Scanner Capability Assessment of SNAP-Authorized Small Retailers: Final Report

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Executive Summary

The Agricultural Act of 2014, Section 4002 (otherwise known as the 2014 Farm Bill), aims to reduce fraud by requiring all Supplemental Nutrition Assistance Program (SNAP)–authorized retailers to use scanning technologies to redeem SNAP benefits unless the retailer is located in a geographic region that has severe food access limitations. In 1998, an average of 32 percent of SNAP-authorized retailers used scanning systems, and of these retailers, only 5 to 25 percent were small retailers (U.S. Department of Agriculture [USDA], Food and Nutrition Service [FNS], 1998). In the last 20 years, electronic benefit transfer (EBT) has been fully implemented, and scanning systems have evolved. Despite these technological advances, some small retailers still do not use a scanning system or have an older system that lacks the ability to identify SNAP-eligible products.

This study sought to provide accurate and up-to-date information on adoption of scanning technology among small SNAP-authorized retailers to assess readiness for meeting the Farm Bill requirement, the barriers and benefits to adoption of scanning technologies, and the per-store and total industry cost for nonadopters to meet the Farm Bill requirement.

ES.1 Study Methodology

The study used a mixed-methods approach to collect, analyze, and synthesize quantitative and qualitative data assessing barriers and costs of adopting scanning technologies by small SNAP-authorized retailers. The study included three primary data collection components:

- Telephone interviews with nine vendors of scanning equipment and point-of-sale (POS) technologies.
- A nationally representative survey of small SNAP-authorized retailers, referred to as the SCANR Survey (n = 1,040).
- Follow-up in-person or telephone interviews with a subset of survey respondents (n = 50).

The study used data from the SCANR Survey to estimate the number of adopters and nonadopters of scanning technologies by store type and other characteristics and the number of nonadopting retailers likely to adopt a new scanning system to meet the Farm Bill requirement and remain SNAP authorized. Cost information collected in the vendor interviews and the follow-up interviews with retailers, along with data from the SCANR Survey and secondary data sources, informed the estimates of the per-store and total industry costs for all small SNAP-authorized retailers to meet the 2014 Farm Bill requirement. Additionally, the results of the study provide insight to the barriers to adopting scanning systems as well as the benefits of adoption.

ES.1.1 Vendor Interviews

The vendor interviews provided information on the POS scanning technologies available to small retailers and the costs of installing these technologies, in order to estimate the store-level costs of complying with the Farm Bill requirement. The study team conducted interviews with nine vendors that sell and install

scanning hardware and software compatible with EBT systems; each interview lasted approximately 1 hour.

ES.1.2 SCANR Survey with Retailers

The SCANR Survey aimed to obtain a reliable, national estimate of the extent to which scanning systems with various levels of functionality (e.g., presence of SNAP flag, integrated versus nonintegrated) are used by small SNAP-authorized retailers. The 15-minute survey instrument was designed to collect store-level characteristics, current POS system information, likelihood of installing a new scanning system to remain SNAP authorized, and factors influencing this decision.

The respondent universe for the survey was small SNAP-authorized retailers defined as franchise convenience, nonfranchise convenience, medium grocery, small grocery, and specialty stores, excluding large chains with 10 or more stores under the same ownership.[1] FNS's Store Tracking and Redemption Subsystem (STARS) database served as the sampling frame. The study used a nationally representative probability-based systematic stratified random sample of small SNAP-authorized retailers, stratified by the five store types and urbanicity (rural or urban).

The survey used a two-phase design that employed mail, Web, and computer-assisted telephone interviewing to gather data over the 5-month period March through July 2018. Surveys were completed with 1,040 retailers, achieving the response rate goal of 80 percent.

ES.1.3 Follow-Up Interviews with Retailers

The follow-up interviews with a subset of respondents to the SCANR Survey aimed to collect information on the cost to purchase and install scanning systems for the cost analysis, qualitative information on perceived barriers and benefits to adopting scanning systems, and other information. The study team conducted interviews with nonadopters (stores that did not have a scanning system at the time of the survey or had a scanning system without a SNAP flag indicator) and adopters (stores that at the time of the survey had adopted scanning systems capable of identifying items as SNAP eligible). Interviewers conducted the 25 nonadopter interviews by telephone and the 25 adopter interviews onsite at the retailer location. The interviews lasted approximately 15 minutes (nonadopters) to 30 minutes (adopters).

ES.2 Key Findings

Adopting scanning systems requires an investment in capital equipment, training, and ongoing maintenance of the UPC database.

- POS systems need specific hardware and software to identify SNAP-eligible products. The hardware and software are usually sold as a bundled package that also includes installation, training, and the first year of a service contract covering troubleshooting, maintenance, software updates, license fees, and more.

[1] The study did not include these types of small retailers: farmers' markets, direct-marketing famers, delivery routes, or meal services.

- POS systems older than 10 years do not generally have the capability to identify SNAP-eligible products. Thus, stores with older systems would need to purchase a new system to meet this requirement because a software upgrade is not possible.

- Retailers that are updating their POS system would almost always install a new system (upgrades to existing systems are not feasible) and choose an integrated system because the cost of an integrated versus nonintegrated system is negligible, according to the vendors interviewed.[2]

- Installation is relatively easy, provided by the vendor, and generally does not disrupt business operations. Vendors train store managers on using the POS system, who in turn train their cashiers.

- Other labor costs include the amount of time for the store manager/owner to select the scanning system and to create and maintain the UPC database.

Many small SNAP-authorized retailers have not adopted a scanning system and thus do not meet the Farm Bill requirement.

- About 63 percent of small SNAP-authorized retailers do not meet the Farm Bill requirement: 42 percent do not have a scanning system and 21 percent have an older system lacking the ability to identify SNAP-eligible products.

- About 37 percent of small SNAP-authorized retailers meet the Farm Bill requirement: 20 percent have integrated systems and 17 percent have nonintegrated systems.

Readiness to meet the Farm Bill requirement varies by store type and other characteristics.

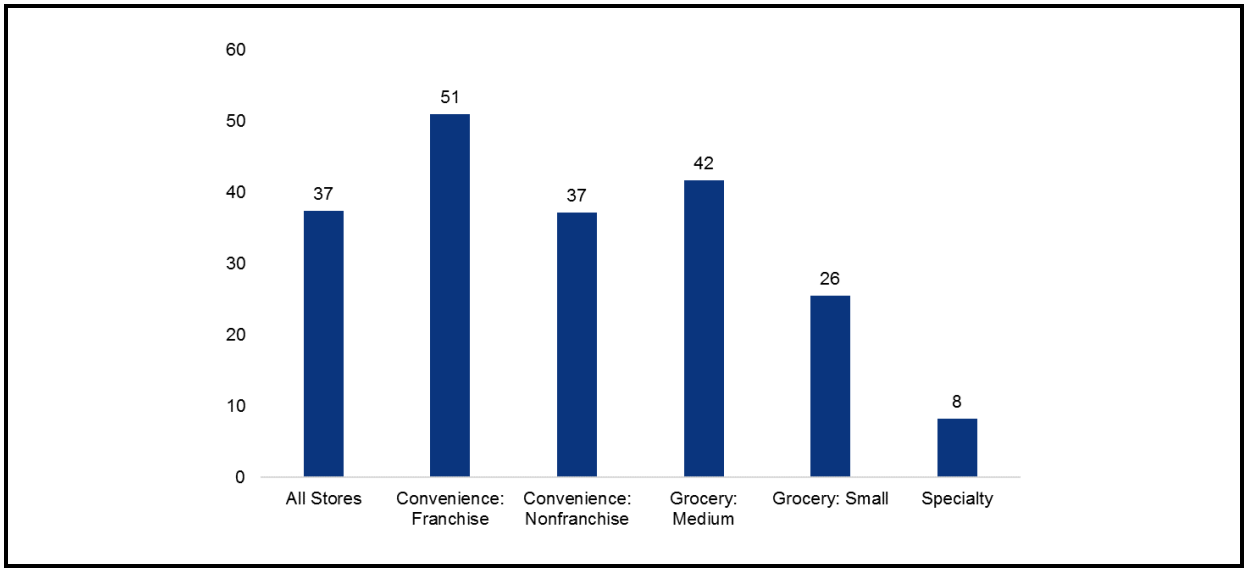
- Adoption of scanning systems varies by store type, with adoption highest among franchise convenience stores (51 percent) and medium grocery stores (42 percent) and lowest among specialty stores (8 percent) (see **Figure ES-1**).

- Stores that stock relatively more different types of barcode food products and stores with multiple locations are more likely to be adopters, suggesting some economies for larger stores and chains.

- Conversely, stores that carry a lot of different types of random-weight products (e.g., meat or cheese sold by the pound without a barcode), often specialty stores stocking a limited number of products, are less likely to be adopters because these stores have less to gain in terms of efficiency from using a scanning system with a SNAP flag.

[2] Integrated systems allow seamless communication between the register and payment pad. With nonintegrated systems, the cashier manually enters the dollar amount of SNAP-eligible purchases into the payment pad, which is subject to error or potential fraud.

Figure ES-1. Percentage of Small SNAP-Authorized Retailers That Meet the Farm Bill Requirement by Store Type



Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents.

The Rao-Scott design-adjusted chi-square goodness-of-fit test ($p < .0001$) for a one-way table was used to test the null hypothesis of equal proportions. The p-value indicates that a statistical difference between at least two subgroups was found.

Adopters believe that scanning systems are a worthwhile investment.

- Interviewed adopters identified several benefits of using scanning technologies: cost savings, access to inventory tracking and sales data, improved accuracy, and better customer service.
- Cost savings resulting from the use of a scanning system include reduced labor costs (e.g., making markdowns); reduced food waste; and reduction in potential costly errors, fraud, and theft.
- Interviewed adopters said that they are less dependent on cashiers to complete an accurate transaction because of the scanning technology.

Nonadopters expressed concerns about cost and other barriers to installing scanning systems.

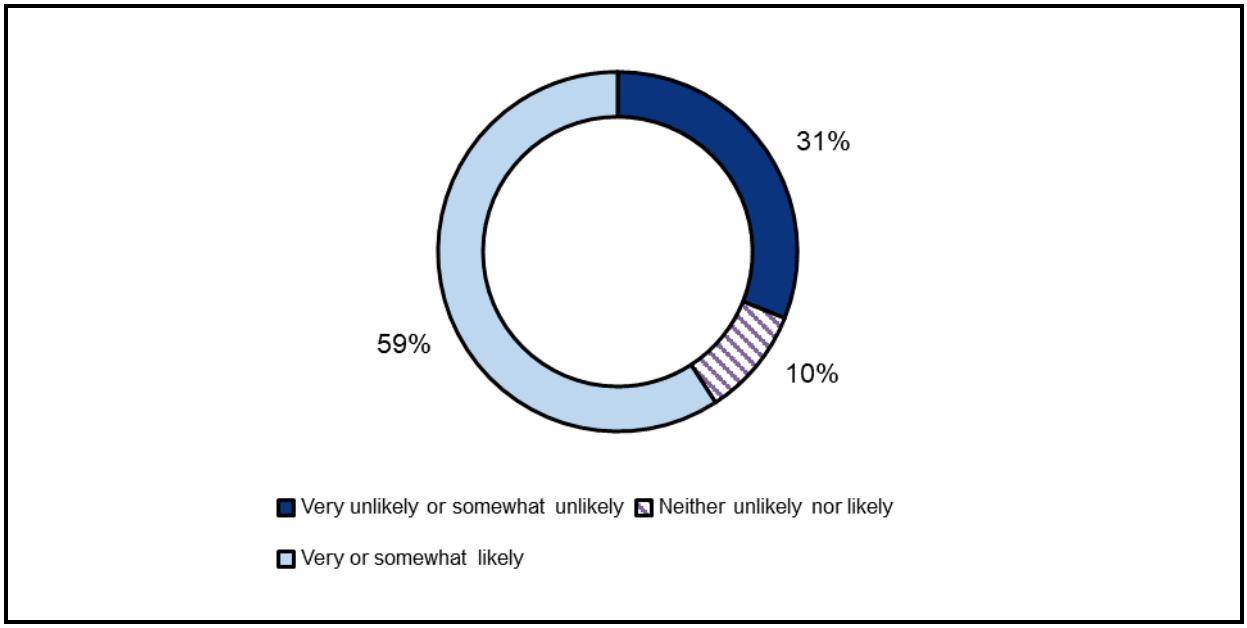
- Nonadopters surveyed identified the cost to purchase, install, and maintain a scanning system and the cost to train staff as the most important barriers to adopting a scanning system. Some stores identified relatively low SNAP sales volume as a barrier to adoption.
- Nonadopters surveyed identified the following noncost factors of concern: not having staff available to assist with system failures and troubleshooting, time to maintain product database, and time to evaluate which type of system to purchase and install.
- Educational efforts, such as informing stores that service contracts are available to assist with system failures and troubleshooting and that a minimal amount of time is needed to make UPC updates, may help address some of these concerns.

Many stores reported they would adopt scanning systems to remain SNAP authorized.

- About 59% of stores reported they would be very or somewhat likely to purchase new equipment to meet the Farm Bill requirement. Differences were not observed by store type (see **Figure ES-2**).

- Interviewed nonadopters who were unwilling to invest in the cost to purchase and maintain a system expressed concern for their community which depends on them for SNAP purchases if their store were no longer SNAP authorized. Other nonadopters interviewed were concerned about the initial investment cost but seemed inclined to make the investment to remain SNAP authorized.

Figure ES-2. Retailers' Self-Reported Likelihood to Adopt a Scanning System and Remain SNAP Authorized



Source: 2018 SCANR Survey

Question 17 from SCANR Survey: There is a new law that will require all SNAP-authorized retailers to use scanners at checkout to accept SNAP benefits. In the future, your store may need to upgrade or purchase and maintain new equipment to comply with this law. How likely are you to do this so you can remain a SNAP-authorized retailer?

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. Only respondents without a scanning system with a SNAP flag answered the question (n = 660). Data are not available for 20 respondents who did not answer this question and 34 respondents who indicated they were in the process of purchasing or installing a system that would meet the Farm Bill requirement. CI = confidence interval.

Meeting the Farm Bill requirement would require considerable investment by small SNAP-authorized retailers.

- The initial average cost to purchase and install a scanning system ranged from $7,373 for small grocery stores to $10,584 for medium grocery stores. Ongoing average operating and maintenance cost ranged from $1,779 for specialty stores to $15,298 for medium grocery stores.[3]
- The total industry cost for all stores that have not yet adopted scanning systems or do not have the capability to identify SNAP-eligible items using their current system is $808 million.
- Of the $808 million, approximately $460 million is attributed to stores that are likely to purchase a scanning system to remain SNAP authorized. The remaining $348 million is attributed to retailers that would likely not purchase a new system and thus would be required to leave the SNAP program.

ES.3 Conclusion

The results of this study provide FNS with information to inform rulemaking for the 2014 Farm Bill requirement that all SNAP-authorized retailers use scanning technologies to redeem SNAP benefits. The study provided estimates of the number of nonadopting and adopting retailers and estimates of the per-store and total industry costs for all small SNAP-authorized retailers to meet the 2014 Farm Bill requirement. Additionally, the study provides FNS with information to better understand the economic, technological, and other barriers to adopting scanning systems and how they can be mitigated, as well as the facilitators to adoption, thus helping to ensure successful implementation of the 2014 Farm Bill requirement without negatively affecting food access for SNAP clients.

Educating retailers on requirements to meet the 2014 Farm Bill, the potential costs of installing a new scanning system, and the benefits to an updated scanning system may help address retailers' concerns and encourage adoption of scanning systems meeting the Farm Bill requirement, which may help limit the number of retailers that may choose to leave the SNAP program. Given the relatively lower adoption rates among specialty stores, small grocery stores, and nonfranchise convenience stores, these retailers may need more assistance to help them identify affordable technology solutions and financing options to remain SNAP authorized.

[3] Initial costs comprise amortized system purchase and installation costs, labor for system selection, and labor for staff training. Ongoing costs comprise the cost for UPC database updates, service contracts, and labor for new employee training.

1. Introduction

The U.S. Department of Agriculture (USDA), Food and Nutrition Service (FNS) contracted with RTI International and its subcontractor, Altarum Institute, to conduct the *Scanner Capability Assessment of SNAP-Authorized Small Retailers* or SCANR study. The purpose of the study was to better understand how the 2014 Farm Bill requirement to use a scanning system at checkout to accept Supplemental Nutrition Assistance Program (SNAP) benefits would affect small SNAP-authorized retailers. This section provides a brief overview of SNAP, including information on the scanning system requirement, describes the purpose of the study and the research objectives, and details the organization for the remainder of the report.

1.1 Overview of the Supplemental Nutrition Assistance Program and Requirements for Use of Scanning Technologies

SNAP is designed to provide a nutrition safety net and alleviate food insecurity among low-income Americans by increasing access to a healthy diet. SNAP provides food benefits to eligible low-income households via electronic benefit transfer (EBT) cards that are reloaded by State agencies every month. SNAP participants pay for eligible food items by swiping their EBT card at point-of-sale (POS) devices in one of more than 250,000 authorized retailers, of which approximately 125,000 are small, independent stores.[4]

SNAP benefits may only be used to purchase eligible food items.[5] The advent of EBT has reduced the potential for participants to use their benefits to purchase ineligible items because in many stores an electronic scanning system is linked to the EBT terminal at the POS and automatically determines which items may be purchased using SNAP benefits. However, not all SNAP-authorized retailers use integrated systems, and some retailers intentionally or unintentionally allow SNAP participants to purchase ineligible items using their EBT cards.

Store Types for Small Retailers

- Franchise convenience
- Nonfranchise convenience
- Medium grocery
- Small grocery
- Specialty stores

The Agricultural Act of 2014, Section 4002 (otherwise known as the 2014 Farm Bill) aims to reduce ineligible items from being purchased by requiring all SNAP retailers to use scanning technologies to redeem SNAP benefits unless the retailer is located in a geographic region that has severe food access limitations. A study conducted before the full implementation of EBT found that an average of 32 percent of SNAP-authorized retailers used scanning systems; supermarkets represented the majority of retailers that used scanning technology (88 percent), and a much lower percentage of small retailers (5 percent to 25 percent) used scanning technology (USDA, FNS, 1998). Over the past 20 years, technologies and scanning equipment have evolved; however, some small retailers still do not use an automated scanning system. FNS funded this study to provide accurate and up-to-date

[4] These small, independent retailers do not include farmers' markets, direct-marketing farmers, delivery routes, or meal services.

[5] SNAP benefits can be used for most food and beverages as well as for plants and seeds to grow food. Ineligible items include any nonfood item (e.g., pet food, household supplies, paper products, etc.), vitamins and medicines, hot foods, food items that will be eaten in the store, and alcoholic beverages and tobacco (USDA, FNS, 2017).

information on adoption of scanning technology among small SNAP-authorized retailers to assess readiness for meeting the Farm Bill requirement.

1.2 Purpose and Research Objectives

The purpose of the study is to provide FNS with information to inform rulemaking for the 2014 Farm Bill requirement that all SNAP-authorized retailers use scanning technologies with a SNAP flag indicator to redeem SNAP benefits. **Table 1-1** lists each of the study's research questions (RQs) and summarizes the data sources and analysis approach for addressing each RQ.

Table 1-1. Summary of Data Sources and Analysis Approach for Addressing the Research Questions

	Research Questions	Data Sources	Analysis Approach
Objective 1. Determine and describe the requirements for installing and operating electronic scanning systems at small retailers.			
1.1	What are the requirements for electronic scanning systems that can electronically confirm which items are SNAP eligible and scan the price of all items that a customer may wish to purchase with SNAP benefits from the retailer?	Vendor interviews	Conducted thematic analysis of qualitative data to describe: ▪ Requirements for installing and operating scanning systems ▪ Requirements for maintaining scanning systems
1.2	What are the requirements associated with ongoing maintenance and support for an electronic scanning system, including maintenance of associated product databases?		
1.3	What are the requirements for a system with the functionality described above, as well as full integration with the EBT POS terminal?		
1.4	What is the length of time necessary for different store types to select and implement an electronic scanning system (for both the minimum requirements and integration with the EBT terminal)?		
1.5	What additional requirements (e.g., physical, training, managerial) are needed to support and maintain these systems?		
Objective 2. Provide cost estimates for installing and maintaining electronic scanning systems at small retailers.			
2.1	What are the estimated costs for each phase of scanning system implementation (i.e., start-up, database maintenance, logistical, and ongoing support)?	Vendor interviews, SCANR survey, follow-up interviews with subset of respondents to SCANR Survey, and secondary data	▪ Calculated per-store cost associated with the purchase, installation, and maintenance of scanning systems by store type ▪ Estimated minimum, most likely, and maximum cost values using @Risk software to account for uncertainty in cost estimates ▪ Used the mean per-store cost estimates from @Risk and data from the SCANR Survey on number of nonadopters to calculate the total cost for all small SNAP-authorized retailers to meet the Farm Bill requirement by store type
2.2	What are the estimated costs per store?		
2.3	What are the estimated cost breakdowns by functionality (i.e., confirming eligible items and integration with the EBT terminal)?		
2.4	How, if at all, do costs differ for stores that require system upgrades, rather than instituting a new system?		
2.5	Are there anticipated technological innovations in electronic scanning systems that might affect cost estimates in the near term (3–5 years)? If so, what are the expected changes?		
2.6	What factors, if any, are associated with variation in the costs of installing and maintaining electronic scanning systems by small retailers?		

(continued)

Table 1-1. Summary of Data Sources and Analysis Approach for Addressing the Research Questions (continued)

Research Questions	Data Sources	Analysis Approach
Objective 3. Provide reliable national estimates of the extent to which scanning systems are in place at small SNAP-authorized retailers.		
3.1 What is the estimated number of small SNAP-authorized stores, by store type, that lack: 3.1a Scanning systems of any kind? 3.1b Scanning systems integrated with store inventory and can identify which items are eligible to be purchased with SNAP? 3.1c Scanning systems with the functionality described above and integrated with the EBT terminal to not allow SNAP to be used to purchase ineligible items? 3.2 How does the availability of scanning technology vary by key retailer subgroups, including store type, urbanicity, and other store-level characteristics?	SCANR Survey	▪ Using weighted survey data, conducted univariate analysis to address each RQ overall and bivariate analysis by store type and other subgroups (e.g., urbanicity, sales volume, and other retailer characteristics) ▪ Conducted multivariate analysis to describe the characteristics of retail stores that are more likely to adopt scanning systems
Objective 4. Determine barriers and facilitators to using scanning technologies by small SNAP-authorized retailers.		
4.1 How much do store owners/operators believe implementing these systems would cost? Among small retailers that currently have scanning systems, what do they report for initial implementation and ongoing costs? 4.2 What are the costs that retailers estimate they would be able to bear for the purchase, installation, and maintenance of scanning systems? 4.3 How knowledgeable are store owners and/or operators about available scanning systems? What additional information do they require or desire in order to implement this technology? 4.4 What are the perceived noncost barriers to adoption of scanning systems? 4.5 What benefits, if any, do owners/managers associate with implementing scanning systems? 4.6 What is the estimated number or proportion of current SNAP-authorized retailers that may not comply with this provision because of cost or other barriers and instead choose to leave SNAP?	SCANR Survey and follow-up interviews with subset of respondents to SCANR Survey	Using weighted survey data, conducted univariate analysis to: ▪ Describe perceived cost and noncost barriers to implementation among nonadopters ▪ Estimate number and proportion of current SNAP-authorized retailers that may not meet the Farm Bill requirement and choose to leave SNAP Conducted thematic analysis to describe: ▪ Perceived cost and noncost barriers to implementation ▪ Among adopters, estimated costs of scanning systems (for use in cost analysis) ▪ Among nonadopters, cost willing to bear ▪ Knowledge and information needs ▪ Perceived benefits ▪ Reasons why SNAP-authorized retailers may choose to not meet the Farm Bill requirement and leave SNAP

This study used a mixed-methods approach to collect, analyze, and synthesize quantitative and qualitative data assessing barriers and costs of adopting scanning technologies by small SNAP-authorized retailers. Data collection comprised the following three components:

- Interviews with nine vendors of scanning equipment and POS technologies.
- A nationally representative survey of small SNAP-authorized retailers, hereafter referred to as the SCANR Survey (n = 1,040).
- Follow-up in-person or telephone interviews with a subset of survey respondents (n = 50).

Data from the SCANR Survey were used to estimate:

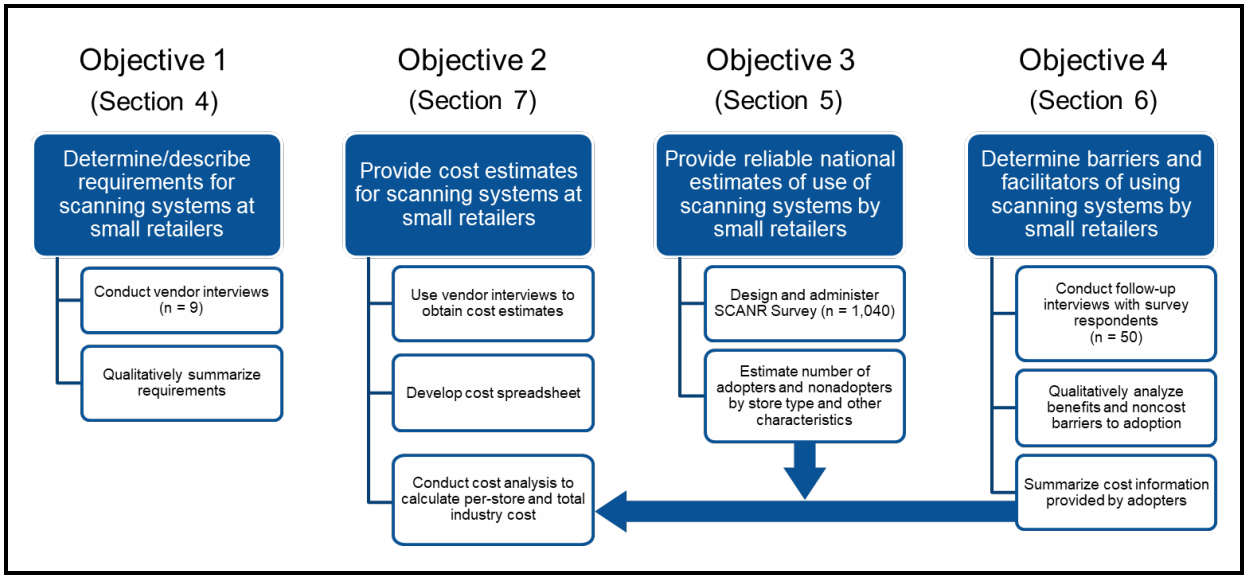
(1) The numbers of adopters and nonadopters of scanning technologies by store type (franchise convenience, nonfranchise convenience, medium grocery, small grocery, and specialty) and other characteristics.

(2) The numbers of nonadopting retailers likely to purchase a scanning system to meet the Farm Bill requirement and remain SNAP authorized.

Cost information collected in the vendor interviews and the follow-up interviews with retailers, along with data from the SCANR Survey and secondary data sources, informed the estimates of the per-store and total industry costs for all small SNAP-authorized retailers to meet the 2014 Farm Bill requirement. Additionally, the results of the study provided the knowledge base to better understand the economic, technological, and other barriers to adopting scanning systems and how these barriers can be mitigated. The results also provided information on the facilitators to adoption, thus ensuring successful implementation of the 2014 Farm Bill requirement without negatively affecting food access for SNAP clients.

Figure 1-1 shows the relationship between the four study objectives, report sections, and the data collection and analysis activities. **Appendix A** provides a mapping of the research questions (RQs) to where each RQ is addressed in the final report.

Figure 1-1. Relationship Between the Four Study Objectives, Report Sections, and the Data Collection and Analysis Activities



1.3 Organization of the Report

The following sections describe the study methods and results for the *Scanner Capability Assessment of SNAP-Authorized Small Retailers* study. Outlined below is a brief summary of each section and relevant appendices:

- ***Section 2:*** Describes the study design, data collection, and analysis methods for each data collection component: vendor interviews, SCANR Survey, and follow-up interviews with a subset of retailers. **Appendix B** provides a more in-depth description of the study methods. **Appendix C** provides copies of the data collection instruments for each of the data collection components.

- ***Section 3:*** Provides a description of the respondents to the SCANR Survey and the follow-up interviews.

- ***Section 4:*** Describes the requirements for scanning systems at small retailers (Objective 1) based on responses to the vendor interviews and follow-up interviews with retailers.

- ***Section 5:*** Provides estimates of adoption of scanning systems and readiness for meeting the Farm Bill requirement among small retailers (Objective 3) by store type and other retailer characteristics based on an analysis of the SCANR Survey data. **Appendix D** provides tables with weighted responses to all of the survey questions.

- ***Section 6:*** Summarizes the barriers and facilitators to adopting scanning systems by small retailers (Objective 4) by examining retailer knowledge of scanning systems, retailer perceptions of implementation costs, noncost barriers to adoption, and benefits to adoption. This section also provides estimates of the number of nonadopting retailers likely to meet the Farm Bill requirement in order to remain SNAP authorized. These results are based on responses to the SCANR Survey and follow-up interviews with retailers.

- ***Section 7:*** Provides the estimated per-store and total industry cost to adopt scanning systems (Objective 2). The estimates are based on a cost analysis incorporating data from the vendor interviews, SCANR Survey, follow-up interviews with retailers, and secondary data.

- ***Section 8:*** Concludes the report by discussing key findings and implications of the study.

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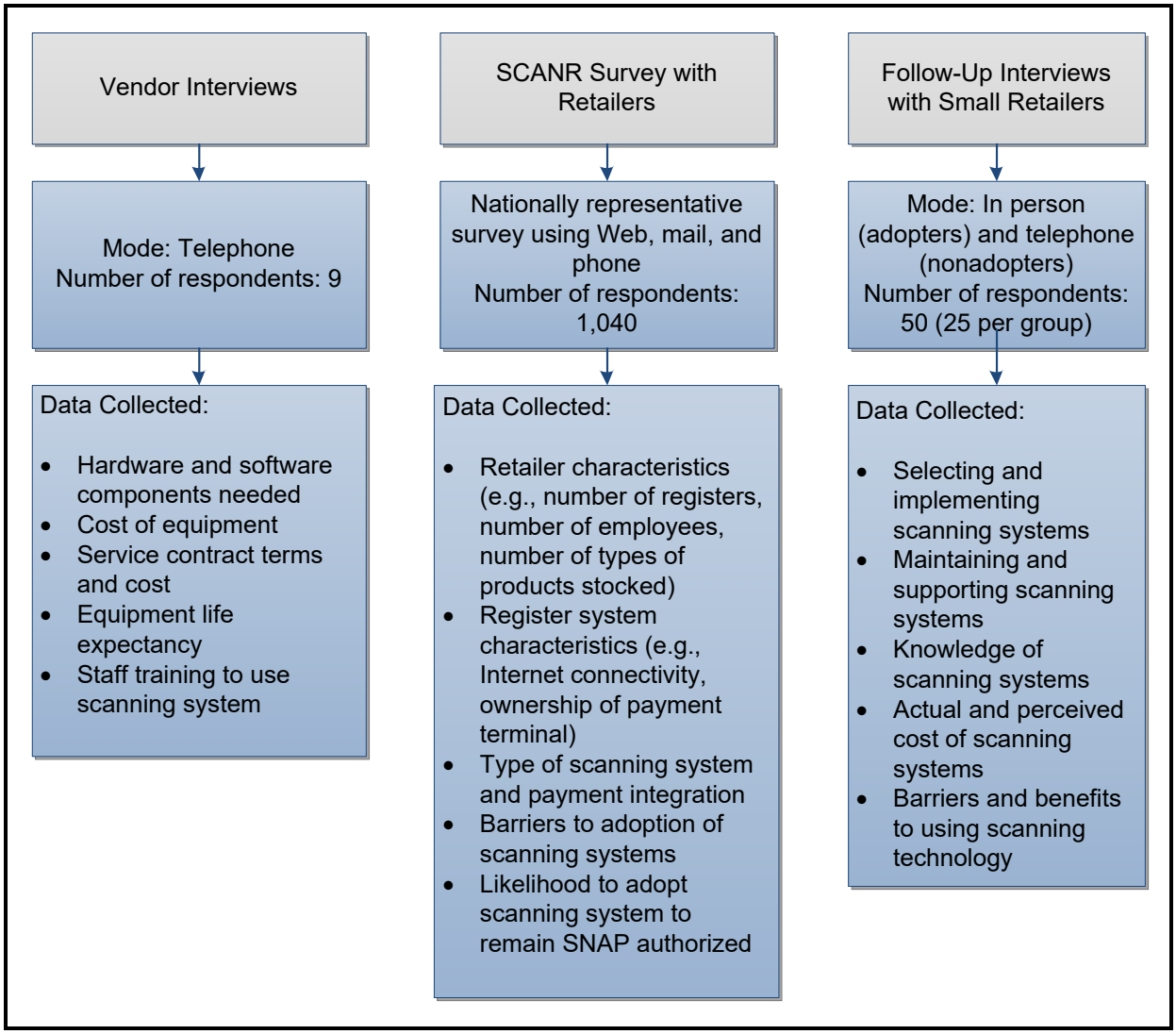
2. Study Methods

Data collection for this study comprised a mixed-methods approach using quantitative and qualitative data collected through three primary data collection components: vendor interviews, a nationally representative survey of small SNAP-authorized retailers, and follow-up interviews with a subset of survey respondents. This section provides an overview of the data sources used to address FNS's RQs and then briefly describes the study design, data collection, and analysis methods for each data collection component (see **Figure 2-1**). **Appendix B** provides a complete description of the study methods, including information on instrument development and testing and detailed information on the analysis procedures.

Figure 2-1. Overview of Data Collection Activities to Address the Research Questions



2.1 Vendor Interviews

The study interviewed vendors to obtain a better understanding of the POS scanning technologies available to small retailers and the costs of installing these technologies in order to estimate the store-level costs of complying with the Farm Bill requirement (to meet Objectives 1 and 2). This section briefly describes the data collection procedures and the analysis approach.

2.1.1 Data Collection

The study team interviewed nine vendors that sell and install scanning hardware and software compatible with EBT systems. Interviewers used a semi-structured interview guide to structure the interviews. The interviews provided information on the specific requirements of each type of scanning system and the different types of costs incurred by retailers when purchasing, installing, and maintaining scanning systems. Additionally, the interviews provided information on whether costs vary by store type (franchise convenience, nonfranchise convenience, medium grocery, small grocery, and specialty), urbanicity, and sales volume.

Trained interviewers conducted the 1-hour telephone interviews. One vendor sold only to online customers, whereas the remaining vendors were traditional brick-and-mortar establishments that sold to primarily local customers (within their State or region). Following each interview, the interviewers transcribed the detailed notes and entered the cost data into an Excel spreadsheet.

2.1.2 Analysis

To address Objective 1, the study team analyzed the data provided by the vendors to describe the following:

- Technical requirements for scanning systems meeting the functionality requirements of the Farm Bill (presence of SNAP flag, integrated vs. nonintegrated system).
- Requirements to install and operate electronic scanning systems.
- Requirements to maintain these scanning systems.
- Requirements to upgrade an existing system.

To address Objective 2, the cost analysis used data collected from the vendor interviews, SCANR Survey, follow-up interviews with retailers, and secondary data to estimate per-store and total industry costs of meeting the 2014 Farm Bill (see **Section 2.4** for a description of the cost analysis procedures).

2.2 SCANR Survey with Retailers

The SCANR Survey aimed to obtain a reliable, national estimate of the extent to which scanning systems with various levels of functionality are in place at small SNAP-authorized retailers (to meet Objective 3). The survey collected store-level information on the following data elements: number of lanes, number of food products sold, number of employees, Internet connectivity, Women, Infants, and Children (WIC) authorization, ability to scan barcodes on products during checkout, POS system integration, POS system

identification of SNAP-eligible products, likelihood of upgrading scanning equipment to remain SNAP authorized, and factors influencing this decision.

Small SNAP-authorized retailers are defined as franchise convenience stores, nonfranchise convenience stores, medium grocery stores, small grocery stores, and specialty stores. Although farmers' markets, direct-marketing farmers, delivery routes, or meal services are typically considered small retailers, the study did not survey these entities because these groups are exempted from the Farm Bill requirement. This section describes the survey instrument, the sample design, data collection procedures, survey response, and the analysis approach.

2.2.1 Sample Design

Respondent Universe

The SCANR Survey was designed to provide nationally representative information on adoption of scanning technologies by store type and urbanicity. The respondent universe comprised small SNAP-authorized retailers, defined as franchise convenience, nonfranchise convenience, medium grocery, small grocery, and specialty stores. The universe excluded large chains with 10 or more stores under the same ownership. Stores that are part of a large chain are very likely to have an integrated scanning/EBT system in place and already meet the Farm Bill requirement, so it was deemed unnecessary to survey these stores.

The study used FNS's Store Tracking and Redemption Subsystem (STARS) database as the sampling frame. The frame started with 143,993 stores not including supermarkets, large grocery stores, or superstores. On the STARS database, the variable "C-Plan" indicates SNAP-authorized retailers that were identified by FNS as large chains under the same ownership. Using this variable, SNAP-authorized chain retailers were removed from the sampling frame. In total, 33,157 chain retailers were removed, leaving 110,836 SNAP-authorized retailers in the sampling frame.

The sampling unit and analytic unit were the retail stores, and the respondents were the retail store owner/manager or regional manager (or other knowledgeable individual) who completed the survey.

Sampling Method, Stratification, and Selection

The study team selected a nationally representative probability-based stratified random sample of small SNAP-authorized retailers from the sampling frame. The sample was stratified by store type (franchise convenience, nonfranchise convenience, medium grocery, small grocery, and specialty) and urbanicity (rural or urban), creating a total of 10 mutually exclusive strata before the systematic sampling.

The STARS database provides information on store type. A store was categorized as a franchise convenience store if the store name was listed more than 10 times in the sampling frame, resulting in 20,009 convenience stores categorized as franchises. The remaining convenience stores were categorized as nonfranchise convenience stores.

The STARS database includes Rural-Urban Commuting Area (RUCA) codes, which are a Census tract-based classification scheme that uses the standard Bureau of Census Urbanized Area and Urban Cluster definitions in combination with work commuting information to characterize all of the nation's Census

tracts regarding their rural and urban status and relationships (https://depts.washington.edu/uwruca/). RUCA codes were used to classify a store as urban or rural.

Appendix B provides information on the expected precision for national and subgroup analyses (by store type and urbanity). For the desired level of precision for national estimates, the required sample size was 935 stores overall. To achieve the goal of 935 completed surveys, a sample of 1,377 small SNAP-authorized retailers was selected with a reserve sample of 750 additional stores for a total starting sample of 2,127 (see **Table 2-1**). The starting sample size assumed that 15 percent of the selected retailers would be ineligible (e.g., no longer SNAP-authorized retailer, out of business); a 50 percent response rate in Phase I, after adjusting for ineligibility; and a 60 percent response rate in Phase II. **Section 2.2.2** provides additional information on the two-phase survey approach that was designed to maximize the survey response rate.

To maximize the precision for estimates by store type, the sample was allocated equally across the five store types, resulting in 275 sampled SNAP-authorized stores for each store type (with 277 for the nonfranchise convenience). Within each store type, stores were allocated to either rural or urban stores with two-thirds allocated to urban (184 selected stores with 186 for the nonfranchise convenience) and one-third allocated to rural (91 selected stores). In total, 922 sampled stores were allocated to the urban stratum, and 455 sampled stores were allocated to the rural stratum.

Within each stratum, retailers were selected with equal probability. Before selecting the stratified random sample, the frame was sorted by store owner name, ZIP code, and annual retail sales to ensure the final sample included a wide range of retailers across the nation that ranged in size (within the 10 mutually exclusive stratification groups).

Table 2-1. Sample Allocation for the SCANR Survey with Stratification by Urbanicity and Store Type

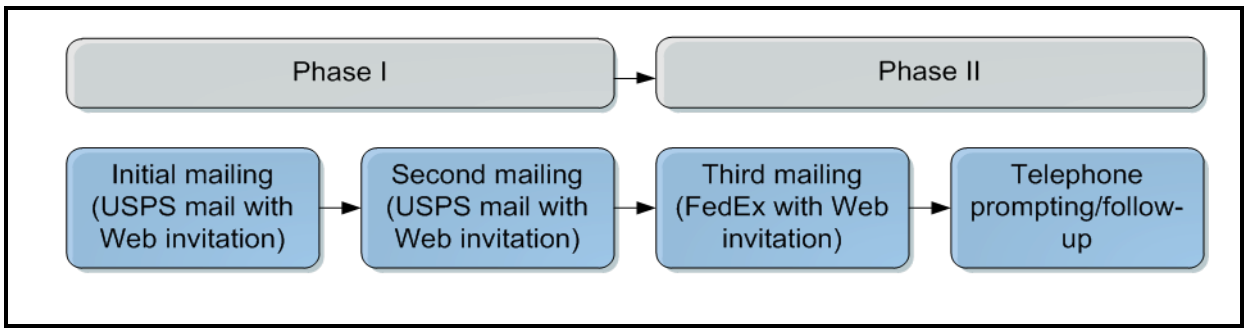
Final Frame Counts and Sampling Allocation[a]	Convenience: Franchise		Convenience: Nonfranchise		Grocery: Medium		Grocery: Small		Specialty		National
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	
Number on frame	18,176	1,833	56,080	9,280	7,091	1,157	10,226	974	5,259	760	110,836
Number sampled	184	91	186	91	184	91	184	91	184	91	1,377
Reserves	100	50	100	50	100	50	100	50	100	50	750
Estimated number of completes	187		187		187		187		187		935

[a] Equal allocation for store type and oversampling rural stores (allocate two-thirds of sample to urban and one-third to rural within store type).

2.2.2 Data Collection and Survey Response

The survey used a two-phase design developed to address the challenges of surveying small retailers with busy schedules and limited motivation to participate. The approach employed mail, Web, and computer-assisted telephone interviewing (CATI) to gather data (see **Figure 2-2**). The design was based on best practices as outlined by the Dillman (2007) Tailored Design Method,[6] which optimizes the mode and timing of contacts to minimize survey error and maximize response. Data collection took place over the 5-month period March through July 2018.

Figure 2-2. Two-Phase Design for the SCANR Survey



The survey instrument comprised 18 items with an estimated burden of 15 minutes. Phase I of the survey consisted of an initial and a second mailing that included an endorsement letter from FNS, a hard copy of the survey, and a link to complete the survey via the Web if desired. The link to the survey was also sent by email if an email address was available. Phase II began with a third mailing via FedEx, and 2 weeks after the FedEx mailing, trained telephone interviewers began calling all nonresponding retailers. Interviewers completed the survey with retailers over the phone, or if preferred, they could assist retailers in completing the survey by mail or via the Web.

A total of 1,040 surveys were completed with a response rate of 80 percent. Because 94 percent of stores were eligible, rather than the projected 85 percent, to achieve the 80 percent response goal, more surveys needed to be completed (see **Table 2-2**). No reserve sample was released.

