Charging the Future

The Role of Retail in Our EV Transition

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Contents

Executive Summary

Around a third of Americans say they would be interested in buying an electric vehicle (EV) if they were to get a vehicle today, but this growing interest in clean transportation is dampened by our nation's lack of progress in building out EV charging infrastructure. In fact, charging logistics is the attribute Americans most commonly select as preventing them from getting an EV if they were to get a vehicle today—and among those people, the scarcity of public charging stations is the most common specific charging consideration holding them back.[1] Less than a tenth of the estimated 1.25 million public chargers needed to meet the demand for electric vehicle infrastructure by 2030 have been built, according to recent federal data.[2]

There is a key player being overlooked in the effort to build out our EV charging infrastructure: retail stores. Retail stores make excellent candidates for the placement of EV chargers. Their brick-and-mortar facilities have parking lots located near highways and convenient points of interest in communities across the country. And they have a self-interested reason to install EV chargers: Following the installation of a nearby fast charger, retailers see an increase in both foot traffic (an average of 4 percent) and revenue (5 percent) as consumers shop and run errands while they charge their vehicle.[3]

Further financial incentives are available through the federal Bipartisan Infrastructure Law, which authorized $7.5 billion to build out a national EV charging network, and the Inflation Reduction Act, which provides tax credits of up to 30 percent of the cost of installing EV chargers (up to $100,000 per charger) for qualifying retail store locations.

This report, based on CR's first-of-its-kind investigation, examined which retailers are leading and which are lagging when it comes to EV charging. The findings are bleak: **Only about 1 percent of the 270,000 retail locations controlled by the 75 retail and fast-food companies we reviewed offer any EV charging.** Big box retailers have the highest proportion of store locations with charging infrastructure, but it's still very low. On average, EV charging is available at 1 out of every 14 big box store locations; 1 out of every 15 grocery stores; and 1 out of every 40 department stores.

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[1] "Battery Electric Vehicles and Low Carbon Fuel," Consumer Reports nationally representative survey of 9,030 U.S. adults (2023), https://article.images.consumerreports.org/image/upload/v1701451301/prod/content/dam/surveys/Consumer_Reports_BEV_LCF_National_June_July_2023.pdf.

[2] Depending upon speed of charger hardware. See: Eric Wood et al., "The 2030 National Charging Network: Estimating U.S. Light-Duty Demand for Electric Vehicle Charging Infrastructure," *National Renewable Energy Laboratory*, June 2023, https://www.nrel.gov/docs/fy23osti/85654.pdf.

[3] Yash Babar and Gordon Burtch, "Recharging Retail: Estimating Consumer Demand Spillovers from Electric Vehicle Charging Stations," *Boston University Questrom School of Business Research Paper No. 4235748*, September 20, 2023, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4235748#.

All other retail sectors trail these numbers by a wide margin. In short, **these results show that there is no retail category where a driver can be confident that an EV charger will be available.**

This study's additional notable findings include the following:

- Only one retailer, Ikea, offers EV charging at nearly 100 percent of its U.S. locations.
- Among big box retailers, including Target and Walmart, no company except Ikea currently offers EV charging at more than 10 percent of its locations.
- In the grocery sector, Amazon and some regional supermarkets including Big Y, Hy-Vee, Meijer, and Raley's offer EV charging at over 10 percent of their locations. Trader Joe's and Aldi are lagging behind, with a mere 10 locations in total.
- Wawa and Sheetz are leading the convenience store category with more than 10 percent of locations providing EV charging. Larger chains like 7-Eleven and Circle K claim they are developing internal charging networks, but neither currently provides charging at more than 1 percent of store locations.
- While Kohl's has made significant EV infrastructure investments in its department stores, Ross, Dillard's, JCPenney, and TJX Co. combined have installed charging at fewer than 10 locations.
- The drugstore category shows a split between Walgreens and CVS. While Walgreens is making progress, CVS has made no public statements regarding whether it will expand EV charging beyond its current offering at fewer than 10 store locations.
- Discount stores like Dollar General, Dollar Tree, and Five Below have effectively made no investments in EV charging despite the critical role these companies, with their nearly 40,000 store locations, could play in improving access to rural and under-resourced communities.
- No leading fast-food company reviewed by CR has made significant progress. No company offers EV charging at more than 1 percent of store locations.

CR is urging retailers to do the following:

- Commit to—and follow through on—clear, specific timelines for the installation of EV charging equipment.
- Prioritize equity considerations when weighing site locations.
- Educate customers and employees about EV charging.
- Be transparent with charging locations and amenities.
- Ensure that chargers are properly maintained.

Introduction: Toward a Healthy EV Charging Ecosystem

Growing demand for electric vehicles (EVs) gives retailers a unique opportunity to attract new customers while providing a vital service to the communities in which they operate. Consumers are increasingly interested in purchasing an EV, but a recent nationally representative Consumer Reports (CR) survey of Americans finds that, among those who said anything was holding them back, charger logistics is the single most commonly selected barrier.[4] Retail parking lots, with familiar, convenient locations across the U.S., offer a solution and represent a key component to building consumer confidence in EVs.[5]

America's charging challenge should not be underestimated. Out of the 1.25 million public chargers that experts expect will be needed by 2030, the U.S. has just over 109,000 built out—less than 9 percent of the infrastructure needed.[6] A recent report in the journal Energy Economics shows that about half of current public EV chargers are located within 350 feet of a retail outlet.[7]

Modeling by the federal government suggests retailers should account for 16.68 percent of public charging by 2030, under a baseline scenario that assumes the continuation of current EV adoption rates.[8] This would require retailers to install 208,000 public chargers by 2030, including roughly 178,000 slower Level 2 chargers (which deliver an 80 percent charge in 3 to 10 hours) and 30,000 fast chargers (which deliver an 80 percent charge in 20 to 60 minutes). If government modeling is in line with the findings of the aforementioned report, retailers will need to more than triple the number of EV chargers installed within the next six years.

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[4] "Battery Electric Vehicles and Low Carbon Fuel," Consumer Reports nationally representative survey of 9,030 U.S. adults (2023), https://article.images.consumerreports.org/image/upload/v1701451301/prod/content/dam/surveys/Consumer_Reports_BEV_LCF_National_June_July_2023.pdf.

[5] Wood et al., "The 2030 National Charging Network: Estimating U.S. Light-Duty Demand for Electric Vehicle Charging Infrastructure," *National Renewable Energy Laboratory*, June 2023, https://www.nrel.gov/docs/fy23osti/85654.pdf.

[6] Abby Brown et al., "Electric Vehicle Charging Infrastructure Trends from the Alternative Fueling Station Locator: Second Quarter 2023," *National Renewable Energy Laboratory*, October 2023, https://afdc.energy.gov/files/u/publication/electric_vehicle_charging_infrastructure_trends_second_quarter_2023.pdf.

[7] Marie-Louise Arlt and Nicolas Astier, "Do Retail Businesses Have Efficient Incentives to Invest in Public Charging Stations for Electric Vehicles?," *Energy Economics*, 2023, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4291679. Arlt and Astier's report offers a broader view of the retail market by including chargers that are located in large shopping complexes and not necessarily convenient for retail customers; CR's review focused on chargers installed in retail store parking lots.

[8] Wood et al., "The 2030 National Charging Network: Estimating U.S. Light-Duty Demand for Electric Vehicle Charging Infrastructure," *National Renewable Energy Laboratory*, June 2023, https://www.nrel.gov/docs/fy23osti/85654.pdf.

CR's review identified the state of retail charging among leading regional and national companies and sectors. Although we do not purport to have captured the entire retail universe,[9] it is evident that there is significant need for further investment. Fortunately, the business case for adding chargers is strong, and assistance is increasingly available as federal incentives ramp up.

