

# Evaluation of Technology Modernization for SNAP Benefit **Redemption Through Online** Transactions

Final Evaluation Report

September 2023

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Final Evaluation Report

September 2023

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### **Executive Summary**

With authorization from Section 4011 of the Agricultural Act of 2014 (2014 Farm Bill),<sup>1</sup> the U.S. Department of Agriculture's (USDA) Food and Nutrition Service (FNS) authorized selected pilot States and retailers to allow online redemption of Supplemental Nutrition Assistance Program (SNAP) benefits under the SNAP Online Purchasing Pilot (OPP).

In 2018, FNS funded Abt Associates, Inc. to conduct the *Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions (SNAP Online Purchasing Evaluation*, or *SOPE*) to examine the feasibility of online purchasing for SNAP. This report presents the results of SOPE, evaluating the experience of five retailers (ALDI; Amazon; ShopRite; Walmart Stores, Inc.; and Wright's Markets, Inc.) and six States that implemented the pilot in 2019 and 2020 (Alabama, Iowa, Nebraska, New York, Oregon, and Washington).

#### The Supplemental Nutrition Assistance Program and the SNAP Online Pilot

SNAP is a Federal program administered by FNS with the goal to provide "nutrition benefits to supplement the food budget of needy families so they can purchase healthy food and move towards self-sufficiency."<sup>2</sup> SNAP benefits are redeemed through an electronic benefits transfer (EBT) card, with benefits distributed monthly to be spent at authorized retailers. Traditionally, SNAP has required participants to visit retailers in person to redeem their benefits.

Expanding SNAP benefits to allow participants to purchase groceries online has potential advantages both for SNAP participants and for retailers. For participants, online shopping and home delivery can increase their access to reasonably priced, healthy groceries, particularly for those who struggle with transportation. For example, SNAP participants living in rural or urban areas might lack reliable access to a vehicle or reliable public transportation. For participating online-only retailers, online shopping is a source of new customers; for participating brick-and-mortar retailers, online shopping lets them sell to a broader group of SNAP participants than they might otherwise be able to reach.

In recognition of these potential advantages, the 2014 Farm Bill allowed FNS to implement online SNAP benefit redemption. On September 15, 2016, FNS issued a Request for Volunteers for the Electronic Benefits Transfer Online Purchasing Pilot.<sup>3</sup> FNS selected eight retailers to implement the pilot across eight States: Alabama, Iowa, Maryland, Nebraska, New Jersey, New York, Oregon, and Washington State.

In April 2019, the SNAP Online pilot launched in New York State with two retailers, followed by a third retailer shortly after. By April 2020, the pilot had expanded to include five retailers in six States; two selected pilot States (Maryland and New Jersey) were excluded from the evaluation, and three of the originally selected retailers had withdrawn. Separately, outside of the pilot, FNS recognized the fast-growing demand for online grocery purchasing driven by the COVID-19 public health emergency, and it acted rapidly with States to expand authorization of SNAP Online. By the end of 2022, SNAP Online was available in 49 States plus the District of Columbia.<sup>4</sup>

<sup>&</sup>lt;sup>1</sup> <u>https://www.fns.usda.gov/pl-113-79</u>

<sup>&</sup>lt;sup>2</sup> <u>https://www.fns.usda.gov/snap/supplemental-nutrition-assistance-program</u>

<sup>&</sup>lt;sup>3</sup> <u>https://fns-prod.azureedge.us/sites/default/files/snap/onlinepurchasing-rfv.pdf</u>

<sup>&</sup>lt;sup>4</sup> Only Alaska, Guam, and the Virgin Islands had yet to implement SNAP Online purchasing.

#### **Evaluation Overview**

Through SOPE, FNS sought to learn the risks and benefits of online purchasing, including its potential effect on program integrity. The SOPE study team explored outcomes related to program integrity for the six SNAP Online pilot States included in the evaluation. SOPE examined delivery patterns, including relationships to household addresses and retailer locations; participation in SNAP Online purchasing; and the frequency of purchases, refunds, and reversals.

SOPE analyses relied on three data sources, all provided by FNS: (1) Online Purchasing Pilot (OPP) data from online EBT transactions for the six pilot States; (2) Store Tracking and Redemption System (STARS) data; and (3) Anti-Fraud Locator Using Electronic Benefit Transfer Retailer Transactions (ALERT) data.

The evaluation focused on the following:

- Determine to the extent feasible from the data available, the extent to which online purchases are being made by participants residing in rural, urban, and suburban areas in each of the six (6) study States?
- How many SNAP EBT customers use online SNAP EBT payments?
- What is the percentage of SNAP EBT customers that use online SNAP EBT payments?
- What is the frequency of online purchases per household per month?
- How many refunds are issued to SNAP EBT cards?
- If a delivery is not made to a participant's home address or an FNS authorized retailer, is the delivery address used by enough other participants that the pattern is suspicious; i.e., the address is a "hotspot"? How often does this pattern occur?
- How many delivery/shipping addresses match the address of an authorized store (based on a comparison to FNS's Store Tracking and Redemption System (STARS)? If possible, how many SNAP EBT customer names match the names of authorized store owners (based on a comparison of the data in STARS)?
- What kinds of delivery types<sup>5</sup> are used by online retailers?

#### **Key Findings**

The evaluation examined SNAP Online purchasing participation and found that:

- Most SNAP households in participating pilot States made exclusively in-store rather than online purchases during the study period. Sixteen percent (16.1 percent) of SNAP households in participating pilot States completed a SNAP Online purchase during the 13-month study period. Conversely, nearly 84 percent (83.9 percent) made exclusively in-store purchases during the study period.
- Household SNAP Online purchasing participation grew over time, with highest participation rates occurring in the final month of the study period, except for Iowa which peaked in the month prior. The rate of SNAP households that made an online purchase increased the most between the first and last month of the study period in Oregon and New York.

<sup>&</sup>lt;sup>5</sup> This report uses the term "fulfillment method" rather than "delivery type" because the former encompasses pick-up transactions, which do not involve delivery.

- Most participating households averaged one or two SNAP Online purchases in months when they participated. Among the 544,698 households participating in SNAP Online purchasing during the study period, three-quarters (75.9 percent) made, on average, one or two SNAP Online purchases per month in the months in which they participated.
- The rate of online refunds issued to SNAP EBT cards as a share of total transactions varied little by urbanicity. The rate of online refunds was highest in rural areas (35.4 percent), followed closely by towns (35.0 percent) and suburbs (33.1 percent). Cites had the lowest rate of online refunds (29.6 percent). Refund rates include adjustments made for weight differences (e.g., for meat and produce purchases) and for out-of-stock items.

To address FNS's desire to develop analyses to identify potential fraud within SNAP Online transactions, the evaluation examined deliveries to **potentially suspicious addresses**. The study team analyzed the number of delivery addresses that received SNAP Online purchases from a larger-than-typical number of SNAP households. This report refers to these addresses as "**hotspots**," defined as delivery addresses receiving SNAP Online orders from five or more different SNAP households. The evaluation found the following:

- The overall incidence of hotspot SNAP Online delivery addresses was less than 1 percent of all delivery addresses. Washington State had the highest incidence, with 0.8 percent of unique delivery addresses identified as hotspots. Nebraska had the lowest incidence, with 0.3 percent of all unique delivery addresses identified as hotspots.
- None of the hotspot addresses matched an FNS authorized retailer.
- Less than 0.02 percent of 357,413 unique delivery addresses were hotspots associated with a store owner's home address. Overall, 84 hotspot addresses were a store owner's address.

To understand the delivery types used by online retailers, the evaluation examined retailer **fulfillment methods**. Retailers used three delivery types: 1) pick-up (i.e., the customer picked up their order at the retailer); 2) direct delivery (i.e., the retailer delivered to the customer); and 3) commercial delivery (i.e., all Amazon transactions, regardless of whether the customer picked up their order at an Amazon Hub or Amazon Fresh location or the order was delivered to the customer's address; Amazon was the only pilot retailer with commercial delivery transactions). The evaluation found that:

- The OPP transaction data did not fully reflect the customer experience of picking up their order because Amazon reported all orders as commercial delivery. Nearly half of SNAP Online orders were fulfilled by Amazon (42.9 percent) and were reported as commercial delivery. Excluding Amazon orders, most SNAP Online orders were fulfilled through pick-up, rather than through delivery to the household.
- Most orders in rural areas were fulfilled by pick-up; most orders in city areas were fulfilled by Amazon and reported as commercial delivery (58.2 percent). Pick-ups were dramatically more common for rural orders (68.1 percent of all rural orders) than were direct deliveries (8.2 percent), whereas for city orders pick-up and direct delivery orders were almost equally common (21.8 percent versus 20.0 percent, respectively). However, with the larger proportion of SNAP Online orders fulfilled by Amazon in urban areas, it is difficult to assess whether apparent urban-rural differences in the proportion of non-commercial delivery orders fulfilled by pick-up versus direct delivery reflect true differences in the customer fulfillment experience.
- Rural and city areas of Alabama, Iowa, and Nebraska had a higher percentage of purchase transactions fulfilled through pick-up than did rural and city areas of New York and Washington State. In rural areas of Alabama, Iowa, and Nebraska, among noncommercial deliveries, the great majority (between 70 and 80 percent of all orders) were pick-up fulfillments, with only a small proportion of direct delivery fulfillments (between 3.8 and 7.7 percent).

#### **Data Limitations**

To understand how elements in the transaction data related to one another and to correctly interpret data patterns, the study team conducted a series of initial data checks. These data checks revealed some unexpected patterns that appear to be related to how SNAP operated across States and how EBT host processors coded fulfillment methods in the data for the different retailers. **Data Limitations** identified include:

- For some retailers, the fulfillment method reported in the OPP transaction data did not necessarily reflect the fulfillment method experienced by the SNAP customer. For example, all Amazon transactions in the OPP transaction data appeared as commercial delivery regardless of whether the order was picked up by the customer at an Amazon pick-up location (e.g., Amazon Hub or Amazon Fresh location) or delivered to the customer's address. From the retailer perspective, the fulfillment method was coded correctly because Amazon orders that a customer picks up have been delivered to an Amazon pick-up location by a commercial shipper. However, available data did not identify whether the address the order was delivered to was an Amazon pick-up location or a customer address. Not being able to differentiate pick-ups by the customer from deliveries to the customer for Amazon orders presented a challenge for hotspot analysis. This issue also affects the interpretability of the fulfillment method summary results.
- Oregon did not provide household addresses in the OPP transaction data. For this State, it was therefore not possible to identify hotspots, as that analysis relied on the ability to geocode household addresses. Missing household address data for Oregon also made it impossible to calculate and report urbanicity for this State.
- No administrative data were available to accurately calculate participation rates for areas smaller than the State. It was therefore not possible to compute SNAP Online participation rate (i.e., SNAP participants making online purchases as a fraction of all SNAP participants) at the ZIP code level or comparable unit, and by extension, at the urbanicity level.

#### **Promising Areas for Future Research**

SOPE contributes to FNS's understanding of the implementation of SNAP Online benefit redemption by examining outcomes related to program integrity for six pilot States: Alabama, Iowa, Nebraska, New York, Oregon, and Washington State. It identified patterns in SNAP Online participation, identified hotspots, and analyzed fulfillment methods. There is still much to be learned about SNAP Online as it continues to expand across the country, covering nearly every State and involving more than 180 retailer chains, representing thousands of actual stores.

One of the goals of SNAP technology modernization is to increase household participation. To help FNS better understand the extent of SNAP Online participation in rural versus urban areas, or among different populations or geographies, researchers could analyze State-level case record data. These data could be geocoded to analyze geographic trends; for example, the prevalence of SNAP Online participation among households that live in areas with low food access.

In-depth interviews or focus groups with members of SNAP households could shed light on how SNAP Online has affected purchasing and consumption of food. Information gathered about the participant perspective could be used to better understand why certain populations (e.g., rural residents) choose to or not to participate in online shopping. These perspectives would inform equity and inclusion considerations in SNAP Online participation. Analyses of SNAP case records would provide details about the characteristics of SNAP households (e.g., older adults, families versus able-bodied adults without dependents). These data, along with insights gained from the in-depth interviews with SNAP households that shop online, could allow FNS, State agencies, and community partners to target outreach to populations that would benefit from access to healthy foods through online shopping. FNS and future researchers also might be interested in better understanding the online order fulfillment method experienced by the SNAP participants. Given the prevalence of SNAP Online purchases through Amazon, additional analysis of Amazon's fulfillment methods might be warranted. An address file containing all Amazon pick-up locations could be matched to the fulfillment addresses in the OPP transaction data to better describe the use of secondary, centralized pick-up locations.

An implementation study, including interviews with State administrators, EBT host processors, and retailers, would help FNS identify best practices and lessons learned to share with retailers and States as they consider, plan for, implement, and expand SNAP Online. Such research could be used to refine technical assistance and support to retailers and States, but it could also be useful to inform future SNAP modernization efforts. Additionally, interviews with retailers could shed light on the reasons driving which fulfillment methods are available in different areas they serve. This could provide insight into options available to customers that might influence their decisions to redeem SNAP benefits online.