The majority (54 percent) of surveys were completed by mail, followed by Web (31 percent) and telephone (15 percent); thus, the preferred mode of survey completion was by mail. Response rates by subgroup ranged from 72 percent (small urban grocery) to 97 percent (medium rural grocery). Across subgroups, rural stores responded at higher rates than urban stores.

[6] The Tailored Design Method was developed by Don A. Dillman in the 1970s for mail and telephone surveys and emphasizes all aspects of data collection to make the survey experience as easy as possible for the respondent. The method includes personalizing correspondence, writing survey questions seen as useful to respondents, providing explanations as to why the survey will be useful to others, establishing legitimacy of the survey, and including several coordinated contacts.

Table 2-2. SCANR Data Collection Results by Mode, Store Type, and Urbanicity

Case Disposition	Convenience: Franchise		Convenience: Nonfranchise		Grocery: Medium		Grocery: Small		Specialty		All Stores
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	
Target number of completes	125	62	125	62	125	62	125	62	125	62	935
Number of completes by mode											
Mail	52	27	81	43	75	56	73	32	81	47	566
Web	51	24	38	18	47	16	32	26	51	16	319
CATI	29	17	20	11	17	14	13	9	11	14	155
Total number of completes	**132**	**68**	**139**	**72**	**139**	**86**	**118**	**67**	**143**	**77**	**1,040**
Number of nonrespondents											
Refusals	6	6	13	2	8	1	8	3	8	1	57
Other nonrespondents (i.e., final noncontact to CATI follow-up)	39	12	29	10	23	2	39	16	22	8	200
Total number of nonrespondents	45	18	42	12	31	3	47	19	30	9	257
Number of ineligibles											
Not SNAP authorized (answered no to Q1 in the survey)	3	5	3	5	2	2	7	2	3	2	34
No longer in business	1	0	2	2	5	0	5	2	3	1	21
Language barrier	3	0	0	0	7	0	7	1	5	2	25
Total number of ineligibles	7	5	5	7	14	2	19	5	11	5	80
Total sample released	184	91	186	91	184	91	184	91	184	91	1,377
Response rate (target: 80%)[a]	75	79	77	86	82	97	72	78	83	90	80
Eligibility rate (estimated 85%)[b]	96	95	97	92	92	98	90	95	94	95	94

[a] Response Rate = Number of Completes/[Sample Released − Number of Ineligibles]

[b] Eligibility Rate = [Number of Completes + Number of Nonrespondents]/[Number of Completes + Number of Nonrespondents + Number of Ineligibles]

2.2.3 Analysis

The analysis procedures included developing the final analysis weights; preparing the analysis dataset; and conducting univariate, bivariate, and multivariate analyses. Because the study achieved an 80 percent response rate, it was not necessary to conduct a nonresponse bias analysis.

The analyses used standard design-based methods to estimate point estimates and variance estimates. These estimates were used to calculate confidence intervals (CIs) on means and percentages. Final analysis weights reflected the probability of selection, eligibility rates, and nonresponse allowing for nationally representative estimates as well as subgroup-level estimates representative of the subgroups of interest (i.e., store type and urbanicity). The final analysis weights were used to conduct all statistical analyses.

The purpose of the univariate analyses was to describe the survey data. The tables in **Appendix D** provide the following for each survey question: the unweighted number of responses for each response item, the weighted proportion, and the 95 percent CIs. The purpose of the bivariate analyses was to examine differences in adoption rates for different types of scanning systems and the proportion of stores meeting the Farm Bill requirement. This analysis examined differences by store type, urbanicity, annual retail sales, average monthly SNAP redemptions, length of time SNAP authorized, WIC authorization, Internet connectivity, number of unique barcode food products, and number of cash registers. **Appendix D** presents the results of the bivariate analyses, including statistical testing on the relationship between the outcome of interest and store characteristics.

The purpose of the multivariate analysis was to better understand the characteristics of stores that may influence the likelihood of whether a store has adopted a scanning system. Specifically, Classification and Regression Tree, or CART, analysis was used to identify store characteristics that are associated with whether a store has a scanning system that meets the Farm Bill requirement.

2.3 Follow-Up Interviews with Retailers

The follow-up interviews with a subset of respondents to the SCANR Survey collected information for the cost analysis, qualitative information on perceived barriers and facilitators to adopting scanning systems, and other information. This section briefly describes the data collection procedures and analysis approach.

2.3.1 Data Collection

The study team selected two different samples of retailers for follow-up interviews:

- Nonadopters: Stores that did not meet the Farm Bill requirement because they did not have a scanning system at the time of the survey or had a scanning system not capable of identifying items as SNAP eligible (i.e., did not have a SNAP flag indicator). The selected sample of nonadopters yielded 25 *telephone* interviews.

- Adopters: Stores that met the Farm Bill requirement because they had either an integrated or nonintegrated scanning system with a SNAP flag indicator at the time of the survey. The selected sample of adopters yielded 25 *onsite* interviews. Interviewers conducted these interviews onsite to facilitate the collection of the cost data and to photograph the store's scanning system.

Interviewed adopters and nonadopters were purposively selected to include a mix of store types and urbanity (urban vs. rural) and were geographically dispersed across 24 States and the District of Columbia.

The study team developed two semi-structured interview guides—one for nonadopters and one for adopters (see **Appendix C**). Each interview guide included questions about the retailer's POS equipment, actual or perceived costs associated with purchasing or leasing scanning equipment, and actual or perceived benefits and barriers associated with having scanning equipment.

Interviewers conducted nonadopter interviews by telephone, which lasted approximately 15 to 20 minutes. Interviewers conducted all adopter interviews onsite at the retailer location with one exception,[7] and the interviews lasted approximately 30 minutes. For interviews conducted onsite, interviewers also took photos of the checkout lanes, register and scanning equipment (if applicable), and any other relevant equipment or documentation, taking care not to photograph any store employees or customers. Both adopters and nonadopters received a $25 gift card for taking part in the interview.

2.3.2 Analysis

A professional service transcribed the interview audio recordings for use in the analysis. The study team developed a coding outline before coding the interview data to ensure the analysis responded to the RQs and mapped to the relevant interview questions. Analysts revised the coding outline and recoded responses during analysis as necessary. A subset of variables extracted from the SCANR Survey added relevant attributes (e.g., store type and type of scanning system) to the interview responses. After responses were coded at the interview question level, the study team reviewed the responses to identify common themes, exceptions to the themes; and, to the extent feasible, similarities and differences among retailers in different settings (e.g., store type or urbanicity) or with different characteristics (e.g., type of system).

2.4 Cost Analysis Procedures

The cost analysis used data from the vendor interviews, the SCANR Survey, and the follow-up interviews with retailers who had adopted scanning systems and secondary data on labor rates and interest rates. The cost analysis used a three-step approach: (1) develop inputs for the cost analysis, (2) estimate store-level costs by store type, and (3) estimate industry-level costs by store type and overall. This section summarizes the cost analysis procedures, with additional detail on the inputs and calculation of costs provided in **Section 7** and **Appendix B**.

[7] A small retailer in Nebraska agreed to participate in an interview but was not available when the interviewer was in the area; thus, the study team scheduled the interview for a later date and took place via telephone.

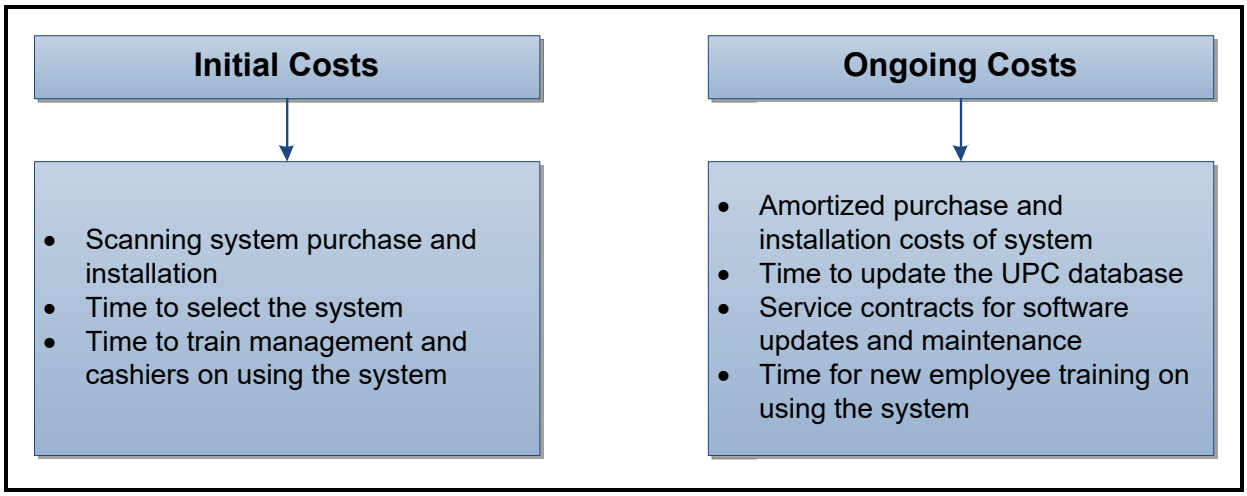
2.4.1 Develop Inputs for Cost Analysis

In the first step, an Excel spreadsheet was created with each quantitative data point from the vendor (n = 9) and follow-up interviews with adopters (n = 25) to describe the following types of costs: capital equipment costs, service contracts, and labor hours for vendor selection, training, and database maintenance. Vendors and adopters provided some costs on a per-lane/register basis (e.g., purchase and installation of scanning system),[8] while others were on a per-store basis (e.g., cost of UPC maintenance). The average number of register lanes by store type (from the SCANR Survey) was used to convert all estimates into a per-store cost. For each type of cost, the range (minimum and maximum) and mean value across all respondents were calculated.

2.4.2 Estimate Store-Level Costs

In the second step, the study estimated initial and ongoing annual costs by store type using a structured cost estimation spreadsheet developed in Excel using data from Step 1. The cost categories comprised initial and ongoing annual costs and included the following types of costs: system purchase and installation costs, service contracts, and labor for vendor selection, staff training, and Universal Product Code (UPC) database maintenance. **Figure 2-3** identifies the types of initial and ongoing costs included in the analysis. The amortized cost of capital equipment purchases used information on the expected life of the system from the vendor interviews. The total cost of installing and maintaining a scanning system summed all initial costs and all annual ongoing costs by store type. The cost analysis used weighted data from the SCANR Survey for the following inputs, which varied by store type: average number of lanes, average number of cashiers, and average number of unique barcode food products (i.e., UPCs). Next, minimum, most likely, and maximum cost estimates were developed based on the ranges from Step 1 using @Risk software (Palisade, 2016) to account for uncertainty in the cost estimates.

Figure 2-3. Initial and Ongoing Costs Included in the Cost Analysis



[8] All costs are for fully integrated systems. In the vendor interviews, vendors could not distinguish prices for nonintegrated systems versus a system that is fully integrated with the store's EBT payment terminal. See **Section 7.3** for additional information.

2.4.3 Estimate Industry-Level Costs

The study team estimated industry-level costs for stores that do not currently have scanning systems that meet the Farm Bill requirement and for those stores that are likely to purchase a new system in order to meet the Farm Bill requirement using the following steps:

- Calculated the weighted number of adopters and nonadopters by store type using data from the SCANR Survey.
- Multiplied the number of nonadopters by the simulated mean of per-store initial, annual, and annualized costs to calculate the industry-level costs overall and by store type for *all* nonadopters to purchase a scanning system that meets the Farm Bill requirement.
- Used data on nonadopters from the SCANR Survey to subtract out the weighted number of stores (by store type) that indicated that they are unlikely to purchase a new system to meet the Farm Bill requirement (and thus no longer remain a SNAP-authorized retailer). The remaining number of stores represents the number of stores that would incur costs to purchase a scanning system meeting the Farm Bill requirement.
- Multiplied the per-store costs from the cost analysis by the adjusted number of nonadopters to calculate the industry-level costs that are likely to occur overall and by store type.

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3. Description of Respondents to SCANR Survey and Follow-Up Interviews

This section provides a description of the respondents to the SCANR Survey and the subset of respondents who participated in the follow-up interviews with adopters and nonadopters.

3.1 Description of SCANR Survey Respondents

This section summarizes the characteristics of small SNAP-authorized retailers based on the nationally representative sample using data from the STARS dataset and the SCANR Survey and the characteristics of retailers' register systems, noting any differences by store type.

3.1.1 Characteristics of Small SNAP-Authorized Retailers

Figure 3-1 provides information on the characteristics of small SNAP-authorized retailers overall using information from the STARS dataset, and **Appendix D, Table D-1** provides information by store type. Based on the results of statistical testing (see Table D-1), there is a statistically significant relationship (or association) between store type and the following characteristics: annual retail sales, average monthly SNAP redemptions, length of time the store was SNAP authorized, and urbanicity.[9] Information on these relationships is summarized below.

Annual Retail Sales. Annual retail sales are generally higher for franchise and nonfranchise convenience stores and medium grocery stores than for small grocery stores and specialty stores. For franchise and nonfranchise convenience stores, 72 percent and 58 percent of stores, respectively, have annual retail sales in the third or fourth quartile (i.e., greater than $660,000). About 73 percent of medium grocery stores also have annual retail sales in the third or fourth quartile. Conversely for small grocery stores, 74 percent of stores have annual retail sales in the first quartile (less than $304,615), and among specialty stores, about 70 percent have annual retail sales in the first or second quartile (less than $660,000).

Average Monthly SNAP Redemptions. Average monthly SNAP redemptions are generally higher for medium grocery stores and, to some extent, small grocery stores compared with convenience stores. Medium grocery stores have the highest percentage of average monthly SNAP redemptions in the fourth quartile, which is greater than $3,528 (63 percent). Comparatively, about 46 percent of small grocery stores and 39 percent of specialty stores have average monthly SNAP redemptions in the fourth quartile. For both franchise and nonfranchise convenience stores, the majority (70 percent and 83 percent, respectively) have average monthly SNAP redemptions in the first three quartiles (i.e., less than $3,529).

Length of Time SNAP Authorized. At the time of the survey, 33 percent of all stores had been SNAP authorized for 3 years or less, 28 percent for 4 to 6 years, 23 percent for 7 to 13 years, and 16 percent for 14 years or longer. Medium grocery stores (29 percent) and specialty stores tend to have more stores that have been SNAP authorized for 14 years or longer (35 percent) compared with other store types.

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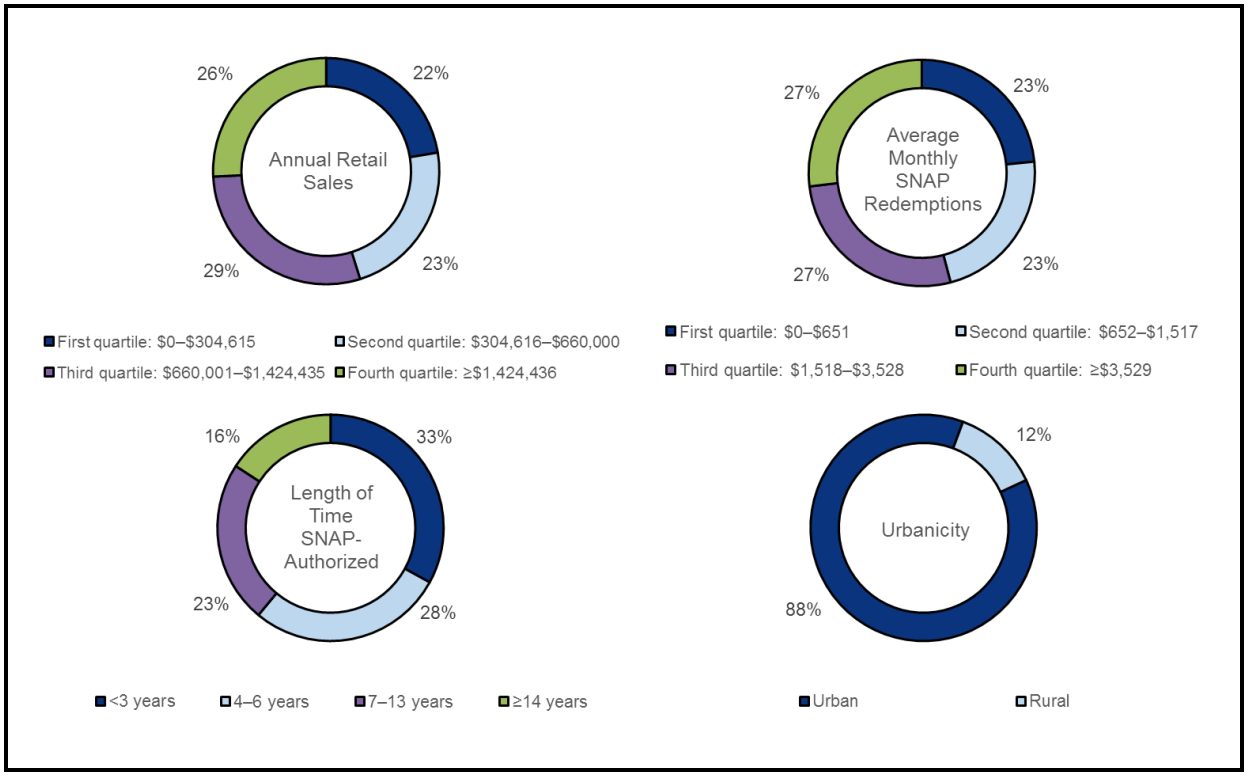
[9] **Appendix D, Tables D-1** through **D-4** provide information on statistical testing. A *p*-value of less than .05 indicates that there is a statistically significant relationship (or association) between store type and the characteristic.

Figure 3-1. Characteristics of Small SNAP-Authorized Retailers Using the STARS Dataset



Source: FNS STARS dataset, January 2018.

Notes: Estimates are based on the 1,040 stores responding to the SCANR Survey.

Urbanicity.[10] Most stores are in urban locations (88 percent); 12 percent of stores are located in rural areas. Medium grocery stores (15 percent) and nonfranchise convenience stores (14 percent) tend to have a larger percentage of stores in rural locations.

Figure 3-2 provides information on the characteristics of small SNAP-authorized retailers overall based on responses to the SCANR Survey, and **Appendix D, Table D-2** provides information by store type. There is a statistically significant relationship (or association) between store type and the following characteristics: multiple locations, number of cash registers/lanes, and number of unique random-weight food products. Information on these relationships is summarized below.

Multiple Locations. About 60 percent of all stores reported having only one location (i.e., the store surveyed), and 40 percent reported having stores in one or more locations. Among small, medium, and specialty grocery stores, less than 28 percent of these store types have stores in more than one location. Conversely, 47 percent of franchise convenience stores and 57 percent of nonfranchise convenience stores have stores in multiple locations. For stores with multiple locations, 62 percent reported owning one to three other stores (results not shown).

[10] Urbanicity was determined using RUCA codes as described in **Appendix B**.

Number of Cash Registers/Lanes. About 52 percent of all stores have one lane or cash register, 43 percent have two lanes, and 5 percent have three or more lanes. Small and specialty grocery stores primarily have only one lane or cash register (87 percent and 78 percent, respectively). Franchise and nonfranchise convenience stores primarily have up to two lanes (92 percent and 97 percent). About 86 percent of medium grocery stores have up to two lanes, and 14 percent have three or more lanes.

Figure 3-2. Characteristics of Small SNAP-Authorized Retailers Using the SCANR Survey Data

Source: 2018 SCANR Survey

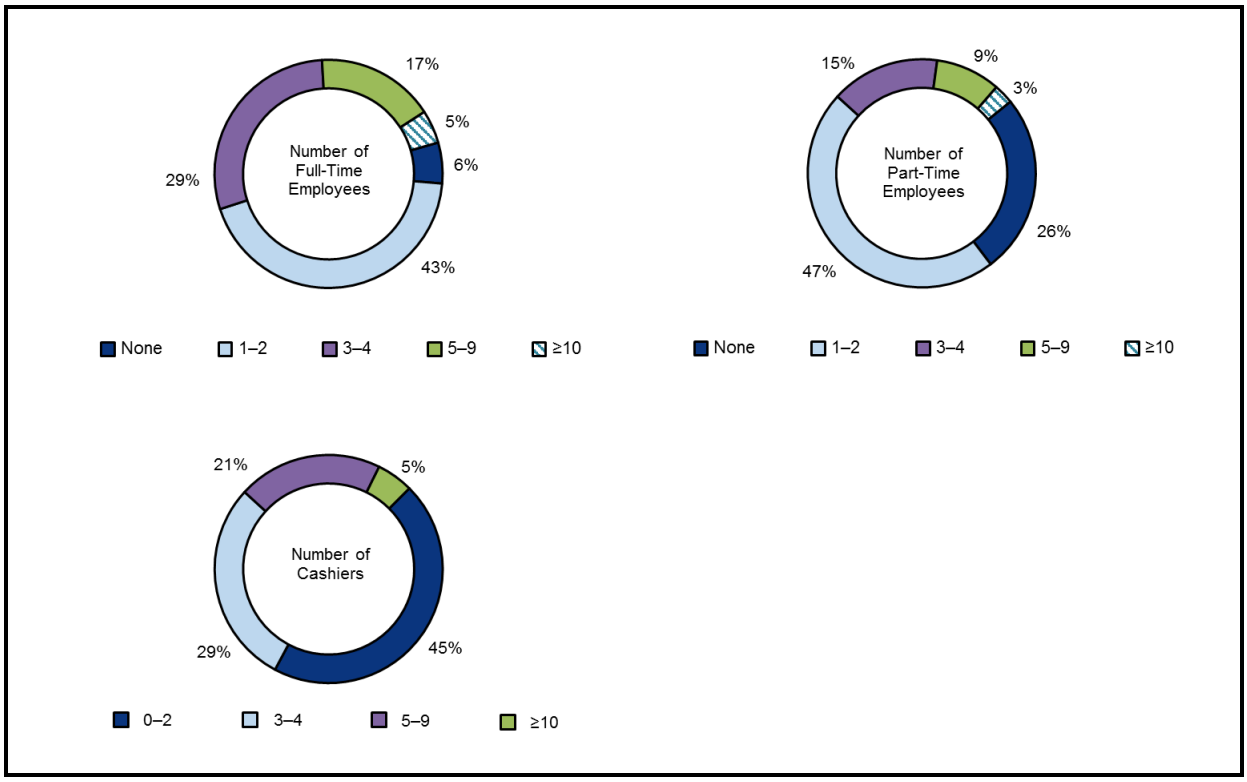
Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents.

Number of Unique Barcode Food Products. About 59 percent of all stores sell fewer than 1,000 unique barcode food products (i.e., UPCs). Not surprisingly, specialty stores sell the fewest number of unique UPCs: 86 percent stock less than 100 unique products. The vast majority of franchise convenience stores (86 percent), nonfranchise convenience stores (85 percent), and medium grocery stores (84 percent) stock 100 or more unique products.

Number of Unique Random-Weight Food Products. About 15 percent of all stores do not sell random-weight products (these are items sold by weight and can include meat, fruit, vegetables, and other items), 41 percent sell 1 to 24 unique random-weight products, and 44 percent sell more than 24 unique random-weight products. Medium grocery, small grocery, and specialty stores report carrying more unique random-weight products compared with franchise and nonfranchise convenience stores.

Figure 3-3 provides information on number of employees for small SNAP-authorized retailers overall based on responses to the SCANR Survey, and **Appendix D, Table D-3** provides information by store type. There is a statistically significant relationship (or association) between store type and the following characteristics: number of full-time employees, number of part-time employees, and number of employees primarily responsible for checking out customers (i.e., cashiers). Information on these relationships is summarized below.

Figure 3-3. Characteristics of Small SNAP-Authorized Retailers: Number of Employees



Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents.

Number of Full-Time Employees. Across all store types, about 72 percent of stores employ between one and four full-time employees. Small grocery stores tend to have fewer full-time employees than other store types (64 percent employ only one to two full-time employees), and franchise convenience stores tend to have more full-time employees than other store types (27 percent employ five or more full-time employees).

Number of Part-Time Employees. Across all store types, 26 percent have no part-time employees, and 63 percent employ between one and four part-time employees. Medium grocery stores tend to have more part-time employees than other store types, 35 percent employ one to two part-time employees and 46 percent employ three or more part-time employees.

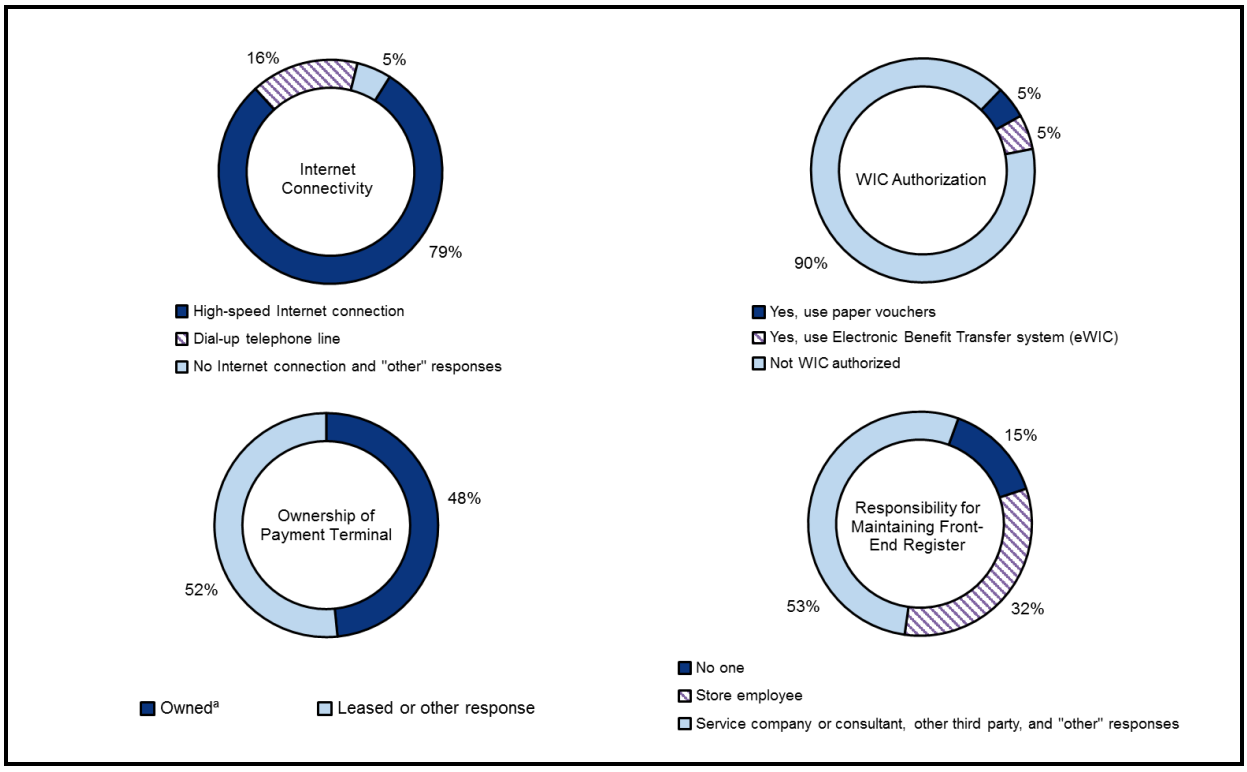
Number of Cashiers. About 45 percent of all stores employ up to two employees (full or part time) who are responsible for checking out customers (i.e., cashiers). Small grocery stores and specialty stores tend

to have fewer cashiers than other store types (81 percent and 59 percent have up to two cashiers, respectively). Conversely, 20 percent or more of convenience stores (franchise and nonfranchise) and medium grocery stores have five or more cashiers.

3.1.2 Characteristics of Small SNAP-Authorized Retailers' Register Systems

Figure 3-4 provides information on the characteristics of small SNAP-authorized retailers' register systems overall based on responses to the SCANR Survey, and **Appendix D, Table D-4** provides information by store type. A statistically significant relationship (or association) exists between store type and the following characteristics: Internet connectivity, ownership of payment terminal, and responsibility for maintaining front-end register. Information on these relationships is summarized below.

Figure 3-4. Characteristics of Small SNAP-Authorized Retailers: Register System Features



Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents.

[a] Owned includes 10 respondents who answered owned and leased and 1 respondent who answered owned and other.

Internet Connectivity. About 79 percent of all stores have a high-speed Internet connection, 16 percent use dial-up, and 5 percent reported not having Internet or entered an "other" response. Small grocery stores and specialty stores tend to have more limited access to high-speed Internet (29 percent and 35 percent, respectively) than other store types.

WIC Authorization. Most stores are not WIC authorized (90 percent). Among the 10 percent of stores that are WIC authorized, half use paper vouchers and half use EBT (eWIC) for WIC-authorized purchases. WIC authorization is highest among medium grocery stores (25 percent).

Ownership of Payment Terminal. About half of all stores own their payment terminal, and half lease their terminal or entered an "other" response. Small grocery stores (56 percent) and nonfranchise convenience stores (54 percent) had the highest percentages of stores reporting leasing their terminal.

Responsibility for Maintaining Front-End Register. Among all stores, 53 percent reported retaining a service company, consultant, or other third party (or entered an "other" response) to maintain their store's front-end register system, and 32 percent rely on a store employee. The remaining 14 percent responded that no one is responsible for maintaining the front-end register. Reliance on a third party tends to be greatest among franchise convenience stores (70 percent) and lowest among specialty stores (35 percent). Among stores that rely on employees to maintain their front-end register system, the employee with this responsibility is usually the store owner, president, manager, or director (results not shown).

3.2 Description of Retailers Participating in the Follow-Up Interviews

The study team conducted follow-up interviews by telephone with nonadopters (n = 25) and onsite with adopters (n = 25).[11] **Table 3-1** provides a description of these 50 retailers by their adoption status, using data from the SCANR Survey and STARS dataset. As previously noted, stores were purposively selected to provide a mix of geographic locations, store types, sizes (in terms of annual retail sales), and urbanicity. Most of the adopter participants were medium grocery stores, in part, because this store type comprised a large portion of the initial sample (23 of 53 stores) and had a higher response rate relative to the other store types. The stores interviewed (adopter and nonadopter) were geographically dispersed across the following 24 States and the District of Columbia: Alaska, California, Colorado, Florida, Georgia, Iowa, Illinois, Indiana, Louisiana, Maine, Maryland, Massachusetts, Minnesota, Nebraska, New Jersey, New Mexico, New York, Oklahoma, Oregon, North Carolina, Tennessee, Texas, Virginia, and Washington.

Table 3-1. Characteristics of Respondents to the Follow-Up Interviews with Retailers

Characteristic	Overall		Nonadopters		Adopters	
	n	Percentage	n	Percentage	n	Percentage
Store Type						
Convenience: Franchise	6	12.0	4	16.0	2	8.0
Convenience: Nonfranchise	8	16.0	4	16.0	4	16.0
Grocery: Medium	23	46.0	6	24.0	17	68.0
Grocery: Small	5	10.0	4	16.0	1	4.0
Specialty	8	16.0	7	28.0	1	4.0
Number of respondents	50		25		25	

(continued)

[11] As previously noted, one adopter retailer was not available when the interviewer was in the area; thus, the interview was scheduled for a later date and took place via telephone.

Table 3-1. Characteristics of Respondents to the Follow-Up Interviews with Retailers (continued)

Characteristic	Overall		Nonadopters		Adopters	
	n	Percentage	n	Percentage	n	Percentage
Annual Retail Sales						
First quartile: 0–$304,615	8	16.0	7	28.0	1	4.0
Second quartile: $304,616–$660,000	11	22.0	7	28.0	4	16.0
Third quartile: $660,001–$1,424,435	16	32.0	5	20.0	11	44.0
Fourth quartile: ≥$1,424,435	15	30.0	6	24.0	9	36.0
Number of respondents	50		25		25	
Average Monthly SNAP Redemptions						
First quartile: 0–$651	9	18.0	7	28.0	2	8.0
Second quartile: $652–$1,517	3	6.0	2	8.0	1	4.0
Third quartile: $1,518–$3,528	19	38.0	11	44.0	8	32.0
Fourth quartile: ≥$3,528	19	38.0	5	20.0	14	56.0
Number of respondents	50		25		25	
Length of Time SNAP Authorized						
≤3 years	12	24.5	8	33.3	4	16.0
4 to 6 years	11	22.4	3	12.5	8	32.0
7 to 13 years	12	24.5	6	25.0	6	24.0
≥14 years	14	28.6	7	29.2	7	28.0
Number of respondents	49		24		25	
Number of nonrespondents	1		1		0	
Urbanicity						
Urban	36	72.0	17	68.0	19	76.0
Rural	14	28.0	8	32.0	6	24.0
Number of respondents	50		25		25	
Multiple Locations						
Yes	11	22.9	2	8.3	9	37.5
No	37	77.1	22	91.7	15	62.5
Number of respondents	48		24		24	
Number of nonrespondents	2		1		1	
Number of Cash Registers/Lanes						
1	23	46.9	17	70.8	6	24.0
2	20	40.8	6	25.0	14	56.0
3+	6	12.2	1	4.2	5	20.0
Number of respondents	49		24		25	
Number of nonrespondents	1		1		0	

Sources: FNS STARS dataset January 2018 and 2018 SCANR Survey

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4. Results: Requirements for Scanning Systems at Small Retailers

This section describes scanning technologies, including requirements for hardware, software, installation, training, and maintenance based on information collected in the vendor interviews. Information on system selection and implementation is summarized based on information collected in the vendor interviews and the follow-up interviews with adopters.

4.1 Description of Scanning System Requirements

Summary of Key Findings

- It was not challenging for retailers to select scanning systems. They chose POS systems based on guidance from their current supplier/distributor, online research, comparing POS systems at other small stores in their area, and/or talking to their current POS vender.
- Installation of POS systems is relatively easy, provided by the vendor, and generally does not disrupt business operations.
- Training at the time of installation is not very time consuming, and ongoing training is not required except for new employees.
- Creating the UPC database is often the most difficult aspect of using scanning equipment. Minimal effort is needed when UPC databases with product and price information can be transferred from one POS system to another or provided by the wholesaler. Otherwise, the retailer must manually input price, product details, and the SNAP flag for all products, which is time consuming. Maintaining the UPC database is not very time consuming.
- Service contracts that cover troubleshooting, maintenance, software updates, and license fees are usually included in the bundled package price for the first year. Retailers pay a periodic fee after the first year to continue their service agreement.

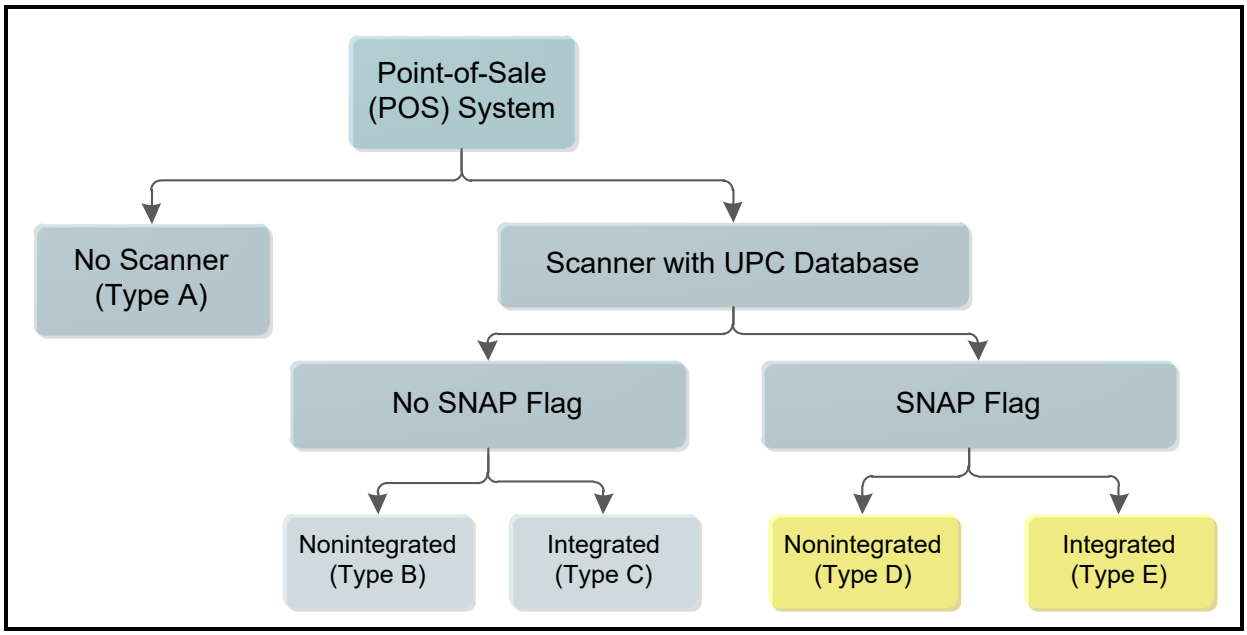
To be used to redeem SNAP benefits, scanning technologies must have a combination of hardware to scan the products and software to determine if the products are SNAP eligible. Specifically, hardware in a POS system includes a computer with a monitor for the cashier (can be touchscreen or not), a keyboard (unless monitor is touchscreen), a cash drawer, a barcode scanner, a scale scanner (for produce), a screen display for the customer, a payment pad (serves as the EBT payment terminal or connection to the EBT system), and a receipt printer. Software programs for POS systems access a UPC database with product and price information and flag SNAP-eligible products, and most include options to track inventory, collect data on sales, automatically reorder products, and more. Generally, all systems sold within the last 10 years have the capability to identify SNAP-eligible products; thus, older systems may not meet the Farm Bill requirement. Most vendors sell hardware and software together as a bundled package.

POS systems can either be PC based or cloud based. PC-based systems have a "back-end" system with an additional computer in the store (typically in an office area of the store) that stores the server for the UPC database. A cloud-based system stores the UPC database in the cloud. During informal discussions with industry participants, one noted that small chains have the greatest adoption of tablet-based systems, a type of cloud-based system.

Small retailers currently have a range of POS systems, from no scanning system to a full scanning system that can flag SNAP-eligible products and is integrated with the EBT payment terminal, as described below and shown in **Figure 4-1**.

- Type A: No scanning system.
- Type B: Scanning system that links to UPC database but does not have the ability to identify SNAP-eligible items and is not integrated with the EBT payment terminal (this system does not meet the requirement of the Farm Bill).
- Type C: Scanning system that links to UPC database, does not have the ability to identify SNAP-eligible items but is integrated with the EBT payment terminal (this system does not meet the requirement of the Farm Bill).
- Type D: Scanning system that links to UPC database and has the ability to identify SNAP-eligible items but is not integrated with the EBT payment terminal (this system meets the minimum requirement of the Farm Bill).
- Type E: Scanning system that links to UPC database, has the ability to identify SNAP-eligible items, and is integrated with the EBT payment terminal (this system exceeds the minimum requirement of the Farm Bill).

Figure 4-1. Configurations for POS Systems



Systems that are integrated with the EBT payment system allow seamless communication between the register and the payment pad. When systems are not integrated, the cashier must manually enter the total amount of SNAP purchases into the payment pad, which may allow intentional or unintentional errors in entering of this amount.

4.1.1 Selecting Scanning Systems

Checkout counter featuring drop-in scanning system, pin pad, and integrated register system

Source: 2018 follow-up interviews with adopters.

Adopters provided information on their most recent POS system replacement or upgrade. Most adopters using a scanning system with a SNAP flag considered multiple POS options before deciding on their current system. These adopters most frequently used one or more of the following methods to research and obtain information about available systems: sought guidance from their current supplier/distributor, conducted online research, looked at what other small stores in their area were using, and/or talked to their current POS provider.

> "[Our wholesaler] gave several options, but they did recommend one that works well with their computing system and the availability to transfer information back and forth." — *Medium grocery store (Adopter)*

> "After researching via the Internet and foot work asking other small retailers about their systems, [the owner] knew he was being offered a deal. As a small business owner, cash flow is very important and equipment upgrades were too expensive." — *Medium grocery store (Adopter)*

About one-fourth of interviewed adopters did not consider multiple POS options when deciding on their current system. Instead, these adopters chose a system primarily based on the recommendation of their current grocery supplier (i.e., distributor). This was advantageous because it ensured compatibility with the supplier's system and the ability to download product information directly from the supplier into their UPC database for pricing and/or inventory purposes. One adopter described selecting his current system because it was available through a local vendor, and proximity to his service provider was the most important deciding factor.

> "[Our wholesaler] we're part of a cooperative warehouse with them. They are our resource for anything we do in this store, for any type of equipment, whether it's (inaudible) jacks, register systems, store fixtures, store signage. If I want to buy paper or toner, I'll go through them first, because they're supplying 3,000 stores and they're gonna have the pricing, and they're the ones who would have weeded out any vendor that may not be good at pricing." — *Medium grocery store (Adopter)*

A small number of adopters also mentioned other considerations for selecting scanning systems: hearing the reputation of a certain system, receiving direct marketing from a POS provider, choosing a system already in use at another one of their store locations, receiving information at a trade show, and using a system recommended by their fuel provider.[12] The two interviewed franchise convenience stores noted that the corporate office ultimately selected their current system, and all franchisees are required to use it.

Software of a nonintegrated system displaying a line item for amount allowable for a SNAP purchase.

Source: 2018 follow-up interviews with adopters.

> "I had other options, but I didn't [consider them], just because all my stores now use the same system, and upgrading to another software and learning about that software takes time. So I would rather not do it." — *Nonfranchise convenience store (Adopter)*

> "It was really recommended by the fuel company that's most advantageous to running the pumps and things like that. It's capable of lots of things. So we really didn't have any idea. They just recommended this register to us." — *Nonfranchise convenience store (Adopter)*

Only about one-fourth of interviewed adopters discussed the length and amount of time they spent selecting a POS system or scanning technology, which varied greatly. One adopter spent only 5 minutes, a few spent between 8 and 10 hours total over a period of about 3 to 4 weeks, and another reported spending an undefined amount of time over a 4- to 5-day period to conduct research and decide on which system to purchase. Retailers did not distinguish between time spent searching for integrated systems and nonintegrated systems.

4.1.2 Implementing Scanning Systems

Most of the vendors interviewed include in-person installation as part of the purchase price for a bundled system. The online vendor interviewed does remote installation, as does a vendor in Hawaii for out-of-state purchases. Most interviewed adopters, particularly those with fully integrated systems, had their POS and/or scanning equipment installed by the company through which they purchased or leased their system. However, about half of adopters with a stand-beside POS device reported installing their own systems.

[12] Adopters that mentioned using a scanning system recommended by their fuel provider were convenience stores that sell food in addition to gas.

Adopters reported a wide range of responses regarding the length or amount of time it took to install and/or update their current scanning system. Eight adopters estimated that it took less than 1 day to install their system, with estimates ranging between 10 minutes and 8 hours. However, the adopter at the highest end of this estimate specifically noted that it took 8 hours to both install the system *and* train store personnel.

Checkout lane including drop-in scale/scanning system, cashier screen, customer screen, printer, and multiple card devices for SNAP and WIC for a nonintegrated system.

Source: 2018 follow-up interviews with adopters.