EV Charging Is Good for Business

Retailers have strong economic incentives to install EV chargers. A policy brief by Atlas Public Policy and the Retail Industry Leaders Association found that hosting an EV charging station "offers a range of potential benefits for retailers, including direct revenue from charging station use, increased sales, and improved corporate branding."[10] An analyst at energy consulting firm Wood Mackenzie more recently gushed that, "there is so much opportunity in the brick-and-mortar segment" because of its "synergies with EV charging."[11]

Indeed, one charging network found that customer "dwell time" (the amount of time that a shopper spends in a store) increased by an average of 50 minutes, with an average spend of $1 per minute, following the installation of Level 2 EV charging equipment at a major retailer.[12] A different network found that 89 percent of EV drivers make a retail purchase while charging.[13] And according to a recent paper from Boston University and University of Wisconsin-Madison researchers, locating a Tesla Supercharger near a retailer increases monthly visits by 4 percent on average, and grows revenue by 5 percent.[14]

These economic benefits have the potential to defray even substantial installation and purchase costs of between $4,400 to $10,600 per port for slower Level 2 chargers, and between $112,200 and $285,300 per fast charger port.[15]

[9] See Methodology section, alongside disclaimer.
[10] Charles Satterfield and Nick Nigro, "Public EV Charging Business Models for Retail Site Hosts," *Atlas Public Policy*, April 2020, https://atlaspolicy.com/wp-content/uploads/2020/04/Public-EV-Charging-Business-Models-for-Retail-Site-Hosts.pdf.
[11] Anne Fischer, "Electric vehicle charging stations to quadruple in U.S. by 2027," *PV Magazine*, June 28, 2023, https://pv-magazine-usa.com/2023/06/28/electric-vehicle-charging-stations-to-quadruple-in-u-s-by-2027/
[12] "Leading Retailer Partners with ChargePoint to Attract and Retain Loyal Customers," *Chargepoint,* 2015, https://www.chargepoint.com/files/casestudies/cs-retail.pdf.
[13] "Retail Charging Solutions," *Blink,* last modified 2023, https://blinkcharging.com/businesses/industries/retail/.
[14] Babar and Burtch, "Recharging Retail: Estimating Consumer Demand Spillovers from Electric Vehicle Charging Stations," *Boston University Questrom School of Business Research Paper No. 4235748*, September 20, 2023, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4235748#.
[15] Depending upon speed of charger hardware. See: Wood et al., "The 2030 National Charging Network: Estimating U.S. Light-Duty Demand for Electric Vehicle Charging Infrastructure," *National Renewable Energy Laboratory*, June 2023, https://www.nrel.gov/docs/fy23osti/85654.pdf.

While groups like Plug In America and the EV Charging for All Coalition are doing important work to make EV charging a requirement of new construction,[16] implementing U.S. transportation electrification goals will also require retrofitting existing buildings. Retail locations represent an ideal opportunity for existing site redevelopment. Parking lots provide retailers with a competitive advantage as a site for deploying photovoltaic solar canopies over parking spaces, further defraying costs and burnishing environmental credentials. Research finds that covering roughly 15 to 18 percent of a typical Walmart parking lot with solar could provide enough electricity for about 100 EV ports.[17]

Retailers are using a range of economic models for the installation of charging stations. Some are partnering with charging networks, utilities, or local governments as site hosts, while others—including Walmart, Circle K, and 7-Eleven—are working to build out their own internal charging networks.[18]

Installing charging stations in retail parking lots enables businesses to match vehicle charging time with the natural dwell time for a particular retailer, a concept called "right-speeding."[19] For example, grocery stores and fast-food businesses with shorter dwell times will want to focus on fast charging, while department stores may be better served by investing in slower Level 2 charging stations.

Retailers have explored a range of pricing strategies as well. Some offer EV charging as a free amenity, while others have used it to generate revenue, either by placing a charging station in a fee-based parking garage or other gated area, or by charging by the kilowatt-hour for the electricity delivered. Some retail locations use a tiered approach, with free charging for an initial period of time (for example, 2 hours), followed by an hourly charge.

Given the range of secondary benefits, most retailers are not currently prioritizing direct revenue from the cost of charging, but instead using charging to "seek positive spillovers for their core

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[16] "Building Codes for Equitable, Ubiquitous EV Charging Infrastructure," *EV Charging for All,* last modified October 2023, https://pluginamerica.org/policy/ev-charging-for-all/.

[17] Swaraj Sanjay Deshmukh and Joshua M. Pearce, "Electric Vehicle Charging Potential From Retail Parking Lot Solar Photovoltaic Awnings," *Renewable Energy*, May 2021, https://www.sciencedirect.com/science/article/abs/pii/S0960148121000756.

[18] Kapadia, Vishal, "Leading the Charge: Walmart Announces Plan to Expand Electric Vehicle Charging Network," *Walmart,* April 6, 2023, https://corporate.walmart.com/news/2023/04/06/leading-the-charge-walmart-announces-plan-to-expand-electric-vehicle-charging-network; "7-Eleven, Inc. Launches New Electric Vehicle Charging Network, 7Charge," *PRNewswire,* March 16, 2023, https://www.prnewswire.com/news-releases/7-eleven-inc-launches-new-electric-vehicle-charging-network-7charge-301773614.html; "Couche-Tard Begins EV Charging Rollout, Eyes 200 Sites Across North America by 2024," *PRNewswire,* May 20, 2022, https://www.prnewswire.com/news-releases/couche-tard-begins-us-ev-charging-rollout-eyes-200-sites-across-north-america-by-2024-301551972.html.

[19] Wood et al., "The 2030 National Charging Network: Estimating U.S. Light-Duty Demand for Electric Vehicle Charging Infrastructure," *National Renewable Energy Laboratory*, June 2023, https://www.nrel.gov/docs/fy23osti/85654.pdf.

business" through increased traffic.[20] To the extent that retailers offer EV charging as a loss leader, it serves multiple bottom lines, attracting new customers while providing an important social good.

Federal Funds Are Flowing

The 2021 Bipartisan Infrastructure Law authorized $7.5 billion in federal spending on EV charging infrastructure. Much of this funding will ultimately be available for retailers to install EV charging, through two component programs: Under the National Electric Vehicle Infrastructure Formula Program, $5 billion will be awarded to states, which will then award competitive grants to install EV chargers; and under the Charging and Fueling Infrastructure Grant Program, the federal government will directly award $2.5 billion in funding for states and localities to develop chargers along travel corridors and in local communities. The 2022 Inflation Reduction Act also extended the Alternative Fuel Vehicle Refueling Property Credit, otherwise known as 30C, through 2032. This tax credit can cover up to 30 percent of the cost of installing EV chargers—up to $100,000 per charger installed for a qualifying retail store location. The tax credit is limited to charger installations in specific census tracts which are identified as non-urban or low-income. The eligible census tracts cover locations where approximately two-thirds of Americans live.

Additional resources are available from nongovernmental organizations and private businesses. Groups like the National League of Cities have published a state-by-state guide to funding programs.[21] Organizations like Forth facilitate grant applications to develop chargers.[22] And for-profit companies like Enel X Way have introduced financing and other programs for EV charging site hosts.[23]

With robust economic incentives and federal money flowing, retailers that take advantage of this opportunity now will be best positioned to reap the benefits into the future.

Retailers Can Own the Solution

In addition to the benefits to a retailer's core business, installing public chargers sends an encouraging message to prospective EV drivers.

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[20] Arlt and Astier, "Do retail businesses have efficient incentives," *Energy Economics*, 2023, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4291679.
[21] Kyle Funk and Kelly Aves, "Finding Funding for EV Charging: A State Comparison," *National League of Cities,* October 14, 2022, https://www.nlc.org/article/2022/10/14/finding-funding-for-ev-charging-a-state-comparison/.
[22] "Federal Grant Support," *Forth,* last modified 2023, https://forthmobility.org/Federal-Grant-Support.
[23] "Enel X Way Plans to Add 2M+ EV Charging Ports in North America Across Home, Commercial and Public Charging Segments by 2030," *Enel X Way*, April 2023, https://www.enelxway.com/us/en/resources/releases/enelxway-plans-to-add-over-2m-charging-ports-in-north-america.

In late 2022, CR surveyed nearly 1,000 EV owners about their experiences, including asking what concerns they had before getting an EV and what problems they had actually encountered after owning one. Four in 10 (42 percent) cited charging logistics as a pre-purchase concern, second only to range anxiety. And charging logistics ultimately proved to be the most common actual issue after getting an EV as well. (See the chart below.) In addition, nearly a quarter of EV owners reported being "somewhat" or "very" dissatisfied with the current convenience of charging.[24]

Among 140 Community Reporters—the community research wing of Consumer Reports—who submitted an informal survey of charger availability along frequent trips within their community, 70 percent (98) had access to fewer than 10 public chargers for an average 17.8-mile trip, while 12.9 percent (18) had no charger access at all.