## List of Acronyms

ACS	American Community Survey
ALERT	Anti-Fraud Locator Using Electronic Benefits Transfer Retailer Transactions
EBT	Electronic benefits transfer
FNS	Food and Nutrition Service
OPP transaction data	Online Purchasing Pilot transaction data
PIN	Personal Identification Number
SNAP	Supplemental Nutrition Assistance Program
SOPE	SNAP Online Purchasing Evaluation (Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions)
STARS	Store Tracking and Redemption System
USDA	United States Department of Agriculture

## **Glossary of Terms**

Term	Definition
	Households and Addresses
Household	A unique household that received SNAP benefits, identified by State_ID in the Online Purchasing Pilot (OPP) transaction data.
Household address	An address for a SNAP household that made at least one SNAP Online purchase.
Delivery address	An address that received at least one SNAP Online purchase delivery.
Hotspot	An address receiving deliveries of SNAP Online purchases from a larger-than-typical number of SNAP households. For this study, the threshold is five or more SNAP households.
	Urbanicity Categories
Rural	A census-defined rural area.
Town	An area inside an urban cluster and outside an urbanized area.
Suburban	An area outside a principal city and inside an urbanized area.
City	An area inside an urbanized area and inside a principal city.
	Fulfillment Methods
Pick-up	The customer picks up their order at the retailer.
Direct delivery	The retailer provides its own delivery.
Commercial delivery	Delivery is provided by a third party (e.g., FedEx, UPS). Commercial delivery only appears in OPP transaction data for Amazon transactions, regardless of whether the order was delivered to or picked up by the customer. No other retailer reported commercial delivery transactions. All Amazon transactions were commercial delivery transactions; OPP transaction data did not include pick-up or direct delivery transactions for Amazon.
	Transaction Types
SNAP transaction	A purchase made from SNAP benefits, or a refund or reversal of a SNAP purchase.
SNAP Online purchase	A group of SNAP Online purchase transactions for a single household that occur on the same calendar day for the same retailer.
In-store SNAP purchase	SNAP purchase at a brick-and-mortar store.
Refund	Benefits returned to the SNAP balance. A refund might occur for a variety of reasons, including when an item is out of stock, if a weighted item is a lesser amount, or if a customer cancels an item or an order.
Reversal	Reverses the original transaction message for transactions that are not fully processed and recorded, usually due to system errors.

### 1. Introduction, Background, and Context

With authorization from Section 4011 of the Agricultural Act of 2014 (2014 Farm Bill), <sup>6</sup> the U.S. Department of Agriculture's (USDA) Food and Nutrition Service (FNS) authorized selected pilot States and retailers to allow online redemption of Supplemental Nutrition Assistance Program (SNAP) benefits under SNAP Online. In 2018, FNS funded Abt Associates, Inc. to conduct the *Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions (SNAP Online Purchasing Evaluation*, or *SOPE*) to examine the feasibility of online purchasing for SNAP. This report presents the results of SOPE, which evaluated the experience of five retailers and six of the eight States that implemented the pilot in 2019 and 2020. This chapter provides a brief overview of SNAP and modernization of SNAP benefit redemption. It ends with a roadmap to the remainder of the report.

#### 1.1 The Supplemental Nutrition Assistance Program

SNAP is a Federal program administered by FNS with the goal to provide "nutrition benefits to supplement the food budget of needy families so they can purchase healthy food and move towards self-sufficiency" (USDA/FNS, n.d.). In fiscal year 2021, SNAP served 21.6 million households across the United States each month, with households receiving an average monthly benefit of \$418 per household for food purchase (USDA/FNS, 2022a). SNAP benefits are redeemed through an electronic benefits transfer (EBT) card, with benefits distributed monthly to be spent at authorized retailers. Although SNAP is a Federally funded program, benefits are administered by States.

Traditionally, SNAP has required participants to visit retailers in person to redeem their benefits. The average SNAP participant travels a mean distance of 3.4 miles to their usual store, which often is a supercenter or supermarket (Mentzer Morrison & Mancino, 2015). For people with mental or physical disabilities, who are elderly, who lack access to convenient modes of transportation, or who live in areas with low food access (i.e., areas with limited options for purchasing affordable, healthy groceries), to shop and redeem SNAP benefits in person can be a struggle (USDA/FNS, 2016). Challenges of in-person redemption were exacerbated by the COVID-19 public health emergency. Stay-at-home orders limited the opportunity for SNAP participants to visit stores; even when orders were lifted, they might have feared that shopping in person would increase their exposure to the virus.

#### 1.2 SNAP Benefit Redemption Modernization and the SNAP Online Pilot

Expanding SNAP benefits to allow participants to purchase groceries online has potential advantages both for SNAP participants and for retailers. For participants, online shopping and home delivery can increase their access to reasonably priced, healthy groceries, particularly for those who struggle with transportation. For example, SNAP participants living in rural or urban areas might lack reliable access to a vehicle or reliable public transportation. For participating online-only retailers, online shopping is a source of new customers; for participating brick-and-mortar retailers, online shopping lets them sell to a broader group of SNAP participants than they might otherwise be able to reach.

<sup>&</sup>lt;sup>6</sup> https://www.congress.gov/bill/113th-congress/house-bill/2642/text

In recognition of these potential advantages, the 2014 Farm Bill allowed FNS to implement online SNAP benefit redemption. On September 15, 2016, FNS issued a Request for Volunteers for the *Electronic Benefits Transfer Online Purchasing Pilot* (USDA/FNS, 2016). FNS selected eight retailers to implement the pilot across eight States: Alabama, Iowa, Maryland, Nebraska, New Jersey, New York, Oregon, and Washington State. In April 2019, the SNAP Online pilot launched in New York State with two retailers, followed by a third retailer shortly after. By April 2020, the pilot had expanded to include five retailers in six States; two selected pilot States (Maryland and New Jersey) had not yet launched by that time, and three of the originally selected retailers had withdrawn.

#### SOPE Implementation Timeline for States in the Evaluation

- New York: April 2019
- Washington: January 2020
- Alabama: March 2020
- Iowa: March 2020
- Oregon: March 2020
- Nebraska: April 2020

Usual SNAP Federal regulations apply to SNAP Online purchases. SNAP benefits may not be used for delivery, shipping, handling, bags, or tipping fees that are common in online purchasing, though such fees can be paid separately using other forms of payment. Customers may use SNAP EBT to pay for online purchases fully or partially. SNAP Online orders may be fulfilled through delivery or in-store pick-up. A delivery address could also be a pick-up location other than the store or customer's household.

Retailers participating in the pilot routed SNAP Online purchases through Fiserv, which at the onset of the pilot was the only FNS-approved system for secure online entry of personal identification numbers (PINs) for EBT transactions. Along with the retailers (and their web service providers, if any), Fiserv and the EBT host processors (Conduent and Fidelity Information Services, LLC) were important participants and stakeholders in the pilots.

In March 2020, States began issuing stay-at-home orders due to the COVID-19 pandemic. Use of online grocery shopping increased dramatically nationwide over this period. A weekly survey of U.S. consumers reported an 8-percentage-point increase in the number of respondents reporting purchasing groceries online, from 52 percent in March 2020 to 60 percent in August 2020 (Weinswig & Cheng, 2020).

Outside of this pilot, FNS recognized the fast-growing demand for online grocery purchasing and acted rapidly with States to expand authorization of SNAP Online. By the end of 2020, SNAP Online was available in 47 States (including the District of Columbia), compared to 5 in March 2020. Between the appearance of COVID-19 in February 2020 and December 2020, online redemption of SNAP EBT benefits grew from less than \$3 million to \$246 million (Jones, 2021), demonstrating strong and increasing demand for online purchasing by SNAP participants. FNS also expanded the number of retailers authorized to accept online EBT redemption.

#### 1.3 Organization of This Report

This report summarizes findings from SOPE, including evidence on program integrity and participation in the six selected pilot States. The remainder of this report is organized as follows:

- Chapter 2: Evaluation overview
- Chapter 3: Participation in SNAP Online purchasing
- Chapter 4: Hotspots
- Chapter 5: Fulfillment methods
- Chapter 6: Evaluation challenges
- Chapter 7: Discussion

### 2. Evaluation Overview

Through SOPE, FNS sought to learn the risks and benefits of online purchasing, including its potential effect on program integrity. The SOPE study team explored outcomes related to program integrity for six pilot States:

- 1. Alabama
- 2. Iowa
- 3. Nebraska
- 4. New York
- 5. Oregon
- 6. Washington

SOPE examined delivery patterns, including relationships to household addresses and retailer locations; participation in SNAP Online purchasing; and the frequency of purchases, refunds, and reversals.

The evaluation included five retailers:<sup>7</sup>

- 1. ALDI
- 2. Amazon
- 3. ShopRite
- 4. Walmart Stores, Inc.
- 5. Wright's Markets, Inc.
- 2.1 Overview of Data Sources

SOPE analyses relied on three data sources, all provided by FNS:

- Online Purchasing Pilot (OPP) data from online EBT transactions for the six pilot States. These data recorded by EBT host processors included online transaction data (records of online purchases, refunds, and reversals) during the study period (March 2020–March 2021); household, delivery, and pick-up addresses; retailer where the order was placed; and fulfillment method (commercial delivery, direct delivery, or pick-up).
- Store Tracking and Redemption System (STARS) data, with SNAP authorized store addresses and store owner home addresses. STARS is administered by FNS and contains information on retailers participating in SNAP. Federal and State agencies may use it to monitor participating retailers. The study team compared delivery addresses from the OPP transaction data with addresses from the STARS database.
- Anti-Fraud Locator Using Electronic Benefit Transfer Retailer Transactions (ALERT) data, with monthly counts of total transactions and households that redeemed SNAP (online or in person). The ALERT system collects and analyzes daily transaction data provided by EBT processers. It is

<sup>&</sup>lt;sup>7</sup> Three of the eight retailers initially selected by FNS in 2017 to participate in the pilot ultimately withdrew (Dash's Market; Hart's Local Grocers; and Hy-Vee, Inc.). A fourth selected retailer, Safeway, did not formally withdraw but did not accept SNAP payments online during the study period. ALDI joined SNAP Online in late 2020 as part of the FNS expansion effort in the wake of the pandemic; in May 2021, FNS identified ALDI as a fifth retailer to participate in this evaluation.

used for program management, including detecting possible fraudulent activity on the part of retailers. The study team merged OPP transaction data with ALERT summary data to calculate rates of SNAP Online participation among households that redeemed SNAP.

#### 2.2 Research Questions and Methods

At the highest level, the evaluation research questions concern geographic patterns of SNAP Online participation, fulfillment methods, and delivery address patterns. The study team combined data from the three sources described above to address the research questions.

This analysis required geocoding household addresses to identify whether the household lived in a city, suburb, town, or rural area. The study team calculated the number of households that made an online purchase, as well as rates of each fulfillment method, by these urbanicity categories.

In addition to geocoding household addresses, the study team geocoded delivery addresses for an analysis of hotspots. Conceptually, *hotspots* are delivery addresses used by enough other participants that the pattern is suspicious. The study team identified delivery addresses that received orders placed from five or more SNAP accounts. For this analysis, it compared delivery address geocoordinates to household address geocoordinates to analyze patterns of delivery locations.

Table 1 presents the study's research questions and data sources used to answer each question. Appendix A provides a list of tables, figures, and maps corresponding to each research question. Appendix B provides further details on the methods for each research domain.

#### Table 1 Research Questions and Data Sources

Research Question	Data Source
RQ1: Determine to the extent feasible from the data available, the extent to which online	OPP transaction data
purchases are being made by participants residing in rural, urban, and suburban areas in each of the six (6) study States?	ALERT summary data
RQ2: How many SNAP EBT customers use online SNAP EBT payments?	
RQ3: What is the percentage of SNAP EBT customers that use online SNAP EBT payments?	
RQ4: What is the frequency of online purchases per household per month?	OPP transaction data
RQ5: How many refunds are issued to SNAP EBT cards?	OPP transaction data
RQ6: If a delivery is not made to a participant's home address or an FNS authorized retailer, is	OPP transaction data
the delivery address used by enough other participants that the pattern is suspicious; i.e., the address is a "hotspot"? How often does this pattern occur?	STARS retailer data
RQ7: How many delivery/shipping addresses match the address of an authorized store (based	
on a comparison to FNS's Store Tracking and Redemption System (STARS))? If possible, how	
many SNAP EBT customer names match the names of authorized store owners (based on a	
comparison of the data in STARS)?	
RQ8: What kinds of delivery type are used by online retailers?	OPP transaction data (all)

**Key:** ALERT=Anti-Fraud Locator Using Electronic Benefit Transfer Retailer Transactions. EBT=electronic benefits transfer. FNS=Food and Nutrition Service. OPP=Online Purchasing Pilot. STARS=Store Tracking and Redemption System.

## 3. Participation in SNAP Online Purchasing

#### Chapter 3 Key Findings

- During the study period, most SNAP households in participating pilot States made exclusively in-store rather than online purchases.
- Household SNAP Online participation grew over time, with highest participation rates occurring in the final month of the study period, except in Iowa.
- Most participating households averaged one or two SNAP Online purchases in months when they
  participated.
- Roughly a third of SNAP Online transactions were refunds.
- The rate of online refunds issued to SNAP EBT cards varied little by urbanicity.

This chapter presents findings related to SNAP Online purchasing participation and addresses the following research questions:

- RQ1: Determine to the extent feasible from the data available, the extent to which online purchases are being made by participants residing in rural, urban, and suburban areas in each of the six study States?
- RQ2: How many SNAP EBT customers use online SNAP EBT payments?
- RQ3: What is the percentage of SNAP EBT customers that use online SNAP EBT payments?
- RQ4: What is the frequency of online purchases per household per month?

RQ5: How many refunds are issued to SNAP EBT cards?

To address these questions, the study team assessed household participation rates for SNAP Online purchases, the frequency of SNAP Online purchases, and the frequency of SNAP Online transactions that were refunded or reversed.

#### 3.1 Household SNAP Online Participation

Sixteen percent (16.1 percent) of SNAP households completed a SNAP Online purchase during the 13-month study period (see Appendix C, Table C1.1). Across the six pilot States, this constituted more than half a million households (*N*=544,698) completing a SNAP Online purchase. However, most SNAP households in participating pilot States (83.9 percent) made exclusively in-store purchases rather than online purchases during the study period.