Five of the adopters estimated that installation took more than 1 day; most of these estimates ranged from overnight to 3 to 5 days, while one adopter estimated that installation occurred over a period of 2 weeks. In addition, one adopter who only upgraded an existing system noted that the installation "didn't take long," and another adopter described using a "plug-and-play" system, which implies minimal effort was required for installation. However, this adopter noted that setting up the UPC database was time consuming.

Several factors may influence the level of effort required for installation:

- the type of system being installed,
- whether all or just some components were being installed or updated,
- the number of lanes,
- whether renovations were required to retrofit new equipment (e.g., expanded checkout lanes, cutting a hole in the counter for a drop-in type scale),
- whether telecommunication updates were needed to support the system,
- the amount of training required, and
- inventory database setup (i.e., some adopters already had a UPC database setup or could download one from their supplier, whereas others had to set one up for the first time).

Nearly all interviewed adopters indicated that the installation process was easy, with only a few notable challenges mentioned. For example, several adopters indicated that UPC database setup was the only or most challenging part of the process. A few adopters mentioned that it was challenging to certify and calibrate the scale such that it functions and communicates correctly with their POS system. A couple of

adopters described the installation process as difficult because of the challenges associated with transitioning and adjusting to a new system, which may not be directly related to the installation process.

> "It was pretty easy. If you can operate a phone, you can operate this thing." — *Nonfranchise convenience store (Adopter)*

> "Luckily, my cousin is kind of an IT person so he kinda came down to help us set it up. But the really terrible part was entering all the new stuff. So but luckily, we kinda started small and just kinda started adding. So you just sit there. You scan the item, you add it. It's just a constant – it's one at a time. Type in what the product is. Different department it goes into whether it's food stampable or not, whether it has a deposit or not, all that stuff." — *Small grocery store (Adopter)*

> "It wasn't difficult. It was just a change as far as the training the cashiers on how to use it. That was probably the more difficult part of it, going from one system to another." — *Medium grocery store (Adopter)*

Two adopters indicated that customers *might* have experienced a slight delay at checkout because one of their multiple lanes would have been offline at any given time during the installation period. These potential disruptions were described as minor and would have been for only a very brief period (e.g., less than an hour per lane).

4.2 Maintaining and Supporting Scanning Systems

4.2.1 Ongoing Maintenance and Support

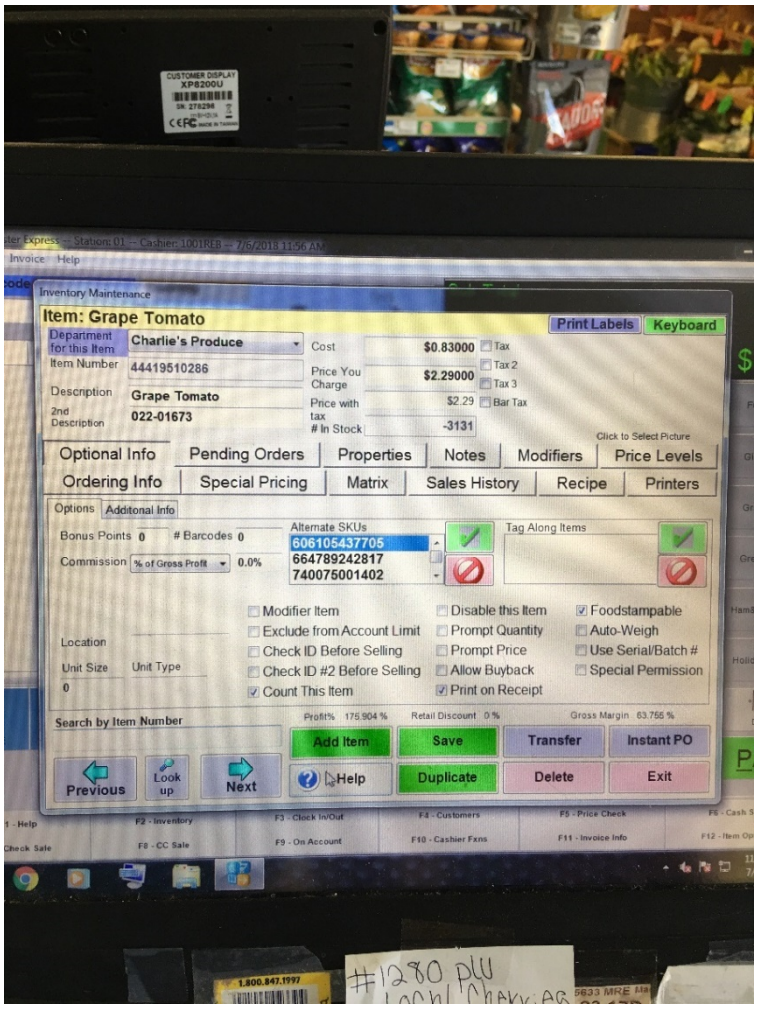
Many adopters that own their scanning system (rather than leasing) indicated that they pay a monthly, quarterly, or annual fee to their POS provider for ongoing maintenance and service or to warranty their equipment. Typically, the first year of the service agreement is included in the bundled package, and then the service is billed on a periodic basis thereafter. Service agreements vary in terms of costs and covered services. Most adopters explained that their service agreement includes technical support and software updates, but they did not always detail other covered services and equipment. Vendors stated that the service agreements also cover the software license.

When issues with scanning technology arise, a few adopters noted that their service provider can remotely access the store's scanning system to fix certain issues. When an issue cannot be resolved over the phone or via remote access, most adopters with a service agreement noted that their service provider will send a technician to the store. Some of these adopters explained that they pay additional costs (in addition to their regular service agreement fee) for onsite service, including for labor, parts, and travel, while others noted that some of these costs are included in their agreement. Most adopters with leased equipment noted that technical support, maintenance, and equipment replacements are included in their leasing agreement.

A key aspect of ongoing maintenance and support for an electronic scanning system is maintaining the retailer's UPC database. The initial setup of a product database can be very time consuming, especially if a retailer must create one on its own (i.e., the retailer does not have a relationship with a wholesaler, or its wholesaler cannot provide the database). After initial setup, maintaining a product database is not

difficult. Some adopters explained that information on new products is pushed from their wholesaler to their database, thus requiring minimal manual entry, while others described entering information into their database upon either ordering or receiving new products. When manual entry is required, adopters noted that entering information on each new product is quick and easy.

View of Inventory software for a SNAP-eligible item in an integrated system.



Source: 2018 follow-up interviews with adopters.

The total amount of time adopters spend per month on maintaining their UPC database varies greatly. Some reported spending as little as 30 to 60 minutes per month, while others reported spending 1 to 4 hours per week or as long as 20 to 30 hours per month. Several adopters noted that they have a staff member or team of staff (1 half-time to 1 full-time equivalent) dedicated to maintaining their database. Even if not explicitly stated during their interview, retailers that reported spending a lot of time (more than 20 to 30 hours per month) on database maintenance are most likely using their software to not only maintain a product database but also to track inventory. As one adopter explained, scanning and entering information on new products is not time consuming, but if a retailer wants to keep accurate inventory of products in their store, this takes more time:

> "It could take up to altogether maybe 30 hours a month, if not more. Depending on merchandise that comes in. If it's new merchandise, then I need to update. If there isn't new merchandise, then there's no update. There's just putting in… No, yeah, you would need about 30-35 hours for a business this size a month because there's two ways. If you care about the inventory and keeping up the inventory, you need to spend that time. If you don't care about inventory and keeping up inventory, then you don't spend none of that time because you don't care. You're just scanning." — *Medium grocery store (Adopter)*

4.2.2 Additional Requirements

In-person training is typically included in the bundled package, although remote training via screen sharing may also be provided. Vendors reported spending between 2 and 16 hours training store managers

and, in some cases, other store employees on using the scanning system. The average amount of time reported on training managers was 8 hours. Trained managers then usually train cashiers.

Nearly all adopters reported that no or only minimal labor costs are associated with training employees and ongoing training is unnecessary. Training takes place when new employees are hired and generally consists of demonstrating the scanning system and then allowing employees time to shadow other employees and then practice on their own. Adopters explained that training new employees on using the scanning equipment is just part of the normal training process; it does not require any extra effort or time. In fact, at least one adopter noted that having the scanning technology makes training easier because, although the cashiers learn about what items are SNAP eligible, they do not need to identify the items during checkout.

> "Just as new employees come on. Yeah. It's just the regular. You have to show them how to run the credit card machine. It's the same thing. The credit card machine processes credit cards and EBT. So you gotta train them on how to do the credit card. You gotta show them the whole thing. So then you just don't take that much longer to arrow down to EBT. It's pretty simple." — *Medium grocery store (Adopter)*

5. Results: Adoption of Scanning Systems among Small Retailers

This section provides information on adoption of scanning systems for different levels of functionality (e.g., with or without SNAP flag, integrated or not integrated) among all small SNAP-authorized retailers and by store type based on the weighted responses to the SCANR Survey. Retailers that have a scanner with a SNAP flag meet the Farm Bill requirement; the system can be integrated or not integrated. The adoption estimates are inputs to the cost analysis, as described in **Section 7**. Additionally, this section provides weighted estimates of the percentage of stores meeting the Farm Bill requirement by annual retail sales, SNAP redemptions, urbanicity, and other store characteristics. The section concludes with the results of the CART analysis and logistic regression model that quantified the likelihood that stores possessing certain characteristics would adopt a scanning system.

Key Findings

- Overall, 37 percent of all small SNAP-authorized retailers have adopted a scanning system with a SNAP flag, thus meeting the Farm Bill requirement.
- Readiness for meeting the Farm Bill requirement varies by store type and is highest among franchise convenience stores (51 percent) and lowest among specialty stores (8 percent).
- Bivariate analysis found a statistically significant relationship (or association) between the percentage of stores that meet the Farm Bill requirement and annual retail sales, Internet connectivity, number of unique barcode food products, and number of cash registers/lanes.
- Multivariate analysis suggests that stores with higher monthly retail sales, more unique barcode food products, and multiple locations are more likely to meet the Farm Bill requirement.

5.1 Adoption Estimates by Type of Scanning System

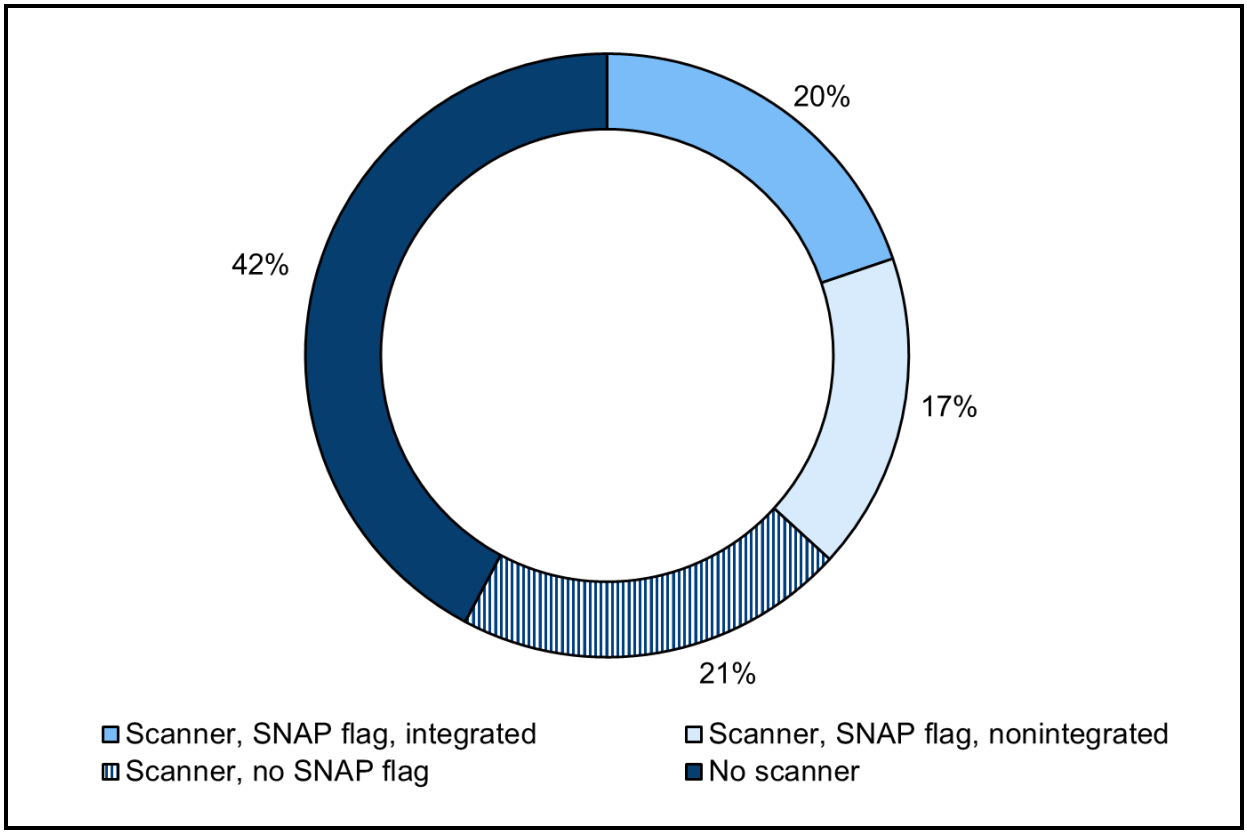
Among the 101,467 small SNAP-authorized retailers, 63,484 (63 percent) did not meet the Farm Bill requirement at the time of the survey, with 42 percent lacking a scanner and 21 percent having a scanner but not the capability to flag SNAP-eligible items. A total of 37,983 stores (37 percent) met the Farm Bill requirement at the time of the survey: 20 percent had integrated systems, and about 17 percent had nonintegrated systems (see **Figure 5-1**).

As shown in **Appendix D, Table D-5**, the type of scanning system used by retailers varies based on store type, with at least one of the differences being statistically significant ($p < .0001$).[13] The use of integrated systems with a scanner and SNAP flag tends to be higher among franchise convenience stores (36 percent) and medium grocery stores (29 percent) compared with other store types, although some stores are using nonintegrated systems with a scanner (13 to 21 percent). About 20 to 25 percent of convenience stores (franchise and nonfranchise) have a scanner without a SNAP flag (these systems do not meet the Farm Bill requirement); use of this type of system is limited for other store types. The percentage of stores without a scanner ranges from 28 percent for franchise convenience stores to 88 percent for specialty stores.

[13] The Rao-Scott design-adjusted chi-square goodness-of-fit test for a one-way table was used to test the null hypothesis of equal proportions. This test adjusts appropriately for the sample design. The *p*-value indicates if there is a statistical difference between at least two subgroups. Additional analysis would be needed to determine which subgroups are different from each other.

Appendix D, Tables D-6 through **D-13** present results for type of scanning system used by other stores and register system characteristics. The significant *p*-value ($p < .05$) for annual retail sales, average monthly SNAP redemptions, Internet connectivity, number of unique barcode food products, and number of cash registers/lanes indicates there is a statistically significant relationship (or association) between this characteristics and scanning system adoption rates. These relationships are explored in more detail in **Section 5.2** when examining readiness for meeting the Farm Bill requirement. A statistically significant relationship was not found for adoption rates and urbanicity, length of time SNAP authorized, and WIC authorization.

Figure 5-1. Percentage of Small SNAP-Authorized Retailers by Type of Scanning System

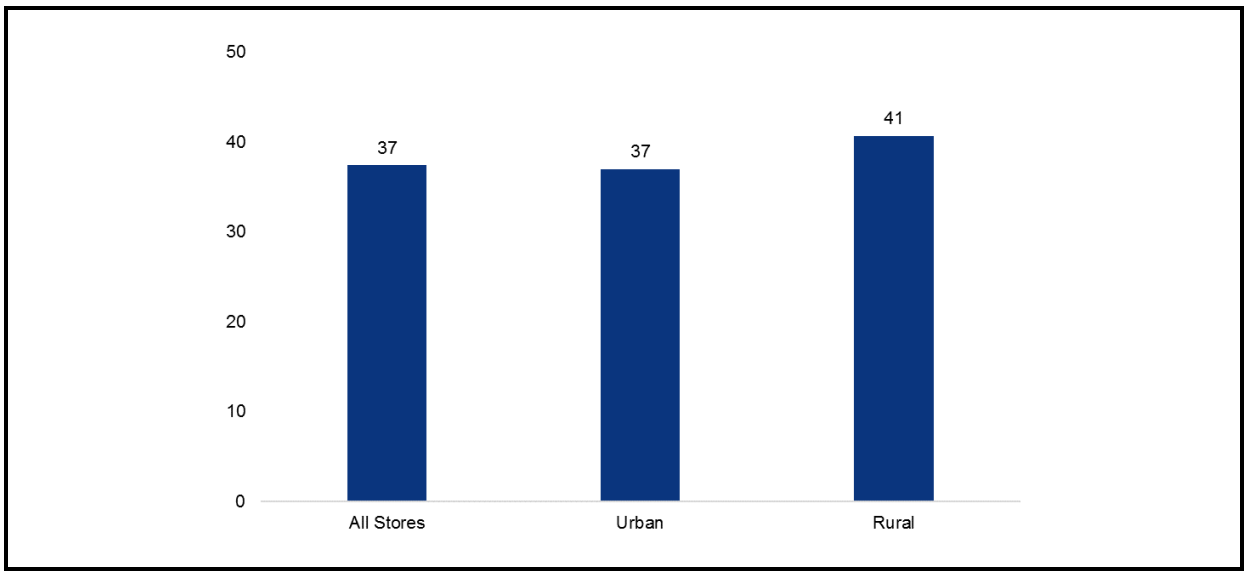


5.2 Estimates for Readiness to Meet the Farm Bill Requirement by Store Characteristic

Appendix D, **Tables D-14** through **D-22** provide the percentages of stores that meet and do not meet the Farm Bill requirement by store and register system characteristic. These results are summarized in **Figures 5-2** through **5-10**. As discussed in more detail below, a statistically significant relationship (or association) exists between readiness to meet the Farm Bill requirement and store type, annual retail sales, Internet connectivity, number of unique barcode food products, and number of cash registers/lanes ($p \leq .05$). A statistically significant relationship was not found for urbanicity (**Figure 5-2**), average monthly

SNAP redemptions (**Figure 5-3**), length of time SNAP authorized (**Figure 5-4**), and WIC authorization (**Figure 5-5**).

Figure 5-2. Percentage of Small SNAP-Authorized Retailers That Meet the Farm Bill Requirement by Urbanicity

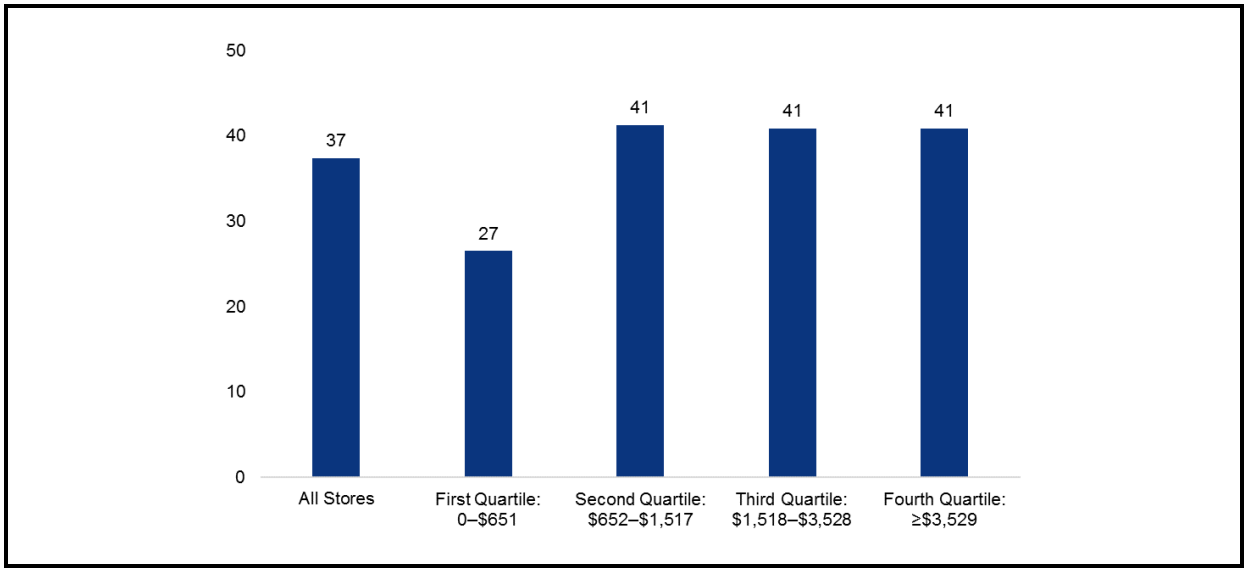


Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents.

The Rao-Scott design-adjusted chi-square goodness-of-fit test (p = .4336) for a one-way table was used to test the null hypothesis of equal proportions. A statistically significant relationship was not found.

Figure 5-3. Percentage of Small SNAP-Authorized Retailers That Meet the Farm Bill Requirement by Average Monthly SNAP Redemptions

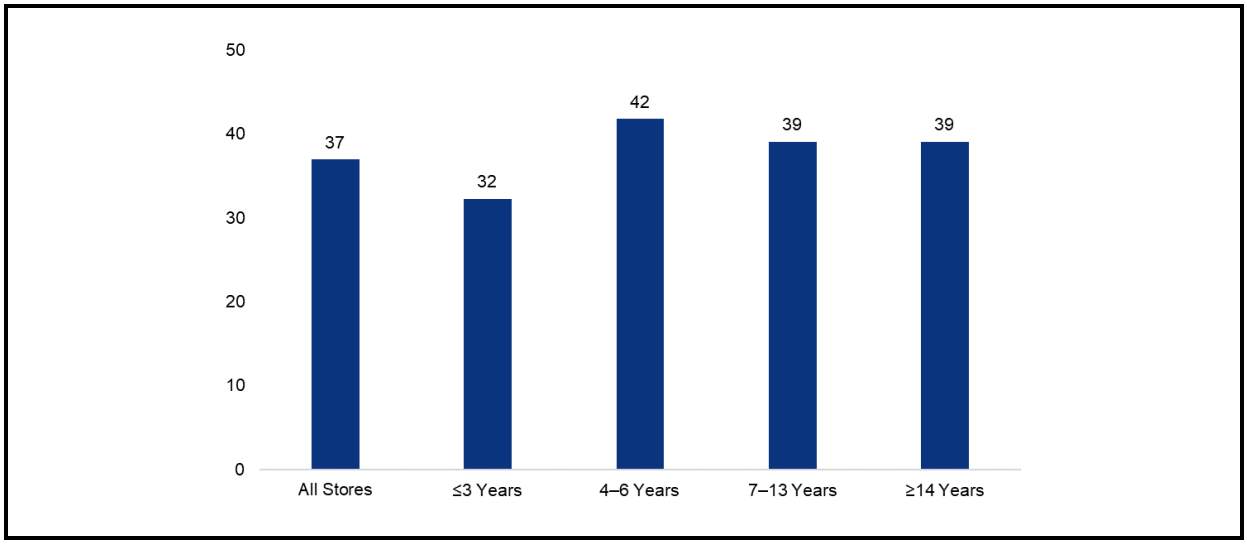


Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents.

The Rao-Scott design-adjusted chi-square goodness-of-fit test (p < .0878) for a one-way table was used to test the null hypothesis of equal proportions. A statistically significant relationship was not found.

Figure 5-4. Percentage of Small SNAP-Authorized Retailers That Meet the Farm Bill Requirement by Length of Time SNAP Authorized

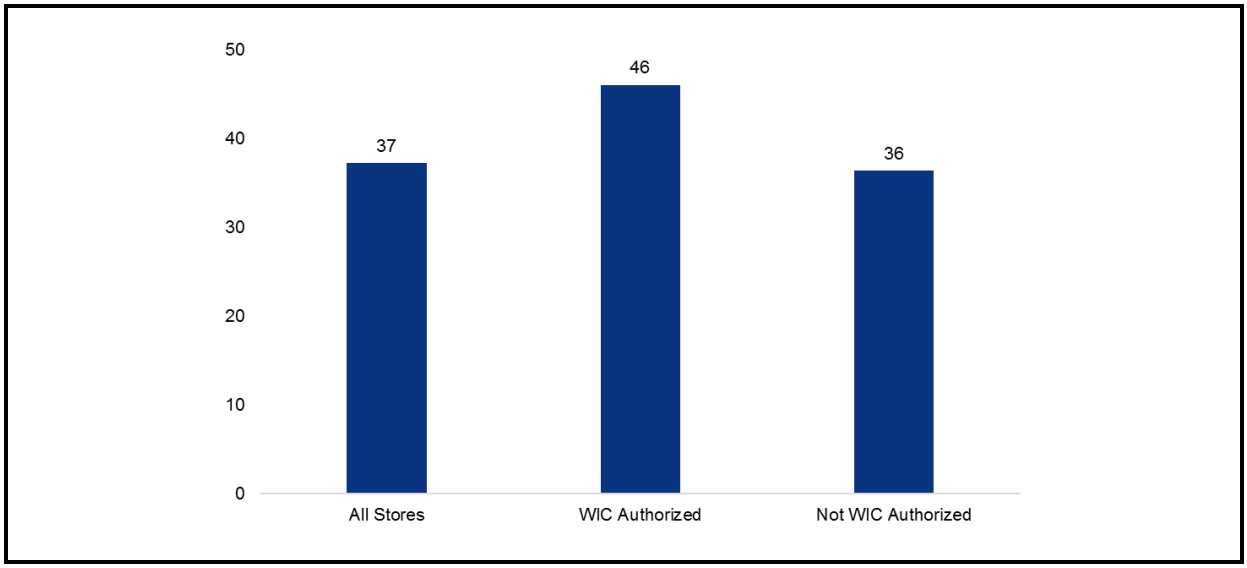


Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents.

The Rao-Scott design-adjusted chi-square goodness-of-fit test ($p < .4457$) for a one-way table was used to test the null hypothesis of equal proportions. A statistically significant relationship was not found.

Figure 5-5. Percentage of Small SNAP-Authorized Retailers That Meet the Farm Bill Requirement by WIC Authorization



Source: 2018 SCANR Survey

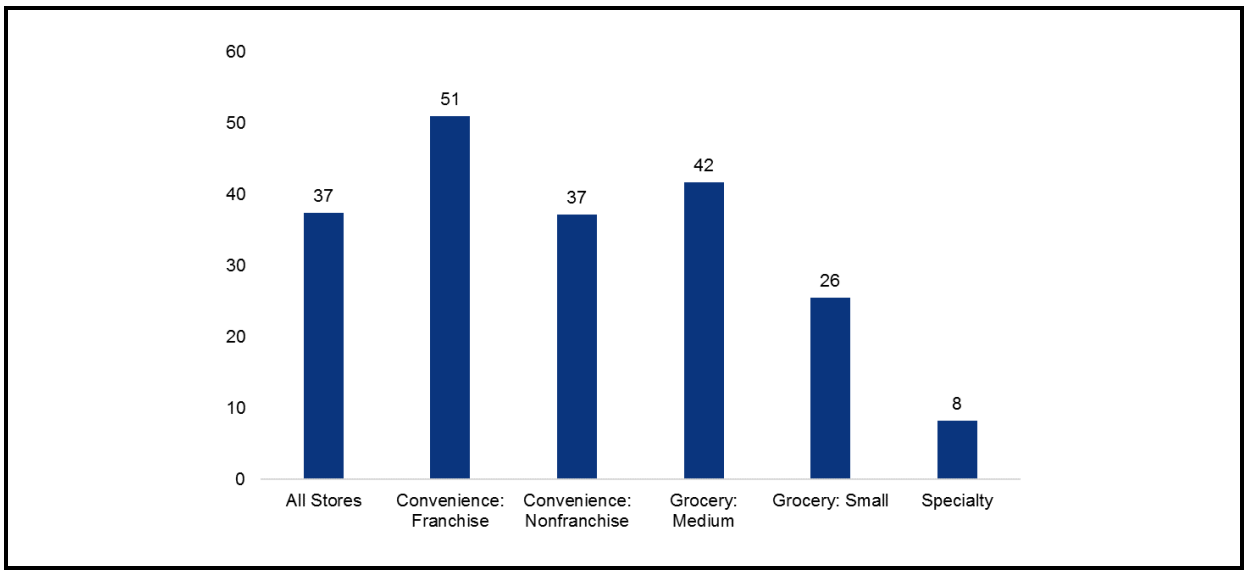
Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents.

The Rao-Scott design-adjusted chi-square goodness-of-fit test ($p < .2199$) for a one-way table was used to test the null hypothesis of equal proportions. A statistically significant relationship was not found.

Store Type. Franchise convenience stores (51 percent) and medium grocery stores (42 percent) are more likely to meet the Farm Bill requirement relative to other store types. About 37 percent of nonfranchise convenience stores and 26 percent of small grocery stores meet the Farm Bill requirement. Specialty

stores (8 percent), which tend to stock fewer barcode products than other store types, were the least likely to meet the Farm Bill requirement (see **Figure 5-6**).

Figure 5-6. Percentage of Small SNAP-Authorized Retailers That Meet the Farm Bill Requirement by Store Type



Source: 2018 SCANR Survey

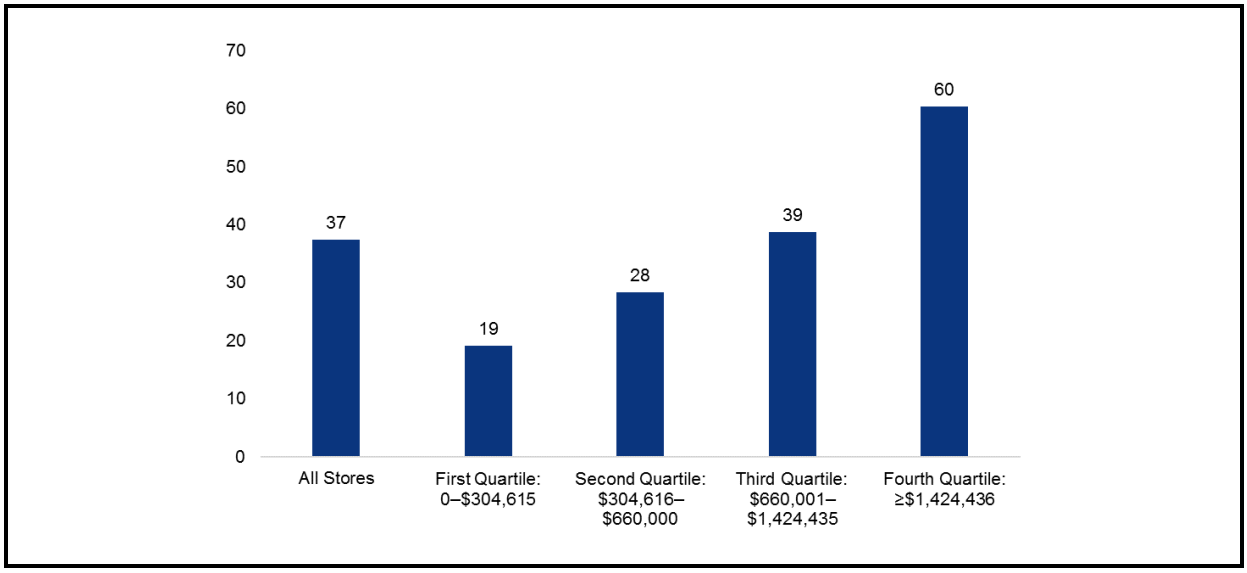
Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents.

The Rao-Scott design-adjusted chi-square goodness-of-fit test ($p < .0001$) for a one-way table was used to test the null hypothesis of equal proportions. The *p*-value indicates that a statistical difference between at least two subgroups was found.

Annual Retail Sales. Stores with higher annual sales are more likely to meet the Farm Bill requirement. Among stores in the highest quartile of annual sales (≥$1,424,436), 60 percent meet the Farm Bill requirement compared with 37 percent of all stores. Among stores in the lowest quartile of annual sales (≤$304,615), 19 percent meet the Farm Bill requirement (see **Figure 5-7**). The relationship between store sales and adoption of scanning systems may be related to the capital cost to purchase and install a scanning system, in that stores with smaller annual sales are less likely to invest in a new system. Interestingly, there is not a relationship between annual monthly SNAP redemptions and readiness to meet the Farm Bill requirement. Cost and other barriers to adoption are discussed in more detail in **Section 6**.

Internet Connectivity. Among stores with high-speed Internet, 41 percent meet the Farm Bill requirement. Among stores with dial-up connectivity, 29 percent meet the Farm Bill requirement. Readiness to meet the Farm Bill requirement is lowest among stores with no Internet connection (or "other" response) (17 percent) (see **Figure 5-8**). As discussed in more detail in **Section 6,** lack of high-speed Internet is a technological barrier to adoption of scanning technologies and integrated systems.

Figure 5-7. Percentage of Small SNAP-Authorized Retailers That Meet the Farm Bill Requirement by Annual Retail Sales

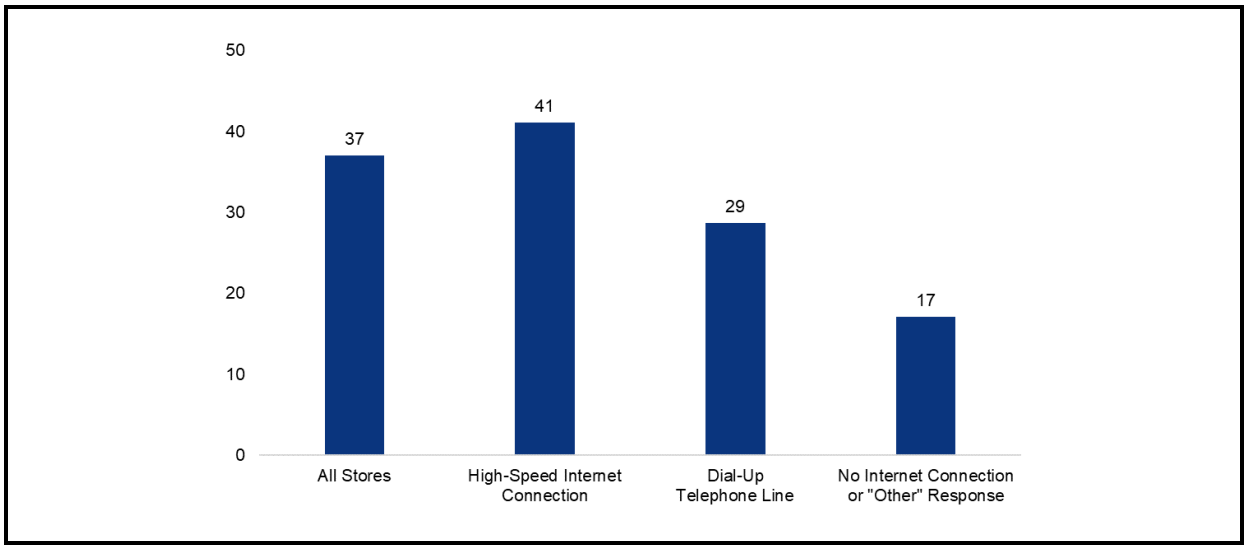


Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents.

The Rao-Scott design-adjusted chi-square goodness-of-fit test ($p < .0001$) for a one-way table was used to test the null hypothesis of equal proportions. The p-value indicates that a statistical difference between at least two subgroups was found.

Figure 5-8. Percentage of Small SNAP-Authorized Retailers That Meet the Farm Bill Requirement by Internet Connectivity



Source: 2018 SCANR Survey

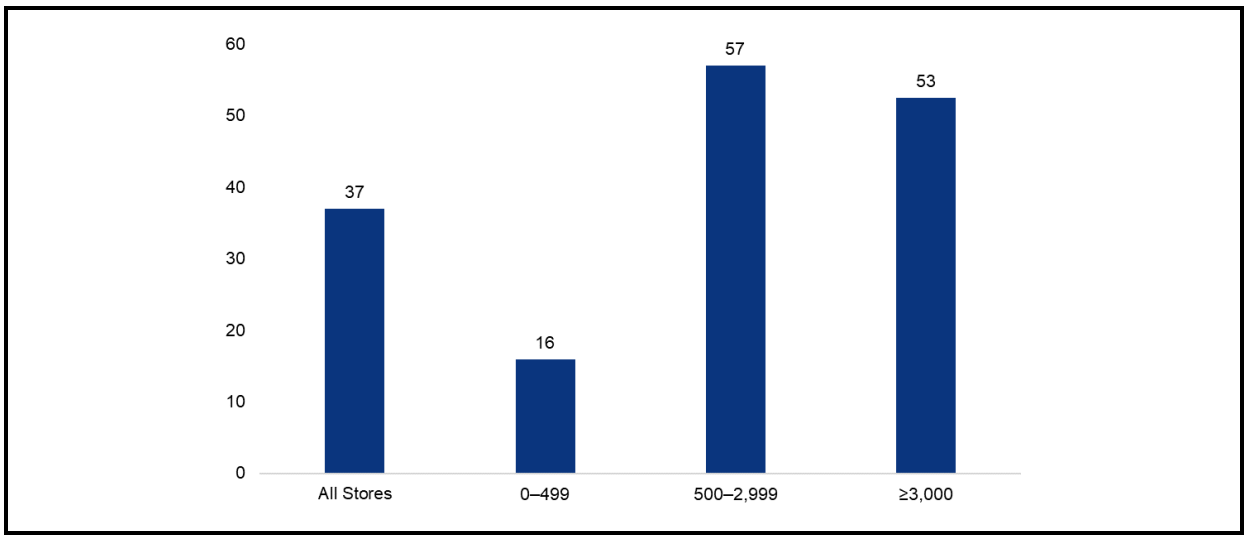
Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents.

The Rao-Scott design-adjusted chi-square goodness-of-fit test ($p < .0147$) for a one-way table was used to test the null hypothesis of equal proportions. The p-value indicates that a statistical difference between at least two subgroups was found.

Number of Unique Barcode Food Products. Readiness for meeting the Farm Bill was highest among stores that stock many different types of products. Among stores with 500 or more unique barcode food

products, more than 50 percent meet the Farm Bill requirement. Among stores with fewer than 500 unique barcode food products, only 16 percent meet the Farm Bill requirement (see **Figure 5-9**).

Figure 5-9. Percentage of Small SNAP-Authorized Retailers That Meet the Farm Bill Requirement Status by Number of Unique Barcode Food Products



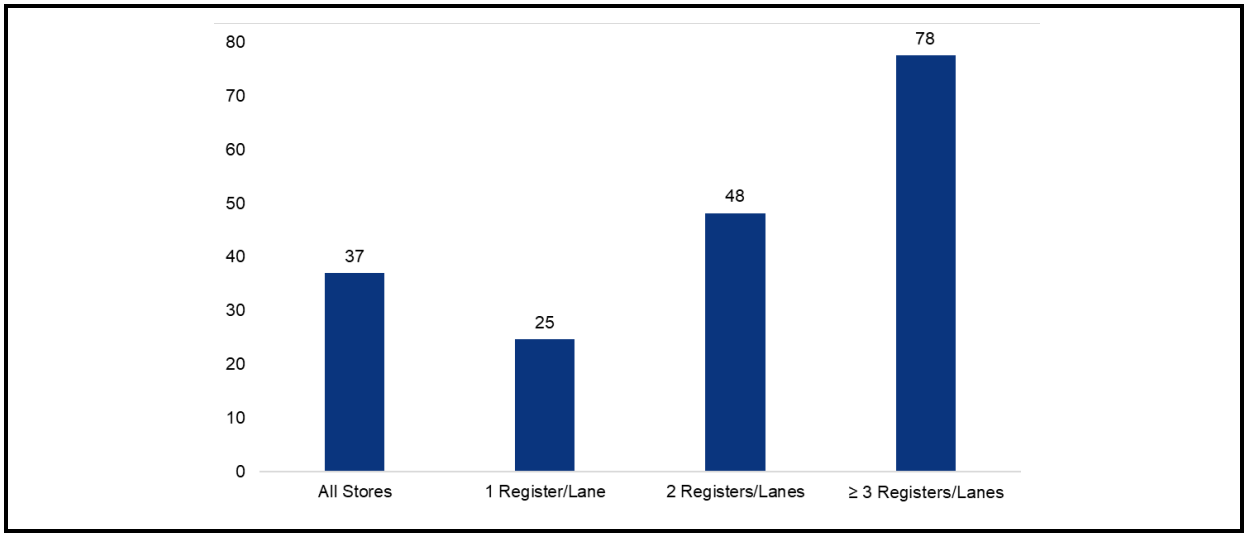
Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents.

The Rao-Scott design-adjusted chi-square goodness-of-fit test ($p < .0001$) for a one-way table was used to test the null hypothesis of equal proportions. The *p*-value indicates that a statistical difference between at least two subgroups was found.

Number of Cash Registers/Lanes. Readiness for meeting the Farm Bill was highest among stores that have relatively more registers/lanes and are thus likely to service more customers. Among stores with three or more lanes, 78 percent meet the Farm Bill requirement. Conversely, among stores with one lane, 25 percent meet the Farm Bill requirement (see **Figure 5-10**).

Figure 5-10. Percentage of Small SNAP-Authorized Retailers That Meet the Farm Bill Requirement by Number of Cash Registers/Lanes



Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents.

The Rao-Scott design-adjusted chi-square goodness-of-fit test ($p < .0001$) for a one-way table was used to test the null hypothesis of equal proportions. The *p*-value indicates if a statistical difference between at least two subgroups was found.

5.3 Results of Classification and Regression Tree Analysis

As discussed in **Section 2.2.3**, the purpose of the CART analysis was to identify store characteristics that predict whether a store has adopted a scanning system that meets the Farm Bill requirement. Specifically, a classification tree was constructed to show the partitioning of stores based on variables that had an effect on readiness for meeting the Farm Bill requirement. The classification analysis included the following variables: store type, urbanicity, multiple locations, number of registers/lanes, number of unique barcode food products, number of unique random-weight products, number of full-time employees, number of part-time employees, number of cashiers, external source/third party maintains front-end register, ownership of terminal, length of time SNAP authorized, WIC authorization, ratio of SNAP-eligible products to sales, ratio of average monthly SNAP redemptions to average monthly sales, and average monthly sales. Next, based on the results of the CART analysis, those variables that have explanatory power were used in a logistic regression model to estimate odds ratios that quantify the likelihood that stores possessing certain characteristics have adopted a scanning system that meets the Farm Bill requirement (see **Table 5-1**).