In addition to their access concerns, consumers are frustrated with the functionality of public charging stations. A 2023 report from J.D. Power found that 20.8 percent of EV drivers using public chargers experienced charging failures or equipment malfunctions.[25] A recent study of chargers in San Francisco found that nearly a quarter had "unresponsive or unavailable screens, payment system failures, charge initiation failures, network failures, or broken connectors."[26] A burgeoning genre of national newspaper articles features jaunty first-person accounts of EV road trips plagued by faulty charging equipment.[27]

Retailers that provide widespread charging availability at their store locations, associate their brand with charging, and focus on ensuring a reliable charging experience have an opportunity to own the solution to the national charging challenge.

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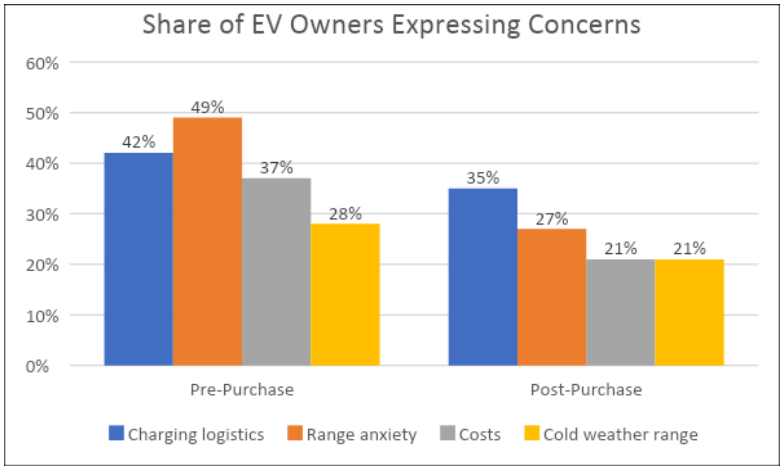
[24] "Electric Vehicle Owners," Consumer Reports nationally representative survey of 943 respondents (February 2023), https://article.images.consumerreports.org/image/upload/v1679253682/prod/content/dam/surveys/Consumer_Reports_EV_Owners_October_November_2022.pdf.

[25] "EV Leasing Volumes Poised to Surge as Tax Rule Makes It Cheaper to Lease than Buy," *J.D. Power*, May 25, 2023, https://www.jdpower.com/business/resources/ev-leasing-volumes-poised-surge-tax-rule-makes-it-cheaper-lease-buy.

[26] David Ferris, "Why America's EV Chargers Keep Breaking," *Politico*, April 12, 2023, https://www.politico.com/news/2023/04/12/america-ev-chargers-keep-breaking-heres-why-00089181; Rempel et al., "Reliability of Open Public Electric Vehicle Direct Current Fast Chargers," November 30, 2023, https://journals.sagepub.com/doi/abs/10.1177/00187208231215242.

[27] See, e.g., Christopher Mims, "Ultralong-Range Electric Cars Are Arriving. Say Goodbye to Charging Stops," *Wall Street Journal*, June 2, 2023, https://www.wsj.com/articles/ultralong-range-electric-cars-are-arriving-say-goodbye-to-charging-stops-a5cf4390; Russ Mitchell, "California's EV Charging Network Could Use a Jolt, a Trip Down I-5 Shows," *Los Angeles Times*, September 22, 2022, https://www.latimes.com/environment/newsletter/2022-09-22/boiling-point-californias-ev-charging-network-could-use-a-jolt-a-trip-down-i-5-shows-boiling-point.



Source: Consumer Reports (2022)[28]

Retailers also have an opportunity to ensure that public access to charging is equitable across diverse U.S. communities. The strong correlation in the U.S. between homeownership and race (as well as homeownership and class) underlines the issue. Americans across different racial/ethnic groups were interested in getting electric vehicles, according to CR's 2023 nationally representative survey: a quarter or more of white, Black, Hispanic, and English-speaking Asian Americans would at least "seriously consider" getting an electric-only vehicle if they were to get a vehicle today.[29] Yet the same survey found that Black and Hispanic Americans are less likely to own a home and more likely to live in multifamily dwellings than white and English-speaking Asian Americans, which would limit their ability to charge where they live; they are also more likely to park on the street, for instance.[30] In addition, a tendency to cater to early adopters has led to more chargers in wealthier (and whiter) neighborhoods. In this context, retailers must focus not only on installing charging at more store locations but also on placing those charging stations at store locations in under-resourced communities that could benefit most from their installation.

[28] "Electric Vehicle Owners," Consumer Reports nationally representative survey of 943 respondents (February 2023), https://article.images.consumerreports.org/image/upload/v1679253682/prod/content/dam/surveys/Consumer_Reports_EV_Owners_October_November_2022.pdf; only top four responses displayed.

[29] "Battery Electric Vehicles and Low Carbon Fuel," Consumer Reports nationally representative survey of 9,030 U.S. adults (2023), https://article.images.consumerreports.org/image/upload/v1701451301/prod/content/dam/surveys/Consumer_Reports_BEV_LCF_National_June_July_2023.pdf.

[30] Ibid.

A Closer Look

Turning Obstacles Into Opportunities

While there are strong incentives for retail companies to invest in EV charging, the process is not without barriers. However, savvy businesses that plan ahead can turn these potential pitfalls into catalysts for growth and innovation. Here's how retailers can address some of the biggest challenges:

- Regional Demand for EV Charging
    - Some retailers may be concerned that demand is not yet strong enough to recoup the costs of investing in EV charging. While in certain regions these concerns may make sense in the short term, growth in EV adoption will continue to bring demand to new areas of the country, and companies that are first movers are likely to benefit the most. Retailers can turn this issue into an opportunity by educating communities where charging installations are planned about the benefits of EVs.
- Working With Landlords and Property Managers
    - Retailers that have stores located on leased property may find that their landlord is unwilling to allow the installation of an EV charging station. To address this, we encourage retailers to discuss with property owners the economic benefits, financial incentives, and community goodwill that EV charging brings—and consider joining with community members and other local retailers to make the case.
- Addressing the Cost of Installation and Maintenance
    - Evidence suggests that leading retailers have the potential to defray the cost of EV charging installations through the increased business such chargers attract. But if a go-it-alone approach is deemed too risky, companies should apply for federal incentive dollars, and can partner with charging networks or local utilities to address installation and maintenance costs.
- Competition From Utility Companies
    - Companies with stores in regions where utility companies are investing heavily in EV charging may be hesitant to invest themselves. But retailers can be the first movers in a region and compete effectively by taking advantage of federal incentive funds, or they can consider partnering with a local utility company on an installation or maintenance plan.
- Demand Charges from Utility Companies
    - Companies will want to find ways to work with their local utility, particularly if they are subject to "demand charges," a steep fee that EV charging-site hosts may incur during periods of elevated electricity demand. Perhaps the best way to skirt such fees, however, is to make stronger investments in green infrastructure such as solar installations and batteries that can be tapped during short-term demand surges.
- On-Site Grid Capacity and Physical Constraints
    - The process of installing an EV charger can be complex, with questions around whether the electric grid is able to support a planned charging station and the number of chargers best suited for any given retailer's parking lot. Companies

can avoid problems with proper planning. The Department of Transportation has a handy checklist that can assist retailers and other site hosts through project development, scoping, utility planning, installation, and operations.[31] As mentioned above, many technical challenges and limitations can be addressed on-site through further investment in renewable energy, such as solar power generation and battery backup.

- Government Permitting and Approval Process
    - While there is strong interest from local, state, and federal officials in providing EV charging access to their constituents, bureaucratic hurdles and red tape can slow down timely installation plans. Retailers should make sure to research all relevant regulations in an area where they plan to install charging, and be in contact with the appropriate officials. Partnering with state and local governments on federal EV charging grants can help retailers speed up and streamline the process.

CR plans to engage with retailers to address these and other barriers that may arise during the course of planning for and installing EV charging infrastructure. The organization will leverage its expertise to highlight funding opportunities, work with government officials, encourage public and private partnerships, improve the consumer charging experience, and spotlight strong and growing demand for EV charging at retail stores.

Key Findings

The Retail Universe

CR analyzed 75 leading national and regional retailers representing 165 consumer brands from salient retail categories, including big box, convenience, grocery, drugstores, department stores, discount stores, and others. These retailers account for more than 270,000 brick-and-mortar locations in the U.S.