The majority of households that made SNAP Online purchases lived in cities (n=238,685). Across five of the six pilot States,<sup>8</sup> the mean number of households in cities

#### **Urbanicity Categories**

- Rural: a census-defined rural area.
- Town: an area inside an urban cluster and outside an urbanized area.
- Suburban: an area outside a principal city and inside an urbanized area.
- *City:* an area inside an urbanized area and inside a principal city.

Section B.3 in Appendix B. Analytic Procedures describes how National Center for Education Statistics locale codes are mapped to urbanicity categories.

<sup>&</sup>lt;sup>8</sup> Household addresses were not reported for Oregon, and, therefore, it was not possible to assess urbanicity across all six pilot States. The evaluation did not have access to data on the share of SNAP households in urban areas. Therefore, it was not possible for the study team to determine whether the rate of usage was higher in urban areas. For more information, see Chapter 6.

making any SNAP Online purchase per month over the study period was 64,586, followed by suburban households (n=25,478), rural households (n=18,355), and households located in towns (n=13,572).

Most SNAP households made exclusively in-store rather than online purchases. However, the rate of SNAP Online participation differed across States (Figure 1). SNAP households in New York were most likely to have made at least one SNAP Online purchase during the study period (18.5 percent), whereas SNAP households in Iowa were least likely to have made at least one purchase (10.2 percent).

## Figure 1 Most SNAP households made exclusively in-store rather than online purchases.



**Source:** Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data and Anti-Fraud Locator Using Electronic Benefit Transfer Retailer Transactions (ALERT) summary data, March 2020–March 2021. For full analysis, see Appendix C, Table C1.1: Rate of SNAP Household Participation in Online Purchasing, March 2020–March 2021.

**Notes:** SNAP households in participating pilot States were categorized into two mutually exclusive categories each month based on purchasing behavior. SNAP households completing only in-store SNAP purchases during the month were categorized as exclusively "in-store." SNAP households making one or more SNAP Online purchases or a combination of in-store and online purchases during the month were categorized as "online."

Future research is needed to better understand who makes online purchases (e.g., socioeconomic, household, and demographic characteristics). On average each month, 10.7 percent of SNAP households in participating pilot States made at least one SNAP Online purchase. Monthly household SNAP Online participation rates grew over the 13month study period. For five of the six States, the highest percentage of household SNAP Online participation occurred in the final month of the study period. The exception was Iowa, which peaked the month prior (Figure 2). Across pilot States, the lowest percentage of household SNAP Online participation occurred in the first month of the study period. At the end of the study period, New York had the highest peak in the percentage of monthly household SNAP Online participation at 19.4 percent, whereas Nebraska had the lowest peak at 10.6 percent.

Overall, SNAP Online participation rates in New York increased at a faster rate than in other States. Figure 2 shows this as a gap between New York and the other States widening over the course of the study period.



Figure 2 Household SNAP Online participation grew over the study period. The highest rate of participation occurred in the final month of the study period, except in Iowa.

**Source:** Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data and Anti-Fraud Locator Using Electronic Benefit Transfer Retailer Transactions (ALERT) summary data, March 2020–March 2021. See Appendix C, Tables C1.2–C1.7: Rate of SNAP Household Participation in Online Purchasing in Pilot State, March 2020–2021.

Notes: Nebraska launched the SNAP Online purchasing pilot on April 2, 2020; therefore, there were no transaction data for March 2020.

Between the first and last month of the study period, the rate of SNAP households making an online purchase increased the most in Oregon (13.6 percentage points) and New York (13.5 percentage points) (Figure 3). The rate increased the least in Nebraska (6.2 percentage points). However, Nebraska also launched its pilot one month later than other participating States; between April 2020 and March 2021, the increase in the participation rate in Nebraska was similar to that experienced in Iowa. See Appendix C, Tables C1.1–C1.7 for additional detail on the rate of SNAP household participation in online purchasing, including State-specific tables by month and by urbanicity.

# Figure 3 The rate of SNAP households that made an online purchase increased the most in Oregon and New York between the first and last month of the study period.



First Month
 Last Month

**Source:** Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data and Anti-Fraud Locator Using Electronic Benefit Transfer Retailer Transactions (ALERT) summary data, March 2020–March 2021. See Appendix C, Tables C1.2–C1.7: Rate of SNAP Household Participation in Online Purchasing in Pilot State, March 2020–2021.

**Notes:** Percentage-point increases between the first and last month of the pilot are presented next to each bar in this figure. Nebraska launched the SNAP Online purchasing pilot on April 2, 2020, therefore there are no transaction data for March 2020.

#### 3.2 SNAP Online Purchases per Month

This section reports on frequency of SNAP Online purchases among participating households each month during the study period. Among those households that made at least one online purchase in a particular month, the study team tallied the total number of purchases made by the household in that month. For each household, the study team then averaged this total number of purchases across all participating months to determine the mean frequency of purchases during the months in which the household participated. Months in which the household did not participate were not included in the means. Households were then categorized by their mean number of purchases in participating months, with mean purchases of one per month categorized into the "1 purchase" category, mean purchases of more than one but less than or equal to two into the "2 purchases" category, and so forth, up to "5 or more purchases."

Among the 544,698 households participating in SNAP Online during the study period, three-quarters (75.9 percent) made, on average, one or two SNAP Online purchases per month in the months in which they participated (Figure 4). This pattern was similar across the six pilot States. See Appendix C, Tables C2.1–C2.7 for additional detail on the frequency of SNAP Online purchases by households per month, including State-specific tables.

## Figure 4 Three-quarters of participating households averaged one or two SNAP Online purchases in months when they participated.



Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data and Anti-Fraud Locator Using Electronic Benefit Transfer Retailer Transactions (ALERT) summary data, March 2020– March 2021. See Appendix C, Table C2.1: Mean Monthly Frequency of SNAP Online Purchases by Households. Notes: Households are categorized according to mean SNAP Online purchases during the months in which they participated. Nonparticipating months were not included in the means. The "1 purchase" category includes those that made exactly one purchase in each participating month, the "2 purchases" category includes those that averaged more than one but two or fewer purchases per participating month, and so forth up to "5 or more purchases."

#### 3.3 Transaction Patterns: Refunds and Reversals

Total SNAP Online transactions assessed in the study included SNAP Online *purchases, refunds,* and *reversals*. This section reports the proportion of online refunds and online reversals as a percentage of all SNAP Online transactions during the study period. The study team also assessed the distribution of refunds and reversals across urbanicity categories for all pilot States except for Oregon.<sup>9</sup>

Refunds occur when an ordered item is out of stock, if a weighted item is a lesser amount than anticipated, or if a customer cancels an item or an order.

SNAP Online refunds represented 32.1 percent of total SNAP Online transactions. Refunds, as a share of SNAP Online transactions, were fairly similar across pilot States, ranging from 28.7 percent of online purchases in New York to 39.9 percent in Alabama.

The rate of SNAP Online refunds varied little by urbanicity (Figure 5). The rate of online refunds was highest in rural areas (35.4 percent), followed closely by towns (35.0 percent) and suburbs (33.1 percent). Cities had the lowest rate of online refunds (29.6 percent).<sup>10</sup>

#### SNAP Online Refunds as a Percentage of Total Transactions, by Pilot State

- New York: 28.7 percent
- Washington: 30.9 percent
- Oregon: 31.9 percent
- lowa: 35.5 percent
- Nebraska: 35.6 percent
- Alabama: 39.9 percent

<sup>&</sup>lt;sup>9</sup> Oregon did not report household address data; therefore, it was not possible to assess returns and reversals by urbanicity in that pilot State. For more information, see Chapter 6.

<sup>&</sup>lt;sup>10</sup> Urbanicity categories—city, suburban, town, rural—are described in Table B2 (Mapping of Urbanicity Classifications to NCES Locale Codes) in Appendix B: Analytic Procedures.



## Figure 5 The rate of online refunds issued to SNAP EBT cards varied little by urbanicity.

**Source:** Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. See Appendix C, Table C3.1b: Rate of Refund and Reversal Transactions in Online Purchasing and Rate by Urbanicity.

Reversals reverse the original transaction message for transactions that are not fully processed and recorded, usually due to system errors.

The percentage of SNAP Online reversals was quite low, representing less than 1 percent of SNAP Online transactions. More specifically, of the more than eight million total SNAP Online transactions (N=8,050,958), only 37,331 were reversed during the study period. Results were consistent across pilot States and varied little by urbanicity. See Appendix C, Tables C3.1a–C3.7b for additional detail on the proportion and rate of refunds and reversals in SNAP Online purchasing by urbanicity, including Statespecific tables with monthly breakdowns.

## 4. Hotspots

#### **Chapter 4 Key Findings**

- The overall incidence of hotspot SNAP Online delivery addresses was less than 1 percent.
- None of the hotspot addresses was associated with an FNS authorized retailer.
- Less than 0.02 percent of unique delivery addresses were hotspots associated with a store owner's home address.

SOPE included two research questions related to the rate of SNAP Online deliveries to potentially suspicious addresses—what the evaluation refers to as "hotspots."

- RQ6: If a delivery is not made to a participant's home address or an FNS authorized retailer, is the delivery address used by enough other participants that the pattern is suspicious; i.e., the address is a "hotspot"? How often does this pattern occur?
- RQ7: How many delivery/shipping addresses match the address of an authorized store (based on a comparison to FNS's Store Tracking and Redemption System (STARS))? If possible, how many SNAP EBT customer names match the names of authorized store owners (based on a comparison of the data in STARS)?

Though SNAP fraud is rare, any incidence of fraud can damage the public's confidence in the Government and the SNAP program (USDA/FNS, 2013). One type of SNAP fraud is *trafficking*, or the exchanging of SNAP benefits for cash, often at a discount; a common type of trafficking occurs at SNAP authorized food retailers (Wilson, 2021). These two research questions addressed FNS's desire to develop analyses to identify potential fraud within SNAP Online transactions. The first focused on identifying delivery addresses receiving orders from a large number of SNAP household accounts as potentially suspicious. The second focused on flagging SNAP authorized retailers (and store owners) receiving orders from a large number of SNAP household accounts.

To address these questions, the study team defined *hotspot*, used this definition to identify hotspots in the OPP transaction data, then compared hotspots against SNAP retailer addresses and home addresses of store owners. Oregon was excluded from the hotspot analyses; that State did not provide household addresses, preventing the comparison of delivery and household addresses necessary for the analysis.

#### 4.1 Defining Hotspots

The evaluation defined a hotspot as an address that received deliveries for SNAP Online purchases from a larger-than-typical number of SNAP households (as defined by their State SNAP Household identifier). OPP data transactions with a fulfillment method of pick-up were not included in the hotspot analysis, as this analysis focused on addresses receiving deliveries. As detailed in Section 6.2, Amazon was the only pilot retailer with commercial delivery transactions, and all Amazon transactions were reported with a commercial delivery fulfillment method, even when they were delivered to an Amazon pick-up location for customer pick-up. As it was not possible to distinguish between deliveries to Amazon pick-up locations and deliveries to customer household addresses, all transactions with a commercial delivery fulfillment type were included in the hotspot analysis.

To assess an appropriate cut-off consistent with this "larger-than-typical" designation, the study team eliminated from the analytic sample all delivery addresses where (1) the participant's home address matched the delivery address and (2) the delivery address received deliveries *only* from SNAP households associated with that address and no other SNAP household addresses. The study team distinguished between delivery addresses belonging to the same multi-unit housing location such as apartment

buildings, to ensure they were not classified as hotspots (see Appendix B.4 for details). For the remaining delivery addresses, the delivery address differed from the household address and/or the delivery address received deliveries from multiple SNAP households not associated with the address. All hotspot analyses were conducted among this subset of remaining delivery addresses.

Within this group, the study team then examined the distribution of delivery addresses by number of households delivering to that address for the States with complete delivery address data (Table 2). In selecting a threshold of households for the hotspot definition, the study team recognized that choosing too high of a number would miss potentially suspicious addresses whereas too low of a number would capture legitimate behavior. On reviewing this distribution and in consultation with FNS, the study team defined *hotspot* as a unique delivery address that received SNAP Online orders from five or more SNAP households.

Number of	Alabama	lowa	Nebraska	New York	Washington					
Households Delivering to a Delivery Address	Number of Delivery Addresses									
1	31,515	15,585	7,352	191,542	59,210					
2	4,196	1,477	607	27,247	6,840					
3	796	266	91	5,238	1,303					
4	280	87	19	1,380	457					
5	81	31	14	512	177					
6	56	17	4	211	90					
7	31	6	2	116	69					
8	22	2	3	62	45					
9	10	3	1	46	28					
10	4	1	0	35	22					
11	5	1	2	20	16					
12	5	0	1	20	18					
13	0	1	0	13	7					
14	1	1	0	9	7					
15+	7	4	1	51	34					

## Table 2Distribution of Delivery Addresses by Number of SNAP Households<br/>Delivering to Address

**Source:** Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021.

Notes: Oregon data are excluded from this table because Oregon did not report household address information. Alabama's data are presented in this table but were excluded from the hotspot cut-off determination because data for approximately 50 percent of Alabama's transaction days were not available at that time.

In considering these results, it is important to note there are legitimate situations in which the household address and delivery address in a SNAP Online transaction will not match, so not all mismatches necessarily indicate suspicious activity. For example, SNAP participants might for convenience choose to have their groceries delivered to a different location away from home, such as their work, a neighbor's house, or a property management office. Alternatively, the SNAP Online delivery address might also be an FNS authorized retailer when an order is fulfilled through pick-up. In addition, SNAP participants can access their benefits when travelling from home to make a SNAP Online order deliver to an address where they are located while away. Finally, a SNAP participant might move but not immediately update their SNAP household address.