Table 5-1. Logistic Regression Results for Factors Predicting Whether a Retailer Has Adopted a Scanning System That Meets the Farm Bill Requirement

Variable	Mean Odds Ratio	*p*-value	95% Confidence Limits	
			Lower Limit	Upper Limit
Store type				
Franchise convenience vs. specialty	1.54	.4131	0.55	4.33
Nonfranchise convenience vs. specialty	1.49	.4553	0.52	4.29
Medium grocery vs. specialty	2.20	.0981	0.86	5.62
Small grocery vs. specialty	2.15	.1182	0.82	5.61
Multiple locations				
Yes vs. no*	1.91	.0117	1.16	3.17
Number of unique barcode food products				
≥3,000 vs. <100*	7.89	<.0001	3.12	19.95
1,000 to 2,999 vs. <100*	15.97	<.0001	5.99	42.57
500 to 999 vs. <100*	10.18	<.0001	3.72	27.82
100 to 499 vs. <100	2.27	.0711	0.93	5.54
Number of unique random-weight food products				
≥500 vs. none	0.53	.3352	0.15	1.93
100 to 499 vs. none*	0.33	.0255	0.12	0.87
50 to 99 vs. none	0.56	.2593	0.20	1.54
25 to 49 vs. none*	0.29	.0068	0.12	0.71
1 to 24 vs. none	0.69	.3738	0.31	1.56
Store owns payment terminal				
Yes vs. no	1.07	.7897	0.64	1.81
External source/third-party maintains front-end register				
Yes vs. no*	2.38	.0011	1.42	3.99
Number of cashiers				
≥10 vs. none	1.49	.7234	0.16	13.73
5 to 9 vs. none	1.35	.7675	0.19	9.73
3 to 4 vs. none	0.64	.6485	0.09	4.35
0 to 2 vs. none	0.39	.3166	0.06	2.44
Average monthly retail sales in hundreds of thousands of dollars[a]	1.26	.0542	1.00	1.59
Percentage of average monthly retail sales for SNAP-eligible products	1.73	.4105	0.47	6.34
Overall model Wald test	139.20 ($p < .0001$)			

Sources: 2018 SCANR Survey and FNS STARS dataset, January 2018

Notes: Logistic regression model was estimated in Stata (using logit command) to investigate how different factors influenced the likelihood of a small SNAP-authorized retailer adopting a scanning system that meets the Farm Bill requirement (i.e., has a scanner with a SNAP flag, system may be integrated or nonintegrated). Specifically, a dichotomous indicator of meeting the Farm Bill was regressed on characteristics of the retailer and its scanning system. The specific characteristics included in this regression were identified using a CART analysis. Number of respondents used in analysis = 959. Results are weighted.

Estimate (with 95 percent confidence limits) indicates the odds ratio of adopters to nonadopters.

[a] Annual retail sales from STARS dataset divided by 12.

* indicates statistical significance at $p < 0.05$.

The results of the logistic regression analysis are summarized below:

- **Stores that carry more unique barcode food products are more likely to have adopted.** Stores that stock more barcode food products are more likely to have adopted scanning systems that meet the Farm Bill requirement. For example, stores that have 500 to 999 barcode products are 10 times more likely to have adopted scanning systems with a SNAP flag than stores with 100 or fewer barcode products ($p < .01$). Stores that stock relatively more different barcode products are likely to realize greater efficiencies from using a scanning system that has a SNAP flag.

- **Stores with multiple locations are more likely to have adopted**. Stores that own more than one location are more likely to have adopted scanning systems that meet the Farm Bill requirement. Specifically, stores with multiple locations are 91 percent more likely to have adopted ($p = .01$). The use of scanning systems may be related to standardization of technology across multiple locations or the availability of capital to fund the initial purchase and installation cost.

- **Stores that carry a lot of unique random-weight food products tend to be less likely to have adopted**. Specifically, stores that carry 25 to 49 random-weight products and stores that carry 100 to 499 random-weight products are, respectively, 71 percent and 67 percent less likely to have adopted a system that complies with the Farm Bill requirement as stores with no random-weight products ($p < .01$ and $p = .03$). This suggests that stores that sell relatively more random-weight products have less to gain in terms of efficiency from using a scanning system with a SNAP flag. However, it is worth noting that stores with 1 to 24, 50 to 99, and 500 or more random-weight products are not statistically more likely to have adopted.

The remaining variables were not significant in the regression.

6. Results: Barriers and Facilitators to Using Scanning Systems

This section describes the barriers and facilitators that small SNAP-authorized retailers face with using scanning technologies, including their knowledge of scanning technologies, perceptions of the cost of scanning technologies, relative importance of various barriers to adoption, and benefits of having a scanning system. The section concludes with weighted estimates of the number and percentage of SNAP-authorized retailers that do not currently meet the Farm Bill requirement but are likely to adopt a scanning system so that they remain a SNAP-authorized retailer (**Appendix D, Table D-24** and **Table D-25**). These findings are based on responses to the SCANR Survey and follow-up interviews with adopters and nonadopters.

6.1 Retailers' Knowledge of Scanning Technologies

Key Findings

- Most interviewed nonadopters were not knowledgeable about available scanning systems and their cost.
- Important cost barriers were the cost to purchase, install, and maintain scanning systems and the cost to train staff. For some stores, their relatively low SNAP sales volume was a concern.
- Important noncost barriers were not having staff available to help with system failures and other troubleshooting, time to maintain the UPC product database, and time to evaluate and decide which type of scanning system to install.
- Benefits cited most often by adopters were the potential cost savings, access to inventory tracking and sales data, improved accuracy (e.g., pricing and sales taxes), and better customer service.
- Among nonadopters, 59 percent of stores reported they were very or somewhat likely to adopt new scanning equipment to meet the Farm Bill requirement and remain SNAP authorized.

Many of the interviewed nonadopters were not very or not at all knowledgeable about available scanning technology. To obtain information on POS and scanning technology, interviewed nonadopters frequently indicated that they sought or would seek input from either their current food supplier/distributor or POS provider. Only a few nonadopters reported that they had or would find information about scanning technology online. One nonadopter reported receiving information from salespeople who come to his store and another reported receiving information via mail and email.

When asked about information they would like to have on scanning technologies, about one-third of the interviewed nonadopters either were not interested or could not think of additional information they needed. Among nonadopters who expressed wanting or needing additional information, the most common request was for information on costs. Relatedly, several nonadopters indicated that they would like to understand different scanning systems that are available. Several nonadopters also expressed that they would like more information about how scanning technology works. For example, one nonadopter suggested that retailers should be provided with step-by-step instructions, while another retailer wanted to understand how barcodes can be added to items that do not already have them. Also important to a few nonadopters was clarification about the new Farm Bill requirement, including the rationale, expectations (e.g., are there additional reporting requirements, how long would retailers have to implement the new requirements), and the benefits of installing scanning technology.

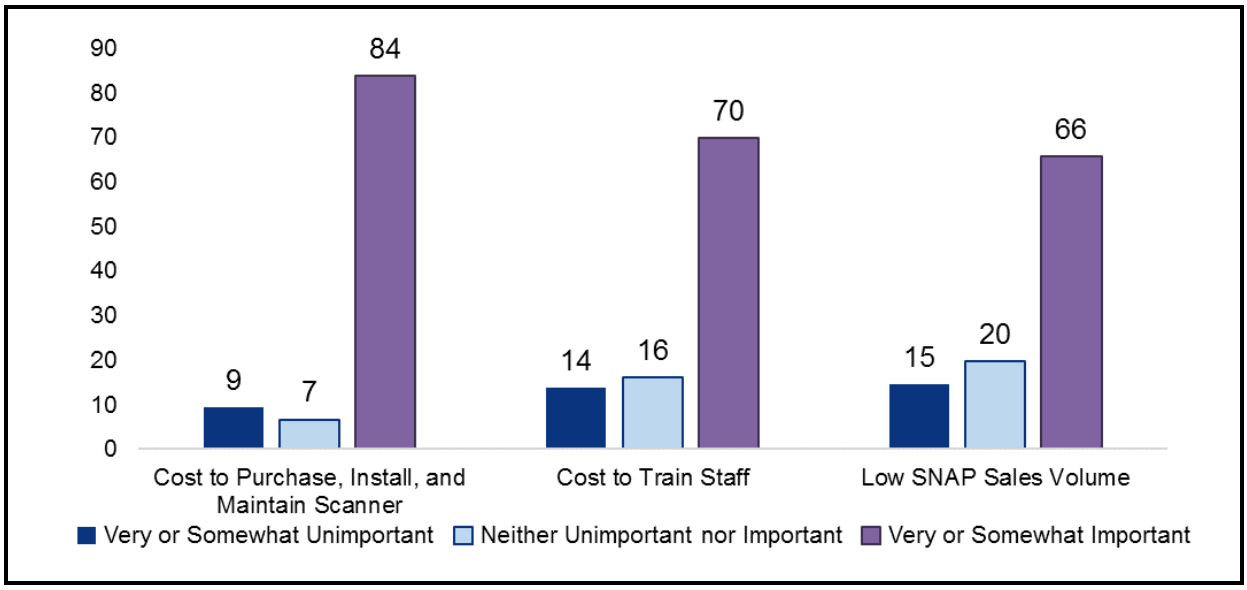
About half of interviewed nonadopters discussed how they would prefer to receive information about the Farm Bill requirement or scanning technology in general. Most frequently, they wanted to receive

information via mail, email, or both; however, several nonadopters noted that they preferred to find or review information online.

6.2 Retailers' Perceptions of Implementation Costs for Scanning Technologies

Respondents to the SCANR Survey that did not have scanning systems meeting the Farm Bill requirement were asked to rate the importance of various factors in their decision on whether to upgrade or purchase scanning technology. Barriers related to cost were considered most important in their decision. About 84 percent of stores reported that the cost to purchase, install, and maintain scanner equipment would be somewhat or very important in their decision. Additionally, nearly 70 percent of respondents reported that the cost to train staff would be somewhat or very important in their decision. About 66 percent of respondents reported that low SNAP sales volume would be somewhat or very important in their decision (see **Figure 6-1** and **Appendix D, Table D-23**). Retailers with relatively low SNAP sales volume may be reluctant to invest in the cost of purchasing and maintaining a scanning system. These barriers were also mentioned in the follow-up interviews conducted with nonadopters, which are further summarized below.

Figure 6-1. Retailers' Perceived Barriers to Adoption of Scanning Systems: Cost Factors (Weighted Percentage of Stores)



Source: 2018 SCANR Survey

Question 18: How important would each of these factors be in your decision on whether to upgrade or purchase scanning technology that meets the new requirement?

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. Only respondents without a scanning system with a SNAP flag answered the question (n = 660). Data are not available for 20 respondents who did not answer this question.

Many interviewed nonadopters did not know or could not estimate what it would cost to implement a scanning system with a SNAP flag. Although they could not assign a dollar amount, several of these nonadopters explained that they knew it would be expensive. Nine interviewed nonadopters estimated costs for purchasing or leasing the necessary equipment ranging from $2,800 to $20,000 (see **Table 6-1**).

Estimates on the lower end of this range were provided by small grocery and specialty stores, which are more likely to only have one checkout station, while estimates on the higher end of this range were provided by medium grocery stores, which typically have multiple checkout lanes, each requiring its own system. Only two nonadopters (one small grocery store and one specialty store) estimated the monthly cost of leasing equipment; the estimates ranged from $60 to $250. Lastly, one franchise convenience store indicated that an upgrade to the current system (purchase of a scanner) for $800 would be sufficient to meet the requirement.

Table 6-1. Nonadopters' Perceptions of the Cost of Scanning Systems with a SNAP Flag

Interview Respondent Store Type	Perceived Cost	Description
Franchise convenience	$800	Update or upgrade current system
Small grocery store	$2,800–$3,000	Purchase scanning technology
Small grocery store	$200–$250/month	Lease scanning technology
Medium grocery store	$8,000	Purchase scanning technology
Medium grocery store	$8,000–$10,000	Purchase scanning technology
Medium grocery store	$20,000 $1,100/year	Purchase scanning technology Service agreement
Specialty store	$60/month	Lease scanning technology
Specialty store	$7,500	Purchase scanning technology
Specialty store	$5,000	Purchase scanning technology

Source: 2018 follow-up interviews with nonadopters

Based on the cost analysis (see **Table 7-9**), the cost to install a new scanning system ranges from $7,371 to $10,584 depending on store type, which was within the range of retailers' perceived costs. Interviewed nonadopters also explained that additional costs associated with training personnel, creating and maintaining a product database, making renovations to accommodate the new equipment, covering ongoing service and repairs, and accounting for travel time for a technician to install or repair the system would be incurred, but they did not or could not estimate a dollar value for these expenses.

Interviewed nonadopters were also asked about what costs they would be able to bear for the purchase, installation, and maintenance of scanning systems. Many nonadopters did not share a specific amount or noted that they would not be able to bear any additional costs. Among the nine interviewed nonadopters who shared this information, the estimates ranged from $100 to $4,000 for one-time expenses (i.e., the upfront cost of equipment) or from $10 to $250 in monthly expenses. Nonadopters were generally not familiar with any sources of financing or funding to support the purchase of scanning technology. Several nonadopters noted that it would be possible to obtain a loan or line of credit from their bank but would not want to do so.

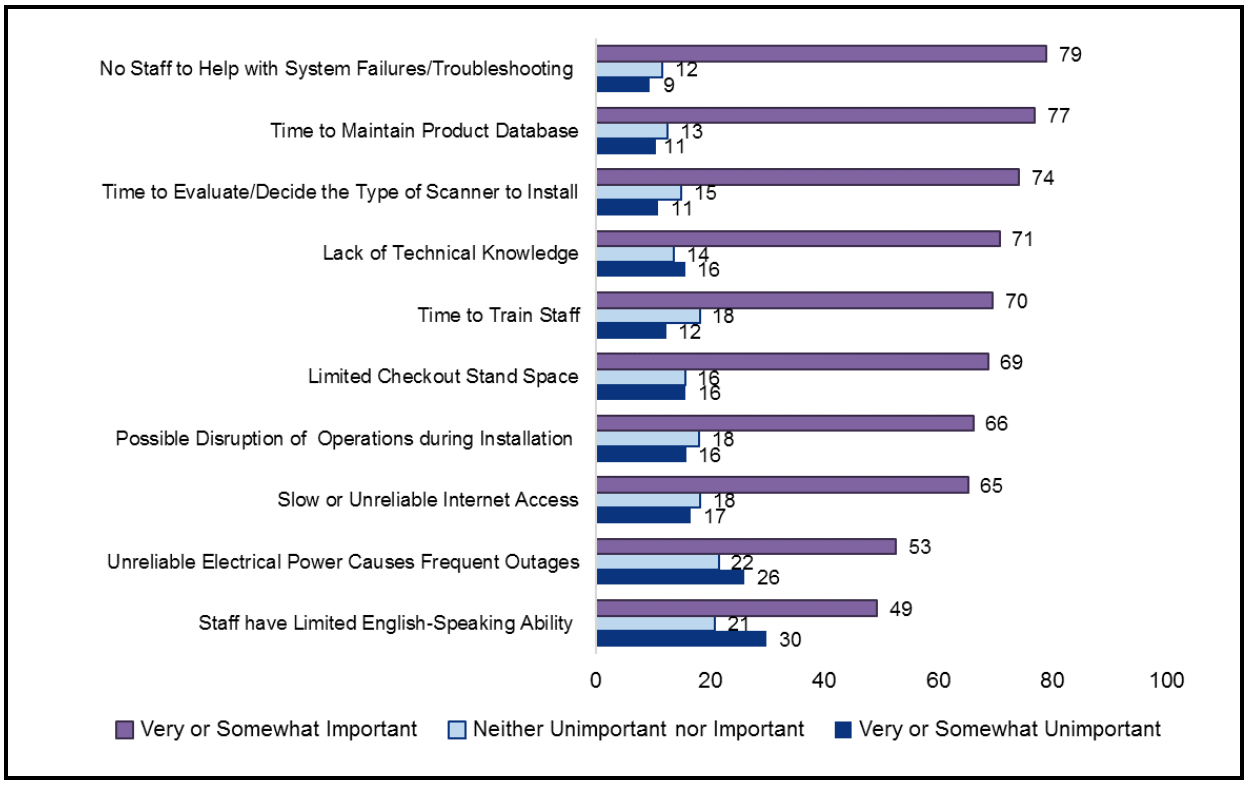
6.3 Retailers' Perceived Noncost Barriers to Adoption of Scanning Technologies

Only about one-third of interviewed nonadopters described barriers to adoption that were not explicitly about costs. These respondents expressed a wide range of concerns. A couple of nonadopters explained

that they were apprehensive about adopting scanning technology because of a general fear of change and/or having a limited comfort level with computers and technology.

Based on responses to the SCANR Survey, nonadopters identified a variety of noncost factors that are perceived as barriers to installing scanning technologies in addition to factors related to cost (see **Figure 6-2** and **Appendix D, Table D-23**). Of the 10 noncost factors listed on the survey, 9 were rated as somewhat or very important by 50 percent or more of respondents in their decision to upgrade or purchase scanning technology that meets the Farm Bill requirement. The three highest rated factors were no staff to help with system failures and other troubleshooting (79 percent), time to maintain product database (77 percent), and time to evaluate and decide which type of scanner to install (74 percent). Additional barriers were lack of technical knowledge (71 percent), time to train staff (70 percent), and limited checkout stand space (69 percent). The two factors mentioned the least were unreliable electrical power causes frequent outages (53 percent) and staff have limited English-speaking ability (49 percent). Based on nonadopters' responses to the follow-up interviews, concerns about noncost factors were discussed less frequently as summarized below.

Figure 6-2. Retailers' Perceived Barriers to Adoption of Scanning Systems: Noncost Factors (Weighted Percentage of Stores)



Source: 2018 SCANR Survey

Question 18: How important would each of these factors be in your decision on whether to upgrade or purchase scanning technology that meets the new requirement?

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. Only respondents without a scanning system with a SNAP flag answered the question (n = 660). Data are not available for 20 respondents who did not answer this question.

> "I don't know, it is easier for me, when I want to change prices I really don't have to go into the system, I'm not really like a computer guy so it kind of works for me, the old school system." — *Small grocery store (Nonadopter)*

At least three nonadopters expressed concern about downtime due to Internet or power outages or system repairs.

> "Like I said, I don't know much about it, do they run on an Internet if the Internet is down? What if the power goes out? At least if the power goes out here we have the option to open the drawer and use a calculator to go ahead and add things up and ring them in later." — *Nonfranchise convenience store (Nonadopter)*

At least three nonadopters expressed concern about setting up and maintaining an accurate product database and training staff on how to do so. One of these respondents was unclear about how to set up a product database. He was also concerned that cashiers would become too reliant on the system for pricing and would not catch errors that might occur in the system. Another respondent explained that his store runs ads in the paper with special pricing, so keeping up with prices that change frequently would be difficult.

> "See we also run an ad every week in the newspaper—a store ad—so every week [we] would also have to change the regular prices to the ad prices and then take all of that off the next week and put the new ones on." — *Medium grocery store (Nonadopter)*

Finally, one nonadopter expressed concern that implementing scanning technology would result in slower customer service for his non-SNAP customers, particularly because the cashier and customer are separated by glass so a SNAP customer would need to hand the cashier one product at a time.

> "[The current process is faster] because we are used to [typing in the prices] and the customer will have to spread out everything on the counter and you have to ring everything and then give them the receipt. With the scanning, you have to say, 'will you hand me this?' Okay. Because we have the partition because it is a rough area." — *Franchise convenience store (Nonadopter)*

6.4 Retailers' Perceived Benefits to Adoption of Scanning Technologies

According to interviewed adopters, the perceived benefits of using scanning systems generally fall into one of four categories that are somewhat interrelated as described below: cost savings, access to inventory tracking and sales data, improved accuracy, and better customer service. Many medium grocery stores and convenience franchise interviewees mentioned cost savings as a benefit. Most frequently these respondents associated cost savings with reduced labor costs (i.e., save time by not having to mark prices on each individual item); reduced waste; and a reduction in potentially costly errors, fraudulent behavior, and employee theft. Even if the latter does not result in actual cost savings, store owners expressed that they worry less knowing that the system is accurate, contains consistent pricing information, and can identify SNAP-eligible items. In other words, these adopters feel less dependent on cashiers to complete an accurate transaction.

> "It's so easy to just go ahead and do everything back here because if you didn't have scanning, you'd have to go out with a [pricing] gun and mark everything and that's a lot of work for people to do that, changing the prices once the sales off. Then you'd have to pull all the tags off each item, each can and it makes the cans look terrible when they got all the stickers on them. So yeah. It's just technology's a wonderful thing." — *Medium grocery store (Adopter)*

> "We enter everything there, so we just scan. It controls inventory and from causing mistakes. Sometimes if you don't have the system, if an item costs $15.00, sometimes they would just put $1.50 or something or it could be a mistake on the receipt. So it helps a lot with this." — *Medium grocery store (Adopter)*

Having access to inventory and sales data was also an important benefit noted by nearly half of interviewed adopters. Adopters expressed that this information helps reduce waste (and costs) because they have a better understanding of what products are popular; how much they are selling; and, in some cases, how much remains on the shelves. At least one adopter indicated that having inventory and sales data allows them to provide better customer service because they know what items are being purchased with SNAP benefits, for example, and can be sure to maintain adequate stock of these items.

> "One of the problems is waste and identifying items that aren't moving. A lot of times, if items aren't moving it gets put on the clearance table. If that doesn't get communicated to other employees, then I go through, for example and do the reordering, and that gets reordered. That costs us a lot of money and waste." — *Medium grocery store (Adopter)*

> "We track our SNAP transactions every day, so we know the volume that we're doing…It's really helped us to watch that volume, to understand which products we need to have on the floor, so if we're offering enough varieties of milk or enough varieties of beans and lentils and all of that sort of stuff. So that information has been helpful. What we don't want to happen is a customer coming in and saying, 'They don't have anything for me,' and then leaving. So by us understanding the volume that we do, we can make sure that we have the right product." — *Nonfranchise convenience store (Adopter)*

Accuracy was another common theme among interviewed adopters when discussing the benefits of scanning technology. Accuracy came up in the context of pricing, completing transactions appropriately, and reporting sales tax.

> "The system tells my employees that they are not supposed to sell cigarettes on EBT or medicines or motor oil or pet food. Like I said, it makes their life easier after spending that much money. So we are not getting in violation on that or something." — *Franchise convenience store (Adopter)*

> "Just the accuracy of pricing. Most things are scanned, so there's not really a lot of guesswork by the cashiers. They're scanning it, it is what it is in the system." — *Medium grocery store (Adopter)*

Finally, improved customer service was another important benefit discussed by interviewed adopters (e.g., access to sales and inventory data allows at least one adopter to ensure adequate stock of frequently purchased SNAP-eligible items). Other adopters noted that with scanning technology in place customers benefit from a faster checkout process and more detailed receipts.

> "So many SKUs [stock keeping units] throughout the store that I have to have [scanning technology] just in order to get people out the door in a timely manner. You process a $150.00 order or something here, that already takes you a decent amount of time. If you're sitting there manually entering prices, you're gonna be there for a half hour, 45 minutes. So yeah. I would say it's 100 percent it's needed. There's no possible way we could ever live without it." — *Small grocery store (Adopter)*

> "Of course the customers love it because they get checked out a lot quicker. They have an itemized ticket. Before, we just did groceries, meat, and produce. This tells them exactly what produce they bought, what groceries they bought. They love it." — *Medium grocery store (Adopter)*

When asked about benefits they associate with implementing scanning equipment, nearly half of all nonadopters interviewed described one or more of the four benefits identified by adopters. Improved inventory control and accuracy were the most frequently reported perceived benefits among nonadopters. About one-third of all interviewed nonadopters indicated that they were either not familiar enough with the technology to know about the benefits or had not heard about benefits associated with implementing the technology.

6.5 Retailers' Self-Reported Likelihood to Adopt Scanning System Meeting the Farm Bill Requirement and Remain SNAP Authorized

Among nonadopting retailers, a weighted total of 35,665, or 59 percent, reported that they would be very or somewhat likely to purchase and maintain new equipment to meet the Farm Bill requirement to remain a SNAP-authorized retailer (see **Figure 6-3**, **Table 6-2**, and **Appendix D, Table D-25** for estimates by store type). Nearly a third reported they would be very or somewhat unlikely to adopt a new system to meet this new requirement, and 10 percent would be neither unlikely nor likely to do so (i.e., undecided). The weighted percentage of likely adopters ranged from 62 percent for nonfranchise convenience stores to 45 percent for specialty grocery stores, although the p-value of $> .05$ indicates that the responses to this question did not vary by store type.[14]

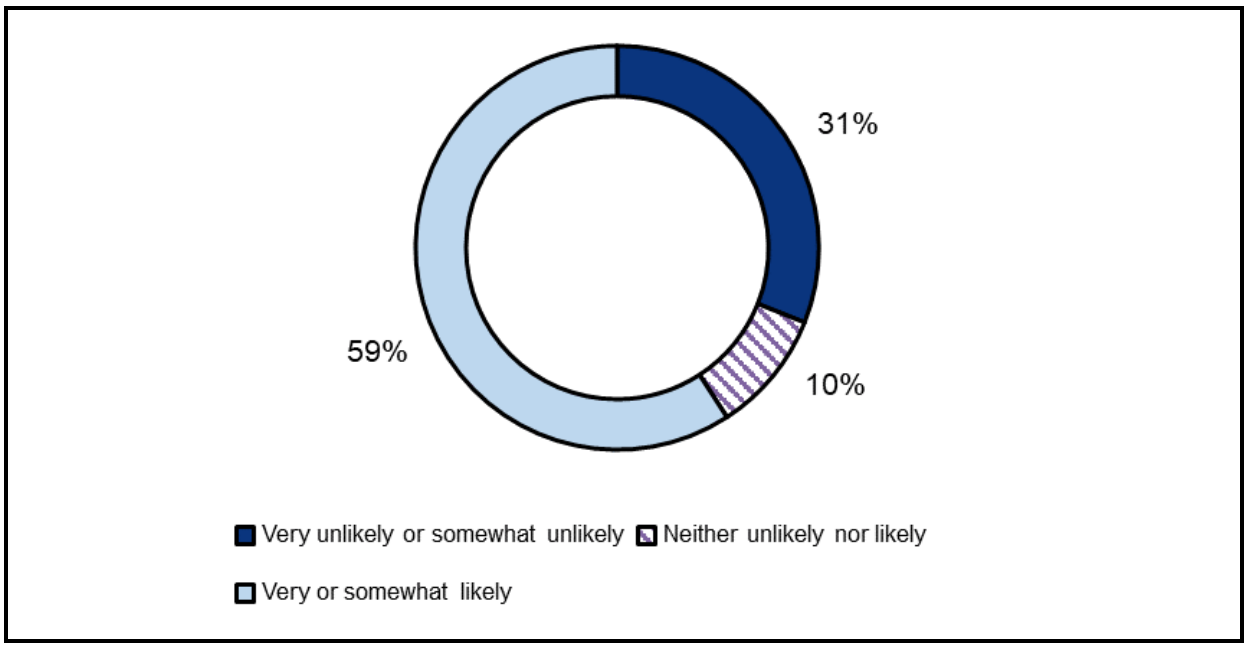
In the follow-up interviews, approximately one-third of interviewed nonadopters indicated that they were unlikely to or still uncertain about installing scanning technology, even if it meant they could no longer accept SNAP. Most of these nonadopters also responded on the survey that they were somewhat or very unlikely to install scanning technology with a SNAP flag. Except for medium grocery stores, at least one interviewed nonadopter from each store type (franchise and nonfranchise convenience stores, small grocery stores, and specialty stores) shared they are unlikely to install the equipment. Among interviewed nonadopters that were unlikely to meet the requirement, a few expressed that not accepting SNAP would cause them financial hardship, while several others expressed more concern for their community, which depends on them for SNAP purchases.

[14] The weighted number of stores (by store type) that would be very or somewhat likely to make this investment and remain SNAP authorized was used in the cost analysis for estimating the overall cost to the industry to meet the Farm Bill requirement (see Section 7).

"As far as financially for us, it's not that it's going to be a huge difference for us not to accept it. Maybe $1,000/month, give or take. Sometimes it's going to be more, sometimes less. But as far as the community that we live in, I think it would have a bigger impact on the people that come here rather than us." — *Franchise convenience store (Nonadopter)*

"No I have not made a decision because I am a very, very small store, sales are down and to be honest to put a new machine in that would do all of that would be very expensive and I honestly don't know if I can afford it. And it would not just hurt me, it would hurt the town. I have a lot of people in this town that do not have driver's license so they do shop in here with their EBT cards." — *Nonfranchise convenience store (Nonadopter)*

Figure 6-3. Retailers' Self-Reported Likelihood to Adopt a Scanning System and Remain SNAP Authorized



Source: 2018 SCANR Survey

Question 17 from SCANR Survey: There is a new law that will require all SNAP-authorized retailers to use scanners at checkout to accept SNAP benefits. In the future, your store may need to upgrade or purchase and maintain new equipment to comply with this law. How likely are you to do this so you can remain a SNAP-authorized retailer?

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. Only respondents without a scanning system with a SNAP flag answered the question (n = 660). Data are not available for 20 respondents who did not answer this question and 34 respondents who indicated they were in the process of purchasing or installing a system that would meet the Farm Bill requirement. CI = confidence interval.

A majority of interviewed nonadopters initially expressed—either on the SCANR Survey or earlier in the interview—that they were unlikely to or not currently considering adoption even though many ultimately said they *would* install a scanning system with a SNAP flag to meet the requirement. Several interviewed nonadopters explained that they had not heard about the requirement before receiving the survey, which might have influenced their initial negative response. Several other nonadopters shared that, although they think scanning technology is unnecessary or that it would cost too much, they would not want to or could not afford to lose the revenue generated from SNAP purchases; thus, they would install scanning technology if required to remain SNAP authorized.

"Well, if I had to get it done, I'd come up with the money because I don't want to lose any customers. If I don't get the system to meet the requirement and if somebody comes in with SNAP or EBT or credit cards and I can't accept them, then I wouldn't have any choice but to try to get it." — *Specialty store (Nonadopter)*

"Well that is going to hurt me a lot, I know that. If I've got to install the scanner in order to accept EBT, then I guess I am going to have to." — *Specialty store (Nonadopter)*

Table 6-2. Weighted Number and Percentage of Small SNAP-Authorized Retailers' Self-Reported Likelihood to Adopt Scanning System and Remain SNAP Authorized by Store Type

	All Stores		Convenience: Franchise		Convenience: Non-Franchise		Grocery: Medium		Grocery: Small		Specialty	
Response	Number	Percentage of Stores (95% CI)	Number	Percentage of Stores (95% CI)	Number	Percentage of Stores (95% CI)	Number	Percentage of Stores (95% CI)	Number	Percentage of Stores (95% CI)	Number	Percentage of Stores (95% CI)
Very likely/ somewhat likely	35,665	59.1 (53.0, 65.3)	4,556	58.2 (46.0, 70.3)	22,647	61.5 (52.0, 71.0)	2,194	56.0 (46.0, 66.1)	4,027	59.4 (49.8, 69.1)	2,241	45.2 (37.5, 52.9)
Neither unlikely nor likely	5,910	9.8 (6.3, 13.3)	1,126	†	2,923	†	454	†	900	†	506	†
Somewhat unlikely/very unlikely	18,737	31.1 (25.2, 36.9)	2,152	†	11,263	30.6 (21.6, 39.6)	1,266	32.3 (23.0, 41.7)	1,848	27.3 (18.6, 35.9)	2,208	44.6 (36.9, 52.2)
Total number of stores	60,311		7,834		36,833		3,915		6,775		4,955	

Source: 2018 SCANR Survey

Question 17 from SCANR Survey: There is a new law that will require all SNAP-authorized retailers to use scanners at checkout to accept SNAP benefits. In the future, your store may need to upgrade or purchase and maintain new equipment to comply with this law. How likely are you to do this so you can remain a SNAP-authorized retailer?

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. Only respondents with a scanning system with a SNAP flag answered the question (n = 660). Data are not available for 20 respondents who did not answer this question and 34 respondents who indicated they were in the process of purchasing or installing a system that would meet the Farm Bill requirement. CI = confidence interval.

The Rao-Scott design-adjusted chi-square goodness-of-fit test (p = .2742) for a one-way table was used to test the null hypothesis of equal proportions. A statistically significance relationship was not found.

† Estimate is suppressed if the number of respondents in a given category is fewer than 30 or the coefficient of variation is greater than 30 percent.

7. Results: Cost Estimates for Implementing Scanning Systems at Small Retailers

This section describes the cost analysis procedures and presents the results of the cost analysis to describe the financial impact of requiring all small SNAP-authorized retailers (not including farmers' markets, direct-marketing famers, delivery routes, or meal services) to implement scanning systems capable of identifying SNAP-eligible products. The section provides an explanation of the types of costs that a retailer would incur to adopt a scanning system and describes the cost inputs used in the analysis. Next, it presents descriptions of the calculation of costs by phase (i.e., initial and ongoing annual costs) at the store level and the estimated store-level costs by store type. As described in **Section 2.5**, these costs were estimated using data from the vendor interviews, the SCANR Survey, and the follow-up interviews with retailers who had purchased and implemented scanning systems and secondary data on labor rates and interest rates and then simulated using a probability distribution. Finally, the section provides descriptions of the calculation of industry-level costs using the store-level costs and information from the SCANR Survey on scanning system adoption and presents the estimated industry-level costs overall and by store type.

Key Findings

- The initial per-store simulated mean costs for a scanning system ranged from $7,373 for small grocery stores to $10,583 for medium grocery stores.[15] The primary driver in the cost difference among store types was average number of lanes, which varies by store type.
- Ongoing annual per-store simulated mean costs ranged from $1,779 for specialty stores to $15,298 for medium grocery stores.
- The total industry cost for all stores that currently do not meet the Farm Bill requirement is $808 million.
- Of the $808 million, approximately $460 million is attributed to stores that are planning to implement the requirement to remain SNAP authorized and the remaining to stores that are unlikely to adopt.

7.1 Store-Level Costs

The total cost of investment for a small retailer to install and use scanning systems includes capital equipment, labor, maintenance, annual amortization, and other costs, as described below:

- **Capital equipment costs** are the costs to select, purchase and install POS equipment. These costs are estimated in dollars.
- **Labor costs** are wages for cashiers, information clerks, and managers to be trained on how to use the scanning system. These costs are estimated in hours per year by type of employee and then multiplied by hourly wages from the Bureau of Labor Statistics (BLS).
- **Maintenance costs** include service contracts that retailers enter into with vendors of scanning equipment. These costs are estimated in dollars per year.

[15] All costs presented are for fully integrated systems. In the vendor interviews, vendors could not distinguish prices for systems that meet the minimum requirements of the Farm Bill (i.e., nonintegrated system with a SNAP flag indicator) versus a fully integrated system.

- **Annual amortization costs** for capital equipment are calculated based on years of life or useful life of equipment and the interest rate.
- **Other costs** include the cost of updating the UPC database as new items are introduced into the store.[16]

7.1.1 Cost Inputs

As described in **Section 2.4.1**, cost inputs were obtained from a combination of secondary data, vendor interviews, follow-up interviews with retailers who have purchased and implemented scanning systems, and the SCANR Survey. Respondent-level data from the vendor interviews and follow-up interviews were entered in an Excel spreadsheet, and the mean values and range of costs were calculated for the cost analysis. **Table 7-1** provides the minimum, mean, and maximum estimated costs of the bundled system (i.e., software, hardware, and installation for a scanning system) and service contract, accompanied by hourly estimates for training and other tasks. The uncertainty analysis (conducted using @Risk software) used the mean values; the minimum and maximum values are provided to show the full range of potential costs to small retailers. @Risk conducts a simulation to obtain an interval around the predicted estimates with high confidence of bounding the true but unknown estimate of industry costs. Elements that varied in the simulation included the cost of scanner system purchase and installation; labor costs for vendor selection, training, and UPC maintenance; and the cost of service contracts. The remaining cost elements were kept constant in the simulation. The simulation used a PERT distribution[17] (similar to the triangular distribution) that creates a probability distribution from assumptions regarding minimum, most likely, and maximum values. However, values near the extremes of the distribution (the minimum and maximum) are assumed to be less likely to occur than in the triangular distribution.

Table 7-1. Cost Inputs: Estimated Expenses Associated with Installing and Maintaining Retail Scanning Systems

Expense	Minimum	Mean	Maximum
Bundled price to purchase and install system, per lane ($)	$1,250[a]	$4,845	$10,800
Service contract ($ per lane per year)	$63	$436	$700
Training per cashier (hours)	0.25	2	6
Training for managers (hours)	2	8	16
POS selection (manager hours)	1	9	24
Annual hours per UPC on database maintenance	0.0015	0.1829	0.64

Sources: Vendor interviews and follow-up interviews with retailers, 2018

[a] The minimum cost to purchase and install a system represents the cost of purchasing it through an online vendor.

To calculate labor costs, estimates of wage rates were obtained for the Food and Beverage Store industry (North American Industry Classification System [NAICS] code 4450A1) from BLS for cashiers,

[16] The cost of maintaining a UPC database (to add new products and prices) was included, but the initial cost of setting up a UPC database was not included. Vendors explained that distributors already have UPC database files of products that are sold to retailers, or retailers can transfer the UPC database from their old POS system to a new POS system. Although as previously noted, UPC database setup can be labor intensive if the initial set up is done manually.

[17] The PERT distribution is a family of continuous probability distributions defined by the minimum, most likely, and maximum values that a variable can take.

information and record clerks, and general and operations managers (BLS, 2017) (see **Table 7-2**). The estimates do not account for benefits. The uncertainty analysis used the median wage rate. The minimum (10th percentile) and maximum (90th percentile) values are provided to facilitate estimation of the range of cost estimates for each practice, if FNS desires in the future.

Table 7-2. Cost Inputs: Wage Rates, 2017 for Food and Beverage Stores (NAICS Code 4450A1)

Labor Category	Dollars per Hour			Source:
	10th Percentile	Median	90th Percentile	
Cashiers	$8.23	$10.11	$13.95	https://www.bls.gov/oes/current/oes412011.htm
Information and record clerks	$12.12	$19.16	$27.62	https://www.bls.gov/oes/current/oes434199.htm
General & operations managers	$21.40	$48.27	$100.00	https://www.bls.gov/oes/current/oes111021.htm

Source: Bureau of Labor Statistics

Note: These rates do not include benefits.

Additional inputs for the cost analysis were number of lanes, number of cashiers, and number of unique barcode food products. Weighted estimates were calculated using the SCANR Survey and varied by store type (see **Table 7-3**).

Table 7-3. Cost Inputs: Weighted Means for Number of Lanes, Cashiers, and Unique UPCs by Store Type

Store Type	Number of		
	Lanes	Cashiers[a]	Unique Food Products (UPCs)
Franchise convenience	1.74	5.54	2,396
Nonfranchise convenience	1.54	4.10	2,589
Medium grocery	1.79	3.99	3,145
Small grocery	1.19	2.63	1,550
Specialty	1.27	3.31	170

Source: 2018 SCANR Survey

[a] Number of full- or part-time employees primarily responsible for checking out customers.

7.1.2 Initial Costs

The initial, or upfront, costs of a scanning system include the capital equipment purchase of the bundled system, the time required to select a vendor and POS system, and the time for manager and cashier training.[18] Sufficient data were not available to conduct a separate cost analysis for leasing scanning systems. Each of these initial cost inputs is described below:

- **System purchase and installation cost**: Data are in dollars on a per-lane basis (from the vendor and follow-up retailer interviews) and converted into a per-store cost using the average number of lanes per store, which varied by store type.

[18] The simulated mean costs for each initial cost component can be found in Tables 7-4 through 7-8.

- **Labor for POS system selection:** Data are in hours for store managers (from the follow-up retailer interviews), which remained constant across store types, and converted into dollars by multiplying by wage rates.

- **Labor for staff training:** Data are in hours (from vendors and follow-up retailer interviews), which remained constant across store types, and converted into dollars by multiplying by appropriate wage rates. It was assumed that the vendor trains the manager, who in turn trains the store cashiers.[19] It was also assumed that all cashiers are trained at the same time. Thus, the time for manager training equals the sum of manager training plus cashier training. The number of cashiers requiring training varied by store type.

Thus, the initial cost of a scanning system was calculated using the following formula:

$$COST\_IN_t = (BUN \times LANE_t) + (LH\_SEL \times WR\_MGR) + \{[LH\_TR_c \times CASH_t \times WR\_CASH] + [(LH\_TR_m + LH\_TR_c) \times WR\_MGR]\},$$

where $COST\_IN_t$ is the initial cost by store type, BUN is the cost of a bundled system, $LANE_t$ is the number of lanes by store type, LH_SEL is the labor hours used to select a vendor and system, WR_MGR is the wage rate of a store manager, LH_TR_c is the labor hours used by cashiers for training, $CASH_t$ is the number of cashiers by store type, WR_CASH is the wage rate of a cashier, and LH_TR_m is the labor hours used by managers for training (initial training from the vendor and then training of cashiers).

The initial per-store simulated mean costs ranged from $7,373 for small grocery stores to $10,583 for medium grocery stores (see **Tables 7-4** through **7-8**).

7.1.3 Ongoing Annual Costs

Annual, or recurring, costs include the costs for updating the UPC database to add new products, service contracts, labor for new employee training, and the amortized purchase and installation cost of the capital equipment (i.e., the bundled system). Details for each of the recurring cost inputs are described below:

- **UPC database updates:** Time for the information clerk to enter new products, prices, and SNAP eligibility into the UPC database. A ratio of hours per UPC per store (the average of hours spent on UPC database updates, as obtained from the retailer interviews with adopters) and number of unique UPCs per store (from SCANR Survey) were used, which both varied by store type, and this ratio was multiplied by the information clerk wage rate.

- **Service contract:** Data provided in dollars on a per-lane basis by vendors and retailers, which remained constant across store types, and converted into a per-store cost using the average number of lanes per store (from SCANR Survey), which varied by store type.

- **Labor for new employee training:** Data provided in hours by vendors and retailers, which remained constant across store types, and converted into dollars using the appropriate wage rates. It was assumed that the manager trains the store cashiers as they are hired. Thus, the time for

[19] In some cases, the vendor trains the manager and staff, and in other cases the vendor only trains the manager, who then trains the staff. The cost analysis assumed the latter, representing the upper bound of costs, because the costs would be lower if the manager and cashiers are trained at the same time.

manager training equals the cashier training. The number of cashiers requiring training varied by store type (from SCANR Survey). It was assumed a 100 percent annual turnover rate for cashiers (Martin, n.d.); thus, the number of hours for new employee training is the same as for initial training.

- **Amortized purchase and installation costs for the bundled system:** Estimated with the PMT function in Excel using an assumed 10-year life span of the scanning system (from the vendor interviews) and 7 percent interest financing rate.

Thus, the annual costs of operating and maintaining a scanning system were calculated using the following formula:

$$COST\_AN_t = BUN\_AM + (HR\_UPC_t \times UPC_t \times WR\_IN) + (SER \times LANE_t) + [(LH\_TR_c \times CASH_t \times WR\_CASH) + (LH\_TR_c \times CASH_t \times WR\_MGR)],$$

where $COST\_AN_t$ is the annual cost by store type, BUN_AM is the amortized cost of a bundled system, HR_UPC is the ratio of hours per UPC by store type, UPC_t is the number of new UPCs by store type, WR_IN is the wage rate for information clerks, SER is the per-lane service contract cost, $LANE_t$ is the number of lanes by store type, LH_TR_c is the labor hours used by cashiers for training, $CASH_t$ is the number of cashiers by store type, WR_CASH is the wage rate of a cashier, and WR_MGR is the wage rate of a manager.