Within this universe, no sector provides EV charging at more than 10 percent of possible locations. While it is evident that certain retailers are beginning to invest in EV charging, only one company reviewed, Ikea, has installed EV chargers at nearly all of its locations. Although a number of companies, including Target, Walgreens, and Albertsons, have installed more charging stations nationwide than Ikea has, their progress still represents a small fraction of their overall locations.

[31] "Electric Mobility Infrastructure Project Planning Checklist," *Department of Transportation,* https://www.transportation.gov/urban-e-mobility-toolkit/e-mobility-infrastructure-planning/project-planning-checklist#ProjDevandScope.

Retail Category (Number of Companies Included)	Retail Locations		Percentage of Retail Locations With EV Charging
	Total	With EV Charging	
Big Box (5)	8,062	589	**7.3%**
Convenience (11)	31,279	429	**1.4%**
Department (7)	8,555	216	**2.5%**
Dollar/Discount (4)	37,825	2	**0.0%**
Drug (3)	19,754	268	**1.4%**
Fast Food (12)	127,899	166	**0.1%**
Grocery (20)	14,584	990	**6.8%**
Other (13)	22,169	32	**0.1%**
Retail Total (75)	**270,127**	**2,692**	**0.99%**

A full category-by-category analysis of all 75 companies reviewed is available in Appendix 1.

Charging Ports and Connectors

The number of ports available at a given retail EV charging location obviously limits the number of vehicles that can charge at the same time. The majority of companies reviewed (50 of 75) provide between two and five ports per charging location. Increasing port density makes consumers more confident that they will not need to wait in line to charge. However, this may not be appropriate for companies with smaller parking lots. Still, 11 companies we reviewed have between six and 10 ports per site, and five have more than 10 ports per site.

More than half of all retail charging locations offer Level 2 charging. Among those that offer DC fast charging, just under one-third of stations offer the CHAdeMO connector (needed to charge only the Nissan Leaf), and just over one-third offer Combined Charging System (CCS) connectors, which is the most widely accepted standard. Slightly more than 1 in 5 offer Tesla's NACS connector.

Currently, many of Tesla's NACS connectors can be used only for charging Tesla vehicles, a limitation that would limit their contribution to widespread EV adoption. But in order to qualify for federal incentives under the 2021 Bipartisan Infrastructure Law, Tesla publicly committed to making a subset of its NACS connectors open to non-Tesla vehicles. (On the other hand, Tesla vehicles can be charged on CCS connectors using an adapter.)

Company Commitments

In addition to examining extant EV chargers at retail locations, CR reviewed commitments made by individual retailers regarding future EV charging infrastructure, consideration of equity issues when determining placement of EV chargers, and future engagement in broader climate goals. We attempted to contact all companies with a questionnaire to confirm or correct our findings.

EV Charging Commitments

Out of 75 companies reviewed, only 13 made public commitments on the installation of EV chargers.[32] By and large, companies that made these commitments are also those that have already made the most progress in installing EV chargers.

CR examined not only whether a company had made such a commitment but also whether that commitment specified a timeline for action and the exact number of charging locations to be installed by that date. Only four companies—Alimentation Couche-Tard (parent company of Circle K), H-E-B, Kohl's, and Northeast Grocery—made specific commitments of this kind. Texas grocery chain H-E-B, for instance, committed "to install chargers to an additional 40 stores by 2025," beyond the 21 locations where they are currently installed.[33] By contrast, although Walgreens has made an important commitment to install 1,000 DC fast chargers at "more than 500" U.S. Walgreens locations, more specificity is needed.[34] Likewise, Lowe's announced plans "to add customer EV charging stations at select stores in 2023," but the lack of detail makes the impact of such a commitment uncertain.[35]

While CR did not track whether companies had adhered to past commitments, we plan to include that information in future reporting.

Climate Goals

EV charging should be an important component of any company's climate-related goals, providing businesses a way to reduce both their own and their customers' greenhouse gas emissions. Our analysis indicates that 45 of the 75 companies reviewed have set some form of broader climate goals. Four companies—Apple, Dollar General, Lidl, and Ross—have climate goals but have not installed any public EV charging locations. Thirty companies surveyed appear to have neither climate goals nor plans to produce any.[36]

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[32] Those 13 companies are Ahold Delhaize USA, Alimentation Couche-Tard, BP, H-E-B, Ikea, Kohl's, Northeast Grocery, Starbucks, Target, Yum Brands, Lowe's, Walgreens Boots Alliance, and Walmart.

[33] "Electric Charging Stations," *H-E-B*, https://ourtexasourfuture.com/electric-charging-stations/.

[34] Bridget Goldschmidt, "Walgreens, Volta Expand EV Charging Partnership," *Progressive Grocer*, February 13, 2022, https://progressivegrocer.com/walgreens-volta-expand-ev-charging-partnership.

[35] "2022 Corporate Responsibility Report," *Lowe's*, 2023, https://corporate.lowes.com/sites/lowes-corp/files/2023-07/lowes-2022-crr.pdf.

[36] See this document for a list of companies with and without climate goals: http://advocacy.consumerreports.org/wp-content/uploads/2024/02/Climate-Goals-EV-Charging-Report.pdf.

Few Companies Address Equity

Research finds public charger access to be significantly lower in lower-income areas, and in areas with more Black and Hispanic residents.[37] CR queried whether companies made a commitment to equity in EV site placement, seeking a company statement focused on addressing both “charging deserts” and access in low-income communities. Given that so few retailers have acknowledged the importance of equity in choosing site locations for EV chargers, it merits mentioning those that have made public statements on the issue, including Walmart, 7-Eleven, and a Taco Bell franchisee in California.

Transparency and Education

CR analyzed public documents and asked companies a range of questions relating to transparency and consumer education. The review finds that five retailers—7-Eleven, Circle K, Casey's, H-E-B, and Ikea—currently provide a map or list on their website of all of their locations where EV charging is available. Providing this information gives consumers an understanding of where they can charge, and allows consumers and advocates to track the progress individual retailers are making on this issue.

In addition to installing chargers at more locations, retailers must adequately maintain their existing charging infrastructure. Yet no retailer currently provides real-time, publicly accessible data on their own website about the reliability of their charging locations.

Five retailers—7-Eleven, Circle K, Casey's, Ikea, and Wawa—currently provide some information about the amenities available at a given charging location, such as lighting, canopies, and attendants. But despite the role that retailers could play in facilitating the adoption of EVs, we found no instance of a retailer providing in-store educational information on electric vehicles for its customers.

[37] Chih-Wei Hsu and Kevin Fingerman, “Public Electric Vehicle Charger Access Disparities Across Race and Income in California,” *Transport Policy*, 100 (January 2021): 59-67, https://www.sciencedirect.com/science/article/pii/S0967070X20309021.

Recommendations to Retailers

Commit to—and Develop—More EV Charging Stations

Retailers have every reason to act swiftly and make a public commitment to EV charging. Those commitments should include a specific number of chargers to be placed by a specific time. We encourage retailers to provide EV charging at 90 percent of their store locations by 2030.

Locations without nearby chargers should be a priority. But even in shopping centers that already have EV charging stations, retailers may benefit by investing in charger locations closer to their storefronts. Retailers who have achieved their past commitments should update their goals, and those with outstanding commitments should continue to work assiduously toward them.

Embrace the 'Public' in Public Charging

The choice to install EV charging is a business decision for a retailer, but it is also a civic commitment. Retailers should embrace their role in the national transition to electric vehicles and seek to engage with their customers and employees about charging. Retailers should provide educational materials on EVs and EV charging to customers, either through a display rack, at checkout, or at another easily accessible location, and to employees. This material should provide consumers with a basic understanding of what an EV is, the difference between an EV and an internal combustion vehicle, the importance of EVs in addressing climate change, how to charge an EV, and web links for more information.

To further increase transparency for consumers, companies should provide a publicly available map indicating the locations of all stores that offer EV charging. In providing this information, retailers should note the specific location of a charger within a parking lot, as well as the amenities available at a given charging location, such as trash cans, lighting, canopies, and the availability of attendants.