Because of these latter two possibilities, even a delivery address in a State differing from the State of the recorded home address is not inherently suspicious; SNAP benefits are interoperable, meaning participants can use their benefits outside the issuing State.

#### 4.2 Prevalence of Hotspots

Pilot States had a very low incidence of SNAP Online delivery addresses identified as hotspots (Figure 6). Across all pilot States, fewer than 1 percent of delivery addresses (0.5 percent) were hotspots. Washington State had the highest incidence, with 0.8 percent of unique delivery addresses identified as hotspots. Nebraska had the lowest incidence, with 0.3 percent of all unique delivery addresses identified as hotspots (Table 3).

## Figure 6 Fewer than 1 percent of SNAP Online delivery addresses were identified as hotspots.



**Source:** Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data and FNS's Store Tracking and Redemption System (STARS) retailer data, March 2020–March 2021. See Appendix C, Table C4: Relationship Between Delivery Address and Household Address.

Table 3	Number of Hots	pots and Percentage	e of All Unio	ue Delivery	y Addresses
---------	----------------	---------------------	---------------	-------------	-------------

Alabama		lowa Nebraska		New York Or		Oregon <sup>a</sup>		Washington		Total				
	%	N	%	Ν	%	Ν	%	Ν	%	Ν	%	Ν	%	Ν
Total number of hotspots	0.6	222	0.4	67	0.3	28	0.5	1,095	_	_	0.8	513	0.5	1,925
Total unique delivery addresses (N)b		37,009		17,482		8,097		226,502	_	_		68,323		357,413

**Source:** Appendix C, Table C4: Relationship Between Delivery Address and Household Address.

#### Notes:

<sup>a</sup> Oregon data are excluded from this table because Oregon did not report household address information.

<sup>b</sup> SNAP households can order delivery to more than one unique delivery address. There were 310,328 unique households in total, with 58,906 households (19.0 percent) associated with two or more delivery addresses.

None of the SNAP Online hotspot delivery addresses matched the address of a SNAP authorized retailer, and few matched a store owner's home address. Overall, 84 hotspot addresses were store owners' addresses, representing less than 0.02 percent of unique delivery addresses. New York had the highest number of matches at 50. None of Nebraska's store owners' home addresses was identified as a hotspot. There was only one match in Iowa (Table 4).

	Alabama		lowa		Nebraska		New York		Oregon <sup>a</sup>		Washington		Total	
	%	Ν	%	Ν	%	N	%	Ν	%	Ν	%	Ν	%	Ν
Hotspot delivery address is a:														
SNAP authorized retailer	0.0	0	0.0	0	0.0	0	0.0	0	-	-	0.0	0	0.0	0
Store owner's home address	4.1	9	1.5	1	0.0	0	4.6	50	-	-	4.7	24	4.4	84
Other <sup>b</sup>	95.9	213	98.5	66	100.0	28	95.4	1,045	_	_	95.3	489	95.6	1,841
Number of hotspots (N)	222		67		28		1,095		—		513		1,925	

#### Table 4 Percentage and Number of Hotspots by Delivery Location Type

Source: Appendix C, Table C4: Relationship Between Delivery Address and Household Address. Notes:

<sup>a</sup> Oregon data are excluded from this table because Oregon did not report household address information.

<sup>b</sup> Hotspot addresses that did not match to a SNAP retailer address or a SNAP store owner's home address.

The study team performed Google and web searches for the remaining 1,841 SNAP Online hotspot delivery addresses that were neither SNAP authorized retailers nor store owner's home addresses to categorize the address type and determine whether they were authorized pick-up locations (such as an Amazon Hub<sup>11</sup> or Amazon Fresh location). Within these 1,841 cases searched, 83.0 percent were residential (i.e., single-family or multifamily homes or apartments); 6.9 percent were locations providing social services (e.g., substance use disorder rehabilitation facility or homeless shelter); 5.8 percent were Amazon pick-up locations; 2.7 percent were college campuses, hotels/motels, or farms; and the final 1.5 percent were stores.

The rate of hotspots identified within each of the four urbanicity categories (*Rural, Town, Suburban, City*) were relatively consistent at 0.4, 0.7, 0.5, and 0.6 percent of unique delivery addresses, respectively. See Appendix C, Tables C5a and C5b for more detail on hotspots by urbanicity.

<sup>&</sup>lt;sup>11</sup> The Amazon Hub family includes Amazon Hub Locker, Amazon Hub Locker+, Amazon Hub Apartment Locker, and Amazon Counter.

### 5. Fulfillment Methods

#### **Chapter 5 Key Findings**

- The OPP transaction data did not fully reflect the customer experience of picking up their order because Amazon reported all orders as commercial delivery.
- Most orders in rural areas were fulfilled by pick-up; most orders in city areas were fulfilled by Amazon and reported as commercial delivery.
- Rural and city areas of Alabama, Iowa, and Nebraska had a higher percentage of purchase transactions fulfilled through pick-up than did rural and city areas of New York and Washington State.
- Overall, cities had a higher percentage of orders fulfilled through direct delivery than did rural areas.

This section addresses the last research question:

RQ8: What kinds of delivery type are used by online retailers?

To answer this question, the study team analyzed the OPP transaction data that indicated how a SNAP Online purchase was fulfilled. This report uses the term "fulfillment method" rather than "delivery type" because the former encompasses pick-up transactions, which do not involve delivery.

#### 5.1 Definition of Fulfillment Methods

The OPP transaction data included a field on fulfillment method for SNAP Online purchase transactions. This field contained one of three values for each purchase transaction:

- 1. **Pick-up**: the customer picks up their order at the retailer.
- 2. **Direct delivery**: the retailer delivers to the customer.
- 3. **Commercial delivery**: Amazon was the only pilot retailer with commercial delivery transactions, and all Amazon transactions were commercial delivery, whether the customer picked up their order at an Amazon Hub<sup>12</sup> or Amazon Fresh location, or the order was delivered to the customer's address.

As detailed in Section 6.1, the fulfillment method for all Amazon purchase transactions appeared as "commercial delivery" in the OPP transaction data. Therefore, for commercial delivery orders, the fulfillment method as experienced by a SNAP customer (whether a delivery or pick-up) cannot be determined with the OPP transaction data.

#### 5.2 Fulfillment Methods for Online Transactions – Overall

Commercial delivery (i.e., Amazon transactions) was the most common fulfillment method (42.9 percent) across all SNAP Online purchase transactions made in pilot States during the study period. Excluding Amazon orders, most SNAP Online orders were fulfilled by pick-up rather than direct delivery to the participant (Figure 7).

<sup>&</sup>lt;sup>12</sup> The Amazon Hub family includes Amazon Hub Locker, Amazon Hub Locker+, Amazon Hub Apartment Locker, and Amazon Counter.

# Figure 7 Nearly half of SNAP Online orders were fulfilled by Amazon, reported as commercial delivery. Excluding Amazon orders, most SNAP Online orders were fulfilled through pick-up (rather than through delivery to the household).



**Source:** Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. See Appendix C, Table C6.1a: Proportion of Online Order Fulfillment Method by Urbanicity.

The rate of fulfillment of SNAP Online purchase transactions through direct delivery was similar across the six pilot States, ranging from 16.6 percent in Iowa to 22.2 percent in Nebraska (Figure 8). Rates of pick-up and commercial delivery (i.e., Amazon transactions) varied more: Alabama, Iowa, and Nebraska had the highest pick-up rates, at 70.1, 65.9, and 63.6 percent; Oregon and Washington had lower rates, at 41.2 and 40.4 percent, respectively. New York had both the lowest rate of pick-up (20.2 percent) and the highest rate of commercial delivery (i.e., Amazon) (61.2 percent).

## Figure 8 New York had the highest rate of commercial delivery (i.e., Amazon). Iowa, Nebraska, and Alabama had high rates of pick-up.



**Source:** Evaluation of Technology Modernization for SNAP Benefit Redemption through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. See Appendix C, Table C6.1a: Proportion of Online Order Fulfillment Method by Urbanicity.

#### 5.3 Fulfillment Methods by Urbanicity

This section presents findings on the proportion of SNAP Online orders fulfilled through direct delivery, pick-up, or commercial delivery methods by urbanicity and by State. As detailed in Section 6.2, Oregon was not included in these analyses because the State did not provide SNAP household addresses.

As discussed below, fulfillment methods varied substantially by urbanicity, as did patterns by urbanicity across pilot States. However, an important caveat is that, as mentioned above in Section 5.1, it was not possible to determine from the OPP transaction data whether orders fulfilled through commercial delivery (i.e., Amazon orders) were picked up by the customer or delivered to the customer. This issue presents some challenges for interpretation. For example, with the larger proportion of SNAP Online orders fulfilled by Amazon in

Future research is needed to determine whether high rates of pick-up fulfillment in rural areas are due to customer preference or the unavailability of a home delivery option.

urban areas, it is difficult to assess whether apparent urban-rural differences in the proportion of noncommercial delivery orders fulfilled by pick-up versus direct delivery reflect true differences in the customer fulfillment experience.

With that caveat in mind, Figure 9 shows the distribution of pick-up, direct delivery, and commercial delivery order fulfillment for SNAP Online orders in rural and city areas. In rural areas, commercial delivery (i.e., Amazon transactions) accounted for only about a quarter of orders (23.7 percent). In contrast, in cities, most orders were fulfilled by commercial delivery (58.2 percent). Pick-ups were dramatically more common for rural orders (68.1 percent) than were direct deliveries (8.2 percent); whereas for city orders, the split was nearly even between pick-up (21.8 percent) and direct delivery

Future research is needed to determine whether those who would benefit most from delivery to their home address have equitable access to that fulfillment option.

(20.0 percent). Overall, the rates of pick-up, direct delivery, and commercial delivery in town and suburban areas bridged the gap between city and rural area rates, with pick-up transactions decreasing and direct and commercial delivery rates increasing.

## Figure 9 Most rural orders were fulfilled by pick-up whereas most city orders were fulfilled by Amazon and reported as commercial delivery.



**Source:** Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. See Appendix C, Table C6.1b: Rate of Online Order Fulfillment Method by Urbanicity.

For Alabama, Iowa, and Nebraska as a group, patterns by urbanicity were relatively similar to those reported for all pilot States (Figure 10). In rural areas of these States, less than a quarter of all orders were commercial deliveries. Among noncommercial deliveries for which it was possible to determine whether orders were picked up by or directly delivered to SNAP Online participants, the great majority (between 70 and 80 percent of all orders) were pick-up fulfillments, with only a small proportion of direct delivery fulfillments (between 3.8 and 7.7 percent). In the city areas of these States, pick-up fulfillments were still in the majority (between 50 and 60 percent), with direct deliveries accounting for almost a third of transactions and the smallest proportion fulfilled through commercial delivery (ranging from 10.3 to 14.4 percent). For these States, transactions in town areas mostly closely followed the pattern of rural areas, and transactions in suburban areas followed city areas (see Appendix C, Table C6.1b).

As noted in Section 5.1, overall, New York was a substantial outlier in fulfillment method, with a much higher proportion of orders fulfilled via commercial delivery than in the other States. This appears to have been primarily driven by city areas of the State: A full 78.2 percent of New York orders in city areas were fulfilled via commercial delivery, very few city orders were fulfilled via pick-up (6.5 percent), and the remainder were filled via direct delivery (15.3 percent)—a pattern quite dissimilar to that of city areas overall (Figure 10). In contrast, fulfillment in rural areas of New York appeared more similar to rural areas overall, with relatively similar levels of commercial delivery orders (29.5 percent vs. 23.7 percent), only moderately lower pick-up orders (59.5 percent vs. 68.1 percent), and only moderately higher direct delivery orders (10.9 percent vs. 8.2 percent). In New York town and suburban areas, pick-up rates were lower than in all States generally, and direct delivery and commercial delivery were higher (see Appendix C, Table C6.1b).

Though not as much of an outlier as New York, Washington State had the second-highest proportion of commercial deliveries among the pilot States examined, at 41.3 percent (see Figure 8). Unlike New York, in Washington this difference was not driven by city areas of the State only—Washington had only moderately higher commercial delivery order rates in its city areas (44.1 percent) versus its rural areas (36.4 percent) (Figure 10). In rural areas, Washington pick-up fulfillment rates (57.1 percent) were similar to those in New York and lower than those in Alabama, Iowa, and Nebraska; direct delivery rates (6.5 percent) conversely were slightly lower than those in New York and similar to those in the other three States examined. In city areas of Washington, pick-up fulfillment rates (32.1 percent) and direct delivery fulfillment rates (23.9 percent) fell between rates in New York and rates for the other three States. Washington town areas had the second-lowest rate of direct deliveries (2.6 percent) versus town areas of the other States, and the highest rate of commercial deliveries (32.4 percent) (see Appendix C, Table C6.1b). This pattern was similar in Washington's suburban areas, which had the lowest direct delivery rate of all State suburban areas (21.3 percent) and a high commercial delivery rate, in line with that of suburban areas of New York (43.1 vs. 44.3 percent, respectively) (see Appendix C, Table C6.1b).

## Figure 10 Patterns of fulfillment rates in Alabama, Iowa, and Nebraska differed from those in New York or Washington, even within urbanicities.



Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. See Appendix C, Table C6.1b: Rate of Online Order Fulfillment Method by Urbanicity.