Tables 7-4 through **7-8** present the estimated costs for each store type. The columns on the left show the preliminary minimum, most likely, and maximum cost estimates, and the columns on the right show the results of the uncertainty analysis to calculate costs for the simulation mean, 5th percentile, and 95th percentile. The annualized per-store simulated mean costs ranged from $2,893 for specialty stores to $16,812 for medium grocery stores (see **Tables 7-4** through **7-8**).

This cost analysis is comprehensive, examining the full cost of the Farm Bill requirement on small SNAP-authorized retailers, taking into consideration the life span of the equipment. From a retailer's perspective when making the decision to purchase scanning technology, the initial cost of a system would likely be compared with the store's gross monthly revenue, particularly monthly SNAP redemptions. For example, if a specialty store has $200 of SNAP sales per month and the initial cost to install a system is approximately $6,000, it would take 2.5 years for the store's SNAP sales to pay for the system. In this case, the cost would likely outweigh the benefit. Alternatively, if a nonfranchise convenience store has $2,500 in SNAP sales per month and the initial cost to install a system is approximately $7,500, it would take about 3 months for the store's SNAP sales volume to pay for the system.

Table 7-4. Estimated Per-Store Cost of Each Phase of Scanning Systems for Franchise Convenience Stores

Phase and Type of Cost	Cost Estimates				Uncertainty Analysis Results		
	Minimum	Most Likely	Maximum	Mean for PERT Distribution	Simulation Mean	5th Percentile	95th Percentile
Initial Cost							
System purchase & installation costs[a]							
Per-lane cost	$1,250	$4,845	$10,800	$5,238			
Average number of lanes	1.74	1.74	1.74	1.74			
Total cost of system purchase and installation, per store	$2,177	$8,437	$18,806	$9,122	$9,122	$4,311	$14,484
Labor for POS system selection							
Hours for manager	1.00	9.00	24.00	10.17			
Wage rate ($/hour)	$21.40	$48.27	$100.00	$52.41			
Total labor cost for POS system selection	$21	$434	$2,400	$533	$533	$167	$1,048
Labor for staff training							
Hours for cashiers[b]	1.39	11.08	33.24	13.16			
Hours for manager[c]	2.25	10.00	22.00	10.71			
Cashier wage rate ($/hour)	$8.23	$10.11	$13.95	$10.44			
Manager wage rate ($/hour)	$21.40	$48.27	$100.00	$52.41			
Total labor costs for staff training	$60	$595	$2,664	$699	$698	$339	$1,179
Total initial costs	$2,258	$9,466	$23,870	$10,353	$10,353	$5,562	$15,740
Ongoing Annual Costs							
UPC database updates							
Hours per UPC	0.0015	0.1829	0.64	0.23			
Average number of UPCs per store	2,396	2,396	2,396	2,396			
Information clerk wage rate	$12.12	$19.16	$27.62	$19.40			
Total labor cost for UPC database updates	$44	$8,396	$42,354	$10,636	$10,644	$2,614	$21,032
Service contract							
Cost per lane	$63	$436	$700	$418			
Average number of lanes	1.74	1.74	1.74	1.74			
Total service contract cost	$109	$759	$1,219	$727	$727	$372	$1,057

(continued)

Table 7-4. Estimated Per-Store Cost of Each Phase of Scanning Systems for Franchise Convenience Stores (continued)

Phase and Type of Cost	Cost Estimates				Uncertainty Analysis Results		
	Minimum	Most Likely	Maximum	Mean for PERT Distribution	Simulation Mean	5th Percentile	95th Percentile
Labor for new employee training[d]							
Hours for cashiers	1.39	11.08	33.24	13.16			
Hours for manager[e]	1.39	11.08	33.24	13.16			
Cashier wage rate ($/hour)	$8.23	$10.11	$13.95	$10.44			
Manager wage rate ($/hour)	$21.40	$48.27	$100.00	$52.41			
Total labor costs for staff training	$41	$647	$3,788	$827	$825	$330	$1,538
Total ongoing annual costs	$193	$9,803	$47,360	$12,190	$12,197	$4,217	$22,686
Amortized total initial costs[f]	$321	$1,348	$3,399	$1,474	$1,474	$792	$2,241
Total annualized costs	**$515**	**$11,150**	**$50,759**	**$13,664**	**$13,671**	**$5,648**	**$24,156**

Sources: 2018 SCANR Survey, vendor interviews, and 2018 follow-up retailer interviews

Notes: Wage rates are the 10th percentile, median, and 90th percentile estimates as reported by BLS. All other estimates are presented as minimum, most likely, and maximum. The costs shown for the uncertainty analysis results for the 5th and 95th percentile do not sum to equal the totals because the @Risk simulation performs the calculations simultaneously, not sequentially. These results are shown to provide information on the uncertainty of the cost estimates for each phase and type of cost.

[a] Includes hardware, software, and installation costs.

[b] Number of hours for cashier training multiplied by the number of cashiers.

[c] Managers are trained by the vendor, who then train their cashiers; thus, the manager's time for training is the sum of manager training plus cashier training. Assumed all cashiers are trained at one time.

[d] Industry turnover for cashiers was estimated at 100 percent; thus, the same number of cashiers is required to be trained each year. The same number of hours as initial training for cashiers was used.

[e] Assumed cashiers are trained individually as they are hired.

[f] Amortized costs were estimated using an assumed interest rate of 7 percent and a life span of 10 years.

Table 7-5. Estimated Per-Store Cost of Each Phase of Scanning Systems for Nonfranchise Convenience Stores

Phase and Type of Cost	Cost Estimates				Uncertainty Analysis Results		
	Minimum	Most Likely	Maximum	Mean for PERT Distribution	Simulation Mean	5th Percentile	95th Percentile
Initial Cost							
System purchase & installation costs[a]							
Per lane cost	$1,250	$4,845	$10,800	$5,238			
Average number of lanes	1.54	1.54	1.54	1.54			
Total cost of system purchase and installation, per store	$1,920	$7,444	$16,593	$8,048	$8,048	$3,804	$12,781
Labor for POS system selection							
Hours for manager	1.00	9.00	24.00	10.17			
Wage rate ($/hour)	$21.40	$48.27	$100.00	$52.41			
Total labor cost for POS system selection	$21	$434	$2,400	$533	$534	$168	$1,059
Labor for staff training							
Hours for cashiers[b]	1.03	8.20	24.60	9.74			
Hours for manager[c]	2.25	10.00	22.00	10.71			
Cashier wage rate ($/hour)	$8.23	$10.11	$13.95	$10.44			
Manager wage rate ($/hour)	$21.40	$48.27	$100.00	$52.41			
Total labor costs for staff training	$57	$566	$2,543	$663	$662	$316	$1,146
Total initial costs	$1,998	$8,444	$21,536	$9,244	$9,244	$4,969	$14,031
Ongoing Annual Costs							
UPC database updates							
Hours per UPC	0.0015	0.1829	0.64	0.23			
Average number of UPCs per store	2,589	2,589	2,589	2,589			
Information clerk wage rate	$12.12	$19.16	$27.62	$19.40			
Total labor cost for UPC database updates	$47	$9,073	$45,765	$11,492	$11,491	$2,817	$22,681
Service contract							
Cost per lane	$63	$436	$700	$418			
Average number of lanes	1.54	1.54	1.54	1.54			
Total service contract cost	$96	$670	$1,075	$642	$642	$328	$933

(continued)

Table 7-5. Estimated Per-Store Cost of Each Phase of Scanning Systems for Nonfranchise Convenience Stores (continued)

Phase and Type of Cost	Cost Estimates				Uncertainty Analysis Results		
	Minimum	Most Likely	Maximum	Mean for PERT Distribution	Simulation Mean	5th Percentile	95th Percentile
Labor for new employee training[d]							
Hours for cashiers	1.03	8.20	24.60	9.74			
Hours for manager[e]	1.03	8.20	24.60	9.74			
Cashier wage rate ($/hour)	$8.23	$10.11	$13.95	$10.44			
Manager wage rate ($/hour)	$21.40	$48.27	$100.00	$52.41			
Total labor costs for staff training	$30	$479	$2,803	$612	$613	$241	$1,147
Total ongoing annual costs	$173	$10,221	$49,644	$12,746	$12,746	$4,071	$23,837
Amortized total initial costs[f]	$285	$1,202	$3,066	$1,316	$1,316	$707	$1,998
Total annualized costs	**$458**	**$11,424**	**$52,710**	**$14,062**	**$14,062**	**$5,362**	**$25,211**

Sources: 2018 SCANR Survey, vendor interviews, and 2018 follow-up retailer interviews

Notes: Wage rates are the 10th percentile, median, and 90th percentile estimates as reported by BLS. All other estimates are presented as minimum, most likely, and maximum. The costs shown for the uncertainty analysis results for the 5th and 95th percentile do not sum to equal the totals because the @Risk simulation performs the calculations simultaneously, not sequentially. These results are shown to provide information on the uncertainty of the cost estimates for each phase and type of cost.

[a] Includes hardware, software, and installation costs.

[b] Number of hours for cashier training multiplied by the number of cashiers.

[c] Managers are trained by the vendor, who then train their cashiers; thus, the manager's time for training is the sum of manager training plus cashier training. Assumed all cashiers are trained at one time.

[d] Industry turnover for cashiers was estimated at 100 percent; thus, the same number of cashiers is required to be trained each year. The same number of hours as initial training for cashiers was used.

[e] Assumed cashiers are trained individually as they are hired.

[f] Amortized costs were estimated using an assumed interest rate of 7 percent and a life span of 10 years.

Table 7-6. Estimated Per-Store Cost of Each Phase of Scanning Systems for Medium Grocery Stores

Phase and Type of Cost	Cost Estimates				Uncertainty Analysis Results		
	Minimum	Most Likely	Maximum	Mean for PERT Distribution	Simulation Mean	5th Percentile	95th Percentile
Initial Cost							
System purchase & installation costs[a]							
Per-lane cost	$1,250	$4,845	$10,800	$5,238			
Average number of lanes	1.79	1.79	1.79	1.79			
Total cost of system purchase and installation, per store	$2,241	$8,686	$19,362	$9,391	$9,391	$4,439	$14,914
Labor for POS system selection							
Hours for manager	1.00	9.00	24.00	10.17			
Wage rate ($/hour)	$21.40	$48.27	$100.00	$52.41			
Total labor cost for POS system selection	$21	$434	$2,400	$533	$532	$167	$1,053
Labor for staff training							
Hours for cashiers[b]	1.00	7.98	23.94	9.48			
Hours for manager[c]	2.25	10.00	22.00	10.71			
Cashier wage rate ($/hour)	$8.23	$10.11	$13.95	$10.44			
Manager wage rate ($/hour)	$21.40	$48.27	$100.00	$52.41			
Total labor costs for staff training	$56	$563	$2,534	$660	$660	$304	$1,145
Total initial costs	$2,319	$9,684	$24,296	$10,584	$10,583	$5,605	$16,151
Ongoing Annual Costs							
UPC database updates							
Hours per UPC	0.0015	0.1829	0.64	0.23			
Average number of UPCs per store	3,145	3,145	3,145	3,145			
Information clerk wage rate	$12.12	$19.16	$27.62	$19.40			
Total labor cost for UPC database updates	$57	$11,021	$55,594	$13,960	$13,953	$3,421	$27,614
Service contract							
Cost per lane	$63	$436	$700	$418			
Average number of lanes	1.79	1.79	1.79	1.79			
Total service contract cost	$112	$782	$1,255	$749	$749	$383	$1,088

(continued)

Table 7-6. Estimated Per-Store Cost of Each Phase of Scanning Systems for Medium Grocery Stores (continued)

Phase and Type of Cost	Cost Estimates				Uncertainty Analysis Results		
	Minimum	Most Likely	Maximum	Mean for PERT Distribution	Simulation Mean	5th Percentile	95th Percentile
Labor for new employee training[d]							
Hours for cashiers	1.00	7.98	23.94	9.48			
Hours for manager[e]	1.00	7.98	23.94	9.48			
Cashier wage rate ($/hour)	$8.23	$10.11	$13.95	$10.44			
Manager wage rate ($/hour)	$21.40	$48.27	$100.00	$52.41			
Total labor costs for staff training	$30	$466	$2,728	$596	$596	$234	$1,100
Total ongoing annual costs	$199	$12,269	$59,576	$15,305	$15,298	$4,784	$28,895
Amortized total initial costs[f]	$330	$1,379	$3,459	$1,507	$1,507	$798	$2,300
Total annualized costs	**$529**	**$13,648**	**$63,036**	**$16,812**	**$16,805**	**$6,260**	**$30,513**

Sources: 2018 SCANR Survey, vendor interviews, and 2018 follow-up retailer interviews

Notes: Wage rates are the 10th percentile, median, and 90th percentile estimates as reported by BLS. All other estimates are presented as minimum, most likely, and maximum. The costs shown for the uncertainty analysis results for the 5th and 95th percentile do not sum to equal the totals because the @Risk simulation performs the calculations simultaneously, not sequentially. These results are shown to provide information on the uncertainty of the cost estimates for each phase and type of cost.

[a] Includes hardware, software, and installation costs.

[b] Number of hours for cashier training multiplied by the number of cashiers.

[c] Managers are trained by the vendor, who then train their cashiers; thus, the manager's time for training is the sum of manager training plus cashier training. Assumed all cashiers are trained at one time.

[d] Industry turnover for cashiers was estimated at 100 percent; thus, the same number of cashiers is required to be trained each year. The same number of hours as initial training for cashiers was used.

[e] Assumed cashiers are trained individually as they are hired.

[f] Amortized costs were estimated using an assumed interest rate of 7 percent and a life span of 10 years.

Table 7-7. Estimated Per-Store Cost of Each Phase of Scanning Systems for Small Grocery Stores

Phase and Type of Cost	Cost Estimates				Uncertainty Analysis Results		
	Minimum	Most Likely	Maximum	Mean for PERT Distribution	Simulation Mean	5th Percentile	95th Percentile
Initial Cost							
System purchase and installation costs[a]							
Per-lane cost	$1,250	$4,845	$10,800	$5,238			
Average number of lanes	1.19	1.19	1.19	1.19			
Total cost of system purchase and installation, per store	$1,483	$5,747	$12,810	$6,213	$6,213	$2,936	$9,867
Labor for POS system selection							
Hours for manager	1.00	9.00	24.00	10.17			
Wage rate ($/hour)	$21.40	$48.27	$100.00	$52.41			
Total labor cost for POS system selection	$21	$434	$2,400	$533	$534	$166	$1,056
Labor for staff training							
Hours for cashiers[b]	0.66	5.26	15.78	6.25			
Hours for manager[c]	2.25	10.00	22.00	10.71			
Cashier wage rate ($/hour)	$8.23	$10.11	$13.95	$10.44			
Manager wage rate ($/hour)	$21.40	$48.27	$100.00	$52.41			
Total labor costs for staff training	$54	$536	$2,420	$626	$626	$277	$1,105
Total initial costs	$1,558	$6,717	$17,630	$7,373	$7,373	$4,037	$11,100
Ongoing Annual Costs							
UPC database updates							
Hours per UPC	0.0015	0.1829	0.64	0.23			
Average number of UPCs per store	1,550	1,550	1,550	1,550			
Information clerk wage rate	$12.12	$19.16	$27.62	$19.40			
Total labor cost for UPC database updates	$28	$5,432	$27,399	$6,880	$6,883	$1,700	$13,641
Service contract							
Cost per lane	$63	$436	$700	$418			
Average number of lanes	1.19	1.19	1.19	1.19			
Total service contract cost	$74	$517	$830	$496	$496	$253	$720

(continued)

Table 7-7. Estimated Per-Store Cost of Each Phase of Scanning Systems for Small Grocery Stores (continued)

Phase and Type of Cost	Cost Estimates				Uncertainty Analysis Results		
	Minimum	Most Likely	Maximum	Mean for PERT Distribution	Simulation Mean	5th Percentile	95th Percentile
Labor for new employee training[d]							
Hours for cashiers	0.66	5.26	15.78	6.25			
Hours for manager[e]	0.66	5.26	15.78	6.25			
Cashier wage rate ($/hour)	$8.23	$10.11	$13.95	$10.44			
Manager wage rate ($/hour)	$21.40	$48.27	$100.00	$52.41			
Total labor costs for staff training	$19	$307	$1,798	$393	$393	$159	$736
Total ongoing annual costs	$122	$6,256	$30,027	$7,768	$7,771	$2,563	$14,520
Amortized total initial costs[f]	$222	$956	$2,510	$1,050	$1,050	$575	$1,580
Total annualized costs	**$344**	**$7,212**	**$32,538**	**$8,818**	**$8,820**	**$3,570**	**$15,534**

Sources: 2018 SCANR Survey, vendor interviews, and 2018 follow-up retailer interviews

Notes: Wage rates are the 10th percentile, median, and 90th percentile estimates as reported by BLS. All other estimates are presented as minimum, most likely, and maximum. The costs shown for the uncertainty analysis results for the 5th and 95th percentile do not sum to equal the totals because the @Risk simulation performs the calculations simultaneously, not sequentially. These results are shown to provide information on the uncertainty of the cost estimates for each phase and type of cost.

[a] Includes hardware, software, and installation costs.

[b] Number of hours for cashier training multiplied by the number of cashiers.

[c] Managers are trained by the vendor, who then train their cashiers; thus, the manager's time for training is the sum of manager training plus cashier training. Assumed all cashiers are trained at one time.

[d] Industry turnover for cashiers was estimated at 100 percent; thus, the same number of cashiers is required to be trained each year. The same number of hours as initial training for cashiers was used.

[e] Assumed cashiers are trained individually as they are hired.

[f] Amortized costs were estimated using an assumed interest rate of 7 percent and a life span of 10 years.

Table 7-8. Estimated Per-Store Cost of Each Phase of Scanning Systems for Specialty Stores

Phase and Type of Cost	Cost Estimates				Uncertainty Analysis Results		
	Minimum	Most Likely	Maximum	Mean for PERT Distribution	Simulation Mean	5th Percentile	95th Percentile
Initial Cost							
System purchase and installation costs[a]							
Per-lane cost	$1,250	$4,845	$10,800	$5,238			
Average number of lanes	1.27	1.27	1.27	1.27			
Total cost of system purchase and installation, per store	$1,586	$6,149	$13,707	$6,648	$6,648	$3,142	$10,558
Labor for POS system selection							
Hours for manager	1.00	9.00	24.00	10.17			
Wage rate ($/hour)	$21.40	$48.27	$100.00	$52.41			
Total labor cost for POS system selection	$21	$434	$2,400	$533	$532	$166	$1,047
Labor for staff training							
Hours for cashiers[b]	0.83	6.62	19.86	7.86			
Hours for manager[c]	2.25	10.00	22.00	10.71			
Cashier wage rate ($/hour)	$8.23	$10.11	$13.95	$10.44			
Manager wage rate ($/hour)	$21.40	$48.27	$100.00	$52.41			
Total labor costs for staff training	$55	$550	$2,477	$643	$643	$293	$1,127
Total initial costs	$1,663	$7,133	$18,584	$7,825	$7,824	$4,269	$11,798
Ongoing Annual Costs							
UPC database updates							
Hours per UPC	0.0015	0.1829	0.64	0.23			
Average number of UPCs per store	170	170	170	170			
Information clerk wage rate	$12.12	$19.16	$27.62	$19.40			
Total labor cost for UPC database updates	$3	$596	$3,005	$755	$754	$186	$1,480
Service contract							
Cost per lane	$63	$436	$700	$418			
Average number of lanes	1.27	1.27	1.27	1.27			
Total service contract cost	$79	$553	$888	$530	$530	$271	$770

(continued)

Table 7-8. Estimated Per-Store Cost of Each Phase of Scanning Systems for Specialty Stores (continued)

Phase and Type of Cost	Cost Estimates				Uncertainty Analysis Results		
	Minimum	Most Likely	Maximum	Mean for PERT Distribution	Simulation Mean	5th Percentile	95th Percentile
Labor for new employee training[d]							
Hours for cashiers	0.83	6.62	19.86	7.86			
Hours for manager[e]	0.83	6.62	19.86	7.86			
Cashier wage rate ($/hour)	$8.23	$10.11	$13.95	$10.44			
Manager wage rate ($/hour)	$21.40	$48.27	$100.00	$52.41			
Total labor costs for staff training	$25	$386	$2,263	$494	$494	$198	$913
Total ongoing annual costs	$107	$1,536	$6,157	$1,779	$1,779	$1,047	$2,620
Amortized total initial costs[f]	$237	$1,016	$2,646	$1,114	$1,114	$608	$1,680
Total annualized costs	**$344**	**$2,551**	**$8,802**	**$2,893**	**$2,893**	**$1,985**	**$3,905**

Sources: 2018 SCANR Survey, vendor interviews, and 2018 follow-up retailer interviews

Notes: Wage rates are the 10th percentile, median, and 90th percentile estimates as reported by BLS. All other estimates are presented as minimum, most likely, and maximum. The costs shown for the uncertainty analysis results for the 5th and 95th percentile do not sum to equal the totals because the @Risk simulation performs the calculations simultaneously, not sequentially. These results are shown to provide information on the uncertainty of the cost estimates for each phase and type of cost.

[a] Includes hardware, software, and installation costs.

[b] Number of hours for cashier training multiplied by the number of cashiers.

[c] Managers are trained by the vendor, who then train their cashiers; thus, the manager's time for training is the sum of manager training plus cashier training. Assumed all cashiers are trained at one time.

[d] Industry turnover for cashiers was estimated at 100 percent; thus, the same number of cashiers is required to be trained each year. The same number of hours as initial training for cashiers was used.

[e] Assumed cashiers are trained individually as they are hired.

[f] Amortized costs were estimated using an assumed interest rate of 7 percent and a life span of 10 years.

7.2 Industry-Level Costs

To estimate the cost of requiring all SNAP-authorized retailers to adopt scanning systems capable of identifying SNAP-eligible products, the per-store costs were multiplied by the weighted number of retailers that have not yet implemented a system that would meet the Farm Bill requirement. Total industry-level initial costs, annual costs, and annualized costs (i.e., the sum of amortized initial costs and annual costs) were calculated. Total industry initial costs were calculated using this formula:

$$COST\_IN_{ic} = (STOR_{cf} \times COST\_IN_{cf}) + (STOR_{cnf} \times COST\_IN_{cnf}) + (STOR_{gm} \times COST\_IN_{gm}) + (STOR_{gs} \times COST\_IN_{gs}) + (STOR_{s} \times COST\_IN_{s})$$

where $COST\_IN_{ic}$ is the industry-level initial costs, $STOR_{cf}$ is the weighted number of franchise convenience stores that would need to adopt scanning systems, $COST\_IN_{cf}$ is the per-store initial costs of franchise convenience stores, $STOR_{cnf}$ is the weighted number of nonfranchise convenience stores, $COST\_IN_{cnf}$ is the per-store initial costs of nonfranchise convenience stores, $STOR_{gm}$ is the weighted number of medium grocery stores, $COST\_IN_{gm}$ is the per-store initial costs of medium grocery stores, $STOR_{gs}$ is the weighted number of small grocery stores, $COST\_IN_{gs}$ is the per-store initial costs of small grocery stores, $STOR_{s}$ is the weighted number of specialty stores, and $COST\_IN_{s}$ is the per-store initial costs of specialty stores. Annual costs and amortized costs were calculated using a similar formula but replacing per-store initial costs with annual costs and amortized costs.

Two sets of industry costs were estimated: (1) the total cost of implementing scanning systems among stores that did not have a scanning system at the time of the SCANR Survey or had a scanning system without a SNAP flag indicator so did not meet the Farm Bill requirement (i.e., all nonadopters) (see **Table 7-9**) and (2) the total cost of implementing scanning systems among nonadopters that indicated a willingness to upgrade or purchase technology to meet the Farm Bill requirement and remain a SNAP-authorized retailer (see **Table 7-10**). The numbers of stores in each category by store type were estimated using weighted responses to the SCANR Survey.

The total, industry-wide annualized cost of adopting scanning systems meeting the Farm Bill requirement by the estimated 63,484 stores without such a system is $808 million. Accounting for the retailers that would likely not purchase the required technology, the industry-wide annualized cost is estimated to be $460 million for the estimated 35,665 stores that plan to remain a SNAP-authorized retailer but currently do not meet the Farm Bill requirement.

7.3 Additional Notes on Cost Analysis

In the vendor interviews, interviewers attempted to obtain separate estimates on the cost of a scanning system that meets the minimum requirement of the Farm Bill (i.e., has the ability to determine SNAP-eligible products) and a scanning system that meets the minimum requirement *and* is fully integrated with the EBT payment terminal. However, vendors were unable to distinguish between these types of systems. According to the vendors, any system installed within the last 10 years should have the ability to determine SNAP-eligible products. Systems installed more than 10 years ago would not have the software

Table 7-9. Estimated Mean Industry Cost of Implementing Scanning Systems by Store Type

Store Type	Weighted Number of Stores with No Scanning System or No SNAP Flag	Per-Store Initial Cost	Total Industry Initial Cost	Per-Store Annual Cost	Total Industry Annual Cost	Per-Store Annualized Cost[a]	Total Industry Annualized Cost
Franchise convenience	9,217	$10,353	$95,425,551	$12,197	$112,415,935	$13,671	$126,002,386
Nonfranchise convenience	37,937	$9,244	$350,688,366	$12,746	$483,536,954	$14,062	$533,467,088
Medium grocery	4,289	$10,583	$45,391,717	$15,298	$65,612,502	$16,805	$72,075,261
Small grocery	7,065	$7,373	$52,093,214	$7,771	$54,899,678	$8,820	$62,316,580
Specialty	4,976	$7,824	$38,932,584	$1,779	$8,850,200	$2,893	$14,393,324
Total	**63,484**		**$582,531,432**		**$725,315,269**		**$808,254,639**

Sources: 2018 SCANR Survey, vendor interviews, and 2018 follow-up retailer interviews

Note: Assumes store implements new system that is fully integrated with payment terminal.

[a] Per-store annualized cost is the sum of amortized initial costs (not shown) plus annual costs.

Table 7-10. Estimated Mean Industry Cost of Implementing Scanning Systems Among Stores Very or Somewhat Likely to Purchase New Scanning System and Remain SNAP Authorized by Store Type

Store Type	Weighted Number of Stores with No Scanning System or No SNAP Flag Likely to Purchase New System	Per-Store Initial Cost	Total Industry Initial Cost	Per-Store Annual Cost	Total Industry Annual Cost	Per-Store Annualized Cost[a]	Total Industry Annualized Cost
Franchise convenience	4,556	$10,353	$47,169,232	$12,197	$55,567,647	$13,671	$62,283,484
Nonfranchise convenience	22,647	$9,244	$209,348,115	$12,746	$288,653,858	$14,062	$318,460,320
Medium grocery	2,194	$10,583	$23,219,731	$15,298	$33,563,495	$16,805	$36,869,462
Small grocery	4,027	$7,373	$29,692,763	$7,771	$31,292,428	$8,820	$35,520,009
Specialty	2,241	$7,824	$17,533,746	$1,779	$3,985,791	$2,893	$6,482,202
Total	**35,665**		**$326,963,587**		**$413,063,219**		**$459,615,478**

Sources: 2018 SCANR Survey, vendor interviews, and 2018 follow-up retailer interviews

Note: Assumes store implements new system that is fully integrated with payment terminal.

[a] Per-store annualized cost is the sum of amortized initial costs (not shown) plus annual costs.

capability to add a SNAP flag and thus would need to be completely replaced to meet the Farm Bill requirement. When vendors quote prices to new customers or to customers that need a complete replacement, it is generally a bundled price that includes all hardware and software that have the ability for payment integration. The additional cost to integrate the system with an EBT payment terminal is negligible and is therefore included in the bundled price.

Many retailers have recently upgraded their register systems to accept Europay, Mastercard and Visa (EMV), or cards with a chip.[20] When retailers upgraded their register systems to accept EMV, many used this as an opportunity to add payment integration if needed. One vendor stated that the average cost of an upgrade to become EMV compliant was approximately $300 per lane, which included the cost of a new payment pin pad. Because of this recent wave of technological advancement to accommodate EMV, retail participants were not aware of additional technological innovations that retailers may want to implement within the next few years. Vendors noted that POS companies are merging with credit card companies, so retailers will not have a choice about having their payment systems integrated. They noted this could drive down the cost of the POS system. The vendors also noted that more POS systems are being semi-integrated where none of the credit card transaction data reside on the POS system, meaning the POS system is only passing a total over to the credit card machine and getting an acknowledgement back without processing transaction data. As a result, there is more point-to-point encryption (i.e., from retailer to credit card company) and tokenization of data, which is an even more secure solution.

The cost analysis was subject to several limitations. Most of the data presented in this section are based on the knowledge and expertise of the vendors and retailers that were interviewed. Further, the estimates provided by the vendors and retailers are general estimates. In some cases, the retailers could not recall the exact cost because they had installed their systems years ago. In addition, some cost categories were not captured in the cost analysis such as taxes, which are regional, and the salvage value of capital equipment. Further, the wage estimates are national averages, could vary by region and store type or size, and do not include the cost of benefits.

The vendors and retailers interviewed did not provide information on the cost to lease equipment; thus, it was not possible to conduct a cost analysis for leased equipment. As previously noted, about 52 percent of small SNAP-authorized retailers reported leasing their equipment at the time of the survey. The cost analysis assumed that retailers would purchase a new system; thus, the results provide an upper bound on the total industry cost for meeting the Farm Bill requirement.

[20] Although EMV is now required for all retailers who accept debit and credit cards, industry experts estimate the adoption rate is approximately 60 percent (Sanborn, 2018)

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8. Conclusion and Implications

The Agricultural Act of 2014, Section 4002 (otherwise known as the 2014 Farm Bill) aims to reduce fraud by requiring all SNAP-authorized retailers to use scanning technologies to redeem SNAP benefits unless the retailer is located in a geographic region that has severe food access limitations. This study used a mixed-methods approach to provide accurate and up-to-date information on adoption of scanning technology among small SNAP-authorized retailers to assess readiness to meet the Farm Bill requirement, the barriers to adoption of scanning technologies, and the per-store and total industry cost for nonadopters to meet the Farm Bill requirement.

Adopting scanning systems requires an investment in capital equipment, training, and ongoing maintenance of the UPC database. To identify SNAP-eligible products, POS systems need specific hardware and software, usually sold as a bundled package that also includes installation, training, and the first year of a service contract. Software programs for POS systems access a UPC database with product and price information and flag SNAP-eligible products, and many include options to track inventory, collect data on sales, and automatically reorder products. Generally, all systems sold within the last 10 years have the capability to identify SNAP-eligible products, a requirement of the Farm Bill. Thus, stores with older systems without this capability would need to purchase a new system (a software upgrade is not possible) to meet this requirement.

To meet the Farm Bill requirement, the register system can be integrated with the EBT payment terminal or stand-alone (i.e., nonintegrated). Integrated systems allow seamless communication between the register and the payment pad. When systems are not integrated, the cashier must manually enter the amount of SNAP-eligible purchases into the payment pad, which can be prone to error. Retailers that are updating their POS system would almost always choose an integrated system because the cost of an integrated versus nonintegrated system is negligible, according to the vendors interviewed.

Nearly two-thirds of small SNAP-authorized stores have not adopted a scanning system and thus do not meet the Farm Bill requirement. Based on the results of the SCANR Survey, 63 percent of stores do not meet the Farm Bill requirement. They either do not have a scanning system (42 percent) or have an older system without the ability to identify SNAP-eligible products (21 percent). A total of 37 percent of small stores meet the Farm Bill requirement: 20 percent have integrated systems and 17 percent have nonintegrated systems. Prior to full implementation of EBT, only 5 percent to 25 percent of small SNAP-authorized retailers used scanning technology (USDA, FNS, 1998); thus, adoption of scanning systems has increased, which is expected given improvements in technology.

Readiness to meet the Farm Bill requirement varies by store type and other characteristics. Adoption of scanning systems varies by store type, with adoption highest among franchise convenience stores (51 percent) and medium grocery stores (42 percent) and lowest among specialty stores (8 percent), which tend to stock fewer barcode products compared with other store types. Multivariate analysis identified factors that predict whether a store has adopted a scanning system that meets the Farm Bill requirement. Stores that carry more unique barcode food products and stores with multiple locations are more likely to be adopters, suggesting some economies for larger stores and chains. Conversely, stores that carry more unique random-weight products are less likely to be adopters because these stores have less to gain in terms of efficiency from using a scanning system with a SNAP flag. Given the relatively lower adoption

rates, specialty stores, small grocery stores, and nonfranchise convenience stores may need more assistance to help them identify affordable technology solutions and financing options.

Adopters believe that scanning systems are a worthwhile investment. Although the cost analysis does not capture benefits, interviewed adopters identified several benefits of using scanning technologies: cost savings, access to inventory tracking and sales data, improved accuracy, and better customer service. Cost savings are associated with reduced labor costs (e.g., making markdowns); reduced waste; and reduction in potential costly errors, fraud, and theft. Adopters shared the sentiment that they felt less dependent on cashiers to complete an accurate transaction because of the scanning technology.

Nonadopters expressed concerns about cost and other barriers to installing scanning systems. Not surprisingly, cost (purchase, installation, and maintenance and training of staff) was identified as the most important barrier to adopting a scanning system. Retailers with relatively low SNAP sales volume may be reluctant to invest in the cost of purchasing and maintaining a scanning system. Educating these retailers to consider the amortized value of the scanning system over the 10-year service life may help address concerns about the initial up-front investment in a new system.

Noncost factors of concern were not having staff available to assist with system failures and troubleshooting, time to maintain the product database, and time to evaluate which type of system to purchase and install. These retailers may not be aware that when purchasing a bundled system, the cost of a service contract that covers system failures and troubleshooting is included for the first year and can be renewed. Educating retailers on what would be required to meet the 2014 Farm Bill, the potential costs of installing a new scanning system, and the benefits to an updated scanning system may help address retailers' concerns about the time to select a system and time to maintain a product database, which appear to be relatively minimal based on the adopter interviews.

Many stores reported they would adopt scanning systems to remain SNAP authorized. About 59 percent of stores reported they would be very or somewhat likely to upgrade or purchase new equipment to meet the Farm Bill requirement. Differences were not observed by store type. Among the nonadopters interviewed, those who indicated they would be unlikely to meet the Farm Bill requirement cited the cost to purchase and maintain a system as a barrier, although they expressed concern for their community that depends on them for SNAP purchases if they were no longer SNAP authorized. Other nonadopters interviewed were also concerned about the initial investment cost but seemed inclined to make the investment to remain SNAP authorized.

Meeting the Farm Bill requirement would require considerable investment by small SNAP-authorized retailers. The initial per-store simulated mean costs ranged from $7,373 for small grocery stores to $10,584 for medium grocery stores, and ongoing annual per-store simulated mean costs ranged from $1,779 for specialty stores to $15,298 for medium grocery stores. The total industry cost for all stores that have not yet adopted scanning systems or do not have the capability to identify SNAP-eligible items using their current system is $808 million. Of the $808 million, approximately $460 million is attributed to stores that are planning to implement the requirements to remain SNAP authorized. The remaining $348 million is attributed to retailers that would likely not purchase a new system and thus could be required to leave the SNAP program.

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Appendix A: Index of Research Questions by Report Section

	Research Questions	Report Section(s)
1.1	What are the requirements for electronic scanning systems that can electronically confirm which items are SNAP-eligible and scan the price of all items that a customer may wish to purchase with SNAP benefits from the retailer? This may include hardware, software, database systems, internet connectivity, and equipment, among other components.	4.1.1, 4.1.2
1.2	What are the requirements associated with ongoing maintenance and support for an electronic scanning system, including maintenance of associated product databases?	4.2.1
1.3	What are the requirements for a system with the functionality described above, as well as full integration with the EBT POS terminal?	4.2.1
1.4	What is the length of time necessary for different store types to select and implement an electronic scanning system (for both the minimum requirements and integration with the EBT terminal)?	4.1.1, 4.1.2
1.5	What additional requirements, e.g. physical, training, managerial, etc. are needed to support and maintain these systems?	4.2.2
2.1	What are the estimated costs for each phase of scanner system implementation, i.e. start-up, database maintenance, logistical, and ongoing support?	7.1, 7.2
2.2	What are the estimated costs per store?	7.1
2.3	What are the estimated cost breakdowns by functionality, i.e. confirming eligible items and integration with the EBT terminal?	7.3
2.4	How, if at all, do costs differ for stores that require system upgrades, rather than instituting a new system?	7.3
2.5	Are there anticipated technological innovations in electronic scanning systems that might affect cost estimates in the near term (3-5 years)? If so, what are the expected changes?	7.3
2.6	What factors, if any, are associated with variation in the cost installing and maintaining electronic scanner systems by small retailers?	7.1
3.1	What is the estimated number of small SNAP authorized stores, by store type, that lack (a) scanning systems of any kind, (b) scanning systems integrated with store inventory and can identify which items are eligible to be purchased with SNAP, and (c) scanning systems with the functionality described above, and integrated with the EBT terminal to not allow SNAP to be used to purchase ineligible items?	5.1
3.2	How does the availability of scanning technology vary by key retailer sub-groups, including store type, rural/urban/suburban, and other store level characteristics?	5.2, 5.3
4.1	How much do store owners/operators believe implementing these systems would cost? Among small retailers that currently have scanner systems, what do they report for initial implementation and ongoing costs?	6.2
4.2	What are the costs that retailers estimate they would be able to bear for the purchase, installation, and maintenance of scanner systems?	6.2
4.3	How knowledgeable are store owners and/or operators about available scanning systems? What additional information do they require or desire in order to implement this technology?	4.1.1, 6.1
4.4	What are the perceived non-cost barriers to adoption of scanner systems?	6.3
4.5	What benefits, if any, do owners/managers associate with implementing scanning systems?	6.4
4.6	What is the estimated number or proportion of currently SNAP-authorized retailers that may not comply with this provision due to cost or other barriers, and instead choose to leave SNAP?	6.5

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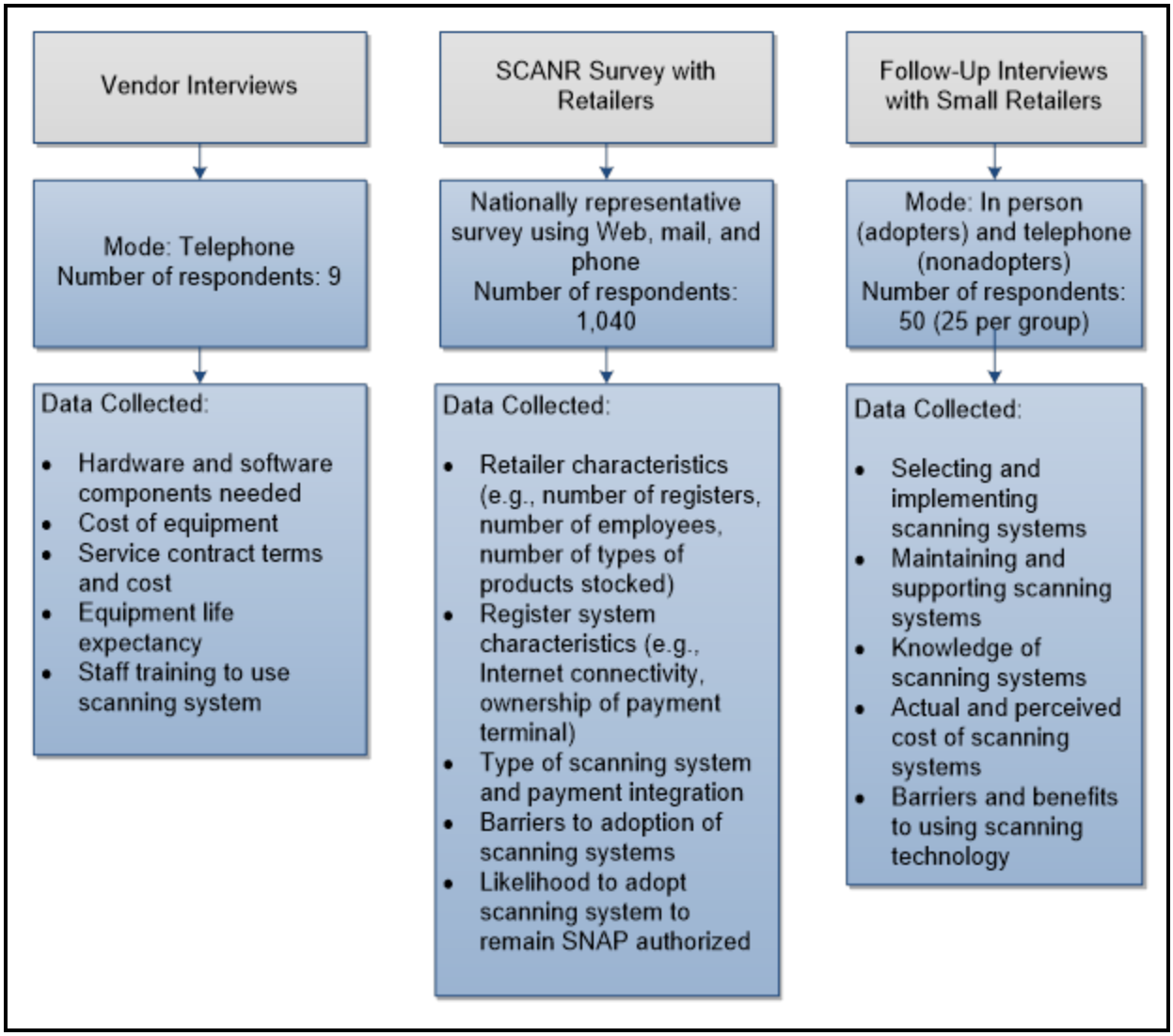
Appendix B: Study Methods

Data collection for this study comprised a mixed-methods approach in which both quantitative and qualitative data were collected through three primary data collection components: vendor interviews, a nationally representative survey of small SNAP-authorized retailers, and follow-up interviews with a subset of survey respondents. This section provides an overview of the data sources used to address FNS's research questions (RQs) and then describes the study design, data collection, and analysis methods for each data collection component (see **Figure B-1**).

Figure B-1. Overview of Data Collection Activities to Address the Research Questions



B.1 Overview and Data Sources

Table B-1 lists each of the study's RQs and summarizes the data sources and analysis approach for addressing each RQ.