Maintain EV Charging Equipment

Properly maintained equipment is necessary both for a healthy EV charging ecosystem and to allay any consumer concerns that might slow broader EV adoption. In addition to funding new chargers, the Department of Transportation authorized up to $100 million to repair and replace existing but non-operational EV chargers.[38] Companies can prevent customer headaches by providing real-time, publicly accessible data on their own website about the operational status and condition of their charging stations.

[38] Andrew Hawkins, "The Biden Administration Approves $100 Million to Fix the Nation's Broken EV Chargers," *The Verge*, September 13, 2023, https://www.theverge.com/2023/9/13/23871857/ev-charger-broken-fix-biden-usdot-funding-infrastructure.

Prioritize Equity Considerations

Public charging at retail locations is particularly vital from an equity perspective. If retail site hosts cater to early EV adopters, who tend to be whiter and wealthier than the general population, a self-reinforcing cycle—where a lack of chargers limits EV demand, which in turn prevents the installation of chargers—could permanently tamp down EV adoption in under-resourced communities. Lack of charging access will result in communities being left behind, with disproportionate negative effects on health, cost, and local grid resilience.

Under an executive order signed by President Joe Biden in 2021, 40 percent of investments into certain categories of federal funding is directed to flow into disadvantaged communities.[39] In order to head off the risk that these communities will be left behind as the country's transportation infrastructure is electrified, the administration created the "Electric Vehicle Charging Justice40" map to identify disadvantaged communities.[40] Likewise, Argonne National Laboratories has a mapping tool to help businesses determine which census tracts qualify for the 30C federal tax credit.[41] Using these resources, retailers can directly seek federal grant funding, or position their EV charging investments with an eye toward available tax credits.

With the used EV market set to expand as adoption grows and vehicle prices decline, retailers best prepared to meet the needs of these consumers will be those that ensure the availability of all connector types, either through adapters or dedicated ports. Tesla's NACS is likely to become the U.S. standard, but ensuring access to older CHAdeMO and CCS connector types will remain important for used EV drivers without home charging.

Companies should also explore ways to provide charging for their employees, and subsidies for low-income EV owners to charge their vehicle. Home charging represents a much cheaper solution, with the average U.S. electricity rate at 16.29 cents per kilowatt-hour,[42] but is less likely to be available for individuals in under-resourced communities. While Level 2 charging may be found for that price, estimates range from between 25 and 75 cents per kilowatt-hour for DC fast charging. The higher end of that spectrum translates to an equivalent rate of $5.60 per gallon of gas. In California the organization GRID Alternatives partnered with national charging network EVgo, Beneficial State Foundation, and Community Housing Development Corporation to launch a program that utilizes location-based pricing to provide lower rates to under-resourced communities.[43] This represents a worthy model, particularly for companies building out their own charging networks.

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[39] "Justice40 Initiative," *Office of Energy Justice and Equity,* 2022, https://www.energy.gov/justice/justice40-initiative.

[40] "Electric Vehicle Charging Justice40 Map," *Department of Transportation*, last modified July 29, 2022, https://anl.maps.arcgis.com/apps/webappviewer/index.html?id=33f3e1fc30bf476099923224a1c1b3ee.

[41] "Refueling Infrastructure Tax Credit," *Argonne National Laboratory,* 2023, https://www.anl.gov/esia/refueling-infrastructure-tax-credit.

[42] "Average Energy Prices for the United States, Regions, Census Divisions, and Selected Metropolitan Areas," U.S. *Bureau of Labor Statistics*, 2024, https://www.bls.gov/regions/midwest/data/averageenergyprices_selectedareas_table.htm.

[43] "Access to Clean Mobility," *GRID Alternatives,* 2023, https://gridalternatives.org/what-we-do/clean-mobility; "Location-Based Pricing," *EVgo,* 2023, https://www.evgo.com/pricing/location/.

Conclusion: Invest in the Future

There is room for improvement in the EV charging space among leading retailers in the U.S. For the majority of companies, even those making major commitments to EV charging and positive statements in the press, EV charging is available at fewer than 1 in 10 store locations. Save for Ikea, more retail investment is needed for consumers to associate any company with EV charging or to feel confident they will find EV chargers at one of the company's outlets.

In some areas of the U.S., retailers have an opportunity to be the only EV charging location available in under-resourced communities, positioning them as key stakeholders for their communities' clean transportation future. Given the importance of bringing all communities along in the ongoing energy and transportation revolution, it is vitally important that companies—particularly those with the highest number of locations—prioritize equity in the placement of their charging locations.

Evidence indicates that EV chargers are a potential boon for retail brick-and-mortar stores. With money flowing through the federal government to states and localities, retailers have a rare and fleeting opportunity to take advantage of these funds. The companies that are first out of the gate on this issue are the ones likely to benefit the most. Installing EV charging can provide multiple bottom-line benefits—increasing retail revenue and market share, addressing climate change, improving transportation access in under-resourced communities, and making the retailer a more integral part of the community.

Consumer Reports Commits To:

- Engaging with retailers to address barriers to the installation of EV charging by highlighting consumer demand, watchdogging the consumer charging experience, scouting funding opportunities, promoting partnerships with utilities and charging networks, and leveraging CR expertise.
- Connecting with local, state, and federal lawmakers and community groups to address impediments to EV charging access.
- Leveraging consumer pressure through organizing and advocacy, partnering to create a movement urging leading retailers to set a goal of charger availability at 9 out of 10 individual store locations by 2030.

Appendix 1: Comparative Performance by Retail Segment

Big Box Stores

Our sample of big box stores included five industry-leading companies (with a total of seven retail brands or subsidiaries). Our analysis of the federal government's Alternative Fuels Data Center (AFDC) identified nearly 600 locations with EV chargers out of a universe of approximately 8,000 big box stores in the U.S., for a segment density of 7.3 percent. This represents the highest density of any segment in the sample.

Big Box Retailers								
			Charging Speed and Connector Type					
			Charging Speed		Connector Type			
Company	Percentage of Stores With EV Charging	Avg. # of Ports per Charging Location	Level 2	Fast Charge	J1772	CHAdeMO	CCS	NACS
BJ's	Less than 1%	2-5	✓	—	✓	—	—	—
Costco	1-10%	2-5	✓	—	✓	—	—	—
Target	1-10%	6-10	✓	—	✓	—	—	—
Walmart/ Sam's Club	1-10%	2-5	—	✓	—	✓	✓	—
Ikea	Nearly 100%	2-5	✓	—	✓	—	—	—

✓ = **Available at more than 50% of locations that offer charging**

— = **Available at less than 50% of locations that offer charging**

AFDC data indicate significant variance within the big box segment. Ikea has achieved virtually total coverage of its U.S. stores. Target and Walmart have both installed EV charging at over 200 and 300 locations respectively, but this nonetheless represents a small percentage of both companies' overall store locations. Among big box retailers, Target typically has more ports per store than other retailers, which allows more customers to charge at any given time. Walmart provides DC fast charging at more than 50 percent of its charging locations, while other retailers in this sector are more likely to have Level 2 chargers. Big box retailers can consider diversifying their charge speed offerings to take advantage of consumers both running quick errands and those conducting longer shopping trips.

Walmart, which has historically operated as a site host for EV charging network operator Electrify America, recently announced it would take EV charging in-house, presumably signifying confidence in the amenity's lasting importance.[44] In an important nod to equity, the company also indicated it would select locations in charging deserts.

In 2011, Costco removed EV chargers from most of its stores, reportedly citing lack of use.[45] Despite the company's historical focus on offering discounted gasoline,[46] AFDC data indicate a few Costco locations have continued to offer charging. Without referencing its earlier decision, the company's 2022 Climate Action Plan draws attention to a pilot program conducting EV charging feasibility studies.[47]

[44] Kapadia, "Leading the Charge: Walmart Announces Plan to Expand Electric Vehicle Charging Network," *Walmart,* April 6, 2023, https://corporate.walmart.com/news/2023/04/06/leading-the-charge-walmart-announces-plan-to-expand-electric-vehicle-charging-network.

[45] Jim Motavalli, "Citing a Lack of Usage, Costco Removes E.V. Chargers," *New York Times*, August 17, 2011, https://archive.nytimes.com/wheels.blogs.nytimes.com/2011/08/17/citing-a-lack-of-usage-costco-removes-e-v-chargers.