#### 5.4 Additional Fulfillment Method Tables and Maps

The study team mapped the percentage of SNAP Online purchases by fulfillment type at the five-digit household ZIP code level for each of the pilot States. The maps are a visual representation of fulfillment method prevalence in cities and rural areas within the States. Due to the lack of household address data for Oregon, it was not possible to include that State in analyses based on household ZIP code.

Appendix D contains three fulfillment rate maps per State. In each set:

- The first State map shows the rate of online order fulfillment through commercial delivery (i.e., Amazon) as a percentage of all SNAP Online purchases.
- The next two maps (pick-up, direct delivery) include two images each, one image where the rate's denominator includes commercial delivery (left) and one image that excludes commercial delivery (right). As Amazon fulfilled a large portion of SNAP Online orders (43 percent, see Figure 7), the analysis calculated pick-up and direct delivery rates among retailers excluding commercial delivery (i.e., Amazon) because, as noted earlier, the customer experience of picking up their order at an Amazon Hub or Amazon Fresh location, or having the order delivered to the customer's address cannot be determined from the available data.

See Appendix C, Tables C6.1a–C6.7b for more detail on fulfillment methods. State-specific Tables C6.2a–C6.7b include the proportion and rate of fulfillment type by pilot State by month and by urbanicity.
## 6. Evaluation Challenges

#### **Chapter 6 Key Findings**

- For some retailers, the fulfillment method reported in the data did not always reflect the fulfillment method experienced by the SNAP customer.
- Oregon did not provide household addresses in the OPP transaction data.
- No administrative data were available to accurately calculate participation rates for areas smaller than the State.

Addressing the SOPE research questions required not only complete and accurate transaction data but also contextual insight into how SNAP operates across States and how retailers fulfilled online orders. This evaluation is the first study that used OPP transaction data. Therefore, little documentation existed to help with interpreting data elements for analysis.

To understand how elements in the OPP transaction data related to one another and to correctly interpret data patterns, the study team conducted a series of initial checks. These checks revealed some unexpected patterns that appear to be related to how SNAP operated across States and how EBT host processors coded fulfillment methods in the data for the different retailers. This chapter documents these patterns and potential analytic challenges so that future researchers are aware of possible pitfalls during data collection and how to interpret the data correctly.

#### 6.1 Reporting of Fulfillment Method

FNS seeks to understand which of three methods pilot retailers used to fulfill SNAP Online orders: pickup, direct delivery, or commercial delivery. The study team used OPP transaction data to analyze fulfillment methods. The values that appeared in the fulfillment method field in the OPP transaction data were:

- "Commercial delivery," when delivery was provided by a third party (e.g., FedEx, UPS). Amazon was the only pilot retailer with commercial delivery purchase transactions, and all Amazon purchase transactions had a fulfillment method of commercial delivery.
- "Direct delivery," when a retailer provided its own delivery to the customer
- "Pick-up," when a customer picked up their order at the retailer

The data additionally contained fields for delivery address and household address, which the study team used to analyze the prevalence of different fulfillment methods by geographic unit, as well as the relationship of household address to delivery address.

The study team used the fulfillment method field to identify orders that were delivered using commercial or direct delivery, as well as orders that were picked up by the customer. However, for two retailers, Amazon and ShopRite, the values for fulfillment method in the OPP transaction data did not always reflect the fulfillment method experienced by the customer, as described below:

• Amazon was the only pilot retailer with commercial delivery transactions, and all Amazon transactions in the OPP transaction data appeared as "commercial delivery" regardless of whether the order was picked up by the customer at an Amazon pick-up location (i.e., Amazon Hub<sup>13</sup> or Amazon

<sup>&</sup>lt;sup>13</sup> The Amazon Hub family includes Amazon Hub Locker, Amazon Hub Locker+, Amazon Hub Apartment Locker, and Amazon Counter.

Fresh location) or delivered to the customer's address. From the retailer perspective, the fulfillment method was coded correctly in the data, because Amazon orders that a customer picks up have been delivered to an Amazon pick-up location by a commercial shipper. However, available data did not identify whether the address the order was delivered to was an Amazon pick-up location or a customer address.

• Not being able to differentiate pick-ups by the customer from deliveries to the customer for Amazon orders presented a challenge for hotspot analysis. The analysis of hotspots tried to understand addresses that received multiple orders fulfilled

Though analysis was limited by data availability, the evaluation, as the first study collecting and using SNAP Online transaction data, provides new insight into the challenges researchers could encounter in this area of research.

through delivery only (commercial delivery or direct delivery) and removed from the analysis orders that appeared as pick-ups in the data. However, since the OPP transaction data did not differentiate Amazon orders picked up by the customer at an Amazon pick-up location from orders delivered to the customer, the inclusion of Amazon orders picked up by customers in the hotspot analysis may have overestimated the number of hotspots. (Chapter 4 provides a more detailed discussion of the hotspot analysis.)

- The inability to distinguish between the customer experience of picking up an order versus having it delivered to a customer address for commercial delivery transactions also affects the interpretability of the fulfillment method summary results. Chapter 5 provides detailed information on this analysis of fulfillment methods.
- For **ShopRite**, transaction data often showed orders fulfilled through pick-up, even though the pick-up location (i.e., delivery address) matched the SNAP household's home address (implying it had been delivered there). Almost three-quarters of pick-up locations in the New York data for ShopRite transactions matched the households' home addresses. These transactions did not appear in the OPP transaction data as either commercial delivery or direct delivery, so the study excluded them from the hotspot analysis. That exclusion may have resulted in an underestimate of the number of hotspots.

For a detailed description of the methods used to identify hotspots, see Appendix B. Analytic Procedures.

#### 6.2 Incomplete Reporting of Transaction and Household Address Data

At the conclusion of data collection, the study was missing three daily OPP transaction files for **Iowa**. In addition, the study's quality control procedures noted missing transactions in the OPP files that were received. The study team found evidence of missing transactions by comparing counts of purchase transactions in the OPP files versus total monthly transaction counts from the ALERT summary data. A notable difference (more than 5 percent) between the ALERT and OPP transaction data transaction counts suggests that the OPP transaction data were missing transactions. As a check, the study team flagged differences greater than 5 percent. Compared to purchases reported in the ALERT summary data, the count of SNAP Online purchases in Iowa was 19 percent lower in the September 2020 OPP transaction data and 6 percent lower in the January 2021 OPP transaction data. In addition, even though the study appeared to have received transaction files for all days for **Nebraska**, the count of purchases was 29 percent lower in the August 2021 OPP transaction data than in the ALERT summary data.

The study team included available data from Iowa and Nebraska in all tabulations in the analysis. Each table presenting Iowa and/or Nebraska data includes a footnote that references missing data.

**Oregon** did not report household addresses in its OPP transaction files. For this State, it was therefore not possible to identify hotspots, as that analysis relied on the ability to geocode household addresses. Hotspot data are not presented for Oregon in Table C4: Relationship Between Delivery Address and Household Address. Missing household address data for Oregon also made it impossible to calculate and

report urbanicity for this State. The breakdown of Oregon data by urbanicity is missing for all tables presenting such detail (i.e., cross-State Tables C1.1, C3.1a, C3.1b, C5a, C5b, C6.1a, and C6.1b, as well as State-specific Tables C1.6, C3.6, and C6.6).

#### 6.3 Errors in State-Reported Transaction Time

OPP transaction data included variables for the date and time a transaction occurred. The study team used transaction time fields to separate transactions across months for analysis of monthly SNAP Online transaction, fulfillment, and participation patterns. There were two date-time variables in the data: State time and Retailer time. The *State Time* was the State's time stamp for the transaction, and *Retailer Time* was the retailer's time stamp. According to FNS Online Purchasing Pilot Comma Separated Value File Requirements, v. 0.05, the field content for State Time was "Transaction date/time–State time zone (Contractor)," and that for Retailer Time was "Transaction date/time–Retailer System (from bits 013 & 012)."

The study team's data review of the time variables revealed errors in State Time. The year for some transactions in the Alabama, Iowa, and New York OPP transaction data was in the future (e.g., December 2021 in a daily file for December 2020), clearly indicating errors in the variable. Because there did not appear to be errors in the dates for Retailer Time, the study team used that data point to separate transactions across months.<sup>14</sup>

#### 6.4 Frequency of Out-of-State Addresses

SNAP benefits are interoperable, meaning participants can use their benefits outside the issuing State; thus, out-of-State transactions are not a concern for FNS.<sup>15</sup> However, without this contextual knowledge, deliveries made to addresses outside the household's home State could seem suspicious. Therefore, it is important that future researchers be aware of the flexibility that SNAP households have in redeeming benefits.

Across the six States in the study, the study team found 3 to 7 percent of transactions included out-of-State delivery addresses. The data also showed ALDI transactions in the Washington State data. Although ALDI was participating in SNAP Online, it did not operate in Washington State. All ALDI transactions in the analysis of Washington OPP transaction data were for out-of-State delivery addresses.

The study team also found less than half of 1 percent of transactions across all States had an out-of-State household address. Out-of-State household addresses could have appeared in a pilot State's OPP transaction data if SNAP households that reside outside the State placed an online order at a retailer participating in the State. In August 2021, the study team and FNS agreed the level of such out-of-State household addresses was low and to include these out-of-State household addresses in the analysis.

<sup>&</sup>lt;sup>14</sup> FNS uses host time GMT for internal analysis. The study team used Retailer Time to remove transactions occurring before the start date of the study period, March 1, 2020, and to separate analysis by month within the study period. For the analysis of frequency of purchases, the study team also used Retailer Time to group purchase transactions in the same calendar day as a single purchase event. Analysis methods are detailed in Appendix B: Analytic Procedures.

<sup>&</sup>lt;sup>15</sup> The study defines *out-of-State* as an address outside of the pilot State as reported in that pilot State's transaction files. For example, a delivery address in New York reported within a Washington State OPP transaction file is considered an "out-of-State" delivery address for Washington State. The study team also identified instances where both the household address and the delivery address in the OPP transaction files were not in the benefitissuing State.

Transactions with both an out-of-State household address *and* an out-of-State delivery address were extremely rare. Excluding Oregon (which did not provide household addresses), fewer than 0.3 percent of transactions per State had both an out-of-State delivery address and an out-of-State household address. To put that another way, between 94 and 99 percent of out-of-State delivery addresses were associated with in-State household addresses. This pattern likely reflects the interoperability of benefits. Here also the study team and FNS agreed that 0.3 percent (or less) of transactions with out-of-State household and delivery addresses was acceptable noise within the OPP transaction files and would remain in the analysis.

#### 6.5 Lack of SNAP Household Participation Data at ZIP Code Level

FNS is interested in the extent to which SNAP participants residing in rural, urban, and suburban areas in each of the study States made online purchases. Using available data, the study team explored options for a spatial analysis of the SNAP Online participation rate; that is, SNAP Online participants in a ZIP code as a percentage of SNAP participants in the ZIP code (or some other sub-State geographic unit). However, no administrative data source available to the study team provided counts of SNAP participants that allowed calculating SNAP participation rates by geographic units smaller than the State. It was therefore not possible to compute SNAP Online participation rates (as a fraction of SNAP participants) at the ZIP code level or comparable unit, and by extension, at the urbanicity level.

The study team explored merging publicly available American Community Survey (ACS) survey data on SNAP participation at the ZIP code level with the OPP transaction data to approximate rates. After careful examination of the merged data, the team with FNS decided not to pursue this analysis further. The following considerations led to that decision:

- Clear evidence exists in the literature that SNAP participation is underreported in surveys. Research shows that ACS nonresponse rates have increased in recent decades. A comparison of ACS and administrative data between 2000 and 2012 shows that estimates of SNAP receipt from the ACS data were almost half of that reported in administrative data (Meyer et al., 2015). More recent literature reveals that patterns of nonresponse bias vary with individual characteristics (Meyer et al., 2020). The study team's exploratory analysis was consistent with the literature, as it saw several ZIP codes with SNAP Online participation rates greater than 100 percent, implying that the denominator (SNAP household estimates from ACS data) was smaller than the numerator (SNAP households making online purchases from OPP transaction data).
- Survey data and pilot time periods do not align. The available ACS data were from the 2020 ACS survey responses on whether one or more current household members received SNAP benefits during the 12 months prior to the survey. SNAP enrollment increased rapidly in the second and third quarters of 2020 due to economic effects of the COVID-19 pandemic: SNAP enrollment jumped more than 15 percent, from 19 million households in January 2020 to 22 million households in January 2021. Enrollment remained elevated at approximately 22 million households through March 2021 (USDA/FNS, 2022a).
- The SNAP Online transaction data included Pandemic EBT (P-EBT) transactions. P-EBT and SNAP transactions were not separated in the OPP transaction data. P-EBT benefits were provided to school-aged children who would have otherwise received free or reduced-price meals if their schools were operating normally (USDA/FNS, 2022b). The inclusion of P-EBT benefits in the OPP transaction data could have led to overestimating of SNAP Online participation rates because the SNAP participant estimates in the ACS data might not include households that received P-EBT but not SNAP.

#### 6.6 Delays in Receiving Complete Data From the EBT Host Processor

Complete and accurate data are critical to identifying transaction patterns that could suggest fraudulent purchase activity. Due to delays by one EBT host processor, the study team received approximately half of Alabama's daily OPP transaction data more than 6 months later than expected.

Using the partial OPP transaction data for Alabama, the study team was still able to perform some preliminary analyses by using ALERT summary data instead of totals from the transaction data to compute denominators. However, with only partial data, it was not possible to answer research questions that required detailed comparisons of household and delivery addresses (e.g., RQ6 and RQ7). As a result, analysis was incomplete until the study team finally received complete data from that EBT host processor. The substantial delay in receipt of data caused inefficiencies in data processing and delays in sharing study findings with FNS.