Table B-1. Summary of Data Sources and Analysis Approach for Addressing the Research Questions

	Research Questions	Data Sources	Analysis Approach
Objective 1. Determine and describe the requirements for installing and operating electronic scanning systems at small retailers.			
1.1	What are the requirements for electronic scanning systems that can electronically confirm which items are SNAP eligible and scan the price of all items that a customer may wish to purchase with SNAP benefits from the retailer?	Vendor interviews	Conducted thematic analysis of qualitative data to describe: ▪ Requirements for installing and operating scanning systems ▪ Requirements for maintaining scanning systems
1.2	What are the requirements associated with ongoing maintenance and support for an electronic scanning system, including maintenance of associated product databases?		
1.3	What are the requirements for a system with the functionality described above, as well as full integration with the EBT POS terminal?		
1.4	What is the length of time necessary for different store types to select and implement an electronic scanning system (for both the minimum requirements and integration with the EBT terminal)?		
1.5	What additional requirements (e.g., physical, training, managerial) are needed to support and maintain these systems?		
Objective 2. Provide cost estimates for installing and maintaining electronic scanning systems at small retailers.			
2.1	What are the estimated costs for each phase of scanning system implementation (i.e., start-up, database maintenance, logistical, and ongoing support)?	Vendor interviews, SCANR survey, follow-up interviews with subset of respondents to SCANR Survey, and secondary data	▪ Calculated per-store cost associated with the purchase, installation, and maintenance of scanning systems by store type ▪ Estimated minimum, most likely, and maximum cost values using @Risk software to account for uncertainty in cost estimates ▪ Used the mean per-store cost estimates from @Risk and data from the SCANR Survey on number of nonadopters to calculate the total cost for all small SNAP-authorized retailers to meet the Farm Bill requirement by store type
2.2	What are the estimated costs per store?		
2.3	What are the estimated cost breakdowns by functionality (i.e., confirming eligible items and integration with the EBT terminal)?		
2.4	How, if at all, do costs differ for stores that require system upgrades, rather than instituting a new system?		
2.5	Are there anticipated technological innovations in electronic scanning systems that might affect cost estimates in the near term (3–5 years)? If so, what are the expected changes?		
2.6	What factors, if any, are associated with variation in the costs of installing and maintaining electronic scanning systems by small retailers?		

(continued)

Table B-1. Summary of Data Sources and Analysis Approach for Addressing the Research Questions (continued)

Research Questions	Data Sources	Analysis Approach
Objective 3. Provide reliable national estimates of the extent to which scanning systems are in place at small SNAP-authorized retailers.		
3.1 What is the estimated number of small SNAP-authorized stores, by store type, that lack: 3.1a Scanning systems of any kind? 3.1b Scanning systems integrated with store inventory and can identify which items are eligible to be purchased with SNAP? 3.1c Scanning systems with the functionality described above and integrated with the EBT terminal to not allow SNAP to be used to purchase ineligible items? 3.2 How does the availability of scanning technology vary by key retailer subgroups, including store type, urbanicity, and other store-level characteristics?	SCANR Survey	▪ Using weighted survey data, conducted univariate analysis to address each RQ overall and bivariate analysis by store type and other subgroups (e.g., urbanicity, sales volume, and other retailer characteristics) ▪ Conducted multivariate analysis to describe the characteristics of retail stores that are more likely to adopt scanning systems
Objective 4. Determine barriers and facilitators to using scanning technologies by small SNAP-authorized retailers.		
4.1 How much do store owners/operators believe implementing these systems would cost? Among small retailers that currently have scanning systems, what do they report for initial implementation and ongoing costs? 4.2 What are the costs that retailers estimate they would be able to bear for the purchase, installation, and maintenance of scanning systems? 4.3 How knowledgeable are store owners and/or operators about available scanning systems? What additional information do they require or desire in order to implement this technology? 4.4 What are the perceived noncost barriers to adoption of scanning systems? 4.5 What benefits, if any, do owners/managers associate with implementing scanning systems? 4.6 What is the estimated number or proportion of current SNAP-authorized retailers that may not comply with this provision because of cost or other barriers and instead choose to leave SNAP?	SCANR Survey and follow-up interviews with subset of respondents to SCANR Survey	Using weighted survey data, conducted univariate analysis to: ▪ Describe perceived cost and noncost barriers to implementation among nonadopters ▪ Estimate number and proportion of current SNAP-authorized retailers that may not meet the Farm Bill requirement and choose to leave SNAP Conducted thematic analysis to describe: ▪ Perceived cost and noncost barriers to implementation ▪ Among adopters, estimated costs of scanning systems (for use in cost analysis) ▪ Among nonadopters, cost willing to bear ▪ Knowledge and information needs ▪ Perceived benefits ▪ Reasons why SNAP-authorized retailers may choose to not meet the Farm Bill requirement and leave SNAP

B.2 Vendor Interviews

The aim of the vendor interviews was to obtain a better understanding of the POS scanning technologies available to small retailers and the costs of installing these technologies in order to estimate the store-level costs of complying with the Farm Bill requirement (to meet Objectives 1 and 2). This section describes the development and testing of the interview guide, details the data collection procedures, and describes the analysis approach.

B.2.1 Instrument Development and Testing

A semi-structured interview guide was used to organize the discussions with vendors and to gather all data needed for the cost analysis (see **Appendix C**). The guide was organized to collect information on the specific requirements of each type of scanning system and all types of costs that may be incurred when purchasing, installing, and maintaining scanning systems. For example, interviewers collected information on the costs of capital equipment, installation, labor associated with selecting systems and training employees on how to use the system, insurance, software updates, and utility costs, when available. They also collected data on the length of life of scanning equipment to calculate amortized costs and requested copies of service agreements to maintain the equipment (if applicable). Additionally, interviewers collected information on whether costs vary by store type (franchise convenience, nonfranchise convenience, medium grocery, small grocery, and specialty), urbanicity, and sales volume and whether chain stores receive a volume discount. To assess usability and the content of the interview guide and to estimate participant burden, a pretest interview was conducted by phone with one vendor, and refinements were made to clarify some of the instructions and add questions to collect information on the cost of new POS systems versus modular upgrades.

B.2.2 Data Collection

Interviews were conducted with nine vendors (including the pretest participant) that sell and install scanning hardware and software compatible with EBT systems. A list of vendors that sell POS systems to grocery retailers was created based on input from an industry expert and by searching online. The 18 largest vendors based on the number of States in which they sold POS systems were selected and recruited via email and telephone. One vendor sold only to online customers, whereas the remaining vendors were traditional brick-and-mortar establishments that sold to primarily local customers (within their State or region). At least two project team members participated in the interviews to lead the discussion and take detailed notes. With agreement from the participant, the interviewers audio-recorded each interview to ensure that all information was captured. Each interview lasted approximately 1 hour and was conducted by teleconference. Following each interview, the interviewers transcribed the detailed notes and entered the cost data into an Excel spreadsheet.

B.2.3 Analysis

To address Objective 1, an analysis was conducted of the information provided by vendors to describe the following:

- Technical requirements for scanning systems meeting the functionality requirements of the Farm Bill (presence of SNAP flag, integrated vs. nonintegrated system)
- Requirements to install and operate scanning systems
- Requirements to maintain these scanning systems
- Requirements to upgrade an existing system

To address Objective 2, a cost analysis was conducted using data collected from the vendor interviews, SCANR Survey, follow-up interviews with retailers, and secondary data to estimate per-store and total industry costs for retailers to meet the 2014 Farm Bill (see **Section B.5** for a description of the cost analysis procedures).

B.3 SCANR Survey with Retailers

The aim of the SCANR Survey was to obtain a reliable, national estimate of the extent to which scanning systems with various levels of functionality are in place at small SNAP-authorized retailers (to meet Objective 3). Small SNAP-authorized retailers are defined as franchise convenience stores, nonfranchise convenience stores, medium grocery stores, small grocery stores, and specialty stores. The study excluded chains with 10 or more outlets under the same owner. This section describes the development and testing of the survey instrument, the sample design, data collection procedures, survey response, and the analysis approach.

B.3.1 Instrument Development and Testing

To inform the development of the draft instrument, informal contacts with vendors were made and existing instruments were reviewed, including instruments used for surveys of retailers conducted by State Supplemental Nutrition Program for Women, Infants, and Children (WIC) in preparation for deploying EBT for WIC. The informal contacts were unstructured telephone calls with representatives of the POS industry to learn more about their industry.[21] The informal contacts provided general information on the types of POS equipment and systems available, the purchase and installation process, how UPC databases are created, service contracts, and the types of store personnel that would be the most knowledgeable to respond to the survey. Additionally, information gathered in the informal contacts helped ensure that the different types of scanning technologies were described in the survey instrument in terminology that was easy to understand and familiar to respondents.

The survey instrument was designed to collect store-level information on the following data elements: number of lanes, number of food products sold, number of employees, Internet connectivity, WIC authorization, ability to scan barcodes on products during checkout, POS system integration, POS system identification of SNAP-eligible products, likelihood of upgrading scanning equipment to remain SNAP authorized, and factors influencing this decision (see **Appendix C**). To help maximize the response rate for the survey, it was developed with the goal of requiring no more than 15 minutes to complete.

A survey methodologist using RTI's proprietary Question Appraisal System (QAS) reviewed the draft questionnaire, which allowed detection of questionnaire problems before cognitive interviewing. QAS is a tool for evaluating items (questions and responses) against more than 50 evidence-based standards and best practices, which helps ensure that the strongest candidate items are used. The QAS process ensures questions and response options are clear, direct, and answerable to respondents and eliminates barriers such as vague terminology, social acceptability bias, mismatch between question and response categories, and culturally or demographically inappropriate language. The draft questionnaire was refined based on the QAS and feedback from FNS and the revised version used for cognitive and usability pretesting with small retailers.

[21] The people contacted for the informal contacts were different individuals than those contacted for the vendor interviews.

Three small SNAP-authorized retailers participated in the pretesting, and an industry expert and four trade associations reviewed the survey instrument and provided feedback. Each pretest interview lasted approximately 1 hour and was conducted either in person or by teleconference. Retailer respondents were sent the questionnaire to complete in advance of the interview and asked to record the time that it took to complete the questionnaire for estimating respondent burden. During the interview, the interviewer used a debriefing guide to lead respondents in a discussion using a "think out loud" approach to understand why respondents chose their responses and to identify questions or terms that were confusing or difficult to understand (Willis, 2005). After the debriefing for the SCANR Survey instrument, the interviewer then conducted the follow-up interview using the appropriate draft version of the interview guide (separate versions were developed for adopters and nonadopters of scanning systems as described in **Section B.4**) and solicited feedback on any areas of the interview guide that seemed problematic. Because of time constraints, the interviewer used a subset of questions from the interview guides (e.g., two to three questions) in each pretest interview so that all interview guide questions were pretested at least twice.

In addition, one national trade association (National Grocers Association) and three State-level associations (California Grocers Association, Missouri Retailers Association, Texas Retailers Association) reviewed the survey questionnaire to provide an overall industry perspective. Seeking feedback from trade associations was also useful in helping to garner their support of the survey among member retailers.

B.3.2 Sample Design

Respondent Universe

The SCANR Survey was designed to provide nationally representative information on adoption of scanning technologies by store type and urbanicity. The respondent universe was small SNAP-authorized retailers, defined as franchise convenience, nonfranchise convenience, medium grocery, small grocery, and specialty stores. The universe excluded farmers' markets, direct-marketing famers, delivery routes, meal services, and large chains with 10 or more stores under the same ownership. Stores that are part of a large chain are very likely to have an integrated scanning/EBT system in place and already meet the Farm Bill requirement, so it was deemed unnecessary to survey these stores.

The sampling frame was created using FNS's Store Tracking and Redemption Subsystem (STARS) database. The frame started with 143,993 stores, not including supermarkets, large grocery stores, or superstores. On the STARS database, the variable "C-Plan" indicates SNAP-authorized retailers that were identified as large chains under the same ownership by FNS. Using this variable, SNAP-authorized chain retailers were removed from the sampling frame. In total, 33,157 chain retailers were removed, leaving 110,836 SNAP-authorized retailers in the sampling frame.

The sampling unit and analytic unit were the retail stores, and the respondents were the retail store owner/manager or regional manager (or other knowledgeable individual) who completed the survey.

Sampling Method and Stratification

A nationally representative probability-based stratified random sample of small SNAP-authorized retailers was selected from the sampling frame. The sample was stratified by store type (franchise

convenience, nonfranchise convenience, medium grocery, small grocery, and specialty) and urbanicity (rural or urban), creating a total of 10 mutually exclusive strata before the systematic sampling.

Store Type. The STARS dataset included a code for store type. The SNAP-authorized retailers on the frame were assigned to one of the four store types, listed below, using these codes. Store-type codes from the STARS dataset were mapped into four store-type categories:[22]

- Convenience store = convenience store (CS)
- Medium grocery = medium grocery (MG)
- Small grocery = small grocery (SG) and nonprofit food-buying cooperative (BC)
- Specialty store = specialty bakery/bread (BB), fruit/vegetables (FV), meat/poultry products (ME), and seafood products (SE)

Convenience stores were further categorized into two categories: franchise versus nonfranchise to create five store-type categories. A store was categorized as a franchise convenience store if the store name was listed more than 10 times in the sampling frame, resulting in 20,009 convenience stores categorized as franchises. The remaining convenience stores were categorized as nonfranchise convenience stores.

Urbanicity. The STARS database includes Rural-Urban Commuting Area (RUCA) codes, which are a Census tract-based classification scheme that uses the standard Bureau of Census Urbanized Area and Urban Cluster definitions in combination with work commuting information to characterize all of the nation's Census tracts regarding their rural and urban status and relationships (https://depts.washington.edu/uwruca/). RUCA codes are classified into two levels. The single-level RUCA codes are whole numbers and define metropolitan, micropolitan, small town, and rural commuting areas based on communing flows:

(1) Metropolitan area core: primary flow within an urbanized area (UA)

(2) Metropolitan area high commuting: primary flow 30 percent or more to a UA

(3) Metropolitan area low commuting: primary flow 10 percent to 30 percent to a UA

(4) Micropolitan area core: primary flow within an urban cluster (UC) of 10,000 to 49,999 (large UC)

(5) Micropolitan high commuting: primary flow 30 percent or more to a large UC

(6) Micropolitan low commuting: primary flow 10 percent to 30 percent to a large UC

(7) Small town core: primary flow within a UC of 2,500 to 9,999 (small UC)

(8) Small town high commuting: primary flow 30 percent or more to a small UC

(9) Small town low commuting: primary flow 10 percent to 30 percent to a small UC

(10) Rural areas: primary flow to a tract outside a UA or UC

[22] Delivery routes were not included in the sampling frame because they do not ring up items at the POS.

The second-level RUCA codes (e.g., 1.1 or 4.0) consider secondary commuting flows. The second-level codes were grouped as shown below for the urbanicity stratification:

- Urban = 1.0, 1.1, 2.0, 2.1, 3.0, 4.1, 5.1, 7.1, 8.1, 10.1
- Rural = 4.0, 4.2, 5.0, 5.2, 6.0, 6.1, 7.0, 7.2, 7.3, 7.4, 8.0, 8.2, 8.3, 8.4, 9.0, 9.1, 9.2, 10.0, 10.2, 10.3, 10.4, 10.5, 10.6

Sample Precision, Allocation, and Selection

As shown in **Table B-2**, a sample of 1,377 small SNAP-authorized retailers was selected with a reserve sample of 750 additional stores for a total sample of 2,127. At the national level, assuming a design effect of 2.3 and an 80 percent response rate, the sample size of 1,377 will yield estimates with a margin of error of ±0.045 percentage points at a 95 percent level of confidence for proportion estimates around 0.5 (at 0.80 power). For the subgroup analysis of store type (i.e., analysis by the five store types), assuming a design effect of 1.25 and an 80 percent response rate, the strata sample sizes will yield estimates with a margin of error of ±0.08 percentage points at a 95 percent level of confidence for proportion estimates around 0.5 (at 0.80 power). For rural estimates, assuming a design effect of 2.44 and for urban estimates a design effect of 1.94, the allocated sample sizes will yield estimates with a margin of error of 0.077 percentage points and 0.055 percentage points, respectively.

As described in more detail in **Section B.3.3**, a multimode, two-phase sample design was used that involved conducting a survey with stores that did not respond to the initial survey in the second phase of data collection (nonresponse survey). To determine the starting sample size, it was assumed that 15 percent of the selected retailers would be ineligible (e.g., no longer SNAP-authorized retailer, out of business), resulting in approximately 1,170 eligible retailers. The goal of 935 completed surveys was calculated by assuming a 50 percent response rate in Phase I, after adjusting for ineligibility, and a 60 percent response rate in Phase II for the nonresponse survey.

To maximize the precision for estimates by store type, the sample was allocated equally across the five store types, resulting in 275 sampled SNAP-authorized stores for each store type (with 277 for the nonfranchise convenience). As a result, convenience stores (franchise and nonfranchise) were undersampled because of the large proportion of convenience stores in the population. Estimates by store type were not affected by this undersampling; however, overall national estimates were less precise because of the unequal weighting effects resulting from this undersampling.

Table B-2. Sample Allocation for the SCANR Survey with Stratification by Urbanicity and Store Type

Final Frame Counts and Sampling Allocation[a]	Convenience: Franchise		Convenience: Nonfranchise		Grocery: Medium		Grocery: Small		Specialty		National
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	
Number on frame	18,176	1,833	56,080	9,280	7,091	1,157	10,226	974	5,259	760	110,836
Number sampled	184	91	186	91	184	91	184	91	184	91	1,377
Reserves	100	50	100	50	100	50	100	50	100	50	750
Estimated number of completes	187		187		187		187		187		935

[a] Equal allocation for store type and oversampling rural stores (allocate two-thirds of sample to urban and one-third to rural within store type).

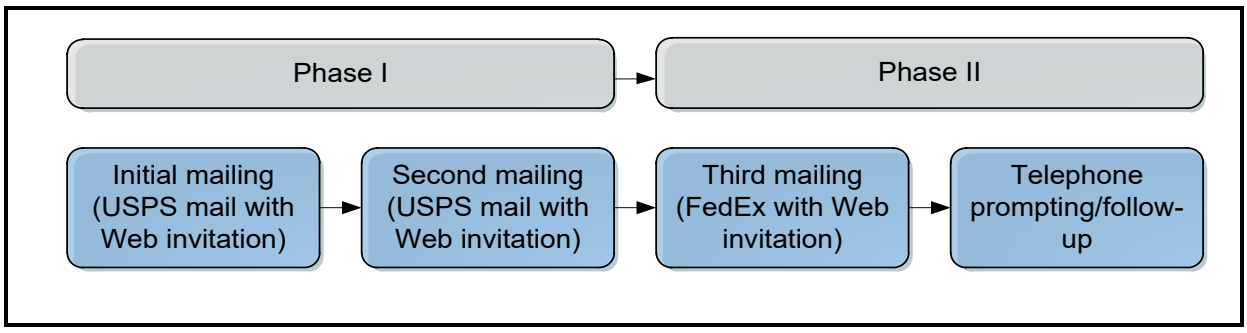
Within each store type, stores were allocated to either rural or urban stores with two-thirds allocated to urban (184 selected stores with 186 for the nonfranchise convenience) and one-third allocated to rural (91 selected stores). In total, 922 stores were allocated to the urban stratum and 455 stores were allocated to the rural stratum.

Within each stratum, retailers were selected with equal probability. Before selecting the stratified random sample, the frame was sorted by store owner name, ZIP code, and annual retail sales to ensure the final sample included a wide range of retailers across the nation that ranged in size (within the 10 mutually exclusive stratification groups).

B.3.3 Data Collection Procedures

The survey used a two-phase design developed to address the challenges of surveying small retailers with busy schedules and limited motivation to participate. The approach employed mail, Web, and computer-assisted telephone interviewing (CATI) to gather data (see **Figure B-2**). The design was based on best practices as outlined by the Dillman (2007) Tailored Design Method,[23] which optimizes the mode and timing of contacts to minimize survey error and maximize response. The SCANR Survey was conducted over the 5-month period March through July 2018.

Figure B-2. Two-Phase Design for the SCANR Survey



Sampled stores received a four-page 18-item paper questionnaire, a cover letter with an endorsement from FNS describing the study and emphasizing the relevance to retailers, a frequently asked questions document, and an invitation to complete the survey via the Web instead of completing the paper questionnaire (Phase I—Initial Mailing). A study toll-free telephone number and email address were also provided. The paper questionnaire included a unique ID and could be returned using a prepaid business

[23] The Tailored Design Method was developed by Don A. Dillman in the 1970s for mail and telephone surveys and emphasizes all aspects of data collection to make the survey experience as easy as possible for the respondent. The method includes personalizing correspondence, writing survey questions seen as useful to respondents, providing explanations as to why the survey will be useful to others, establishing legitimacy of the survey, and including several coordinated contacts.

reply envelope. A unique access code was provided if the retailer preferred to complete the survey via the Web, which was formatted for completing on a mobile device. The link to the survey and the access code were emailed to the retailer if an email address was available. Six weeks after the initial contact, retailers that had not participated received a second paper questionnaire and an invitation to complete the survey via the Web (instead of completing the paper questionnaire) (Phase I—Second Mailing). This invitation was also sent by email if an email address was available.

At month 3 (Phase II—Third Mailing), nonrespondents received another paper questionnaire and Web invitation via Federal Express (or U.S. Priority Mail for retailers with a PO box). Use of FedEx aimed to draw the retailer's attention to the importance of the study. Nonrespondents also received a third email if an email address was available.

Two weeks after the FedEx mailing, trained telephone interviewers began calling all nonresponding retailers (Phase II—CATI). Interviewers completed the survey with retailers over the phone, or if preferred, they could assist retailers in completing the survey by mail or via the Web. Interviewers attempted to identify and address obstacles preventing retailers from responding, such as a busy schedule. Retailers who indicated that they could complete the survey via mail or Web on their own were flagged for phone follow-up if a completed survey was not received within 1 week after the initial call. Tracing efforts via online Google searches for stores with dead-end telephone numbers were attempted.

Interviews conducted by telephone lasted an average of 13 minutes. The telephone interview was identical to the mail and Web survey, except that introductory and end screens were added to explain and close out the interview. All interviews (mail, Web, and phone) were completed in English. To maximize response rates, interviewers made up to 15 call attempts per case.

During data collection, about 40 stores called the toll-free study hotline and 8 contacted the project email account. Reasons for calls or emails included:

(1) Informing the study that the store was out of business.

(2) Informing the study that they no longer own the store.

(3) Asking whether they should complete the survey because they do not use scanning technology.

B.3.4 Survey Response

A total of 1,040 surveys were completed, with a response rate of 80 percent. Because 94 percent of stores were eligible, rather than the projected 85 percent, to achieve the 80 percent response goal, more surveys needed to be completed (see **Table 2-2**). No reserve sample was released.

The majority (54 percent) of surveys were completed by mail, followed by Web (31 percent) and telephone (15 percent); thus, the preferred mode of survey completion was by mail. Response rates by subgroup ranged from 72 percent (small urban grocery) to 97 percent (medium rural grocery). Across subgroups, rural stores responded at higher rates than urban stores.

Table B-3. SCANR Data Collection Results by Mode, Store Type, and Urbanicity

Case Disposition	Convenience: Franchise		Convenience: Nonfranchise		Grocery: Medium		Grocery: Small		Specialty		All Stores
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	
Target number of completes	125	62	125	62	125	62	125	62	125	62	935
Number of completes by mode											
Mail	52	27	81	43	75	56	73	32	81	47	566
Web	51	24	38	18	47	16	32	26	51	16	319
CATI	29	17	20	11	17	14	13	9	11	14	155
Total number of completes	**132**	**68**	**139**	**72**	**139**	**86**	**118**	**67**	**143**	**77**	**1,040**
Number of nonrespondents											
Refusals	6	6	13	2	8	1	8	3	8	1	57
Other nonrespondents (i.e., final noncontact to CATI follow-up)	39	12	29	10	23	2	39	16	22	8	200
Total number of nonrespondents	45	18	42	12	31	3	47	19	30	9	257
Number of ineligibles											
Not SNAP authorized (answered no to Q1 in the survey)	3	5	3	5	2	2	7	2	3	2	34
No longer in business	1	0	2	2	5	0	5	2	3	1	21
Language barrier	3	0	0	0	7	0	7	1	5	2	25
Total number of ineligibles	7	5	5	7	14	2	19	5	11	5	80
Total sample released	184	91	186	91	184	91	184	91	184	91	1,377
Response rate (target: 80%)[a]	75	79	77	86	82	97	72	78	83	90	80
Eligibility rate (estimated 85%)[b]	96	95	97	92	92	98	90	95	94	95	94

[a] Response Rate = Number of Completes/[Sample Released − Number of Ineligibles]

[b] Eligibility Rate = [Number of Completes + Number of Nonrespondents]/[Number of Completes + Number of Nonrespondents + Number of Ineligibles]

For subgroup analyses, the sample design specified 187 completes per store type: 310 completes for rural stores and 626 for urban stores. The study surpassed the target number of completes for each subgroup except small grocery stores, which came close to the target of 187 with 185 completes.

Table B-4 provides an overview of the results at each stage of data collection by phase and mode (mail, Web, and telephone). The targeted response rate was 50 percent for Phase I and 60 percent for Phase II, for an overall targeted response rate of 80 percent. Actual response rates were 51 percent for Phase I, 58 percent for Phase II, and 80 percent overall. The eligibility rate was higher than anticipated (94 vs. 85 percent), resulting in a larger number of surveys completed in each phase.

Table B-4. SCANR Survey Response Rate by Phase and Mode

Overall Starting Sample Size	Phase I Actual Eligibility Rate	Phase I Actual Number of Eligible in Sample
1,377	99%	1,360
Data Collection Stage	**Starting Eligible Sample Size**	**Response Rate (number of completes)**
Phase I		
Initial mailing (USPS mail with Web invitation)	1,377	21% mail (n = 289) 14% Web (n = 185)
Second mailing (USPS mail with Web invitation)	896	15% mail (n = 134) 9% Web (n = 79)
Phase I refusals		0% (n = 1)
Phase I ineligible		1% (n = 17)
Phase I eligibility rate		99%
Phase I response rate		51% (n = 687)
Phase II		
Third mailing (FedEx with Web invitation)	672	15% mail (n = 102) 5% Web (n = 36)
Telephone interviewing/prompting[a]	524	34% telephone (n = 155) 4% Web (n = 19) 9% mail (n = 41)
Phase II refusals[b]		9% (n = 56)
Phase II ineligible		9% (n = 63)
Phase II eligibility rate		91%
Phase II response rate		58% (n = 353)
Overall response rate		80% (n = 1,040)

[a] Ineligibles were excluded to calculate the response rate, making the denominator n = 461.

[b] Ineligibles were excluded from the starting eligible sample size to calculate the response rate, making the denominator n = 609.

Of the 524 nonresponse cases called during Phase II, 155 were completed by telephone, which represents a 34 percent completion rate among cases initiated in CATI and 15 percent of all completed cases for the full data collection. An additional 60 cases were completed by mail and Web after telephone prompting began. After telephone efforts were exhausted, remaining CATI cases were finalized as nonrespondents (n = 200).

B.3.5 Data Analysis

The analysis procedures included developing the final analysis weights; preparing the analysis dataset; and conducting univariate, bivariate, and multivariate analyses. Because the study achieved an 80 percent response rate, it was not necessary to conduct a nonresponse bias analysis.

Weighting Procedures

Standard design-based methods were used for estimating point estimates and variance estimates. These estimates were used to calculate confidence intervals (CIs) on means and percentages. All sampled stores had a sample design base weight equal to the inverse of each store's probability of inclusion in the sample. An ineligibility adjustment was applied to the weights to account for cases that were deemed to be ineligible (i.e., out of business, no longer participating in SNAP). Eighty stores were identified as ineligible and assigned a design weight of 0. Next, stores with unknown eligibility were identified and an unknown eligibility adjustment factor, within the stratum, was created. Overall, 257 stores had unknown eligibility, and 93 percent, or 1,040, were known eligible:

1,040 known eligible respondents/(80 known ineligible + 1,040 known eligible respondents)

To account for the estimated ineligibility among those with unknown eligibility, the sample design weights were multiplied for the 257 with unknown eligibility by the unknown eligibility adjustment factor of 93% to obtain an estimate of 237 eligible stores among the 257 unknown eligible stores.[24] Lastly, a nonresponse adjustment was calculated to reduce nonresponse bias. The WTADJUST procedure within SUDAAN 11 (RTI International, 2012) was used to make the nonresponse adjustment. The nonresponse adjustment model included urbanicity, store type, owner type, and number of registers. The final analysis weights were the product of the sample design weights, unknown ineligibility adjustment, and nonresponse adjustment.

Final analysis weights reflect the probability of selection, eligibility rates, and nonresponse allowing for nationally representative estimates as well as subgroup-level estimates representative of the subgroups of interest (i.e., store type and urbanicity). The final analysis weights were used to conduct all statistical analyses.

Data Preparation

Editing procedures were implemented to ensure the quality of the final survey data. After generating the initial derived variables for use in the analysis (e.g., type of scanning system), the output that contained the value of the derived variable and the corresponding values of the source variable(s) were checked to ensure that the values of the derived variables were accurate based on the data contained in the source variables.

[24] The unknown eligibility adjustment factors were created within each stratum. The example in the text is overall and only shows the mathematical calculations applied within each stratum.

Data-cleaning procedures included comparing "nested" questionnaire items with "gate" items to confirm logic. In the case of ambiguities (e.g., nested item should be blank but contains a value), the "gate" question was treated as the correct response. For questions that included an "Other, specify" response, answers were examined for possible up-coding into close-ended response categories for the associated item. A new response option was created if more than 3 percent of respondents provided the same response.

Descriptive Data Analysis

Univariate analyses were conducted for all survey questions and bivariate analysis for a limited number of questions. An important assumption underlying the univariate and bivariate statistical tests is that the data are independent and identically distributed. The analysis assumed the survey responses are independent of each other, meaning that survey respondents did not consult each other when responding to the survey.[25] Furthermore, the data are identically distributed because every survey respondent had the same response options and thus the same probability of responding with a given response. The procedures for conducting each type of analysis are described below.

The descriptive analyses were conducted using the SAS 9.4 procedure SURVEYFREQ (SAS, 2016), which uses appropriate adjustments for the sample design. This SAS procedure, specifically designed for conducting descriptive analyses with survey data, allows the user to specify analysis weights and stratification variables and incorporate the finite population correction factor. The final analysis weights (described above) and the sampling stratification variable (store type crossed with urbanicity) were used. The population totals from the sampling frame allowed for the calculation of the finite population correction factor, which adjusts the variance estimates.

For the univariate analysis, weighted proportions were computed for questions in which respondents could select one or more responses from a list of responses (categorical variables). Respondents who did not answer the question (i.e., missing values) were not included in the calculation. The tables in **Appendix D** provide the following for each survey question: the unweighted number of responses for each response item, the weighted proportion, and the 95 percent CIs. The CIs were output from the SAS procedure SURVEYFREQ, which, as already noted, adjusted appropriately for the sample design by incorporating the final analysis weights, the sampling stratification variable, and the finite population correction factor.

Bivariate analyses were conducted to examine differences in adoption rates for different types of scanning systems and the proportion of stores meeting the Farm Bill requirement. This analysis examined differences by store type, urbanicity, annual retail sales, average monthly SNAP redemptions, length of

[25] For small chains (nine or fewer outlets) in the study population, it is possible that two or more stores under the same ownership were selected for the study sample and the same person completed the survey for multiple outlets so that their responses are not independent.

time SNAP authorized, WIC authorization, Internet connectivity, number of unique barcode food products, and number of cash registers. The bivariate analysis results are also presented in **Appendix D**.

Statistical testing was conducted as follows. For categorical variables (e.g., store type or revenue category), the Rao-Scott design-adjusted chi-square goodness-of-fit test for a one-way table was used to test the null hypothesis of equal proportions. This test adjusts appropriately for the sample design. A *p*-value > .05 was chosen to indicate statistical difference between at least two subgroups. Additional analysis would be needed to determine which subgroups were different from each other.

When cell counts are small (e.g., under 30), the variability is too high (not precise) for the estimates to be reliable. The estimates are unbiased; however, the width of the CI for these estimates would be very wide, making the estimate not very useful; thus, the results were suppressed. The "†" symbol is used in the table to indicate results that do not meet the criteria for statistical reliability (the number of respondents in a given category is fewer than 30 or the relative standard error [RSE] > 30 percent).

Multivariate Analysis

A multivariate analysis was conducted to better understand the characteristics of stores that influence the likelihood of whether a store has adopted a scanning system. Specifically, Classification and Regression Tree, or CART, analysis was used to identify store characteristics that are associated with whether a store meets the Farm Bill requirement (i.e., the store's register system scans barcodes during checkout and has a flag to indicate whether products are SNAP eligible). This procedure was conducted in SAS and involved first constructing a classification tree that partitions stores based on variables that had an effect on scanning system adoption. Next, those variables that have explanatory power were used in a logistic regression model using Stata (StataCorp, 2017) to estimate odds ratios that quantify the likelihood that stores possessing certain characteristics meet the Farm Bill requirement.

B.4 Follow-Up Interviews with Retailers

The aim of the follow-up interviews with a subset of respondents to the SCANR Survey was to collect information for the cost analysis, qualitative information on perceived barriers and facilitators to adopting scanning systems, and other information. This section describes the selection of retailers for the interviews, instrument development and testing, the data collection procedures, and analysis approach.

B.4.1 Selection of Retailers and Interview Response

As survey responses were received during administration of the SCANR Survey, demographic information was reviewed on survey respondents, including store type and urbanicity, to aid in the purposeful selection of a diverse set of retailers to include in follow-up interviews. Two different samples of retailers were selected for follow-up interviews:

- Nonadopters: Stores that do not meet the Farm Bill requirement because they did not have a scanning system at the time of the survey or had a scanning system that was not capable of identifying items as SNAP eligible (i.e., did not have a SNAP flag indicator). The selected sample of nonadopters was intended to yield 25 *telephone* interviews.

- Adopters: Stores that meet the Farm Bill requirement because they had either an integrated or nonintegrated scanning system with a SNAP flag indicator at the time of the survey. The selected sample of adopters was intended to yield 25 *on-site* interviews. These interviews were conducted on-site to facilitate the collection of the cost data and to allow interviewers to photograph the store's scanning system.

A total of 37 nonadopters (25 sample and 12 reserves) were selected for telephone interviews and 25 interviews were completed. The target completion rate was 70 percent, and the actual completion rate was 68 percent. As shown in **Table B-5**, participants included a mix of store types and urban vs. rural stores.

Table B-5. Status of Follow-Up Telephone Interviews Conducted with Nonadopter Sample

	Convenience: Franchise		Convenience: Nonfranchise		Grocery: Medium		Grocery: Small		Specialty		
Status	**Urban**	**Rural**	**Urban**	**Rural**	**Urban**	**Rural**	**Urban**	**Rural**	**Urban**	**Rural**	**Total**
Total sample released	2	3	4	2	3	5	4	3	8	3	37
Completed interviews	**2**	**2**	**4**	**0**	**2**	**2**	**3**	**2**	**5**	**3**	**25**
Nonrespondents	0	1	0	2	1	3	1	1	3	0	12
Completion rate (%)	100.0	66.7	100.0	0.0	66.7	40.0	75.0	66.7	62.3	100.0	67.6

A total of 53 adopters (25 sample and 28 reserves) were selected for on-site interviews. Although a diverse set of adopters was initially selected, sample and reserve retailers were replaced as needed during the data collection period because of the on-site nature of the interviews and the need to visit retailers that were located approximately 1 to 2 hours from trained study staff or clusters of retailers that were located within 1 to 2 hours of each other. Although the actual completion rate of 47 percent was lower than anticipated (70 percent), we achieved the target number of interviews (n = 25). As shown in **Table B-6**, participants included a mix of store types and urban vs. rural stores. Most of the adopter participants were medium grocery stores, in part, because this store type comprised a large portion of the initial sample (23 of 53 stores) and had a higher response rate (74 percent) relative to the other store types (see).

Table B-6. Status of On-Site Interviews Conducted with Adopter Sample

	Convenience: Franchise		Convenience: Nonfranchise		Grocery: Medium		Grocery: Small		Specialty		
Status	**Urban**	**Rural**	**Urban**	**Rural**	**Urban**	**Rural**	**Urban**	**Rural**	**Urban**	**Rural**	**Total**
Total sample released	7	2	10	4	15	8	3	1	3	0	53
Completed interviews	**2**	**0**	**3**	**1**	**12**	**5**	**1**	**0**	**1**	**0**	**25**
Nonrespondents	5	2	7	3	3	3	2	1	2	0	28
Completion rate (%)	28.6	0.0	30.0	25.0	80.0	62.5	33.3	0.0	33.3	0.0	47.2

The stores interviewed (adopters and nonadopters) were geographically dispersed across the following 24 States and the District of Columbia: Alaska, California, Colorado, Florida, Georgia, Iowa, Illinois, Indiana, Louisiana, Maine, Maryland, Massachusetts, Minnesota, Nebraska, New Jersey, New Mexico,

New York, Oklahoma, Oregon, North Carolina, Tennessee, Texas, Virginia, and Washington. **Table B-7** shows the final status for the adopters and nonadopters that were contacted for follow-up interviews.

Table B-7. Status of Stores Contacted for Follow-Up Interviews

Status	Nonadopters	Adopters
Completed interview	25	25
No-show for scheduled interview	2	2
Refusal	3	8[a]
Did not respond to contact attempts	6	15
Disconnected phone number/unable to leave a message or make contact	1	3
Total	37	53

[a] Two convenience franchisees refused to participate because they have no control over or information about the rationale for choosing their current POS; it is part of their contract as a franchisee. The two franchisee retailers that participated in interviews relayed similar information about their POS and contractual relationship. After hearing this same message from multiple retailers, all remaining convenience franchisees were excluded from the adopter sample because this type of store would not offer very useful information.

B.4.2 Instrument Development and Testing

Two semi-structured interview guides were developed—one for nonadopters and one for adopters (see **Appendix C**). Both interview guides included questions about the retailer's POS equipment, actual or perceived costs associated with purchasing or leasing scanning equipment, and actual or perceived benefits and barriers associated with having scanning equipment. All questions were open ended and included a set of probes for interviewers to use to obtain additional information about a response or to encourage a response. The interview guides were developed only in English and designed to take an average of 20 to 30 minutes to administer. The interview guides were pretested with five retailers to assess content and usability. Each pretest interview lasted approximately 1 hour and was conducted in person. The interviews were frequently interrupted because the participants needed to address employee or customer questions or because the participant was both the owner and the cashier. Interviewers were still able to ask most of the questions with this approach but not in the order in the structured guide. Additionally, as mentioned in **Section B.3.1**, the three SNAP-authorized retailers that participated in the pretest of the SCANR Survey also answered a subset of questions from the follow-up interview guide.

B.4.3 Data Collection

Selected stores in the nonadopter and adopter samples were recruited using the study recruitment materials. Recruitment letters were sent via mail and email (if an email address was available) approximately 1 to 2 weeks before contacting the store by telephone. The interviewers made three attempts to reach each store unless the retailer declined to participate before the third attempt. Nonadopters had the option of completing the interview when they were reached by phone or scheduling the interview for another day and time that was convenient for them. All nonadopter interviews were conducted by telephone and lasted approximately 15 to 20 minutes. For many of the nonadopter interviews, a note-taker joined the interviewer.

Because of their on-site nature, all adopter interviews were scheduled in advance on a day that was mutually convenient for both the retailer and interviewer. All adopter interviews were conducted by one

interviewer on-site at the retailer location with one exception,[26] and the interviews lasted approximately 30 minutes. Both adopters and nonadopters received a $25 gift card for taking part in the interview.

Experienced interviewers who received training on the guides and procedures conducted each interview. Interviewers began by providing background information, explaining reporting procedures, and asking for consent to record the interview. If consent was provided, the interview was audio recorded using a high-quality recording device and later transcribed. If consent was not provided, the interviewer or note-taker, if applicable, took detailed notes. Five participants did not consent to being recorded—three nonadopters and two adopters. For interviews conducted on-site, interviewers also took photos of the checkout lanes, register and scanning equipment (if applicable), and any other relevant equipment or documentation, taking care not to photograph any store employees or customers. All adopters consented to having photos taken.

B.4.4 Analysis

Interview audio recordings were professionally transcribed for use in analysis. The transcriptions include the number assigned to the participant and no identifying information. Using NVivo, Version 11 (QSR International), an analyst trained in NVivo and qualitative analysis uploaded and coded transcriptions and, when applicable, interview guides with responses entered when participants refused to be recorded. A coding outline was developed before coding the interview data in NVivo to ensure the analysis was framed around the RQs and mapped to the relevant interview questions. The coding outline was revised and responses recoded during analysis as necessary. A subset of variables extracted from the SCANR Survey was used to add relevant attributes (e.g., store type and type of scanning system) to the interview responses as they were coded.

After responses were coded at the interview question level, a skilled analyst systematically reviewed the responses to identify common themes and exceptions to the themes and, to the extent feasible, similarities and differences among retailers in different settings (e.g., store type or urbanicity) or with different characteristics (e.g., type of scanning system). The analyst selected specific quotes to describe the themes and highlight unique responses.

B.5 Cost Analysis Procedures

The cost analysis used data from the vendor interviews, the SCANR Survey, and the follow-up interviews with retailers who had adopted scanning systems and secondary data on labor rates and interest rates. The cost analysis used a three-step approach: (1) develop inputs for the cost analysis, (2) estimate store-level costs by store type, and (3) estimate industry-level costs by store type and overall. The cost analysis procedures are summarized below, with additional detail on the inputs and calculation of costs provided in **Section 7**.

[26] A small retailer in Nebraska agreed to participate in an interview but was not available when the interviewer was in the area; thus, the interview was scheduled for a later date and took place via telephone.

B.5.1 Develop Inputs for Cost Analysis

In the first step, an Excel spreadsheet was created with each quantitative data point from the vendor (n = 9) and follow-up interviews with adopters (n = 25) to describe the following types of costs: capital equipment costs, service contracts, and labor hours for vendor selection, training, and database maintenance. Some costs were provided on a per-lane/register basis (e.g., purchase and installation of scanning system)[27] while others were on a per-store basis (e.g., cost of UPC maintenance). The average number of register lanes by store type (from the SCANR Survey) was used to convert all estimates into a per-store cost. For each type of cost, the range (minimum and maximum) and mean value across all respondents were calculated.