[46] Daniel Kline, "Forget Gas: Costco Has a Unique Plan for EVs (and It's Not Chargers)," *TheStreet,* April 20, 2023, https://www.thestreet.com/retailers/forget-gas-costco-has-a-unique-plan-for-evs-its-not-chargers.

[47] "Climate Action Plan," *Costco Wholesale,* December 2022, https://mobilecontent.costco.com/live/resource/img/static-us-landing-pages/5aClimate-Action-Plan.pdf.

Grocery Stores

The 20 companies in our sample represent a total of 62 grocery brands and nearly 15,000 U.S. locations. The grocery segment appears to provide more EV charging locations than any other segment of retail, although at 6.8 percent the overall percentage of store locations with EV charging is lower than that of big box stores.

Grocery Stores									
Company	Percentage of Stores With EV Charging	Avg. # of Ports per Charging Location	Charging Speed and Connector Type						
			Charging Speed		Connector Type				
			Level 2	Fast Charge	J1772	CHAdeMO	CCS	NACS
H Mart	No locations	No locations	—	—	—	—	—	—
Lidl	No locations	No locations	—	—	—	—	—	—
Aldi	Less than 1%	2-5	✓	—	✓	—	—	—
C&S Wholesale Grocers	Less than 1%	Over 10	—	✓	—	—	—	✓
Trader Joe's	Less than 1%	2-5	✓	—	✓	—	—	—
99 Ranch	1-10%	Over 10	—	✓	—	—	—	✓
H-E-B	1-10%	6-10	—	✓	—	—	—	✓
Cub Foods	1-10%	6-10	—	✓	—	—	—	✓
Albertsons (18 brands, including Safeway/Vons/Shaws)	1-10%	2-5	✓	—	✓	—	—	—
Northeast Grocery	1-10%	2-5	✓	—	✓	—	—	—
Publix	1-10%	2-5	✓	—	✓	—	—	—
Sprouts	1-10%	2-5	—	✓	—	✓	✓	—
Wegmans	1-10%	2-5	✓	—	✓	—	—	—
Kroger (14 brands, including Fred Meyer/King Soopers/Ralphs)	1-10%	2-5	—	✓	—	✓	✓	—

Grocery Stores (continued)								
Company	Percentage of Stores With EV Charging	Avg. # of Ports per Charging Location	Charging Speed and Connector Type					
			Charging Speed		Connector Type			
			Level 2	Fast Charge	J1772	CHAdeMO	CCS	NACS
Amazon (Amazon Fresh/Whole Foods)	11-30%	2-5	✓	—	✓	—	—	—
Ahold Delhaize USA (Giant/Food Lion/Stop & Shop/Hannaford)	11--30%	2-5	—	✓	—	—	✓	—
Big Y Foods	11-30%	2-5	✓	—	✓	—	—	—
Hy-Vee	11-30%	2-5	✓	—	✓	—	—	—
Meijer	11-30%	Over 10	—	✓	—	—	—	✓
Raley's	11-30%	2-5	—	✓	—	✓	✓	—
✓ = **Available at more than 50% of locations that offer charging**								
— = **Available at less than 50% of locations that offer charging**								

The grocery segment appears to have several early leaders. Amazon, Big Y, Hy-Vee, Meijer, and Raley's all have EV charging access at more than 10 percent of their store locations. Trader Joe's and Aldi are laggards, having added EV charging at only 10 locations between them.

Many stores in the grocery sector are investing in fast charging, an appropriate response, given short median dwell times of roughly 18 minutes. Certain companies, such as Meijer, H-E-B, and Cub Foods, have installed a relatively low number of charging locations, but high numbers of ports per location to help ensure charging availability for customers and decrease the likelihood of waiting times.

Other grocery chains, including Publix and Stop & Shop (owned by Ahold Delhaize USA), have leaned into charging as an amenity, offering free charging to customers.[48] At most Amazon and Northeast Grocery locations with chargers, non-networked Level 2 charging appears to be free. In the absence of fast charging, offering Level 2 charging as a loss leader may give grocers a competitive advantage.

[48] "Charge While You Shop," *Publix*, https://sustainability.publix.com/storefront/charging-stations/; "Stop & Shop Partners With Volta Charging to Provide Electric Vehicle Fueling Stations to Shoppers at No Cost," *Stop and Shop*, July 21, 2021, https://stopandshop.com/pages/stop-and-shop-partners-with-volta.

Convenience Stores

The 11 companies in our convenience store sample represent 30 brands and over 31,000 U.S. stores. AFDC data indicate that just over 400 of these locations offer EV charging, for a segment density of roughly 1.4 percent.

Convenience Stores								
Company	Percentage of Stores With EV Charging	Avg. # of Ports per Charging Location	Charging Speed and Connector Type					
			Charging Speed		Connector Type			
			Level 2	Fast Charge	J1772	CHAdeMO	CCS	NACS
QuikTrip	No locations	No locations	—	—	—	—	—	—
7-Eleven (5 brands, including Speedway/Stripes)	Less than 1%	2-5	—	✓	—	✓	✓	—
Circle K/ Alimentation Couche-Tard	Less than 1%	6-10	—	✓	—	—	✓	—
BP (Also Amoco/ Thorntons/AMPM)	Less than 1%	2-5	—	✓	—	✓	✓	—
EG America (10 brands, including Fastrac/Kwik Stop/Minit Mart/Turkey Hill)	Less than 1%	2-5	—	✓	—	✓	✓	—
Murphy USA	Less than 1%	6-10	—	✓	—	—	—	✓
Casey's	1-10%	2-5	—	✓	—	—	✓	—
Maverick/ Kum and Go	1-10%	2-5	—	✓	—	—	—	—
Royal Farms	1-10%	6-10	—	✓	—	—	—	✓
Sheetz	11-30%	6-10	—	✓	—	—	—	✓
Wawa	11-30%	6-10	—	✓	—	—	—	✓

✓ = Available at more than 50% of locations that offer charging

— = Available at less than 50% of locations that offer charging

Given the overlap in the U.S. between convenience stores and gas stations, the transition to electric vehicles could pose an existential threat to some actors in this segment. At the same time, it presents an opportunity to gain market share for early adopters.

Convenience stores appear to be appropriately focusing on installing fast charging with high port density. Two mid-Atlantic chains, Wawa and Sheetz, have strong starts as the only retailers to install charging at more than 10 percent of their retail locations. Maverick, Casey's, and Royal Farms (three other regional chains) are also making investments in EV charging. However, while all these companies have made progress, they have not yet made specific future-facing commitments to expand charging access.

Larger national chains have started more slowly, but are making significant investments. In October 2023, BP announced a $100 million order for fast chargers and a $1 billion investment in EV charging for its BP, Amoco, AMPM, and Thorntons locations by 2030.[49]

Some convenience chains are attempting more ambitious approaches by creating closed, proprietary charging networks. Circle K has branded its network "Circle K Charge" and requires use of an app to initiate charging.[50] 7-Eleven has announced that its network, 7Charge, will be "one of the largest and most compatible electric vehicle (EV) fast-charging networks of any retailer in North America" and that it will serve charging deserts.[51]

Department Stores

The seven department store companies (and 13 brands) examined here account for more than 8,000 U.S. locations. With just over 200 of those locations hosting EV charging, the segment has a density of approximately 2.5 percent.

Department Stores								
			Charging Speed and Connector Type					
			Charging Speed		Connector Type			
Company	Percentage of Stores with EV Charging	Avg. # of Ports per Charging Location	Level 2	Fast Charge	J1772	CHAdeMO	CCS	NACS
Ross	No locations	No locations	—	—	—	—	—	—
Dillard's	Less than 1%	2-5	✓	—	✓	—	—	—
JCPenney	Less than 1%	2-5	✓	—	✓	—	—	—

[49] "BP Boosts EV Charging Network With $100 Million Order of Tesla Fastchargers," *BP*, October 26, 2023, https://www.bp.com/en_us/united-states/home/news/press-releases/bp-boosts-ev-charging-network-with-100-million-dollar-order-of-tesla-ultra-fast-chargers.html.
[50] "Circle K Makes EV Charging Easy," *Circle K*, https://www.circlek.com/charge.
[51] "7-Eleven, Inc. Launches New Electric Vehicle Charging Network, 7Charge," *PRNewswire,* March 16, 2023, https://www.prnewswire.com/news-releases/7-eleven-inc-launches-new-electric-vehicle-charging-network-7charge-301773614.html.