### 7. Discussion

SOPE contributes to FNS's understanding of the implementation of SNAP Online benefit redemption by examining outcomes related to program integrity for six pilot States: Alabama, Iowa, Nebraska, New York, Oregon, and Washington State. Previous chapters discussed findings on participation in SNAP Online purchasing, including the frequency of purchases, refunds, and reversals; hotspots; and fulfillment methods—including differences by urbanicity and across participating States. This chapter summarizes key findings, discusses the implications of data challenges for analysis, and discusses promising areas for future research.

#### 7.1 Summary

Traditionally, SNAP households had to visit a retailer in person to make purchases using their SNAP benefits. Across the pilot States, most SNAP households continued to make in-store purchases exclusively, with only 16.1 percent of households completing any online purchase with their SNAP benefits during the study period, March 2020 through March 2021. However, participation grew over time. In the final 3 months of the study period, more than 10 percent of SNAP households each month made at least one SNAP Online purchase. Among those households that made online purchases, most (around three-quarters) averaged only one or two purchases per month in the months when they participated. SNAP Online refunds accounted for 32.1 percent of total online transactions.<sup>16</sup>

The evaluation found that few delivery addresses were receiving SNAP Online orders from five or more SNAP households. Such hotspots were not prevalent across the pilot States, with the overall proportion of hotspot delivery addresses being less than 1 percent of all delivery addresses. None of the hotspot addresses was associated with an FNS authorized retailer, and much less than 1 percent of unique delivery addresses (0.02 percent) were hotspots associated with a store owner's home address.

In addition to giving SNAP participants the flexibility to place and pay for SNAP purchases online, the SNAP Online Purchasing Pilot also expanded the ways those orders could be fulfilled beyond customers visiting a retailer to purchase their order. For SNAP Online purchases, the OPP transaction data included one of three fulfillment types for each order: *pick-up*, for when customers picked up their order at the retailer; *direct delivery*, when retailers provided their own delivery to the customer; or *commercial delivery* which was reported only by Amazon and included both orders delivered to a customer address or when a customer picked up at an Amazon Hub<sup>17</sup> or Amazon Fresh location. Most orders in rural areas were included in the OPP transaction data as fulfilled by pick-up, whereas most orders in city areas were fulfilled by Amazon and included in the OPP transaction data as commercial delivery.<sup>18</sup>

There were some fulfillment type distinctions among pilot States. Rural and city areas in Alabama, Iowa, and Nebraska had a higher percentage of transactions fulfilled through pick-up than did rural and city areas in New York and Washington State. Overall, city areas had a higher percentage of orders fulfilled through direct delivery than did rural areas. However, given limitations of the OPP transaction data, it is not possible to identify whether commercial deliveries were experienced by customers as direct delivery or pick-up fulfillments because Amazon reported all orders as commercial delivery.

<sup>&</sup>lt;sup>16</sup> Refunds occur when an ordered item is out of stock, if a weighted item is a lesser amount, than anticipated or if a customer cancels an item or an order.

<sup>&</sup>lt;sup>17</sup> The Amazon Hub family includes Amazon Hub Locker, Amazon Hub Locker+, Amazon Hub Apartment Locker, and Amazon Counter.

<sup>&</sup>lt;sup>18</sup> All Amazon transactions in the OPP data were reported as commercial delivery whether they were delivered directly to the household or delivered to an Amazon Hub or Amazon Fresh location for pick-up.

#### 7.2 Implications of Data Challenges

This evaluation was the first to use SNAP Online transaction data. Not surprisingly, the study team encountered challenges with obtaining, cleaning, and analyzing the data available. These challenges resulted in delays in reporting and in some cases limited analyses, as described in Chapter 6.

Retailers reported fulfillment methods (pick-up, direct delivery, and commercial delivery) in the OPP transaction data. However, these reported values did not necessarily reflect how customers actually received their online purchases. These discrepancies prevented the study team from accurately describing how online orders were fulfilled from a customer perspective. Consequently, FNS does not have a full understanding of how customers experienced online redemption. Most notably, the study team could not determine whether customers who ordered through Amazon received their orders through delivery directly to their home or work or delivery to an Amazon pick-up location. As fulfillment reported as commercial delivery (i.e., Amazon orders) accounted for nearly 43 percent of all purchase transactions, the inability to distinguish between the customer experience of delivery versus pick-up has significant implications for understanding how SNAP Online orders were fulfilled. In States and city areas where a high proportion of SNAP Online orders were fulfilled by Amazon, for example, this factor could distort comparisons of customer pick-up versus delivery fulfillments, as compared to areas with lower proportions of Amazon orders.

Oregon was the only pilot State that did not provide SNAP household addresses in the OPP transaction data. These missing data affected its State-level analyses (i.e., it was not possible to identify hotspots or calculate urbanicity trends). In addition, as Oregon accounted for 13.6 percent of all pilot SNAP Online transactions, these missing data also affected cross-State analyses and limit FNS's ability to understand larger trends around where purchases were made by urbanicity.

Administrative data were not available that allowed for analysis to calculate rates of participation below a State level. This prevents FNS from understanding the share of SNAP households residing in rural, urban, or suburban areas that made SNAP Online purchases. The lack of such administrative data also impedes analysts from understanding how SNAP Online could help participants without ready access to brick-and-mortar food retailers.

Though analysis was limited by data availability, the evaluation—as the first study collecting and using SNAP Online transaction data—provides new insight into the challenges researchers might encounter in this area of research, and it identifies promising opportunities for future research discussed below.

#### 7.3 Promising Areas for Future Research

This evaluation identified patterns in SNAP Online participation, identified hotspots, and analyzed fulfillment methods. There is still much to be learned about SNAP Online as it continues to expand across the country, covering nearly every State. One of the goals of SNAP technology modernization is to increase eligible households' participation in SNAP. To help FNS better understand the extent of SNAP Online participation in rural versus urban areas, or among different populations or geographies, researchers could analyze State-level case record data. These data could be geocoded to analyze geographic trends; for example, the prevalence of SNAP Online participation among households that live in low food access areas. Though linking case record data to ALERT or OPP transaction data could be challenging, it would increase understanding of equitable access to SNAP Online.

Analysis of transaction amounts would provide useful information about the scale of online purchasing as compared to in-store transactions. Future research could examine the average amount of benefits redeemed per online transaction, as well as the average proportion of monthly benefits households redeem online. Researchers could also examine the size of purchases made per month, particularly among

households that make multiple purchases per month. It would be useful to understand how this compares to transactions among households making multiple in-store purchases per month.

Analysis of the amount of online purchases refunded to households might be of interest. Examining the average amount of refunds, including the proportion of benefits refunded to purchases, could inform FNS's understanding of SNAP Online order adjustments and how they compare to the size and prevalence of in-store refunds.

In-depth interviews or focus groups with members of SNAP households could shed light on how SNAP Online has affected purchasing and consumption of food. Information gathered about the participant perspective could be used to better understand why certain populations (e.g., rural residents) choose to or not to participate in online shopping. These perspectives would inform equity and inclusion considerations in SNAP Online participation. Analyses of SNAP case records would provide details about the characteristics of SNAP households (e.g., older adults, families versus able-bodied adults without dependents). These data, along with insights gained from the in-depth interviews with SNAP households that shop online, could allow FNS, State agencies, and community partners to target outreach to populations that would benefit from access to healthy foods through online shopping.

FNS and future researchers also might be interested in better understanding the online order fulfillment method experienced by the SNAP participants. Given the prevalence of SNAP Online purchases through Amazon, additional analysis of Amazon's fulfillment methods might be warranted. An address file containing all Amazon pick-up locations could be matched to the fulfillment addresses in the OPP transaction data to better describe the use of secondary, centralized pick-up locations.

An implementation study, including interviews with State administrators, EBT host processors, and retailers, would help FNS identify best practices and lessons learned to share with retailers and States as they consider, plan for, implement, and expand SNAP Online. Such research could be used to refine technical assistance and support to retailers and States, but it could also be useful to inform future SNAP modernization efforts. Additionally, interviews with retailers could shed light on which fulfillment methods are available in different areas they serve. Such interviews would likely provide insight into options that might influence customers' decisions to redeem SNAP benefits online.

# Appendix A. Research Questions Addressed by Tables, Figures, and Maps

Research Question		Tables, Figures, and Maps
RQ1: Determine to the extent feasible	Chapter 3	figures
from the data available, the extent to which online purchases are being made by participants	Figure 1	Most SNAP households made exclusively in-store rather than online purchases.
residing in rural, urban, and suburban areas in each of the six (6) study States?	Figure 2	Household SNAP Online participation grew over the study period. The highest rate of participation occurred in the final month of the study period, except in Iowa.
RQ2: How many SNAP EBT customers use online SNAP EBT payments?	Figure 3	The rate of SNAP households that made an online purchase increased the most in Oregon and New York between the first and last month of the study period
RQ3: What is the percentage of SNAP	Annendix	C tables
SNAP EBT navments?		Pate of CNAP Household Participation in Online Durchasing, March 2020
ONAL EDT payments:		March 2021
	Table C1.2	Rate of SNAP Household Participation in Online Purchasing in Alabama, March 2020–March 2021
	Table C1.3	Rate of SNAP Household Participation in Online Purchasing in Iowa, March 2020–March 2021
	Table C1.4	Rate of SNAP Household Participation in Online Purchasing in Nebraska, March 2020–March 2021
	Table C1.5	Rate of SNAP Household Participation in Online Purchasing in New York, March 2020–March 2021
	Table C1.6	Rate of SNAP Household Participation in Online Purchasing in Oregon, March 2020–March 2021
	Table C1.7	Rate of SNAP Household Participation in Online Purchasing in Washington, March 2020–March 2021
RQ4: What is the frequency of online	Chapter 3	figure
purchases per household per month?	Figure 4	Three-quarters of participating households averaged one or two SNAP Online purchases in months when they participated.
	Appendix	C tables
	Table C2.1	Mean Monthly Frequency of SNAP Online Purchases by Household
	Table C2.2	Frequency of SNAP Online Purchases by Households per Month in Alabama, March 2020–March 2021
	Table C2.3	Frequency of SNAP Online Purchases by Households per Month in Iowa, March 2020–March 2021
	Table C2.4	Frequency of SNAP Online Purchases by Households per Month in Nebraska, March 2020–March 2021
	Table C2.5	Frequency of SNAP Online Purchases by Households per Month in New York, March 2020–March 2021
	Table C2.6	Frequency of SNAP Online Purchases by Households per Month in Oregon, March 2020–March 2021
	Table C2.7	Frequency of SNAP Online Purchases by Households per Month in Washington, March 2020–March 2021

#### APPENDIX A. RESEARCH QUESTIONS ADDRESSED BY TABLES, FIGURES, AND MAPS

Research Question	Tables, Figures, and Maps									
RQ5: How many refunds are issued to	Chapter 3 figure									
SNAP EBT cards?	Figure 5 The rate of online refunds issued to SNAP EBT cards varied little by urbanicity.									
	Appendix C tables									
	Table C3.1aRefunds and Reversals as a Proportion of Transactions in OnlinePurchasing by Urbanicity									
	Table C3.1bRate of Refund and Reversal Transactions in Online Purchasing and Rate by Urbanicity									
	Table C3.2aRefunds and Reversals as a Proportion of Transactions in OnlinePurchasing by Urbanicity in Alabama, March 2020–March 2021									
	Table C3.2bRate of Refund and Reversal Transactions in Online Purchasing and Rate by Urbanicity in Alabama, March 2020–March 2021									
	Table C3.3aRefunds and Reversals as a Proportion of Transactions in OnlinePurchasing by Urbanicity in Iowa, March 2020–March 2021									
	Table C3.3bRate of Refund and Reversal Transactions in Online Purchasing and Rate by Urbanicity in Iowa, March 2020–March 2021									
	Table C3.4aRefunds and Reversals as a Proportion of Transactions in OnlinePurchasing by Urbanicity in Nebraska, March 2020–March 2021									
	Table C3.4bRate of Refund and Reversal Transactions in Online Purchasing and Rate by Urbanicity in Nebraska, March 2020–March 2021									
	Table C3.5aRefunds and Reversals as a Proportion of Transactions in OnlinePurchasing by Urbanicity in New York, March 2020–March 2021									
	Table C3.5bRate of Refund and Reversal Transactions in Online Purchasing and Rate by Urbanicity in New York, March 2020–March 2021									
	Table C3.6Refunds and Reversals as a Proportion of Transactions in Online Purchasing in Oregon, March 2020–March 2021									
	Table C3.7aRefunds and Reversals as a Proportion of Transactions in OnlinePurchasing by Urbanicity in Washington, March 2020–March 2021									
	Table C3.7bRate of Refund and Reversal Transactions in Online Purchasing and Rate by Urbanicity in Washington, March 2020–March 2021									
RQ6: If a delivery is not made to a	Chapter 4 tables and figure									
FINS authorized retailer, is the	Table 2         Distribution of Delivery Addresses by Number of SNAP Households           Delivering to Address									
other participants that the pattern is suspicious; i.e., the address is	Figure 6 Fewer than 1 percent of SNAP Online delivery addresses were identified as hotspots.									
a "hotspot"? How often does this	Table 3         Number of Hotspots and Percentage of All Unique Delivery Addresses									
pattern occur?	Table 4         Percentage and Number of Hotspots by Delivery Location Type									
RQ7: How many delivery/shipping	Appendix C tables									
an authorized store (based on a	Table C4 Relationship Between Delivery Address and Household Address									
comparison to FNS's Store	Table C5a Proportion of Hotspots by Urbanicity									
Tracking and Redemption System (STARS))? If possible,	Table C5b Rate of Hotspots and Rate by Urbanicity									
names match the names of										
authorized store owners (based										
on a comparison of the data in STARS)?										

