Postal Service, Service Standards Map, accessed November 2024.

15. Mostafa Sabbaghi, Willie Cade, et al., *Resources, Conservation and Recycling,* The Current Status of the Consumer Electronics Repair Industry in the U.S.: A Survey-Based Study, Volume (116), 137-151, DOI: https://doi.org/10.1016/j.resconrec.2016.09.013, January 2017.
16. Jason Koebler, Vice, *Tractor-Hacking Farmers Are Leading a Revolt Against Big Tech's Repair Monopolies*, 14 February 2018.

17. Kevin O'Reilly, U.S. PIRG Education Fund, *Service Obstructor: John Deere Software Restricts Farmer Repair*, 18 July 2023.

18. Nathan Proctor, Elizabeth Chamberlain, and Beatriz Pozo Arcos, U.S. PIRG Education Fund and iFixit, *Investigation of Barriers to Appliance Service Information Access*, 31 January 2023.
19. Apple, *iPhone Repair and Service*, accessed 15 November 2024.
20. See 1.
21. Pew Research Center, *Mobile Fact Sheet*, 13 November 2024.

22. United States Census Bureau, *Computer and Internet Use in the United States: 2021*, (press release), 18 June 2024.
23. United States Energy Information Administration, *Highlights for Appliances in U.S. Homes by State, 2020*, (data release), March 2023.
24. United States Energy Information Administration, *Use of Energy Explained: Energy Use in Homes*, 18 December, 2023.
25. See 23.
26. Statista, *Small Appliances Worldwide, (factsheet),* May 2024.
27. Nathan Proctor, U.S PIRG Education Fund, *Repair Saves Families Big*, April 2023.
28. United States Census Bureau, *Quickfacts Alaska*, accessed January 2025.
29. Kaitlin Mattos and Tatiana Blanco-Quiroga, University of Colorado and the Alaska Native Tribal Health Consortium, *Water Infrastructure Brief Opportunities and challenges for washeterias in unpiped Alaska communities*, August 2020.
30. See 29.
31. Jenna Kunze, Anchorage Daily News, *Satellite internet has disrupted the market in Alaska — and transformed everyday life for many*, 22 August 2024.
32. Nina Kravinsky, National Public Radio, *In rural Alaska, federal money aims to transform internet access*, 06 December 2022.
33. See 2.
34. See 4.

35. Ankit, Lala Saha, et al., Electronic waste and their leachates impact on human health and environment: Global ecological threat and management, *Environmental Technology & Innovation*, Volume 24: https://doi.org/10.1016/j.eti.2021.102049, November 2021.
36. See 35.
37. See 35.
38. See 3.
39. Backhaul Alaska, *Overview*, accessed 01 January 2025, archived at: https://web.archive.org/web/20250107222944/https://backhaulalaska.org/overview/
40. See 39.
41. See 39.
42. Environmental Financial Advisory Board, *Revenue Options for a Waste Backhaul Service Program in Rural Alaska*, April 2019.
43. See 42.
44. United Nations Institute for Training and Research, *Global e-Waste Monitor 2024: Electronic Waste Rising Five Times Faster than Documented E-waste Recycling*, 20 March 2024.
45. Aurelio Bifulco, et al., Recycling of flame retardant polymers: Current technologies and future perspectives, *Journal of Materials Science & Technology,* Volume 199, 156-183: https://doi.org/10.1016/j.jmst.2024.02.039, November 2024.
46. See 45.
47. Abigail Ng, CNBC, Smartphone Users are Waiting Longer before Upgrading- Here's Why, 16 May 2019.
48. ERI, *How Often Do We Upgrade Our E-Devices*, 10 September 2015.
49. This Old House, How Long Do Appliances and Parts of your Home Last?, 15 October 2024.
50. Bill Wheelhouse, National Public Radio, *Why Farmers Buy New Equipment Frequently*, 27 September 2013.
51. Nathan Proctor, U.S PIRG Education Fund, Repair Saves Families Big, 2023.
52. See 19.
53. See 19
54. See 19.
55. See 15.
56. See 16.
57. See 16.
58. See 16.
59. Kevin O'Reilly, U.S PIRG Education Fund, *Why Farmers Need Right to Repair*, February 2022.
60. Kevin O'Reilly, U.S PIRG Education Fund, Deere in the Headlights, February 2021.

61. See 16.
62. See 17.
63. See 18.
64. See 18.
65. See 18.
66. See 7, 9, and 10.
67. See 11.
68. See 8 and 9.
69. See 7, 8, 9, 10, 11, and 12
70. See 13 and 14.
71. See 14.
72. See 14.
73. Alaska Department of Labor and Workforce Development, *Alaska Population Overview: Alaska Boroughs and Census Areas*, 2019.
74. See 6 and 7.
75. See 6, 9, and 73.
76. See 6, 8, and 73.
77. See 6, 11, and 73.
78. See 6, 9, and 73.
79. See 6, 10, and 73.
80. See 6, and 12.
81. See 7, 8, 9, 10, and 11.
82. See 7, 8, 9, 10, and 11.
83. See 12.