Department Stores (continued)								
Company	Percentage of Stores With EV Charging	Avg. # of Ports per Charging Location	Charging Speed and Connector Type					
			Charging Speed		Connector Type			
			Level 2	Fast Charge	J1772	CHAdeMO	CCS	NACS
TJX Co.(5 brands, including TJ Maxx/ Marshalls/ Home Goods	Less than 1%	2-5	✓	—	✓	—	—	—
Macy's	Between 1-10%	2-5	✓	—	✓	—	—	—
Nordstrom/ Nordstrom Rack	Between 1-10%	2-5	✓	—	✓	—	—	—
Kohl's	Between 11-30%	2-5	✓	—	✓	—	—	—
✓ = **Available at more than 50% of locations that offer charging**								
— = **Available at less than 50% of locations that offer charging**								

Our review of department stores shows a clear division within the industry around investment in EV charging. Kohl's has established itself as a leader with over 10 percent of its store locations offering EV charging, while Macy's and Nordstrom have begun to make investments. Ross, Dillard's, JCPenney, and TJX Co., on the other hand, have installed fewer than 10 charging stations, combined, at their more than 6,000 store locations.

EV charging represents a potential way to revitalize a sector that has long struggled to compete with online shopping. Department stores that currently offer chargers have primarily installed Level 2 chargers, a decision that appears to be appropriately "right-speeding" for customer dwell times.

Kohl's has taken steps to highlight the importance of accessible EV charging, and is engaging in broader efforts around EV adoption and education. The company indicates on its website that it is "committed to accelerating the adoption of electric vehicles by expanding charging networks," and has regularly participated in National Drive Electric Week by offering free EV charging. In 2022, the company provided more than 5,000 charging sessions during the course of the event.[52]

[52] "Environmental Sustainability," *Kohl's*, 2022, https://corporate.kohls.com/corporate-responsibility/sustainability.

Discount Stores

The four companies (accounting for five different brands) that we looked at in the discount segment manage 37,825 U.S. retail locations. According to the AFDC data, exactly two of those locations offer a total of five EV charging ports.

Discount Stores								
			Charging Speed and Connector Type					
			Charging Speed		Connector Type			
Company	Percentage of Stores With EV Charging	Avg. # of Ports per Charging Location	Level 2	Fast Charge	J1772	CHAdeMO	CCS	NACS
Big Lots	No locations	No locations	—	—	—	—	—	—
Dollar General	No locations	No locations	—	—	—	—	—	—
Dollar Tree/ Family Dollar	Less than 1%	2-5	✓	—	✓	—	—	—
Five Below	Less than 1%	2-5	✓	—	✓	—	—	—

✓ = **Available at more than 50% of locations that offer charging**

— = **Available at less than 50% of locations that offer charging**

Discount stores are an important sector for expanding public charging to a wide range of communities, including rural and under-resourced areas. While current installations are negligible, both Dollar Tree and Dollar General have made broader climate commitments. These retailers should view EV charging as part of those broader goals. Discount stores have a unique opportunity to serve multiple bottom lines: increasing foot traffic while addressing climate and positively engaging the communities they serve.

Drugstores

Our drugstore sample of three companies (five brands) includes nearly 20,000 U.S. locations. Just over 250 of these locations offer EV charging, for a segment density of approximately 1.4 percent.

Drugstores								
			Charging Speed and Connector Type					
			Charging Speed		Connector Type			
Company	Percentage of Stores With EV Charging	Avg. # of Ports per Charging Location	Level 2	Fast Charge	J1772	CHAdeMO	CCS	NACS
Rite Aid	No locations	No locations	—	—	—	—	—	—
CVS	Less than 1%	2-5	✓	—	✓	—	—	—
Walgreens Boots Alliance	1-10%	2-5	✓	—	✓	—	—	—

✓ = **Available at more than 50% of locations that offer charging**

— = **Available at less than 50% of locations that offer charging**

Drugstores provide an ideal location for community fast charging. The average dwell time for drugstores like CVS is between 15 and 60 minutes, a good “right-speeding” match for EV fast chargers.

Walgreens has established itself as sector leader by installing EV chargers at hundreds of its 8,700 store locations, in contrast with its main competitor, CVS, which has installed chargers at fewer than 10 of its more than 9,000 locations. Even Walgreens’ progress represents a small fraction of the potential impact the company could make. Rite Aid, meanwhile, has installed no chargers to date, but that could change when Walgreens completes its purchase of the company. In terms of forward-looking public commitment, CVS has so far remained silent on the issue, while Walgreens has publicly committed to further expanding EV charging options for its customers.[53]

[53] Goldschmidt, “Walgreens, Volta Expand EV Charging Partnership,” *Progressive Grocer,* February 14, 2022, https://progressivegrocer.com/walgreens-volta-expand-ev-charging-partnership.

Fast-Food Sector

With nearly 128,000 U.S. locations, the sample of fast-food companies represents the largest segment of retailers surveyed. The dozen companies listed here represent 27 leading brands. Fewer than 200 of their locations offer EV charging, yielding a location density well under 1 percent.

Fast-Food Retailers								
			Charging Speed and Connector Type					
			Charging Speed		Connector Type			
Company	Percentage of Stores With EV Charging	Avg. # of Ports per Charging Location	Level 2	Fast Charge	J1772	CHAdeMO	CCS	NACS
Chick-fil-A	Less than 1%	2-5	✓	—	✓	—	—	—
Chipotle	Less than 1%	2-5	—	✓	—	✓	✓	—
CKE Restaurants (Carl's Jr./Hardees)	Less than 1%	6-10	✓	—	✓	—	—	—
Inspire Brands (Arby's/Dunkin'/Jimmy John's/ Sonic/Buffalo Wild Wings)	Less than 1%	2-5	—	✓	—	—	—	✓
McDonald's	Less than 1%	2-5	✓	—	✓	—	—	—
Panda Express	Less than 1%	2-5	✓	—	✓	—	—	—
Panera Bread (also Caribou Coffee/Einstein Bros. Bagels/ St. Louis Bread Co.)	Less than 1%	2-5	✓	—	✓	—	—	—
Restaurant Brands International (Burger King/Tim Hortons/Popeyes/ Firehouse Subs)	Less than 1%	2-5	✓	—	✓	—	—	—
Starbucks	Less than 1%	2-5	—	✓	—	✓	✓	—
Subway	Less than 1%	2-5	✓	—	✓	—	—	—
Wendy's	Less than 1%	2-5	—	✓	—	—	—	✓
Yum Brands (Taco Bell/KFC/Pizza Hut)	Less than 1%	2-5	—	✓	—	✓	✓	—

✓ = **Available at more than 50% of locations that offer charging**

— = **Available at less than 50% of locations that offer charging**

The fast-food segment may prove to be crucial to the development of a healthy EV charging ecosystem, given its ubiquity and the potential opportunity for "right-speeding." However, less than half of current installations are DC fast chargers, a surprising finding for the sector.

Several major restaurant chains have recently announced plans to develop EV charging infrastructure. Starbucks initiated a pilot program to install chargers at its locations along the I-90, I-84, I-70 interstate highway route between Seattle and Denver.[54] When Chipotle announced a new "responsible restaurant design" in 2023, the company reported there would be "electric vehicle charging stations at select locations."[55] Subway indicates that it is partnering with a charging network to offer "an EV Charging Oasis of the future,"[56] but will start by rolling out a set of "smaller-format, fast EV charging stations" at select locations.

Other Retailers

An eclectic mix of leading U.S. retailers across a range of additional segments, these 13 companies (and 16 brands) account for 22,169 U.S. stores. Only 32 of these store locations offer EV charging, however, a density of well under 1 percent.