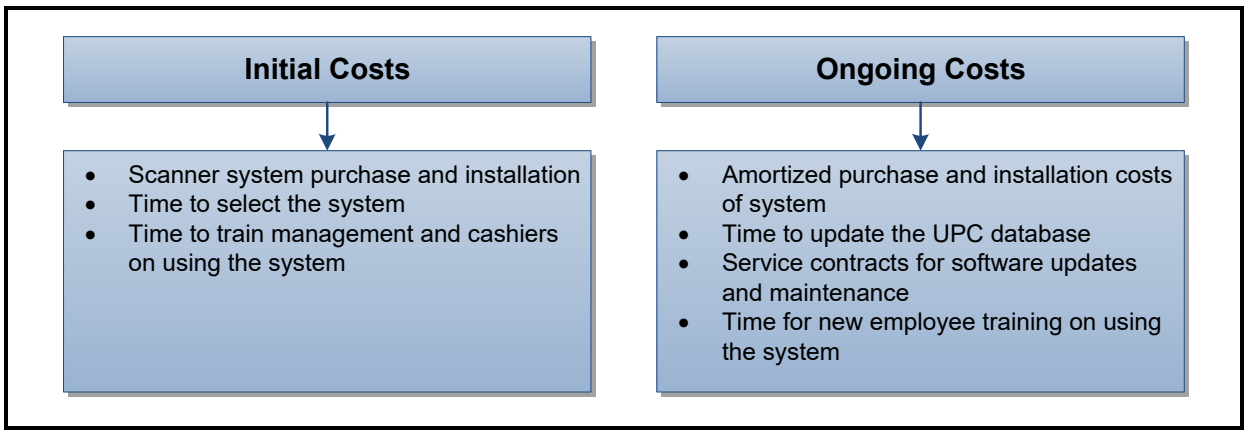
B.5.2 Estimate Store-Level Costs

In the second step, the initial and ongoing annual costs by store type were estimated using a structured cost estimation spreadsheet developed in Excel, with data from Step 1 on the minimum, average, and maximum values serving as the data inputs. The cost categories comprised initial and ongoing annual costs and included the following types of costs: system purchase and installation costs, service contracts, and labor for vendor selection, staff training, and Universal Product Code (UPC) database maintenance. **Figure B-3** identifies the types of initial and ongoing costs included in the cost analysis. To calculate the cost of labor for vendor selection, initial and ongoing staff training, and UPC updates (to reflect new products or price changes in existing inventory), average wage rates from the Bureau of Labor Statistics (BLS) were multiplied by the estimated number of labor hours required for each implementation activity. The amortized cost of capital equipment purchases was calculated using information on the expected life of the system from the vendor interviews. All initial costs and all annual ongoing costs were summed to calculate the total cost of installing and maintaining a scanning system by store type. The cost analysis used weighted data from the SCANR Survey for the following inputs, which varied by store type: average number of lanes, average number of cashiers, and average number of unique barcode food products (i.e., UPCs).

Next, minimum, most likely, and maximum cost estimates were developed based on the ranges from Step 1 using @Risk software (Palisade, 2016) to account for uncertainty in the cost estimates. @RISK conducts a Monte Carlo simulation by substituting a probability distribution for every uncertain parameter. @RISK calculates model results 10,000 times, each time using a different estimate of each uncertain parameter from the probability distributions. The objective of estimating multiple model results is to obtain an interval surrounding the model's predictions. This "prediction interval" (usually from the 5th percentile to the 95th percentile of model results) provides a quantitative region in which there is high confidence of bounding the true but unknown estimate of industry costs.

[27] All costs are for fully integrated systems. In the vendor interviews, vendors could not distinguish prices for nonintegrated systems versus a system that is fully integrated with the store's EBT payment terminal. See Section 7.3 for additional information.

Figure B-3. Initial and Ongoing Costs Included in the Cost Analysis



To conduct the simulation described above, a subjective probability distribution was specified for each uncertain cost element. The uncertain cost elements that varied in the simulation included the cost of scanner system purchase and installation; labor costs for vendor selection, training, and UPC maintenance; and the cost of service contracts. The remaining cost elements were kept constant in the simulation. For the simulation, the minimum, most likely, and maximum cost estimates collected from vendors and retail adopters were used to define a PERT distribution. The PERT distribution is similar to the triangular distribution in that it creates a probability distribution from assumptions regarding minimum, mostly likely, and maximum values. However, values near the extremes of the distribution (the minimum and maximum) are assumed to be less likely to occur than in the triangular distribution.

B.5.3 Estimate Industry-Level Costs

The industry-level costs were estimated for stores that do not currently have scanning systems that meet the Farm Bill requirement and for those stores that are likely to purchase a new system in order to meet the Farm Bill requirement. These were estimated for each store type and overall as follows:

- Calculated the weighted number of adopters and nonadopters by store type using data from the SCANR Survey.
- Multiplied the number of nonadopters by the simulated mean of per-store initial, annual, and annualized costs to calculate the industry-level costs overall and by store type for all nonadopters to purchase a scanning system that meets the Farm Bill requirement.
- Used data on nonadopters from the SCANR Survey to subtract out the weighted number of stores (by store type) that indicated that they are unlikely to purchase a new system to meet the Farm Bill requirement (and thus no longer remain a SNAP-authorized retailer). The remaining number of stores represents the number of stores that would incur costs to purchase a scanning system meeting the Farm Bill requirement.
- Multiplied the per-store costs from the cost analysis by the adjusted number of nonadopters to calculate the industry-level costs that are likely to occur overall and by store type.

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Appendix C: Survey Instruments

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Interview Guide for the Vendor Interviews

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SNAP EBT
Scanner Study

OMB Control Number: 0584-0634
Expiration date: 01/31/2021

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB number. The valid OMB control number for this information collection is 0584-0634. The time required to complete this information collection is estimated to average 60 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

Introduction

Thank you for agreeing to participate in this interview for the SNAP EBT Scanner Study. This project is funded by the USDA, Food and Nutrition Service (FNS) to better understand the effect on small businesses of complying with the recent statutory requirement that all authorized SNAP retailers must use scanners at checkout to accept SNAP benefits. By collecting this information, FNS can better understand and help minimize the burden on small SNAP-authorized retailers. By small retailers, we mean small to medium-size grocery stores which typically have a small or moderate selection of SNAP-eligible products; specialty stores like butcher shops or seafood markets; and independent or franchised convenience stores. We are **not** interested in technologies that may be used exclusively by supermarkets, superstores, and large chains; that is, 10 or more stores owned by the same company or owner.

This interview will take about 1 hour and will include questions about the types of scanning technologies sold by your company, the costs to purchase and operate such technologies, training of store employees on using scanning technologies, and any economic or business operation benefits associated with using scanning technologies.

Your participation in the interview is voluntary. Please answer the questions to the best of your ability. You can decline to answer questions if you don't have the information or if you prefer not to respond. Your responses will be kept private, and any reports prepared with the information you share will not include your name or the name of your business. With your agreement, I would like to record the interview to ensure I accurately capture the information you provide.

Do you have any questions about the interview or use of the information before we begin?

Do you consent to proceed with the interview and to have it recorded?

Overview Questions

[Ask all of the questions in Section 1. The responses to Question 1 will help determine which of the remaining sections to administer during the interview.]

1. What type(s) of scanning technologies does your company sell or lease?
    a. Does your company sell or lease point-of-sale hardware? ***[If yes, ask questions in Section 2]***
    b. Does your company sell point-of-sale software? ***[If yes, ask questions in Section 3]***
    c. Does your company sell bundled systems (i.e., hardware and software packages)? ***[If yes, ask questions in Sections 2, 3, and 4]***

3. When working with small retailers, what personnel at the store do you usually have most contact with (e.g., store manager, purchasing manager)? Remember, by small retailers we mean small to medium-size grocery stores, specialty stores, and independent or franchised convenience stores.

4. When working with companies that own multiple small stores, what type of personnel do you coordinate activities with?

5. Do companies that own multiple stores usually purchase the same hardware and software for all of their stores?

Questions Related to Hardware

1. What hardware components are needed to scan SNAP-eligible items? (Include hardware components needed in addition to the scanner).

2. What is the per-register cost of purchasing (or leasing) hardware needed to scan SNAP-eligible products?

3. Is the installation cost included in the price of the hardware?

4. Are there volume discounts for purchasers of hardware?
    a. If yes, how many units need to be purchased before a discount is given?
    b. What is the amount of the discount?

5. What is the length of life for this hardware?

Questions Related to Software

Walk participant through Figure 1, explaining the differences between the five types of systems. Explain that we will ask a series of questions about the cost of upgrading from one type of system to another. We will begin with the most sophisticated system and work toward the least sophisticated system.

1. If a retailer has a front-end register system that is *not* integrated with the payment terminal, what is the cost to become integrated (going from a Type D system to a Type E system in the figure)? Are these costs included in the hardware costs quoted earlier? (Scenario 5)

2. If a retailer has a front-end register system that is integrated with the payment terminal and can scan products but cannot verify whether products are SNAP-eligible, what is the cost for the modular upgrade to verify SNAP-eligible products (going from a Type C system to a Type E system in the figure)? Are these costs included in the hardware costs quoted earlier? (Scenario 4)

3. If a retailer has a front-end register system that is *not* integrated with the payment terminal, what is the cost to upgrade to a new integrated system that can verify SNAP-eligible products (going from a Type B system to a Type E system in the figure)? Are these costs included in the hardware costs quoted earlier? (Scenario 3)

4. If a retailer has a front-end register system that is *not* integrated with the payment terminal but has a scanner to look up price information, what is the cost for a modular upgrade to verify SNAP-eligible products but is still not integrated (going from Type B system to Type D system in figure)? Are these costs included in the hardware costs quoted earlier? (Scenario 2)

5. If a retailer has a front-end register system that is *not* integrated with the payment terminal and does not have a scanner, what is the cost to upgrade to a system that scans and can verify SNAP-eligible products but is still not integrated (going from a Type A system to a Type D system in the figure)? Are these costs included in the hardware costs quoted earlier? (Scenario 1)

6. Is there a licensing fee for using the front-end register software (different from a service contract fee)?

7. Do the software systems include a UPC database? If optional, what is the cost for including a UPC database?

8. Does the store install the software itself or does the dealer include an installation cost as part of the purchase price or in addition to the purchase price?

9. Do companies that own multiple stores receive volume discounts?

    a. If yes, how many units need to be purchased before a discount is given?
    b. What is the amount of the discount?

10. Does the cost vary by the location or type of store or whether the store is independently owned versus a chain?

11. Please explain the service contracts that a store might purchase from your company. Do they include troubleshooting or regular updates and maintenance? What are the costs of these different types of service contracts? Can you provide a copy of a service contract for us to use as an example?

12. How many months or years is the software reasonably expected to last?

13. How often are software updates provided? ***[if applicable]***

14. What bandwidth and speed of Internet service does a store need to access your software or databases in the cloud? ***[if applicable]***

Questions Related to Bundled Systems

1. What is included in the bundled package (e.g., hardware, software, service agreements)?

2. What are the prices and specifications of your bundled systems?

3. What are the cost savings associated with buying a bundled package over buying the separate components?

4. Do retailers typically replace their front-end register hardware at the same time that they update their scanning software?

Questions on Training

1. Do you provide training on how to use the equipment that you sell? ***[If no, proceed to Section 6]***

2. What is the format of the training (e.g., in person, CD, online)?

3. If in person, where does the training take place?

4. Is the cost of training included in the purchase price?

5. How many store employees are usually trained at each location? ***[if applicable]***

6. What type of employee do you usually train? ***[if applicable]***

7. What is the duration of the training for a completely new system? How much training is provided for modular upgrades within systems? ***[if applicable]***

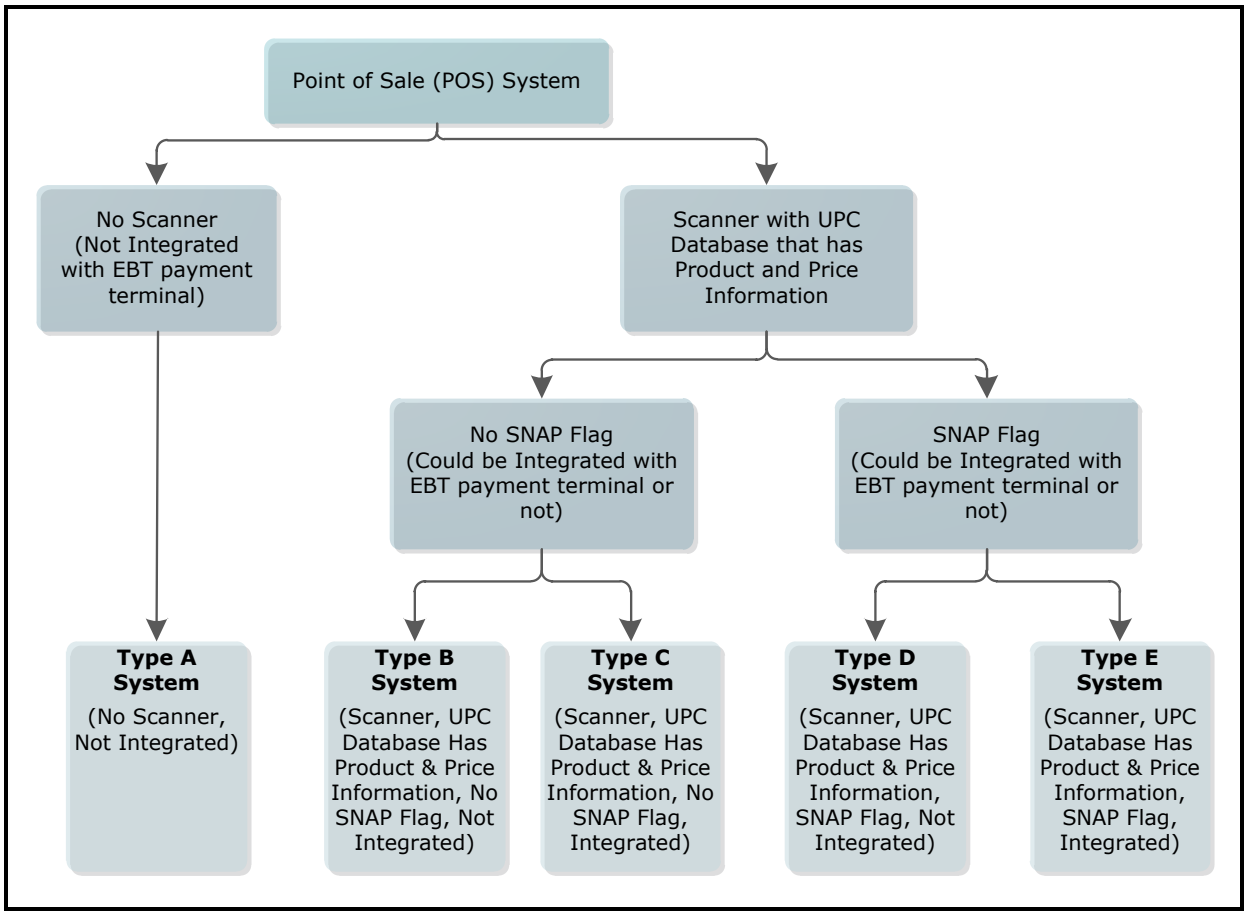
8. As software updates are made, is additional training provided?

Questions on Technological Updates

1. What new technological updates in front-end register hardware or software do you anticipate in the next 3 to 5 years?

2. Based on your experience, what proportion of small retailers would you estimate use the new EMC (chip reader) technology?

Figure C-1. Configurations for POS Systems



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Survey Instrument for the SCANR Survey

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SNAP EBT Scanner Study

OMB Control Number: 0584-0634
Expiration date: 01/31/2021

Please complete this survey even if your business does not currently use scanning technology. Please ask other employees if you do not know the answer to a particular question. For questions that ask for numbers or percentages, **your best estimate is acceptable**. For purposes of this survey, certain words have particular meanings, so please refer to the definitions provided. Unless otherwise indicated, please choose one answer for each question.

Answer all the questions by completely filling in the circle or square to the left of your answer. Please use a black or dark blue ink pen to mark your answers.

- For questions with a circle (○) please answer the question by selecting one answer and marking inside the circle like this ●.
- For questions with a square (☐) please select all that apply by marking inside the square like this ■.

If you make a mistake, mark through the incorrect circle or square like this ⊗ or this ☒ and fill in the correct circle or square.

You are sometimes told to skip over some questions in this survey. When this happens, you will see an arrow with a note that tells you what question to answer next, like this:

○ Yes
● No → **GO TO QUESTION 4**

Be sure to read all of the answer choices before marking your answer.

Please return the completed survey within 2 weeks. The last page provides instructions on how to return the survey. If you have any questions on how to complete the survey, please contact the Survey Helpline toll free at 1-855-322-3039 or SCANR_Survey@rti.org.

1. Questions about Your Store

1. Is this store currently authorized to accept SNAP benefits?
   - ○ Yes
   - ○ No → **Complete Sections 1 and 2 and then return the survey**.

2. Does the owner of this store own and operate any stores at other locations?
   - ○ Yes
   - ○ No → **GO TO QUESTION 4**

3. How many other stores are owned and operated by this store's owner?
   - ○ 1–3
   - ○ 4–6
   - ○ 7–9
   - ○ 10 or more

NOTE: For the remainder of the survey, all questions only concern the store location as identified at the top of the letter you received with the survey.

4. How many cash registers/lanes are currently used by this store?
   - ○ 1
   - ○ 2
   - ○ 3
   - ○ 4
   - ○ 5
   - ○ 6 or more

5. How does this store connect to the Internet?

- O Dial-up telephone line
- O High-speed Internet connection (e.g., cable TV modem, fiber optic connection)
- O This store does not have an Internet connection
- O Other (Please specify): _____

6. Is this store also a WIC-authorized vendor? WIC refers to the Women, Infants, and Children Program.

- O Yes, use paper vouchers
- O Yes, use Electronic Benefit Transfer system (eWIC)
- O No

7. How many unique **barcode food products** are sold in this store? Do not include products that are sold by weight. Remember that your best estimate is fine.

- O Fewer than 100
- O 100 to 499
- O 500 to 999
- O 1,000 to 2,999
- O 3,000 to 4,999
- O 5,000 to 9,999
- O 10,000 to 14,999
- O 15,000 to 20,000
- O More than 20,000

8. How many **other unique food products** are sold in this store that **do not** have a barcode? These items are sometimes sold by weight and can include meat, fruit, vegetables and other items. Your best estimate is fine.

- O None
- O 1 to 24
- O 25 to 49
- O 50 to 99
- O 100 to 499
- O 500 to 999
- O More than 1,000

2. Questions about Your Employees

9. How many **full-time** employees are currently employed at this store (including yourself, if appropriate)? By full time, we mean working at least 35 hours per week.

- O 0
- O 1 or 2
- O 3 or 4
- O 5–9
- O 10–14
- O 15–20
- O More than 20

10. How many **part-time** employees are currently employed at this store (including yourself, if appropriate)? By part time, we mean working fewer than 35 hours per week.

- O 0
- O 1 or 2
- O 3 or 4
- O 5–9
- O 10–14
- O 15–20
- O More than 20

11. How many of your full- or part-time employees are **primarily responsible** for checking out customers?

- ○ 0
- ○ 1 or 2
- ○ 3 or 4
- ○ 5–9
- ○ 10–14
- ○ 15–20
- ○ More than 20

3. Questions About Your Store's Register System and Use of Scanning Technologies

The following questions ask about your store's front-end register system and use of scanning technologies. By front-end register system, we mean the customer service/checkout lanes featuring a cash register and payment terminal.

12. Is your store's front-end register system integrated with the EBT payment terminal?

- ○ Yes
- ○ No, we must enter SNAP transactions in both the register and payment terminal.

13. Is the payment terminal(s) owned by the store or is it leased? **[Select all that apply]**

- ☐ Owned
- ☐ Leased
- ☐ Other (Please specify):

_____

14. Who maintains and upgrades your store's front-end register system?

- ○ Store employee → Specify job title of this person:

_____

- ○ Service company or consultant
- ○ No one
- ○ Other (Please specify):

_____

15. Does your store's register system scan barcodes on products during checkout?

- ○ Yes, currently operational
- ○ Yes, in the process of purchasing/installing
- ○ No → **GO TO QUESTION 17**

16. Does your store's register system indicate whether products are eligible for purchase with SNAP benefits (for example, by using a flag or other indicator)?

- ○ Yes, currently operational → **You have completed the survey**
- ○ Yes, in the process of purchasing/installing → **You have completed the survey**
- ○ No → **ANSWER QUESTIONS 17 AND 18**

17. There is a new law that will require all SNAP-authorized retailers to use scanners at checkout to accept SNAP benefits. In the future, your store may need to upgrade or purchase and maintain new equipment to comply with this law. How likely are you to do this so you can remain a SNAP-authorized retailer?

- ○ Very unlikely
- ○ Somewhat unlikely
- ○ Neither unlikely nor likely
- ○ Somewhat likely
- ○ Very likely

18. In the table below, indicate how important each of the factors would be in your decision on whether to upgrade or purchase scanning technology that meets the new requirement. [Select one response for each row]

	Factor	Very Unimportant	Somewhat Unimportant	Neither Unimportant nor Important	Somewhat Important	Very Important
a.	Slow or unreliable Internet access	○	○	○	○	○
b.	Cost to purchase, install, and maintain scanner	○	○	○	○	○
c.	Lack of technical knowledge	○	○	○	○	○
d.	Limited checkout stand space	○	○	○	○	○
e.	Unreliable electrical power causes frequent outages	○	○	○	○	○
f.	Low SNAP sales volume	○	○	○	○	○
g.	Possible disruption of store operations during installation	○	○	○	○	○
h.	Cost to train staff	○	○	○	○	○
i.	Time to train staff	○	○	○	○	○
j.	No one available to help with system failures and other troubleshooting	○	○	○	○	○
k.	Time to evaluate and decide which type of scanner to install	○	○	○	○	○
l.	Staff have limited English-speaking ability	○	○	○	○	○
m.	Time to maintain product database	○	○	○	○	○

Thank you for filling out the survey!

Please return the survey in the enclosed prepaid envelope to RTI International, Attn: Data Capture (0215527.000.001.005.003) at 5265 Capital Blvd., Raleigh, NC 27690-1653.

Interview Guides for the Follow-Up Interviews with Retailers

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SNAP EBT
Scanner Study

OMB Control Number: 0584-0634
Expiration date: 01/31/2021

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB number. The valid OMB control number for this information collection is 0584-0634. The time required to complete this information collection is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

Introduction

Thank you for agreeing to participate in this interview for the SNAP EBT Scanner Study. This project is funded by the U.S. Department of Agriculture, Food and Nutrition Service to better understand how the 2014 Farm Bill requirement to use scanners at checkout to accept SNAP benefits will affect small business owners. By collecting this information, we can better understand and help minimize the burden of this requirement on small business owners.

This interview will take about 30 minutes and will include questions about the type of scanning technology used in your store, costs to purchase and operate it, your experience with installing and using the technology, and any economic or operational benefits to using scanners.

Your participation in the interview is voluntary, and the information you provide will not have any impact on your authorization to accept SNAP benefits. At the end of the interview, I will give you a $20 Visa gift card. Please answer the questions to the best of your ability. You can decline to answer questions if you don't have the information or if you prefer not to respond. Your responses will be kept private, and any reports prepared with the information you share will not include your name or the name of your business. Your responses will not be shared with anyone outside the research team, except as otherwise required by law. With your agreement, I would like to record the interview to ensure I capture the information you share accurately.

Do you have any questions about the interview or use of the information before we begin?

Do you consent to proceed with the interview and to have it recorded?

Interview Questions

Please show me your cash register system and scanning technology you are using and describe how it works.

Probes:

a. How long have you had this scanning technology?
b. Did you choose it or was it selected by somebody else, for example, the previous store owner or one of your suppliers?
c. [If respondent chose scanning technology] When you chose this technology, did you consider other options? If yes, why did you select this one? If no, what factors do you wish you would have considered when you selected this technology? About how much time did you spend deciding which technology to purchase?
d. [If respondent did not choose the scanning technology] Have you made any updates to the scanning technology or considered replacing it? If so, why?
e. Where do you get information about the types of scanning technologies available? [If not mentioned] Do you get information from vendors, retailer associations, or wholesale distributors? Do/would you hire a consultant to help with selecting a scanning technology? What other ways would you like to get this type of information in the future?
f. How do you keep the scanning technology up to date with the items in your store's inventory? How does it identify the items that are eligible to be purchased with SNAP?

Thinking back to when the scanning technology was installed, or if you've made updates, I'd like to know what changes you made in the store to set it up and what you experienced during the installation or update.

Probes:

a. Did you need to make physical changes, such as adding or removing registers, moving checkout areas, enlarging checkout space, or making electrical/telephone upgrades when it was installed?
b. How long did it take to install [or update] the scanning technology in your store? Were you able to operate with normal business hours during the installation?
c. Who did the installation [or update]? Did you have any problems working with them? [*If yes*] Please describe the problems.
d. Was your business disrupted when it was installed [or updated]? [*If yes*] Please describe the disruptions.
e. Overall, how easy or difficult was it to get it installed [or updated] and operational? What made it [*easy, difficult*]?

I'd like to learn about the costs of installing [or updating] and operating the scanning technology. It is okay to provide estimates or a range if you don't know the exact amount. Just tell me it's an estimate. According to the information on the survey, you *[own or lease*] the scanning technology. Is that correct?

Probes for owned scanning technologies:

a. Approximately how much did it cost to purchase [or update] the scanning technology?
b. Were there additional costs for the installation [or update], for setting up the inventory database, or other "one time" costs? [If yes] What were these costs for and approximately how much were they?
c. How many years do you think it will last—from the time of purchase [or update] to the time you will have to replace it?
d. [If Question 2 indicates there were renovations or changes in checkout areas needed] For the changes you needed to make [restate what was shared by respondent], approximately how much did those changes cost?
e. Were any costs associated with training store personnel to use the scanning technology? [If yes] Can you estimate the cost? [If unable to estimate the cost] About how many hours did the trainer and the store employees spend on training?
f. Do you have ongoing costs for training store personnel to use the scanning technology? [If yes] Can you estimate the cost? [If unable to estimate the cost] About how many hours do the trainer and the store employees spend monthly or annually for the ongoing training?
g. Who maintains the scanning technology, for example, updating the database of items in your inventory or periodic software updates? [If maintained by employees] About how many hours do employees spend on maintenance per month or per year? [If maintained by an external provider] What is the monthly or annual cost for these services?
h. Do you pay any other monthly or annual costs for operating and maintaining the scanning technology, for example, software license fees, service agreement? [If yes] What is the average monthly or annual cost for operation and maintenance?
i. Have you incurred costs that you did not anticipate when you purchased and installed [or updated] the scanning technology? [If yes] What were the costs for and approximately how much are they?
j. Have you had any cost savings from implementing [or updating] this scanning technology? [If yes] Please describe these.
k. Do you feel the cost of the scanning technology was worth it or not? Please explain.

Probes for leased scanning technologies:

a. What is the cost for the lease? [If not mentioned] Is that a monthly or annual cost?
b. What, if any, setup and maintenance services are included with the lease? [If not mentioned] Does the cost for the lease cover setup and maintenance of the database of items in your inventory? Does the cost for the lease cover training employees to use the scanning technology? [If yes] Does this cost include ongoing training for employees?

c. [If the lease does not include maintenance] Who maintains the scanning technology, for example, updating the database of items in your inventory or conducting periodic system software updates? [If maintained by employees] About how many hours do employees spend on this per month or per year? [If maintained by an external provider] What is the monthly or annual cost for maintenance services?
d. [If the lease does not include training] Were costs associated with training store personnel to use the scanning technology? [If yes] Can you estimate the cost? [If unable to estimate the cost] About how many hours did the trainer and the store employees spend on the training?
e. [If the lease does not include ongoing training] Do you have ongoing costs for training store personnel to use the scanning technology? [If yes] Can you estimate the cost? [If unable to estimate the cost] About how many hours do the trainer and the store employees spend monthly or annually for the ongoing training?
f. Did you incur any "one time" or additional costs not included in the lease when it was installed [or updated], for example, setup of the inventory database? [If yes] What were these costs for and approximately how much did they cost?
g. [If Question 2 indicates renovations or changes in checkout areas were needed] For the changes you needed to make [restate what was shared by respondent], approximately how much did those changes cost?
h. Have you incurred costs that you did not anticipate when you installed [or updated] the scanning technology? [If yes] What were the costs for and how much were the costs?
i. Have you had any cost savings from implementing [or updating] the scanning technology? [If yes] Please describe these.
j. Do you feel the cost of this scanning technology was worth it or not? Please explain.

I'd like to hear about any technical issues or problems you have when using the scanning technology either at the time it was installed [or updated] or during the time you've been using it.

Probes:

a. Have you had technical issues with the scanning technology? [If yes] Please describe them. How [do you/would you] get help when technical issues occur?
b. Have you had problems with keeping the inventory database up to date or with having the scanning technology correctly identify items as eligible for SNAP? [If yes] Please describe the problems and tell me how you handle them when they occur.
c. Are employees trained through online or in-person training? Have you had any problems with employees learning to use it when it was implemented or when you hire new employees? [If yes] What is challenging for the employees?
d. Have you had any other issues or problems we haven't discussed? [If yes] Please describe those.

How well does this scanning technology meet your needs? What makes you feel it [*does/does not*] work well for your business?

Probes:

a. Does this scanning technology meet your needs for accurately transacting SNAP sales, for example, identifying SNAP-eligible items? [If not] What improvements are needed?
b. How are you using this scanning technology for your business activities, such as tracking SNAP purchases or inventory control? Are there ways it could be more helpful, for example, other data you would like to have?
c. What benefits, if any, have you experienced with your scanning technology? [If not mentioned, probe: quality control, improved inventory control, increased sales, faster checkout time, improved customer service.]
d. Do you have any plans for changes in your business that would require system upgrades or modifications? [If yes] Please describe these.
e. What negative business impacts, if any, are there from using the scanning technology? [*If any*] Please describe these.

Would you recommend your scanning technology to other stores that do not have scanners but might be considering them? If so, why. If not, why?

That concludes my questions. Would you like to share any other information regarding scanning technologies?

Thank you very much for your time and for the information you shared. With your permission, I would like to take photographs of your register system and scanning technology, checkout lanes, and [insert items from final checklist].

Observation Checklist for On-Site Interviews

1. Take pictures of register system and scanning technology (do NOT include store personnel or customers in pictures)
2. Take pictures of checkout lanes (do NOT include store personnel or customers in pictures)
3. Take pictures of any relevant documents such as instructions for store personnel on use of scanning technology and procedures for updating the inventory database and identifying SNAP-eligible items in system.
4. Collect information on observable items included in the survey:

    a. Number of cash registers
    b. Type of hardware used (PC/Mac/iPad/mobile device)
    c. POS terminal to see if a chip card can be used
    d. Any other items that are relevant, based on interview response

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Follow-Up Nonadopter Interview Guide

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SNAP EBT
Scanner Study

OMB Control Number: 0584-0634
Expiration date: 01/31/2021

Introduction

Thank you for agreeing to participate in this interview for the SNAP EBT Scanner Study. This project is funded by the U.S. Department of Agriculture, Food and Nutrition Service to better understand how the new requirement to install scanners at check out to accept SNAP benefits will affect you and your business. By collecting this information, we can better understand and help minimize the burden of this requirement on you and other small business owners.

This interview will take about 20 to 30 minutes and will include questions about the type of technology used in your store at checkout for SNAP and other sales; suggestions or concerns you have related to buying, installing, and using scanners at checkout to identify which items are eligible to be purchased with SNAP benefits; and information you have or would like to have about scanning technologies.

Your participation in the interview is voluntary, and the information you provide will not have any impact on your authorization to accept SNAP benefits. At the end of the interview, I will send [or give] you a $20 Visa gift card. Please answer the questions to the best of your ability. You can decline to answer questions if you don't have the information or if you prefer not to respond. Your responses will be kept private, and any reports prepared with the information you share will not include your name or the name of your business. Your information will not be shared with anyone outside this research team, except as otherwise required by law. With your agreement, I would like to record the interview to ensure I capture the information you share accurately.

Do you have any questions about the interview or use of the information before we begin?

Do you consent to proceed with the interview and to have it recorded?

Interview Questions

First, I would like to hear about the type of cash register or point-of-sale system you use. Please describe the system you use including any capability to scan items at check out.

Probes:

a. How long have you had this system?
b. Did you choose this system or was it chosen by someone else, for example, the previous owner or a supplier?
c. [If respondent chose system] Why did you choose this system?
d. Does this system have all the features you want or would you like to have this system do some things it currently does not do? [If applicable] What else would you like to have?
e. What types of information about sales can you get from your system?
f. Is there information you would like to have that you can't get from this system? [If yes] What information would you like to have?
g. [If not clear from description of system and responses to follow-up questions] Is this system used for redeeming SNAP benefits? [If no] How do you redeem SNAP benefits?

As I explained when we started the interview, there is a new law that will require SNAP retailers to use scanners to identify SNAP-eligible items. Are you currently considering installing scanning technology [or updating your system]?

Probes, if yes:

a. To what extent does this new federal requirement influence your decision about acquiring [or updating your] scanning technology?
b. Are there other reasons you are considering implementing [or updating your] scanning technology? [If yes] What are those?
c. Have you considered types of available scanning technologies? [*If yes*] What scanning technologies are you considering and why?

Probes, if no:

a. What are the reasons you aren't considering installing scanning technology [or updating your scanning technology] now? [If not mentioned, ask about infrastructure issues, personnel training or capacity issues, disruption of business or perception of scanning system or technology "hassles"]?
b. Do you think you will consider installing scanning technology [or updating your scanning technology] in the future to meet this requirement? Why or why not?
c. How much impact would there be on your business in terms of sales volume if you are no longer authorized for SNAP?

Where do you get information about point-of-sale technology, including scanning technologies?

Probes:

a. [*If not mentioned]* Do you get information from vendors or retailer associations?
b. Have you received information about costs for installing and operating [or updating your] scanning technology? [*If yes*] Where did you get the cost information?
c. *[If store has no scanning capability]* What, if anything, have you heard about the benefits of using scanning technology? Do you think these benefits would be true for your business? [*If not mentioned, ask about increased sales, quality control, improved inventory control.]*
d. *[If store has scanning capability]* What benefits, if any, have you experienced with your scanning technology? [*If not mentioned, probe: quality control, improved inventory control, increased sales, faster checkout time, improved customer service.*]
e. What, if anything, have you heard about [or experienced with] disruptions or problems with installing and using scanning technology? *[If store has no scanning capability]* Do you think these problems would occur in your business?
f. What other information would you like to have about scanning technologies? What's the best way to get information to you? *[If not mentioned, ask about technical information about scanning technologies; cost information for implementation, maintenance, and operation; information regarding setting up; information regarding training.]*

Next, I have some questions about possible costs for installing [or updating] scanning technology to identify SNAP-eligible items.

If response to Question 2 indicates currently considering, or has considered and decided against, installing or updating their register system to include scanning technology:

a. Based on what you've learned, how much do you estimate it will cost to implement [or update the] scanning technology in your store?
b. What costs are included in your estimate, for example, hardware and software purchase or lease, setup and installation costs, store renovations?
c. [If not already included in description of estimate] What, if any, costs might you incur for alterations or renovations if you install [or update your] scanning technology, for example, changes to checkout spaces or electrical wiring?
d. [If not already included in description of estimate] What, if any, other costs do you anticipate incurring when implementing [or updating your] technology, for example, costs to train store personnel on maintaining or using scanning technology?
e. What amount could you afford for implementing [or updating your] scanning technology?
f. Do you have an estimate for the ongoing costs for operating and maintaining scanning technology? [If yes] What is the estimate and what is included?
g. [If store has no scanning capability] What amount could you afford monthly or annually for operating and maintaining scanning technology?
h. Do you know of any sources of funding to help your business with the costs of installing [or updating your] scanning technology? [If yes] What are these sources?

[If not mentioned as a source of funding] Would a loan be an option if you needed help with the costs to install [or update your] scanning technology?

<u>If response to Question 2 indicates NOT currently considering installing or updating their register system to include scanning technology</u>:

a. Do you have an idea of how much it would cost to implement [or update] scanning technology in your store? [*If yes*] What do you estimate it would cost?
b. [*If a cost estimate is provided for item a*] What costs are included in your estimate, for example, technology purchase or lease, installation costs, and ongoing maintenance costs?
c. Would you anticipate incurring other costs like store renovations or training for store personnel to maintain and operate the scanning technology? [*If yes*] Please describe these other costs.
d. What amount could you afford to implement [or update your] scanning technology?
e. *[If store has no scanning capability]* What amount could you afford monthly or annually for operating and maintaining the scanning technology?
f. If you decided to install [or update your] scanning technology, do you know of any sources of funding to help your business cover the cost? [*If yes*] What are these sources? [*If not mentioned as a source of funding*] Would a loan be an option if you needed help with the costs to install [or update your] scanning technology?

Overall, what are the most important factors or concerns you have related to installing [or updating your] scanning technology? Why are those most important?

That concludes the interview questions. Would you like to share any other information regarding scanning technologies?

Thank you very much for your time and for the information you shared.

Appendix D: Supplemental Results for Analysis of SCANR Survey

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Table D-1. Characteristics of Small SNAP-Authorized Retailers Using the STARS Dataset

Characteristic	All Stores		Convenience: Franchise		Convenience: Nonfranchise		Grocery: Medium		Grocery: Small		Specialty	
	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)
Annual Retail Sales ($p < .0001$)												
First quartile: 0–$304,615	299	22.4 (18.7, 26.1)	21	†	35	18.6 (12.7, 24.4)	2	†	129	74.0 (66.9, 81.1)	112	48.1 (40.9, 55.3)
Second quartile: $304,616–$660,000	236	22.8 (18.8, 26.8)	41	18.8 (12.6, 24.9)	52	23.8 (17.5, 30.1)	51	25.7 (19.3, 32.2)	46	22.6 (15.8, 29.4)	46	21.5 (15.6, 27.5)
Third quartile: $660,001–$1,424,435	281	29.1 (24.7, 33.4)	54	25.7 (18.9, 32.5)	65	32.3 (25.4, 39.3)	123	54.1 (46.9, 61.3)	1	†	38	19.2 (13.5, 25.0)
Fourth quartile: ≥$1,424,436	224	25.8 (21.7, 29.8)	84	46.1 (38.2, 53.9)	59	25.3 (19.0, 31.7)	49	19.0 (13.5, 24.5)	9	†	23	†
Number of respondents	1,040		200		211		225		185		219	
Number of nonrespondents	0		0		0		0		0		0	
Average Monthly SNAP Redemptions ($p < .0001$)												
First quartile: 0–$651	219	23.4 (19.3, 27.6)	42	21.2 (14.8, 27.7)	60	27.6 (21.1, 34.2)	16	†	30	12.5 (7.3, 17.7)	71	25.1 (19.2, 31.1)
Second quartile: $652–$1,517	198	22.5 (18.4, 26.6)	41	20.8 (14.4, 27.2)	57	26.0 (19.5, 32.4)	24	†	36	17.4 (11.3, 23.6)	40	16.2 (11.0, 21.4)
Third quartile: $1,518–$3,528	247	27.2 (22.8, 31.5)	58	27.7 (20.7, 34.8)	60	28.9 (22.2, 35.6)	47	20.8 (14.9, 26.7)	45	24.3 (17.2, 31.4)	37	19.4 (13.5, 25.2)
Fourth quartile: ≥$3,529	376	26.9 (23.1, 30.7)	59	30.3 (23.1, 37.4)	34	17.5 (11.8, 23.2)	138	63.4 (56.5, 70.3)	74	45.7 (37.4, 54.0)	71	39.3 (32.2, 46.4)
Number of respondents	1,040		200		211		225		185		219	
Number of nonrespondents	0		0		0		0		0		0	
Length of Time SNAP Authorized ($p < .0001$)												
<3 years	290	33.0 (28.4, 37.5)	69	35.5 (27.9, 43.1)	66	33.9 (26.8, 41.0)	46	22.6 (16.5, 28.8)	52	32.7 (24.8, 40.6)	57	28.2 (21.6, 34.8)
4–6 years	224	28.0 (23.6, 32.5)	51	25.5 (18.6, 32.3)	67	32.2 (25.2, 39.1)	34	14.4 (9.4, 19.4)	47	26.3 (18.9, 33.6)	25	†
7–13 years	271	23.2 (19.4, 27.0)	51	27.8 (20.7, 34.9)	43	19.6 (13.7, 25.4)	69	34.2 (27.2, 41.1)	53	27.9 (20.5, 35.3)	55	25.2 (18.9, 31.5)
≥14 years	241	15.8 (12.5, 19.1)	28	†	32	14.4 (9.3, 19.5)	71	28.8 (22.3, 35.3)	32	13.1 (7.9, 18.4)	78	34.7 (27.8, 41.6)

(continued)

Table D-1. Characteristics of Small SNAP-Authorized Retailers Using the STARS Dataset (continued)

Characteristic	All Stores		Convenience: Franchise		Convenience: Nonfranchise		Grocery: Medium		Grocery: Small		Specialty	
	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)
Number of respondents	1,026		199		208		220		184		215	
Number of nonrespondents	14		1		3		5		1		4	
Urbanicity ($p < .0001$)												
Urban	671	87.6 (87.5, 87.8)	132	91.0 (90.8, 91.2)	139	86.5 (86.3, 86.7)	139	85.1 (84.9, 85.2)	118	90.7 (90.4, 90.9)	143	87.3 (87.1, 87.4)
Rural	369	12.4 (12.2, 12.5)	68	9.0 (8.8, 9.2)	72	13.5 (13.3, 13.7)	86	14.9 (14.8, 15.1)	67	9.3 (9.1, 9.6)	76	12.7 (12.6, 12.9)
Number of respondents	1,040		200		211		225		185		219	
Number of nonrespondents	0		0		0		0		0		0	

Source: FNS STARS dataset, January 2018

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. CI = confidence interval.

The Rao-Scott design-adjusted chi-square goodness-of-fit test for a one-way table was used to test the null hypothesis of equal proportions. This test adjusts appropriately for the sample design. The *p*-values indicate if a statistical difference between at least two subgroups was found.

† Estimate is suppressed if the number of respondents in a given category is fewer than 30 or the coefficient of variation is greater than 30%.