#### APPENDIX A. RESEARCH QUESTIONS ADDRESSED BY TABLES, FIGURES, AND MAPS

Research Question	Tables, Figures, and Maps									
RQ8: What kinds of delivery type are	Chapter 5 f	igures								
used by online retailers?	Figure 7 N	learly half of SNAP Online orders were fulfilled by Amazon and reported as ommercial delivery.								
	Figure 8 N N	lew York had the highest rate of commercial delivery (i.e., Amazon). Iowa, lebraska, and Alabama had high rates of pick-up.								
	Figure 9 M	lost rural orders were fulfilled by pick-up whereas most city orders were ulfilled by Amazon and reported as commercial delivery.								
	Figure 10 P	atterns of fulfillment rates in Alabama, Iowa, and Nebraska differed from nose in New York or Washington, even within urbanicities.								
	Appendix C	tables								
	Table C6.1a	Proportion of Online Order Fulfillment Method by Urbanicity								
	Table C6.1b	Rate of Online Order Fulfillment Method by Urbanicity								
	Table C6.2a	Proportion of Online Order Fulfillment Method by Urbanicity in Alabama, March 2020–March 2021								
	Table C6.2b	<ul> <li>Rate of Online Order Fulfillment Method by Urbanicity in Alabama, March 2020–March 2021</li> </ul>								
	Table C6.3a	Proportion of Online Order Fulfillment Method by Urbanicity in Iowa, March 2020–March 2021								
	Table C6.3b	Rate of Online Order Fulfillment Method by Urbanicity in Iowa, March 2020–March 2021								
	Table C6.4a	Proportion of Online Order Fulfillment Method by Urbanicity in Nebraska, March 2020–March 2021								
	Table C6.4b	Rate of Online Order Fulfillment Method by Urbanicity in Nebraska, March 2020–March 2021								
	Table C6.5a	Proportion of Online Order Fulfillment Method by Urbanicity in New York, March 2020–March 2021								
	Table C6.5b	Rate of Online Order Fulfillment Method by Urbanicity in New York, March 2020–March 2021								
	Table C6.6	Proportion of Online Order Fulfillment Method in Oregon, March 2020– March 2021								
	Table C6.7a	Proportion of Online Order Fulfillment Method by Urbanicity in Washington, March 2020–March 2021								
	Table C6.7b	Rate of Online Order Fulfillment Method by Urbanicity in Washington, March 2020–March 2021								
	Appendix D	) maps								
	Map D1 R ir	Rate of Online Order Fulfillment through Commercial Delivery, i.e., Amazon n Alabama, March 2020–March 2021								
	Map D2 R M	ate of Online Order Fulfillment through Pick-up in Alabama, March 2020– Iarch 2021								
	Map D3 R 2	ate of Online Order Fulfillment through Direct Delivery in Alabama, March 020–March 2021								
	Map D4 R ir	Rate of Online Order Fulfillment through Commercial Delivery, i.e., Amazon n Iowa, March 2020–March 2021								
	Map D5 R M	ate of Online Order Fulfillment through Pick-up in Iowa, March 2020– Iarch 2021								
	Map D6 R 2	ate of Online Order Fulfillment through Direct Delivery in Iowa, March 020–March 2021								

#### APPENDIX A. RESEARCH QUESTIONS ADDRESSED BY TABLES, FIGURES, AND MAPS

Research Question		Tables, Figures, and Maps
	Map D7	Rate of Online Order Fulfillment through Commercial Delivery, i.e., Amazon in Nebraska, March 2020–March 2021
	Map D8	Rate of Online Order Fulfillment through Pick-up in Nebraska, March 2020– March 2021
	Map D9	Rate of Online Order Fulfillment through Direct Delivery in Nebraska, March 2020–March 2021
	Map D10	Rate of Online Order Fulfillment through Commercial Delivery, i.e., Amazon in New York, March 2020–March 2021
	Map D11	Rate of Online Order Fulfillment through Pick-up in New York, March 2020– March 2021
	Map D12	Rate of Online Order Fulfillment through Direct Delivery in New York, March 2020–March 2021
	Map D13	Rate of Online Order Fulfillment through Commercial Delivery, i.e., Amazon in Washington, March 2020–March 2021
	Map D14	Rate of Online Order Fulfillment through Pick-up in Washington, March 2020–March 2021
	Map D15	Rate of Online Order Fulfillment through Direct Delivery in Washington, March 2020–March 2021

**Key:** ALERT=Anti-Fraud Locator Using Electronic Benefit Transfer Retailer Transactions. EBT=electronic benefits transfer. FNS=Food and Nutrition Service. OPP=Online Purchasing Pilot. STARS=Store Tracking and Redemption System.

## **Appendix B. Analytic Procedures**

This appendix provides details on the study's analytic methods. It builds on the *Updated Revised Study Plan* (approved by FNS on June 18, 2021) and the *Analysis Plan Updated Memorandum* (submitted to FNS on November 5, 2021). Analytic procedures used by the study team included the following:

- Geocoding and assigning urbanicity categories
- Identifying hotspots
- SNAP Online participation rates
- Frequency of purchases, refunds, and reversals
- Rates of hotspots, online fulfillment method, and refunds and reversals by urbanicity
- Maps displaying rates of online fulfillment method by ZIP code

#### B.1 Geocoding and Assigning Urbanicity Categories

One of the main objectives of the study was to determine whether SNAP Online deliveries were being sent to addresses that were not the SNAP household's household address, and if so, whether they were being delivered to a SNAP retailer or store owner's home address. The research questions also ask for delivery types and SNAP Online purchase patterns by urban, suburban, and rural locations. To this end, the study team geocoded addresses to locate the coordinates of delivery, household, SNAP retailer, and store owner home addresses for mapping, assigning urbanicity categories, and conducting further spatial analysis. Comparisons between pairs of coordinates are more precise than if the analysis were to rely on text comparisons between addresses (e.g., when the same address is entered slightly differently; "St." vs. "Street"). Text comparisons might treat text variations of the same address as different addresses. Geocoding packages are better able to recognize variations of an address and assign the same coordinates to those variations.

#### B.2 Geocoding

The study team implemented a two-step approach for geocoding using two applications: PC\*MILER Version 34 North America Highway and ArcGIS World Geocoder:

- 1. The study team first processed addresses through the PC\*MILER geocoder and set aside the matched results.
- 2. The study team processed the remaining unlocated addresses using the ArcGIS World Geocoder.

This dual geocoder approach accommodated the large number of addresses and maximized the number of located records without additional labor-intensive manual review. Using two tools when the first was not able to locate an address allowed the second an attempt to find the location. The match rates that this process produced for delivery and household addresses are presented in Table B1. The match rate among store owner home addresses was 95 percent. The coordinates for SNAP retailer addresses were already included in the Store Tracking and Redemption System (STARS) data; therefore, the study team did not geocode them.

	Alab	ama	lowa		Nebraska		New York		<b>Oregon</b> <sup>a</sup>		Washington		Total	
	Delivery Address	Household Address	Delivery Address	Household Address	Delivery Address	Household Address	Delivery Address	Household Address	Delivery Address	Household Address	Delivery Address	Household Address	Delivery Address	Household Address
				Addre	ess Matc	h Rate,	Percent	age of A	Address	es				
Address matched a coordinate	99	96	99	95	99	94	99	97			98	93	99	96

 Table B1
 Geocoding Match Rates Among Delivery and Household Addresses

**Source:** Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021.

#### Notes:

<sup>a</sup> Oregon does not provide household addresses, and therefore was excluded from the hotspot analysis.

The study team conducted a sensitivity analysis to assess differences between the two GIS applications and geocoded a sample of 800 addresses using both PC\*MILER and ArcGIS Word Geocoder. The sample consisted of random addresses from each State's household and retailer address files. The team compared the match rate between methods, as well as the distances between coordinates for the same address. PC\*MILER matched 100 percent of the sample whereas the ArcGIS World Geocoder matched 90 percent of the sample. ArcGIS World Geocoder also produces a quality score,<sup>3</sup> which the team used to filter out lower-quality matches, contributing to the lower match rate. ArcGIS results with a score less than or equal to 95 percent were classified as unmatched.

Differences in match rate appeared to be due to differences in each program's geocoding network and how each geocoder searches for and assigns a match. As PC\*MILER is used primarily for traffic routing, it produces a location directly along the street edge. Conversely, the ArcGIS World Geocoder is used to find address locations that represent individual structures (e.g., the rooftop of a structure when possible). The difference can be relatively small or large depending on the context. For example, a retailer with a large parking lot separating the rooftop from the street address would have a larger distance between the locations.

The study team reviewed the distance between matched coordinates for each address. There were large differences where coordinates were generated based on different interpretations of the same input address (e.g., based on formatting or spelling errors in an address). In these cases, locations did not represent the same place and therefore the comparison showed greater distances between the locations. Minor differences were the most common and were due to differences in what the different applications were designed for. The average distance between delivery locations was 97 meters, and the average distance between household locations was 117 meters. Because the two packages produced similar geocoded locations, the team was confident in implementing the two-step approach described above.

#### **B.3** Assigning Urbanicity Classifications

After geocoding addresses, the study team assigned them urbanicity classifications. To do so, the study team used the National Center for Education Statistics (NCES) Locale framework. The NCES dataset includes spatial data with classification attributes of *city, suburban, town,* and *rural areas*. The team overlaid the address coordinates from the geocoding exercise with the NCES polygons to assign their urbanicity classifications to addresses. Table B2 shows the mapping between the urbanicity classifications and the NCES locale attributes.

Urbanicity Category	Subtype	NCES Locale Codes	Description
	City – Large	11	Territory inside an Urbanized Area and inside a Principal City with population of 250,000 or more.
City	City – Midsize	12	Territory inside an Urbanized Area and inside a Principal City with population less than 250,000 and greater than or equal to 100,000.
	City – Small	13	Territory inside an Urbanized Area and inside a Principal City with population less than 100,000.
	Suburban – Large	21	Territory outside a Principal City and inside an Urbanized Area with population of 250,000 or more.
Suburban	Suburban – Midsize	22	Territory outside a Principal City and inside an Urbanized Area with population less than 250,000 and greater than or equal to 100,000.
	Suburban – Small	23	Territory outside a Principal City and inside an Urbanized Area with population less than 100,000.
	Town – Fringe	31	Territory inside an Urban Cluster that is less than or equal to 10 miles from an Urbanized Area.
Town	Town – Distant	32	Territory inside an Urban Cluster that is more than 10 miles and less than or equal to 35 miles from an Urbanized Area.
	Town – Remote	33	Territory inside an Urban Cluster that is more than 35 miles from an Urbanized Area.
	Rural – Fringe	41	Census-defined rural territory that is less than or equal to 5 miles from an Urbanized Area, as well as rural territory that is less than or equal to 2.5 miles from an Urban Cluster.
Rural	Rural – Distant	42	Census-defined rural territory that is more than 5 miles but less than or equal to 25 miles from an Urbanized Area, as well as rural territory that is more than 2.5 miles but less than or equal to 10 miles from an Urban Cluster.
	Rural – Remote	43	Census-defined rural territory that is more than 25 miles from an Urbanized Area and also more than 10 miles from an Urban Cluster.

Table B2	Mapping of Urbanicity	/ Classifications to NCES	<b>Locale Codes</b>
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Source: Methodology and definitions from EDGE Program: Locale Boundaries File Documentation (Geverdt, 2019).

#### **B.4** Identifying Hotspots

The study defined a "hotspot" as a delivery location that received deliveries from a larger-than-typical number of SNAP accounts. The study team's approach to identifying hotspots was as follows:

- 1. Defined a SNAP account. The study team used the State's SNAP household identifier, State\_ID, to define a SNAP account, instead of the geocoded household address because multiple SNAP households may live at the same address (e.g., a multi-family household or an apartment complex).
- 2. Identified unique delivery addresses and assigned delivery address IDs. The same delivery address may appear in the Online Purchasing Pilot (OPP) transaction data with slight text variations, which is why the study team geocoded locations so that different versions of the same address were treated as one address. However, individual living units in multi-unit dwellings were geocoded to the same location, so geocoding alone could not be relied on to determine a unique delivery address. Relying exclusively on the geocoded location to identify a unique delivery address would have overcounted the number of hotpots. The study team, therefore, took another approach and first standardized common address terms like "Street" and "Road," among others, across addresses, and then used a multi-step approach to identify unique delivery locations:

If a coordinate was mapped to only one delivery address, that delivery address was assigned a unique delivery address ID.

If multiple delivery addresses were geocoded to the same coordinate the study team extracted the house or building number using SAS functions. The code parsed out the text in the delivery address field to see if they differed across addresses. Delivery addresses with different house numbers were treated as different addresses and assigned a 'building' ID (note this is not the final delivery address ID). For example, if delivery addresses "1234 Willow Drive," and "1236 Willow Drive" were geocoded to the same location, the team assigned them different building IDs. If only one delivery address was mapped to a building ID, that address was assigned a separate delivery address ID. A group of addresses with the same building number was assigned the same building ID; their assignment of unique delivery address IDs is explained in the following step.

Identified whether groups of addresses assigned the same building ID from the previous step were multi-unit dwellings. The team searched for key words or symbols in the address field text that may have indicated whether the dwelling was an apartment building, trailer park, duplex, etc. (e.g., "APT," "UNIT," "TRLR," "#"). If a key word was found in any of the addresses mapped to the same building ID, a unique address ID was assigned to each address in the group.