Other Retailers								
			Charging Speed and Connector Type					
			Charging Speed		Connector Type			
Company	Percentage of Stores With EV Charging	Avg. # of Ports per Charging Location	Level 2	Fast Charge	J1772	CHAdeMO	CCS	NACS
Apple	No locations	No locations	—	—	—	—	—	—
Designer Brands/DSW	No locations	No locations	—	—	—	—	—	—
Ace	Less than 1%	2-5	—	✓	—	✓	✓	—
Best Buy	Less than 1%	2-5	✓	—		—	—	—

[54] "Find an EV Charger at Starbucks Stores from Seattle to Denver," *Starbucks,* August 9, 2022, https://stories.starbucks.com/stories/2022/find-an-ev-charger-at-starbucks-stores-from-seattle-to-denver/.
[55] "Chipotle Pilots New Responsible Restaurant Design Alongside Sustainability Campaign," *Chipotle Mexican Grill*, April 11, 2023, https://newsroom.chipotle.com/2023-04-11-chipotle-pilots-new-responsible-restaurant-design-alongside-sustainability-campaign.
[56] "Subway Enhances Guest Experience with Plans to Add Electric Vehicle Charging Oasis Parks," *PR Newswire,* February 21, 2023, https://www.prnewswire.com/news-releases/subway-enhances-guest-experience-with-plans-to-add-electric-vehicle-charging-oasis-parks-301751371.html.

Other Retailers (continued)								
Company	Percentage of Stores With EV Charging	Avg. # of Ports per Charging Location	Charging Speed and Connector Type					
			Charging Speed		Connector Type			
			Level 2	Fast Charge	J1772	CHAdeMO	CCS	NACS
H&M	Less than 1%	2-5	✓	—	✓	—	—	—
Home Depot	Less than 1%	2-5	✓	—	✓	—	—	—
Lowe's	Less than 1%	6-10	✓	—	✓	—	—	—
ODP Corp. (Office Depot/Office Max)	Less than 1%	2-5	✓	—	✓	—	—	—
Petco	Less than 1%	Over 10	✓	—	✓	—	—	—
PetSmart	Less than 1%	6-10	✓	—	✓	—	—	—
Staples	Less than 1%	Over 10	—	✓	—	✓	✓	—
Tractor Supply Company	Less than 1%	2-5	✓	—	✓	—	—	—
True Value	Less than 1%	2-5	✓	—	✓	—	—	—
✓ = **Available at more than 50% of locations that offer charging**								
— = **Available at less than 50% of locations that offer charging**								

Many of these are leading national companies with characteristics similar to big box stores, making them strong candidates to provide their communities with more robust charging access. Best Buy, which counts itself a member of the Corporate Electric Vehicle Alliance, notes in its recent corporate responsibility report that "we work closely with other companies to accelerate the adoption of electric vehicles (EVs) and EV charging infrastructure."[57] Even so, it currently offers charging at less than 1 percent of its store locations. PetSmart announced plans to install EV chargers at its corporate headquarters in 2023 but did not address its store locations.[58] Likewise, Apple indicates it has installed 1,670 EV charging stations at its U.S.-based campuses, but has not made similar investments at its retail locations.[59]

[57] "Corporate Responsibility & Sustainability Report," *Best Buy*, 2023, https://corporate.bestbuy.com/wp-content/uploads/2023/07/FY23_CRS_Report.pdf.
[58] "A World Through Their Eyes, Corporate Responsibility Report 2022," *PetSmart*, 2023, https://www.petsmartcorporate.com/PetSmart_2022_CSR_Report.pdf.
[59] "Environmental Progress Report," *Apple,* October 2023, https://www.apple.com/environment/pdf/Apple_Environmental_Progress_Report_2023.pdf.

Appendix 2

Methodology: Reviewing Retailer Commitments to EV Charging

To better understand the state of retail charging in the U.S., CR conducted an analysis of current charging infrastructure and future company commitments for 75 companies representing 165 consumer brands. These companies account for more than 270,000 retail locations in the U.S.

The single most comprehensive source of publicly available information about EV charging locations in the U.S. is the Department of Energy's Alternative Fuels Data Center (AFDC). The AFDC maintains a dataset of EV charging locations.[60] Data from 13 of the leading charging networks are imported automatically into the AFDC dataset daily, and data from over 20 additional networks "are updated regularly throughout the year."[61] The dataset also includes information on non-networked stations.

Charging Infrastructure

Our approach to analyzing current charging infrastructure involved the following:

1) Building the universe: On Sept. 19, 2023, the AFDC dataset included 57,578 public EV charging stations in the U.S. with either Level 2 or DC fast chargers. Each station included a text field with the station name. Typically, the station name included the name of any retailer associated with that charging station.
2) Identifying leading retailers: Using trade publications, we identified the leading companies in several different segments of retail, paying particular attention to grocery stores, convenience stores, and fast-food stores. With EV commitments typically made at the corporate level, we aggregated brand information under parent companies. Our sample of 75 companies represents 165 retail brands.
3) Cleaning data: A basic text search of AFDC station names indicated an association between charging stations and specific retailers. Data was cleaned first by controlling for common misspellings in station names (e.g., Wal-Mart for Walmart) and then by aggregating other relevant entities (e.g., Sam's Club with Walmart). Finally, the address field in the AFDC dataset ensured a proper location count.[62]
4) Analyzing data: Through analysis of the AFDC dataset, we were able to compare the performance of the retail sector today among leading retailers. The data also included more detailed information about EV charging operations at retailers, including charger levels, charging networks, and connector types.

[60] Department of Energy, "Electric Vehicle Charging Locations," *Alternative Fuels Data Center,* accessed September 2023, https://afdc.energy.gov/fuels/electricity_locations.html#/find/nearest?fuel=ELEC&country=US.
[61] Ibid.
[62] Note: A retailer may have multiple EV charging stations at a single location.

Company Commitments

While a snapshot of EV charging at leading retailers is valuable, CR seeks to encourage retailers to rapidly advance and improve on the progress they have already made regarding charging infrastructure, and to do so in an equitable and transparent manner. To that end, we utilized company websites, press releases, sustainability documents, and other press accounts to review commitments to future EV charging installations, equity in the placement of EV charging, broader climate commitments, and transparency concerning charger placement, amenities, and performance.

Disclaimer

AFDC data is not perfect. Station names cannot be ascribed to a particular company unless the name of the station clearly states the specific retailer that installed the charging station. Different brands and companies are of course more or less likely to own or control the necessary land for EV charging. Some charging stations may be located near or in close proximity to a retailer or a retailer's parking lot but not associated specifically with that retailer in AFDC data. Likewise, some company commitments and statements regarding EV charging infrastructure may not be publicly available or accessible. To address these potential data gaps, prior to publishing this report, CR contacted all retailers to confirm or correct our findings.

Glossary

Charger is a non-technical term that can refer generally to EV charging equipment or—more commonly—to a single charging port.

Charging level refers to the speed of recharging the EV's battery. Level 1 charging is typically used at home and often uses a standard 110-volt household circuit; it might take several days to charge some cars to 80 percent at Level 1. Level 2 charging is significantly faster and will generally require several hours to charge an EV to 80 percent. Level 3, also referred to as "fast chargers," typically requires between 20 minutes and an hour to charge to 80 percent. Levels 1 and 2 use AC power, while Level 3 uses DC power. This report is focused exclusively on Level 2 and Level 3 public charging.

Charging networks are companies that develop and operate (and sometimes own) EV charging stations, typically for profit. Some charging networks require membership, while others are available for anyone to use. Some networks specialize in partnerships with different types of site hosts, such as retailers. Some networks focus on Level 2 charging, some on Level 3 charging, and some provide both. There are dozens of charging networks with different business models. The market-leading networks in the U.S. are (depending on the metric) ChargePoint, Volkswagen's Electrify America, Tesla, Blink, and Volta. Some retailers have launched their own networks.

A **charging station** is roughly analogous to a gas station in that it contains one or more EV chargers for use by consumers. The charging station is the basic unit of scrutiny in the AFDC alternative fuels dataset. Note that a charging station may have a single port or (more likely) multiple ports, and that multiple charging stations may be present at a single retail location. Some charging stations are free to use, some charge a fee, and some are free up to a set time limit and then charge a fee beyond that limit.

A charging location, for the purposes of this report, represents a retail site where EV charging is located. A single charging location may contain one or multiple charging stations.

Connector types govern how a given vehicle connects to an EV charging port. In the U.S., there are four main connector types for Level 2 and Level 3 charging. Nearly all Level 2 charging uses the J1772 connector. Depending on the car manufacturer, Level 3 fast charging may use one of three connector types: CCS, CHAdeMO, or Tesla's NACS.

The **port** is the basic unit of EV charging; it is the equipment that provides power to the EV. A port may have multiple connector types, but a single port can power only one vehicle at a time. For the purposes of this report, a port is commonly referred to as a "charger."

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