Table D-2. Characteristics of Small SNAP-Authorized Retailers Using the SCANR Survey Data

Characteristic	All Stores		Convenience: Franchise		Convenience: Nonfranchise		Grocery: Medium		Grocery: Small		Specialty	
	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)
Multiple Locations ($p < .0001$)												
Yes	327	40.3 (35.6, 45.0)	108	53.1 (45.3, 61.0)	91	43.3 (36.0, 50.6)	61	27.4 (20.9, 33.8)	35	20.0 (13.4, 26.7)	32	14.7 (9.5, 19.9)
No	706	59.7 (55.0, 64.4)	91	46.9 (39.0, 54.7)	120	56.7 (49.4, 64.0)	161	72.6 (66.2, 79.1)	149	80.0 (73.3, 86.6)	185	85.3 (80.1, 90.5)
Number of respondents	1,033		199		211		222		184		217	
Number of nonrespondents	7		1		0		3		1		2	
Number of Cash Registers/ Lanes ($p < .0001$)												
1	592	52.0 (47.3, 56.7)	69	33.7 (26.2, 41.1)	108	51.3 (43.9, 58.7)	82	39.8 (32.6, 46.9)	158	86.8 (81.3, 92.2)	175	78.1 (72.0, 84.2)
2	377	43.4 (38.7, 48.1)	116	58.5 (50.7, 66.2)	96	45.7 (38.3, 53.1)	109	45.8 (38.6, 53.0)	22	†	34	18.7 (12.9, 24.5)
≥3	66	4.6 (2.9, 6.3)	15	†	7	†	33	14.5 (9.5, 19.5)	5	†	6	†
Number of respondents	1,035		200		211		224		185		215	
Number of nonrespondents	5		0		0		1		0		4	
Number of Unique Barcode Food Products*												
0–99	340	19.8 (16.4, 23.2)	36	13.9 (8.6, 19.2)	30	14.6 (9.4, 19.9)	37	15.7 (10.5, 21.0)	54	30.1 (22.5, 37.8)	183	86.4 (81.2, 91.5)
100–499	215	24.7 (20.5, 28.8)	41	23.6 (16.7, 30.5)	56	25.3 (18.9, 31.8)	43	21.4 (15.4, 27.5)	54	32.6 (24.7, 40.5)	21	†
500–999	113	14.1 (10.7, 17.6)	27	†	38	16.6 (11.2, 22.1)	15	†	30	14.7 (8.9, 20.6)	3	†
1,000–2,999	157	18.1 (14.5, 21.8)	44	25.0 (18.1, 31.9)	36	17.5 (11.9, 23.2)	52	25.8 (19.3, 32.2)	23	†	2	†
3,000–4,999	78	9.8 (6.7, 12.8)	21	†	19	†	29	†	8	†	1	†
5,000–9,999	68	8.5 (5.7, 11.3)	21	†	19	†	23	†	5	†	0	†

(continued)

Table D-2. Characteristics of Small SNAP-Authorized Retailers Using the SCANR Survey Data (continued)

Characteristic	All Stores		Convenience: Franchise		Convenience: Nonfranchise		Grocery: Medium		Grocery: Small		Specialty	
	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)
≥10,000	47	5.0 (2.8, 7.2)	6	†	11	†	23	†	7	†	0	†
Number of respondents	1,018		196		209		222		181		210	
Number of nonrespondents	22		4		2		3		4		9	
Number of Unique Random-Weight Food Products ($p < .0001$)												
None	130	15.2 (11.7, 18.6)	43	24.3 (17.5, 31.2)	29	†	9	†	11	†	38	18.2 (12.6, 23.9)
1–24	317	41.0 (36.3, 45.7)	88	42.9 (35.1, 50.7)	99	47.2 (39.7, 54.6)	36	16.8 (11.4, 22.3)	49	26.7 (19.4, 34.0)	45	24.3 (18.0, 30.7)
25–49	177	17.9 (14.2, 21.7)	32	16.1 (10.3, 21.9)	34	18.3 (12.4, 24.2)	39	18.5 (12.9, 24.2)	40	21.8 (14.9, 28.6)	32	12.7 (8.0, 17.3)
50–99	161	11.2 (8.4, 13.9)	20	†	21	†	38	15.2 (10.2, 20.3)	35	18.2 (11.8, 24.6)	47	23.3 (17.1, 29.5)
100–499	180	10.6 (8.1, 13.1)	12	†	16	†	71	32.2 (25.4, 38.9)	37	21.0 (14.2, 27.8)	44	16.6 (11.4, 21.8)
≥500	67	4.1 (2.4, 5.9)	4	†	8	†	32	13.0 (8.3, 17.8)	13	†	10	†
Number of respondents	1,032		199		207		225		185		216	
Number of nonrespondents	8		1		4		0		0		3	

Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. CI = confidence interval.

The Rao-Scott design-adjusted chi-square goodness-of-fit test for a one-way table was used to test the null hypothesis of equal proportions. This test adjusts appropriately for the sample design. The *p*-values indicate if a statistical difference between at least two subgroups was found.

† Estimate is suppressed if the number of respondents in a given category is fewer than 30 or the coefficient of variation is greater than 30 percent.

* Bivariate analysis could not be conducted because one or more cells had a value of zero.

Table D-3. Characteristics of Small SNAP-Authorized Retailers: Number of Employees

Characteristic	All Stores		Convenience: Franchise		Convenience: Nonfranchise		Grocery: Medium		Grocery: Small		Specialty	
	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)
Number of Full-Time Employees ($p < .0001$)												
None	68	5.8 (3.6, 8.0)	1	†	13	†	12	†	26	†	16	†
1–2	439	43.7 (39.0, 48.4)	69	33.7 (26.2, 41.1)	93	44.3 (36.9, 51.6)	77	39.0 (31.9, 46.1)	112	64.3 (56.4, 72.2)	88	41.3 (34.2, 48.5)
3–4	268	29.1 (24.6, 33.5)	68	32.4 (25.0, 39.7)	61	31.1 (24.2, 38.0)	60	24.4 (18.3, 30.5)	35	18.7 (12.2, 25.2)	44	19.9 (14.1, 25.7)
5–9	195	16.8 (13.5, 20.2)	50	27.4 (20.3, 34.4)	36	14.7 (9.7, 19.8)	58	22.9 (17.0, 28.9)	7	†	44	20.3 (14.5, 26.2)
≥10	68	4.7 (2.8, 6.5)	11	†	8	†	18	†	5	†	26	†
Number of respondents	1,038		199		211		225		185		218	
Number of nonrespondents	2		1		0		0		0		1	
Number of Part-Time Employees ($p < .0001$)												
None	260	25.5 (21.4, 29.7)	31	16.1 (10.3, 21.9)	47	25.2 (18.7, 31.7)	33	19.6 (13.7, 25.6)	70	43.0 (34.7, 51.2)	79	38.6 (31.5, 45.7)
1–2	426	47.1 (42.3, 51.8)	85	46.0 (38.1, 53.9)	103	50.2 (42.8, 57.6)	74	34.9 (27.9, 41.8)	83	44.5 (36.2, 52.7)	81	36.6 (29.6, 43.6)
3–4	195	15.4 (12.2, 18.7)	46	23.2 (16.6, 29.9)	33	13.4 (8.5, 18.3)	61	24.1 (18.1, 30.2)	17	†	38	15.2 (10.1, 20.2)
5–9	109	9.2 (6.5, 11.9)	28	†	22	†	38	14.0 (9.2, 18.7)	7	†	14	†
≥10	45	2.8 (1.4, 4.1)	8	†	5	†	19	†	7	†	6	†
Number of respondents	1,035		198		210		225		184		218	
Number of nonrespondents	5		2		1		0		1		1	

(continued)

Table D-3. Characteristics of Small SNAP-Authorized Retailers: Number of Employees (continued)

Characteristic	All Stores		Convenience: Franchise		Convenience: Nonfranchise		Grocery: Medium		Grocery: Small		Specialty	
	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)
Number of Full- or Part-Time Cashiers ($p < .0001$)												
0–2	500	45.3 (40.6, 50.0)	59	29.2 (22.1, 36.4)	83	42.9 (35.6, 50.3)	89	49.7 (42.6, 56.7)	140	80.7 (74.4, 87.1)	129	59.0 (51.8, 66.1)
3–4	282	29.0 (24.6, 33.5)	52	26.6 (19.6, 33.6)	66	32.3 (25.3, 39.2)	72	26.5 (20.4, 32.7)	31	15.4 (9.5, 21.4)	61	28.2 (21.6, 34.7)
5–9	191	20.5 (16.7, 24.3)	58	29.8 (22.6, 37.0)	53	21.6 (15.7, 27.6)	50	18.9 (13.5, 24.4)	6	†	24	†
≥10	63	5.2 (3.4, 7.0)	30	14.3 (8.9, 19.8)	8	†	14	†	7	†	4	†
Number of respondents	1,036		199		210		225		184		218	
Number of nonrespondents	4		1		1		0		1		1	

Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. CI = confidence interval.

The Rao-Scott design-adjusted chi-square goodness-of-fit test for a one-way table was used to test the null hypothesis of equal proportions. This test adjusts appropriately for the sample design. The *p*-values indicate if a statistical difference between at least two subgroups was found.

† Estimate is suppressed if the number of respondents in a given category is fewer than 30 or the coefficient of variation is greater than 30 percent.

Table D-4. Characteristics of Small SNAP-Authorized Retailers: Register System Features

Characteristic	All Stores		Convenience: Franchise		Convenience: Nonfranchise		Grocery: Medium		Grocery: Small		Specialty	
	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)
Internet Connectivity (p = .0225)												
High-speed Internet connection	763	79.4 (75.7, 83.1)	162	81.9 (75.7, 88.0)	161	80.8 (75.1, 86.5)	184	83.5 (78.1, 88.9)	120	70.7 (63.2, 78.2)	136	64.6 (57.6, 71.5)
Dial-up telephone line	178	15.6 (12.3, 18.9)	28	†	34	14.5 (9.4, 19.6)	26	†	40	20.9 (14.2, 27.6)	50	23.8 (17.6, 30.0)
No Internet connection and "other" responses	76	5.0 (3.0, 7.0)	5	†	11	†	10	†	20	†	30	11.6 (7.1, 16.1)
Number of respondents	1,017		195		206		220		180		216	
Number of nonrespondents	23		5		5		5		5		3	
Ownership of Payment Terminal (p = .0490)												
Owned[a]	533	48.4 (43.6, 53.3)	107	56.5 (48.6, 64.5)	95	45.6 (38.1, 53.1)	127	54.7 (47.4, 62.0)	88	44.0 (35.8, 52.3)	116	52.2 (44.9, 59.5)
Leased or other response	480	51.6 (46.7, 56.4)	85	43.5 (35.5, 51.4)	109	54.4 (46.9, 61.9)	92	45.3 (38.0, 52.6)	96	56.0 (47.7, 64.2)	98	47.8 (40.5, 55.1)
Number of respondents	1,013		192		204		219		184		214	
Number of nonrespondents	27		8		7		6		1		5	
WIC Authorized*												
Yes, use paper vouchers	68	4.7 (2.8, 6.6)	0	†	7	†	36	14.3 (9.4, 19.3)	21	†	4	†
Yes, use Electronic Benefit Transfer system (eWIC)	58	5.0 (2.9, 7.2)	7	†	12	†	29	†	5	†	5	†
Not WIC authorized	897	90.3 (87.5, 93.0)	184	95.5 (92.1, 98.9)	189	90.9 (86.6, 95.2)	158	74.7 (68.6, 80.8)	159	84.8 (78.8, 90.8)	207	96.8 (94.3, 99.2)
Number of respondents	1,023		191		208		223		185		216	
Number of nonrespondents	17		9		3		2		0		3	

(continued)

Table D-4. Characteristics of Small SNAP-Authorized Retailers: Register System Features (continued)

Characteristic	All Stores		Convenience: Franchise		Convenience: Nonfranchise		Grocery: Medium		Grocery: Small		Specialty	
	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)
Who Maintains/Upgrades Front-End Register ($p < .0001$)												
No one	187	14.4 (11.1, 17.6)	12	†	24	†	52	24.2 (17.9, 30.5)	50	28.4 (20.9, 36.0)	49	23.6 (17.4, 29.8)
Store employee	343	32.3 (27.8, 36.8)	52	24.1 (17.4, 30.8)	72	34.9 (27.8, 42.0)	61	27.9 (21.3, 34.4)	61	29.8 (22.3, 37.3)	97	41.6 (34.5, 48.7)
Service company or consultant, other third party, and “other” responses	498	53.4 (48.6, 58.1)	135	69.9 (62.7, 77.1)	112	52.4 (44.9, 59.8)	108	47.9 (40.7, 55.2)	72	41.8 (33.5, 50.0)	71	34.8 (27.9, 41.8)
Number of respondents	1,028		199		208		221		183		217	
Number of nonrespondents	12		1		3		4		2		2	

Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. CI = confidence interval.

The Rao-Scott design-adjusted chi-square goodness-of-fit test for a one-way table was used to test the null hypothesis of equal proportions. This test adjusts appropriately for the sample design. The *p*-values indicate if a statistical difference between at least two subgroups was found.

† Estimate is suppressed if the number of respondents in a given category is fewer than 30 or the coefficient of variation is greater than 30 percent.

* Bivariate analysis could not be conducted because one or more cells had a value of zero.

[a] Owned includes 10 respondents who answered owned and leased and 1 respondent who answered owned and other.

Table D-5. Weighted Number and Percentage of Small SNAP-Authorized Stores by Type of Scanning System and Store Type ($p < .0001$)

Type of Scanning System	Number of Respondents	Weighted Estimates											
		All Stores		Convenience: Franchise		Convenience: Nonfranchise		Grocery: Medium		Grocery: Small		Specialty	
		Number of Stores	Percentage of Stores (95% CI)	Number of Stores	Percentage of Stores (95% CI)	Number of Stores	Percentage of Stores (95% CI)	Number of Stores	Percentage of Stores (95% CI)	Number of Stores	Percentage of Stores (95% CI)	Number of Stores	Percentage of Stores (95% CI)
Scanner, SNAP flag, integrated	205	20,126	19.8 (16.2, 23.5)	6,712	35.7 (28.1, 43.3)	9,570	15.8 (10.3, 21.4)	2,145	29.2 (22.6, 35.7)	1,379	†	321	†
Scanner, SNAP flag, nonintegrated	134	17,857	17.6 (13.8, 21.4)	2,870	15.3 (9.7, 20.8)	12,907	21.4 (15.3, 27.5)	918	12.5 (7.8, 17.2)	1,036	†	125	†
Scanner, no SNAP flag	139	20,671	20.4 (16.3, 24.5)	4,019	21.4 (14.9, 27.9)	14,786	24.5 (18.0, 31.0)	846	†	805	†	215	†
No scanner	535	42,813	42.2 (37.5, 46.9)	5,197	27.6 (20.6, 34.7)	23,151	38.3 (31.0, 45.7)	3,443	46.8 (39.5, 54.1)	6,260	66.0 (58.1, 73.9)	4,761	87.8 (83.0, 92.6)
Number of respondents	1,013	101,467		18,799		60,413		7,352		9,480		5,422	

Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. Data are not available for 27 respondents that did not answer the questions on system type. CI = confidence interval.

The Rao-Scott design-adjusted chi-square goodness-of-fit test for a one-way table was used to test the null hypothesis of equal proportions. This test adjusts appropriately for the sample design. The *p*-value indicates if a statistical difference between at least two subgroups was found.

† Estimate is suppressed if the number of respondents in a given category is fewer than 30 or the coefficient of variation is greater than 30%.

Table D-6. Weighted Percentage of Small SNAP-Authorized Stores by Type of Scanning System and Urbanicity ($p = .5604$)

Type of Scanning System	All Stores		Urban		Rural	
	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)
Scanner, SNAP flag, integrated	205	19.8 (16.2, 23.5)	133	20.0 (16.0, 24.1)	72	18.3 (12.3, 24.3)
Scanner, SNAP flag, nonintegrated	134	17.6 (13.8, 21.4)	79	16.9 (12.7, 21.2)	55	22.4 (15.4, 29.4)
Scanner, no SNAP flag	139	20.4 (16.3, 24.5)	92	20.5 (16.0, 25.1)	47	19.2 (12.6, 25.9)
No scanner	535	42.2 (37.5, 46.9)	349	42.5 (37.3, 47.7)	186	40.0 (32.4, 47.6)
Number of respondents	1,013		653		360	
Number of nonrespondents	27		18		9	

Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. CI = confidence interval.

The Rao-Scott design-adjusted chi-square goodness-of-fit test for a one-way table was used to test the null hypothesis of equal proportions. This test adjusts appropriately for the sample design. The *p*-value indicates if a statistical difference was found between the two subgroups.

Table D-7. Weighted Percentage of Small SNAP-Authorized Stores by Type of Scanning System and Annual Retail Sales ($p < .0001$)

Type of Scanning System	All Stores		First Quartile: 0–$304,615		Second Quartile: $304,616–$660,000		Third Quartile: $660,001–$1,424,435		Fourth Quartile: ≥$1,424,436	
	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)
Scanner, SNAP flag, integrated	205	19.8 (16.2, 23.5)	28	†	30	12.1 (6.1, 18.0)	72	24.2 (16.5, 31.9)	75	28.2 (20.2, 36.3)
Scanner, SNAP flag, nonintegrated	134	17.6 (13.8, 21.4)	17	†	24	†	37	14.5 (7.7, 21.3)	56	32.0 (23.0, 41.1)
Scanner, no SNAP flag	139	20.4 (16.3, 24.5)	29	†	29	†	43	26.7 (18.0, 35.5)	38	25.4 (16.7, 34.0)
No scanner	535	42.2 (37.5, 46.9)	222	68.3 (59.3, 77.4)	142	57.5 (47.3, 67.7)	121	34.5 (25.9, 43.1)	50	14.4 (8.4, 20.4)
Number of respondents	1,013		296		225		273		219	
Number of nonrespondents	27		3		11		8		5	

Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. CI = confidence interval.

The Rao-Scott design-adjusted chi-square goodness-of-fit test for a one-way table was used to test the null hypothesis of equal proportions. This test adjusts appropriately for the sample design. The *p*-value indicates if a statistical difference between at least two subgroups was found.

† Estimate is suppressed if the number of respondents in a given category is less than 30 or coefficient of variation greater than 30%.

Table D-8. Weighted Percentage of Small SNAP-Authorized Stores by Type of Scanning System and Average Monthly SNAP Redemptions ($p = .0015$)

	All Stores		First Quartile: 0–$651		Second Quartile: $652–$1,517		Third Quartile: $1,518–$3,528		Fourth Quartile: ≥$3,529	
Type of Scanning System	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)
Scanner, SNAP flag, integrated	205	19.8 (16.2, 23.5)	35	16.8 (9.3, 24.3)	27	†	48	17.7 (10.8, 24.6)	95	28.8 (21.4, 36.3)
Scanner, SNAP flag, nonintegrated	134	17.6 (13.8, 21.4)	18	†	37	26.3 (16.5, 36.2)	40	23.2 (15.0, 31.3)	39	11.5 (6.0, 17.0)
Scanner, no SNAP flag	139	20.4 (16.3, 24.5)	46	31.3 (21.3, 41.2)	25	†	35	20.7 (12.5, 28.9)	33	13.7 (7.6, 19.8)
No scanner	535	42.2 (37.5, 46.9)	118	42.3 (32.0, 52.6)	104	42.3 (31.8, 52.7)	117	38.4 (29.3, 47.6)	196	45.9 (38.0, 53.9)
Number of respondents	1,013		217		193		240		363	
Number of nonrespondents	27		2		5		7		13	

Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. CI = confidence interval.

The Rao-Scott design-adjusted chi-square goodness-of-fit test for a one-way table was used to test the null hypothesis of equal proportions. This test adjusts appropriately for the sample design. The *p*-value indicates if a statistical difference between at least two subgroups was found.

† Estimate is suppressed if the number of respondents in a given category is fewer than 30 or the coefficient of variation is greater than 30%.

Table D-9. Weighted Percentage of Small SNAP-Authorized Stores by Type of Scanning System and Length of Time SNAP Authorized (p = .1173)

Type of Scanning System	All Stores		≤3 Years		4–6 Years		7–13 Years		≥14 Years	
	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)
Scanner, SNAP flag, integrated	201	19.9 (16.2, 23.6)	56	15.3 (10.1, 20.4)	39	17.8 (10.4, 25.1)	58	24.5 (16.5, 32.4)	48	26.3 (15.9, 36.8)
Scanner, SNAP flag, nonintegrated	134	17.7 (13.9, 21.6)	35	17.0 (10.1, 23.9)	44	24.0 (15.7, 32.4)	33	14.6 (7.9, 21.3)	22	†
Scanner, no SNAP flag	138	20.5 (16.4, 24.7)	47	25.1 (16.9, 33.3)	35	22.3 (14.0, 30.5)	35	17.9 (10.4, 25.3)	21	†
No scanner	526	41.8 (37.1, 46.5)	144	42.6 (34.0, 51.2)	100	35.9 (26.8, 45.1)	137	43.0 (33.9, 52.2)	145	48.9 (37.7, 60.0)
Number of respondents	999		282		218		263		236	
Number of nonrespondents	27		8		6		8		5	

Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. Data are not available for 14 respondents with missing data for time authorized. CI = confidence interval.

The Rao-Scott design-adjusted chi-square goodness-of-fit test for a one-way table was used to test the null hypothesis of equal proportions. This test adjusts appropriately for the sample design. The p-value indicates if a statistical difference between at least two subgroups was found.

† Estimate is suppressed if the number of respondents in a given category is fewer than 30 or the coefficient of variation is greater than 30%.

Table D-10. Weighted Percentage of Small SNAP-Authorized Stores by Type of Scanning System and WIC Authorization (p = .0593)

Type of Scanning System	All Stores		WIC-authorized		Not WIC-authorized	
	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)
Scanner, SNAP flag, integrated	197	19.6 (15.9, 23.3)	49	35.5 (21.0, 49.9)	148	17.9 (14.2, 21.7)
Scanner, SNAP flag, nonintegrated	132	17.7 (13.8, 21.6)	18	†	114	18.5 (14.3, 22.7)
Scanner, no SNAP flag	136	20.0 (15.9, 24.1)	13	†	123	20.2 (15.9, 24.6)
No scanner	531	42.7 (37.9, 47.4)	44	36.2 (22.3, 50.0)	487	43.4 (38.3, 48.4)
Number of respondents	996		124		872	
Number of nonrespondents	27		2		25	

Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. Data are not available for 17 respondents with missing data for status of WIC authorization. CI = confidence interval.

The Rao-Scott design-adjusted chi-square goodness-of-fit test for a one-way table was used to test the null hypothesis of equal proportions. This test adjusts appropriately for the sample design. The p-value indicates if a statistical difference between the two subgroups was found.

† Estimate is suppressed if the number of respondents in a given category is fewer than 30 or the coefficient of variation is greater than 30%.

Table D-11. Weighted Percentage of Small SNAP-Authorized Stores by Type of Scanning System and Internet Connectivity (p = .0015)

Type of Scanning System	All Stores		High-Speed Internet Connection		Dial-Up Telephone Line		No Internet Connection or "Other" Response	
	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)
Scanner, SNAP flag, integrated	203	20.1 (16.4, 23.8)	182	22.5 (18.0, 26.9)	17	†	4	†
Scanner, SNAP flag, nonintegrated	132	17.8 (13.9, 21.7)	110	18.6 (14.1, 23.1)	20	†	2	†
Scanner, no SNAP flag	137	20.6 (16.5, 24.8)	117	22.8 (17.9, 27.7)	16	†	4	†
No scanner	522	41.5 (36.8, 46.1)	337	36.1 (30.9, 41.3)	120	58.0 (46.4, 69.5)	65	74.3 (55.5, 93.0)
Number of respondents	994		746		173		75	
Number of nonrespondents	23		17		5		1	

Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. Data are not available for 23 respondents with missing data for type of Internet connectivity. CI = confidence interval.

The Rao-Scott design-adjusted chi-square goodness-of-fit test for a one-way table was used to test the null hypothesis of equal proportions. This test adjusts appropriately for the sample design. The p-value indicates if a statistical difference between at least two subgroups was found.

† Estimate is suppressed if the number of respondents in a given category is fewer than 30 or the coefficient of variation is greater than 30%.

Table D-12. Weighted Percentage of Small SNAP-Authorized Stores by Type of Scanning System and Number of Unique Barcode Food Products ($p < .0001$)

Type of Scanning System	All Stores		0–499		500–2,999		≥3,000	
	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)
Scanner, SNAP flag, integrated	201	19.8 (16.1, 23.5)	54	9.3 (5.7, 12.9)	77	27.4 (20.0, 34.9)	70	29.2 (19.8, 38.6)
Scanner, SNAP flag, nonintegrated	134	17.9 (14.0, 21.8)	31	6.6 (3.4, 9.8)	62	29.6 (21.3, 37.8)	41	23.3 (14.0, 32.5)
Scanner, no SNAP flag	138	20.7 (16.5, 24.8)	64	21.2 (14.9, 27.5)	43	17.8 (11.1, 24.4)	31	23.6 (14.3, 32.9)
No scanner	519	41.7 (37.0, 46.4)	394	62.9 (56.0, 69.7)	81	25.2 (17.7, 32.8)	44	23.9 (14.7, 33.2)
Number of respondents	992		543		263		186	
Number of nonrespondents	26		12		7		7	

Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. Data are not available for 22 respondents with missing data for number of unique barcodes. CI = confidence interval.

The Rao-Scott design-adjusted chi-square goodness-of-fit test for a one-way table was used to test the null hypothesis of equal proportions. This test adjusts appropriately for the sample design. The *p*-value indicates if a statistical difference between at least two subgroups was found.

Table D-13. Weighted Percentage of Small SNAP-Authorized Stores by Type of Scanning System and Number of Cash Registers/Lanes ($p < .0001$)

Type of Scanning System	All Stores		1 Register/Lane		2 Registers/Lanes		≥3 Registers/Lanes	
	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)
Scanner, SNAP flag, integrated	205	19.9 (16.2, 23.5)	64	15.6 (10.5, 20.7)	109	23.4 (17.7, 29.1)	32	33.7 (18.6, 48.9)
Scanner, SNAP flag, nonintegrated	134	17.6 (13.8, 21.5)	47	9.0 (5.3, 12.7)	75	24.8 (18.1, 31.5)	12	†
Scanner, no SNAP flag	139	20.4 (16.3, 24.5)	72	18.2 (12.8, 23.7)	64	24.5 (17.8, 31.3)	3	†
No scanner	530	42.1 (37.4, 46.8)	388	57.2 (50.5, 63.8)	123	27.3 (20.7, 33.9)	19	†
Number of respondents	1,008		571		371		66	
Number of nonrespondents	27		21		6		0	

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. Data are not available for 5 respondents with missing data for number of cash registers. CI = confidence interval.

The Rao-Scott design-adjusted chi-square goodness-of-fit test for a one-way table was used to test the null hypothesis of equal proportions. This test adjusts appropriately for the sample design. The *p*-value indicates if a statistical difference between at least two subgroups was found.

† Estimate is suppressed if the number of respondents in a given category is fewer than 30 or the coefficient of variation is greater than 30%.

Table D-14. Weighted Number and Percentage of Small SNAP-Authorized Stores by Farm Bill Status and Store Type ($p < .0001$)

		All Stores		Convenience: Franchise		Convenience: Non-Franchise		Grocery: Medium		Grocery: Small		Specialty	
Status	Number of Respondents	Weighted Number of Stores	Weighted Percentage of Stores (95% CI)	Weighted Number of Stores	Weighted Percentage of Stores (95% CI)	Weighted Number of Stores	Weighted Percentage of Stores (95% CI)	Weighted Number of Stores	Weighted Percentage of Stores (95% CI)	Weighted Number of Stores	Weighted Percentage of Stores (95% CI)	Weighted Number of Stores	Weighted Percentage of Stores (95% CI)
Meets Farm Bill requirement	339	37,983	37.4 (32.8, 42.1)	9,582	51.0 (43.1, 58.9)	22,477	37.2 (29.9, 44.5)	3,063	41.7 (34.5, 48.8)	2,415	25.5 (18.2, 32.8)	446	†
Does not meet Farm Bill requirement	674	63,484	62.6 (57.9, 67.2)	9,217	49.0 (41.1, 56.9)	37,937	62.8 (55.5, 70.1)	4,289	58.3 (51.2, 65.5)	7,065	74.5 (67.2, 81.8)	4,976	91.8 (87.8, 95.8)
Number of respondents	1,013	101,467		18,799		60,413		7,352		9,480		5,422	

Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. Data are not available for 27 respondents that did not answer the questions on system type. CI = confidence interval.

The Rao-Scott design-adjusted chi-square goodness-of-fit test for a one-way table was used to test the null hypothesis of equal proportions. This test adjusts appropriately for the sample design. The *p*-value indicates if a statistical difference between at least two subgroups was found.

† Estimate is suppressed if the number of respondents in a given category is less than 30 or coefficient of variation greater than 30%.

Table D-15. Percentage of Small SNAP-Authorized Stores by Farm Bill Status and Urbanicity ($p = .4336$)

Status	All Stores		Urban		Rural	
	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)
Meets Farm Bill requirement	339	37.4 (32.8, 42.1)	212	37.0 (31.8, 42.2)	127	40.7 (32.8, 48.6)
Does not meet Farm Bill requirement	674	62.6 (57.9, 67.2)	441	63.0 (57.8, 68.2)	233	59.3 (51.4, 67.2)
Number of respondents	1,013		653		360	
Number of nonrespondents	27		18		9	

Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. CI = confidence interval.

The Rao-Scott design-adjusted chi-square goodness-of-fit test for a one-way table was used to test the null hypothesis of equal proportions. This test adjusts appropriately for the sample design. The *p*-value indicates if a statistical difference between the two subgroups was found.

Table D-16. Percentage of Small SNAP-Authorized Stores by Farm Bill Status and Annual Retail Sales ($p < .0001$)

Status	All Stores		First Quartile: 0–$304,615		Second Quartile: $304,616–$660,000		Third Quartile: $660,001–$1,424,435		Fourth Quartile: ≥$1,424,436	
	N	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)
Meets Farm Bill requirement	339	37.4 (32.8, 42.1)	45	19.1 (11.5, 26.6)	54	28.3 (19.0, 37.6)	109	38.7 (29.7, 47.8)	131	60.3 (51.0, 69.6)
Does not meet Farm Bill requirement	674	62.6 (57.9, 67.2)	251	80.9 (73.4, 88.5)	171	71.7 (62.4, 81.0)	164	61.3 (52.2, 70.3)	88	39.7 (30.4, 49.0)
Number of respondents	1,013		296		225		273		219	
Number of nonrespondents	27		3		11		8		5	

Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. CI = confidence interval.

The Rao-Scott design-adjusted chi-square goodness-of-fit test for a one-way table was used to test the null hypothesis of equal proportions. This test adjusts appropriately for the sample design. The *p*-value indicates if a statistical difference between at least two subgroups was found.

Table D-17. Percentage of Small SNAP-Authorized Stores by Farm Bill Status and Average Monthly SNAP Redemptions (p = .0878)

Status	All Stores		First Quartile: 0–$651		Second Quartile: $652–$1,517		Third Quartile: $1,51–$3,528		Fourth Quartile: ≥$3,529	
	N	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)
Meets Farm Bill requirement	339	37.4 (32.8, 42.1)	53	26.5 (17.4, 35.5)	64	41.3 (30.7, 51.9)	88	40.9 (31.6, 50.2)	134	40.4 (32.3, 48.5)
Does not meet Farm Bill requirement	674	62.6 (57.9, 67.2)	164	73.5 (64.5, 82.6)	129	58.7 (48.1, 69.3)	152	59.1 (49.8, 68.4)	229	59.6 (51.5, 67.7)
Number of respondents	1,013		217		193		240		363	
Number of nonrespondents	27		2		5		7		13	

Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. CI = confidence interval.

The Rao-Scott design-adjusted chi-square goodness-of-fit test for a one-way table was used to test the null hypothesis of equal proportions. This test adjusts appropriately for the sample design. The p-value indicates if a statistical difference between at least two subgroups was found.

Table D-18. Percentage of Small SNAP-Authorized Stores by Farm Bill Status and Length of Time SNAP-authorized (p = .4457)

	All Stores		≤3 Years		4–6 Years		7–13 Years		≥ 14 Years	
Status	N	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)
Meets Farm Bill requirement	335	37.6 (33.0, 42.3)	91	32.3 (24.4, 40.2)	83	41.8 (32.3, 51.3)	91	39.1 (30.0, 48.2)	70	39.1 (27.8, 50.4)
Does not meet Farm Bill requirement	664	62.4 (57.7, 67.0)	191	67.7 (59.8, 75.6)	135	58.2 (48.7, 67.7)	172	60.9 (51.8, 70.0)	166	60.9 (49.6, 72.2)
Number of respondents	999		282		218		263		236	
Number of nonrespondents	27		8		6		8		5	

Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. Data are not available for 14 respondents who did not answer length of time authorized question. CI = confidence interval.

The Rao-Scott design-adjusted chi-square goodness-of-fit test for a one-way table was used to test the null hypothesis of equal proportions. This test adjusts appropriately for the sample design. The p-value indicates if a statistical difference between at least two subgroups was found.

Table D-19. Percentage of Small SNAP-Authorized Stores by Farm Bill Status and WIC Authorization (p = .2199)

Status	All Stores		WIC Authorized		Not WIC Authorized	
	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)
Meets Farm Bill requirement	329	37.3 (32.6, 42.1)	67	46.1 (31.1, 61.1)	262	36.4 (31.4, 41.4)
Does not meet Farm Bill requirement	667	62.7 (57.9, 67.4)	57	53.9 (38.9, 68.9)	610	63.6 (58.6, 68.6)
Number of respondents	996		124		872	
Number of nonrespondents	27		2		25	

Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. Data are not available for 17 respondents who did not answer WIC authorization question. CI = confidence interval.

The Rao-Scott design-adjusted chi-square goodness-of-fit test for a one-way table was used to test the null hypothesis of equal proportions. This test adjusts appropriately for the sample design. The p-value indicates if a statistical difference between the two subgroups was found.

Table D-20. Percentage of Small SNAP-Authorized Stores by Farm Bill Status and Internet Connectivity ($p = .0147$)

Status	All Stores		High-Speed Internet Connection		Dial-Up Telephone Line		No Internet Connection or Other Response	
	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)
Meets Farm Bill requirement	335	37.9 (33.2, 42.6)	292	41.1 (35.6, 46.5)	37	28.7 (18.2, 39.2)	6	†
Does not meet Farm Bill requirement	659	62.1 (57.4, 66.8)	454	58.9 (53.5, 64.4)	136	71.3 (60.8, 81.8)	69	82.9 (68.1, 97.7)
Number of respondents	994		746		173		75	
Number of nonrespondents	23		17		5		1	

Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. Data are not available for 23 respondents who did not answer type of Internet connectivity question. CI = confidence interval.

The Rao-Scott design-adjusted chi-square goodness-of-fit test for a one-way table was used to test the null hypothesis of equal proportions. This test adjusts appropriately for the sample design. The *p*-value indicates if a statistical difference between at least two subgroups was found.

† Estimate is suppressed if the number of respondents in a given category is less than 30 or coefficient of variation greater than 30%.

Table D-21. Percentage of Small SNAP-authorized Stores by Farm Bill Status and Number of Unique Barcode Food Products ($p < .0001$)

Status	All Stores		0–499		500–2,999		3,000 or more	
	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)
Meets Farm Bill requirement	335	37.6 (32.9, 42.4)	85	15.9 (11.3, 20.6)	139	57.0 (48.4, 65.6)	111	52.5 (41.7, 63.3)
Does not meet Farm Bill requirement	657	62.4 (57.6, 67.1)	458	84.1 (79.4, 88.7)	124	43.0 (34.4, 51.6)	75	47.5 (36.7, 58.3)
Number of respondents	992		543		263		186	
Number of nonrespondents	26		12		7		7	

Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. Data are not available for 22 respondents who did not answer number of unique barcodes question. CI = confidence interval.

The Rao-Scott design-adjusted chi-square goodness-of-fit test for a one-way table was used to test the null hypothesis of equal proportions. This test adjusts appropriately for the sample design. The *p*-value indicates if a statistical difference between at least two subgroups was found.

Table D-22. Percentage of Small SNAP-Authorized Stores by Farm Bill Status and Number of Cash Registers/Lanes ($p < .0001$)

Status	All Stores		1 Register/Lane		2 Registers/Lanes		3 or More Registers/Lanes	
	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)
Meets Farm Bill requirement	339	37.5 (32.8, 42.2)	111	24.6 (18.7, 30.5)	184	48.2 (40.7, 55.6)	44	77.6 (65.1, 90.0)
Does not meet Farm Bill requirement	669	62.5 (57.8, 67.2)	460	75.4 (69.5, 81.3)	187	51.8 (44.4, 59.3)	22	†
Number of respondents	1008		571		371		66	
Number of nonrespondents	27		21		6		0	

Source: 2018 SCANR Survey

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. Data are not available for 5 respondents who did not answer number of cash registers question. CI = confidence interval.

The Rao-Scott design-adjusted chi-square goodness-of-fit test for a one-way table was used to test the null hypothesis of equal proportions. This test adjusts appropriately for the sample design. The *p*-value indicates if a statistical difference between at least two subgroups was found.

† Estimate is suppressed if the number of respondents in a given category is less than 30 or coefficient of variation greater than 30%.

Table D-23. Retailers' Perceived Barriers to Adoption of Scanning Systems

Barrier to Adoption	Number of Respondents[a]	Very Unimportant		Somewhat Unimportant		Neither Unimportant nor Important		Somewhat Important		Very Important	
		n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)	n	Weighted Percentage of Stores (95% CI)
Cost Barriers											
Cost to purchase, install, and maintain scanner	633	41	6.4 (3.2, 9.6)	17	†	36	6.7 (3.6, 9.9)	103	17.6 (12.8, 22.5)	436	66.3 (60.3, 72.4)
Cost to train staff	633	54	6.4 (3.4, 9.4)	52	7.5 (4.4, 10.6)	114	16.2 (11.5, 20.9)	147	23.1 (17.7, 28.6)	266	46.8 (40.4, 53.2)
Noncost Barriers											
Slow or unreliable Internet access	625	62	9.5 (5.6, 13.3)	45	7.1 (3.8, 10.3)	111	18.3 (13.2, 23.3)	126	20.4 (15.2, 25.6)	281	44.8 (38.5, 51.1)
Lack of technical knowledge	631	53	6.7 (3.6, 9.8)	49	8.9 (5.0, 12.8)	108	13.7 (9.7, 17.7)	163	28.9 (23.0, 34.9)	258	41.8 (35.5, 48.1)
Limited checkout stand space	631	52	7.2 (3.9, 10.5)	53	8.5 (4.9, 12.1)	97	15.6 (10.9, 20.3)	163	28.4 (22.5, 34.3)	266	40.3 (34.1, 46.5)
Unreliable electrical power causes frequent outages	632	127	16.6 (11.8, 21.3)	56	9.4 (5.8, 13.0)	140	21.5 (16.2, 26.9)	108	19.4 (14.1, 24.8)	201	33.1 (27.2, 39.0)
Low SNAP sales volume	629	54	5.9 (3.3, 8.4)	48	8.7 (5.0, 12.4)	122	19.7 (14.5, 24.8)	165	26.2 (20.5, 31.9)	240	39.6 (33.3, 45.9)
Possible disruption of store operations during installation	630	62	6.5 (3.5, 9.4)	51	9.3 (5.5, 13.1)	120	18.1 (13.2, 22.9)	147	25.5 (19.9, 31.2)	250	40.6 (34.3, 46.9)
Time to train staff	626	54	6.0 (3.4, 8.7)	36	6.3 (3.2, 9.3)	122	18.2 (13.3, 23.1)	131	20.1 (14.9, 25.3)	283	49.4 (43.0, 55.8)
No one available to help with system failures and other troubleshooting	636	48	6.8 (3.5, 10.1)	27	†	82	11.6 (7.7, 15.4)	124	23.3 (17.7, 28.8)	355	55.6 (49.2, 61.9)
Time to evaluate and decide which type of scanner to install	633	49	5.0 (2.6, 7.5)	34	5.9 (2.7, 9.0)	97	15.0 (10.3, 19.6)	159	30.3 (24.3, 36.3)	294	43.8 (37.5, 50.1)
Staff have limited English-speaking ability	638	209	23.9 (18.8, 29.1)	40	6.0 (3.0, 8.9)	141	20.9 (15.7, 26.0)	83	18.0 (13.0, 23.1)	165	31.2 (25.2, 37.2)
Time to maintain product database	635	47	4.6 (2.3, 6.9)	29	†	81	12.6 (8.4, 16.8)	143	28.6 (22.6, 34.5)	335	48.3 (42.0, 54.6)

Source: 2018 SCANR Survey

Question 18: How important would each of these factors be in your decision on whether to upgrade or purchase scanning technology that meets the new requirement?

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. Only respondents with a scanning system with a SNAP flag answered the question (n = 660). Data are not available for 20 respondents who did not answer this question and for 34 respondents who indicated they were in the process of purchasing or installing a system that would meet the Farm Bill requirement. CI = confidence interval.

† Estimate is suppressed if the number of respondents in a given category is fewer than 30 or the coefficient of variation is greater than 30%.

[a] The number of respondents varies because of missing values for the response item.

Table D-24. Retailers' Self-Reported Likelihood to Adopt a Scanning System and Remain SNAP Authorized

Response	n	Weighted Percentage of Stores (95% CI)
Very unlikely	145	18.8 (13.9, 23.7)
Somewhat unlikely	90	12.3 (8.2, 16.4)
Neither unlikely nor likely	73	9.8 (6.3, 13.3)
Somewhat likely	126	20.6 (15.4, 25.8)
Very likely	206	38.5 (32.3, 44.8)
Number of respondents	640	
Number of nonrespondents	20	

Source: 2018 SCANR Survey

Question 17 from SCANR Survey: There is a new law that will require all SNAP-authorized retailers to use scanners at checkout to accept SNAP benefits. In the future, your store may need to upgrade or purchase and maintain new equipment to comply with this law. How likely are you to do this so you can remain a SNAP-authorized retailer?

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. Only respondents that did not have a scanning system with a SNAP flag answered the question (n = 660). Data are not available for 20 respondents who did not answer this question and 34 respondents who indicated they were in the process of purchasing or installing a system that would meet the Farm Bill requirement. CI = confidence interval

Table D-25. Weighted Number and Percentage of Small SNAP-Authorized Stores' Self-Reported Likelihood to Adopt a Scanning System and Remain SNAP Authorized by Store Type ($p = .2742$)

	Weighted Estimates											
	All Stores		Convenience: Franchise		Convenience: Nonfranchise		Grocery: Medium		Grocery: Small		Specialty	
Response	Number of Stores	Percentage of Stores (95% CI)	Number of Stores	Percentage of Stores (95% CI)	Number of Stores	Percentage of Stores (95% CI)	Number of Stores	Percentage of Stores (95% CI)	Number of Stores	Percentage of Stores (95% CI)	Number of Stores	Percentage of Stores (95% CI)
Very or somewhat unlikely	18,737	31.1 (25.2, 36.9)	2,152	†	11,263	30.6 (21.6, 39.6)	1,266	32.3 (23.0, 41.7)	1,848	27.3 (18.6, 35.9)	2,208	44.6 (36.9, 52.2)
Neither unlikely nor likely	5,910	9.8 (6.3, 13.3)	1,126	†	2,923	†	454	†	900	†	506	†
Very or somewhat likely	35,665	59.1 (53.0, 65.3)	4,556	58.2 (46.0, 70.3)	22,647	61.5 (52.0, 71.0)	2,194	56.0 (46.0, 66.1)	4,027	59.4 (49.8, 69.1)	2,241	45.2 (37.5, 52.9)
Number of respondents	60,311		7,834		36,833		3,915		6,775		4,955	

Source: 2018 SCANR Survey

Question 17 from SCANR Survey: There is a new law that will require all SNAP-authorized retailers to use scanners at checkout to accept SNAP benefits. In the future, your store may need to upgrade or purchase and maintain new equipment to comply with this law. How likely are you to do this so you can remain a SNAP-authorized retailer?

Notes: Estimates were weighted to represent the population of stores using the survey weights and based on 1,040 respondents. Only respondents that did not have a scanning system with a SNAP flag answered the question (n = 660). Data are not available for 20 respondents who did not answer this question and 34 respondents who indicated they were in the process of purchasing or installing a system that would meet the Farm Bill requirement. CI = confidence interval

The Rao-Scott design-adjusted chi-square goodness-of-fit test for a one-way table was used to test the null hypothesis of equal proportions. This test adjusts appropriately for the sample design. The *p*-value indicates if a statistical difference between at least two subgroups was found.

† Estimate is suppressed if the number of respondents in a given category is fewer than 30 or the coefficient of variation is greater than 30%.