Checked whether the same delivery address, but with slight text variations, within a multi-unit dwelling was assigned multiple address IDs, and if so corrected them to be the same ID. The study team did this by checking whether different addresses within a multi-unit dwelling corresponded to the same State\_ID. If they did, the delivery address IDs were updated to be the same. The idea was that delivery addresses within the same dwelling that appear to be different because of text variations were more likely to be the same address if the same SNAP account was associated with them.

- 3. Determined whether the delivery address was the same as the household address. The addresses were determined to be the same if the Euclidean distance between the geocoded household and delivery locations was less than or equal to 10 meters.
- 4. Identified hotspots by counting the number of distinct SNAP households (State\_ID) that had orders delivered to a delivery address ID over the study period. For this analysis, the study team restricted the transaction data to orders where the fulfillment method (delivery\_type) = "shipped" or "direct delivery." The delivery\_type value of "shipped" is referred to as *commercial delivery* throughout the report and tabulations. As noted earlier, all Amazon transactions were coded as "shipped" (i.e., commercial delivery) in the OPP transaction data. Therefore, deliveries to Amazon pick-up locations were also categorized as "shipped" instead of pick-up in the OPP data. This likely resulted in an overcount of hotspots because Amazon pick-up locations cannot be identified and filtered out from the analysis. Table 2 in Chapter 4 shows the distribution of the number of SNAP households delivering to an address. Based on this distribution, the number of delivery addresses tapers off when there are five or more SNAP households delivering to an address. The study team, with agreement from FNS, set a cut-off of five households to consider a delivery address a hotspot.
- 5. Compared hotspot addresses to SNAP retailer addresses and store owner home addresses contained in the STARS data. The study team performed Google and web searches for the remaining hotspots not matched to a retailer or store owner home address to categorize the address type.

#### **B.5** SNAP Online Participation Rates

The SNAP Online participation rate is the ratio of two components:

- Numerator: Number of households that made a SNAP Online purchase
- Denominator: Number of households that made any type of SNAP purchase, online or in-store

The study team used OPP transaction data to calculate the number of households that made a SNAP Online purchase (numerator), and the Anti-Fraud Locator Using Electronic Benefit Transfer Retailer Transactions (ALERT) summary data to calculate the number of households that made any type of SNAP purchase (denominator). Using the OPP transaction data to calculate the number of households that made a SNAP Online purchase allows for more accurate calculations of the number of participating households by urbanicity.

The **monthly SNAP Online participation rate** was calculated by taking the ratio of the following components:

- The number of households that made a SNAP Online purchase in a given month
- The number of households that made any type of SNAP purchase, online or in-store, in that month

The mean monthly SNAP Online participation rate was the ratio of the following components:

- The monthly average of the number of households that made a SNAP Online purchase across the 13 months of the study period
- The monthly average of the number of households that made any type of SNAP purchase, online or in-store, across the 13 months of the study period

In addition to these overall measures, the study team separately calculated the total, monthly, and mean monthly number of households that made a SNAP Online purchase for each urbanicity category.

#### B.6 Frequency of Purchases, Refunds, and Reversals

SNAP Online purchases that were split and fulfilled by different locations appeared in the data as different transactions. As the data did not include the order number, it was not possible to link transactions to the same purchase order. To count the number of purchases, the team attempted to identify all transactions from a single purchase order by grouping all purchase transactions that occurred on the same calendar day for the same retailer. Purchase transactions that occurred on a given day were counted as one purchase for that household.

To present the number of households that made, on average, one, two, three, four, or five or more SNAP Online purchases per month, the study team first calculated the average number of SNAP Online purchases per month for each household. The study team used retailer time to separate transactions by month and day.<sup>19</sup> After grouping transactions into purchases, as described above, the study team calculated the average frequency of SNAP Online purchases across the 13 study months for each household. The average frequency of SNAP Online purchases per month by a household is calculated by taking the average of the number of purchases across months they participated in SNAP Online. The study team did not include zeros in the average for months in which they did not make a SNAP Online purchase. A household was counted towards making one SNAP Online purchases per month if their average frequency of purchases per month was exactly one. A household was counted towards making two SNAP Online purchases per month if their average frequency of purchases per month if their average frequency of purchases per month. Tables C2.1–C2.7 present the results of this analysis.

<sup>&</sup>lt;sup>19</sup> The Food and Nutrition Service uses host time GMT for internal analysis.

Refunds<sup>20</sup> and reversals for the same order could have occurred on different days, and the study team did not attempt to group them. Therefore, refunds and reversals from the same order, but split into different transactions, were counted separately. Tables C3.1a–C3.7b present refunds and reversals as percentages of all transactions which include separate (not grouped) purchase transactions.

## B.7 Rates of Hotspots, Online Fulfillment Method, and Refunds and Reversals by Urbanicity

The analysis conducted two types of analysis on rates by urbanicity:

- Distribution of SNAP Online activity across urbanicity categories. These analyses included the distribution of hotspots, separate fulfillment methods, and refunds and reversals across urbanicity categories. The distributions show where hotspots, transactions by fulfillment type, and refunds and reversals were concentrated.
- Rate of SNAP Online activity within a given urbanicity category. These analyses included the rate of delivery addresses within a given urbanicity category that were hotspots; rate of purchases transactions within a given urbanicity category that were fulfilled by a given method; rate of transactions within a given urbanicity category that were refunds; rate of transactions within a given urbanicity category that were refunds; rate of transactions within a given urbanicity category that were refunds; rate of transactions within a given urbanicity category that were refunds; rate of transactions within a given urbanicity category that were refunds; rate of transactions within a given urbanicity category that were reversals. The rates of activity within a given urbanicity category show, for example, whether pick-ups were more prevalent in rural areas than in urban areas.

#### B.8 Maps Displaying Rates of Fulfillment Method by ZIP Code

The geocoded household address data allowed the study team to analyze rates of fulfillment method by ZIP code. The study team calculated rates of transactions that were fulfilled through pick-ups, direct delivery, and commercial delivery for ZIP codes where SNAP households lived during the study period. Because Amazon fulfilled a large portion of SNAP Online orders (43 percent, Figure 7), the analysis also calculated pick-up and direct delivery rates among retailers excluding Amazon because it was not possible to differentiate Amazon orders delivered to the customer versus those picked up by the customer at an Amazon pick-up location.

The steps to generate the maps were as follows:

- 1. Created a CSV file from the OPP transaction data with one record per ZIP code. ZIP codes covered addresses of SNAP households that made at least one SNAP Online purchase during the study period. The five variables presented in the maps are:
  - Rate of pick-up orders among all retailers
  - Rate of direct delivery orders among all retailers
  - Rate of pick-up orders among retailers excluding Amazon
  - Rate of direct delivery orders among retailers excluding Amazon
  - Rate of commercial delivery orders
- Joined CSV file to ZIP code layer in ArcGIS. The team exported the ZIP code layers for Alabama, Iowa, Nebraska, New York, Oregon, and Washington from the ArcGIS services portal: <u>https://services.arcgis.com/P3ePLMYs2RVChkJx/arcgis/rest/services/USA\_ZIP\_Code\_Points\_analys</u> <u>is/FeatureServer</u>

<sup>&</sup>lt;sup>20</sup> The OPP data transaction type variable (trxn\_type) value of "return" (ret) represents refund transactions, and therefore *refund* is used to describe these transactions through the report and tabulations.

- 3. Created "bins" (or groupings) for percentage ranges of fulfillment method rates, where fulfillment rate is denoted by *x*:
  - 0 percent
  - 0 < x ≤ 20 percent
  - $-20 < x \le 40$  percent
  - $40 < x \le 60$  percent
  - $60 < x \le 80$  percent
  - $80 < x \le 100$  percent
  - Not applicable

ZIP codes where fulfillment rates were "not applicable" either are ZIP codes where no households made a SNAP Online purchase or, in the maps excluding Amazon, are ZIP codes where only Amazon fulfilled SNAP Online orders.

### **Appendix C. Full Analysis Tables**

#### C.1 Household SNAP Online Participation: Tables C1.1–C1.7

This set of tables reports household participation rates for SNAP Online purchases. Table C1.1 reports participation rates for the entire study period, as well as mean monthly rates, by pilot State and overall. State-specific Tables C1.2–C1.7 report participation rates by month.

The tables further report participation by urbanicity, as defined in Exhibit 7 of the *Analysis Plan Update Memorandum*.

Tables C1.1–C1.7 answer the following research questions:

- Determine to the extent feasible from the data available, the extent to which online purchases are being made by participants residing in rural, urban, and suburban areas in each of the six (6) study States?
- How many SNAP EBT customers use online SNAP EBT payments?
- What is the percentage of SNAP EBT customers that use online SNAP EBT payments?
- The evaluation calculated urbanicity for these tables based on the household address. Urbanicity is missing when household address information was missing or could not be geocoded.

A small number of households were associated with more than one household address in the OPP transaction data and were assigned to different urbanicity categories. In Nebraska, New York, and Washington, fewer than 1 percent of households appeared to have relocated to an address in another urbanicity category within the 13-month study period. In Alabama and Iowa, fewer than 4 percent of households appeared to have moved to another urbanicity category. These tables include these households in only one of their urbanicity categories to avoid double counting households and overestimating the participation rate.

Nebraska implemented the SNAP Online Purchasing Pilot in April 2020; therefore, there is no March 2020 data for Nebraska (State-specific Table C1.4).

Household addresses were not reported for Oregon. As household address was used to determine the urbanicity category for transactions, Oregon data were not included in this breakdown in this series of tables (Table C1.1 and Table C1.6).

#### C.1.1 Guidance to Reading Table C1.1: Rate of SNAP Household Participation in Online Purchasing, March 2020–March 2021

- The **first row** reports the total number of households that made at least one SNAP purchase during the study period, either online or in-store. *Example: In Alabama, 658,193 households made at least one SNAP Online or in-store purchase during the study period (March 2020–March 2021).*
- The **second row** (in **panel one**) reports the total number of households that made at least one SNAP Online purchase during the study period. *Example: In Alabama, 89,769 households made at least one SNAP Online purchase during the study period.*
- The **third row** (in **panel two**) reports the overall SNAP Online participation rate. The participation rate is households that made at least one SNAP Online purchase during the study period as a percentage of all households making at least one SNAP purchase online or in-store (as enumerated in the first panel). *Example: In Alabama, the SNAP Online participation rate was 13.6 during the study period.*

- Data in **panel three** (rows four to eight) report the breakdown of the number of households making at least one SNAP Online purchase during the study period, by urbanicity. The SNAP Online participation rate by urbanicity (i.e., the number of SNAP Online purchases in rural areas as a percentage of all SNAP purchases in rural areas, online or in-store) could not be calculated and included in the table as the ALERT summary data (from which we determined the number of SNAP households) did not include a breakdown of households making an online or in-store SNAP purchase by urbanicity. Because the OPP transaction data only included SNAP Online transactions and not inperson purchases they could not be used for this purpose either. *Example: In Alabama, 31,485 households in rural areas made at least one SNAP Online purchase during the study period.*
- The **ninth row** (in **panel four**) reports the mean monthly number of households that made at least one SNAP Online purchase and the mean monthly SNAP Online participation rate. The evaluation counted the number of households that made at least one SNAP Online purchase for each month in the study period, then took the average across months. The mean monthly SNAP Online participation rate is the ratio of the mean monthly number of households that made at least one SNAP Online purchase, online or instore. *Example: In Alabama, the mean number of households making at least one SNAP Online purchase per month was 21,475. The mean monthly percentage of households making SNAP Online purchases was 7.4 for Alabama during the study period.*
- **Rows 10 to 14** (in **panel five**) report the mean monthly number of SNAP Online participating households, by urbanicity. As described above, it was not possible to calculate a participation *rate* by urbanicity. *Example: In Alabama, the mean number of households in rural areas making at least one SNAP Online purchase per month was 7,426 over the study period.*

## C.1.2 Guidance to Reading Tables C1.2–C1.7: Household SNAP Online Participation in the Pilot State, March 2020–March 2021

Tables C1.2 through C1.7 report monthly participation data for each of the six pilot States.

- The first row reports the number of households that made at least one SNAP purchase, whether online or in-store, in that month. *Example (Table C1.2): In Alabama, 214,918 households made at least one SNAP* purchase *in March 2020*.
- The **second row** (in **panel one**) reports the number of households that made at least one SNAP Online purchase in that month. *Example (Table C1.2): In Alabama, 214 households made at least one SNAP Online purchase in March 2020.*
- The **third row** (in **panel two**) reports the percentage of households that made at least one SNAP Online purchase in that month. The final column reports the monthly average number of households that made any at least one SNAP Online purchase divided by the monthly average number of households that made any SNAP purchase (final column of second row divided by final column of first row). *Example (Table C1.2): Among Alabama households that made at least one SNAP purchase in March 2020, 0.1 percent made a SNAP Online purchase.*
- **Panel three** (rows four to eight) reports the number of households that made at least one SNAP Online purchase, by urbanicity. *Example (Table C1.2): In Alabama, 81 households in rural areas made at least one SNAP Online purchase in March 2020.*

#### Table C1.1 Rate of SNAP Household Participation in Online Purchasing, March 2020–March 2021

	Alabama Iowa		Nebra	askaª	New	York	Oreg	on <sup>b</sup>	Washi	ngton	Тс	otal			
							Number of	househol	ds						
Total households with any online or in-store SNAP purchase		658,193		306,682		118,531		1,340,587		403,220		558,831		3,386,044	
Total households with any SNAP Online purchase		89,769		31,328	16,816		247,992			67,146		91,647		544,698	
		Overall participation rate, percentage													
Household participation rate in SNAP Online purchasing⁰		13.6		10.2		14.2		18.5		16.7		16.4		16.1	
		Overall participation, number of households													
Number of households that ma	de any SN	IAP Online	e purchase	by urban	icity <sup>d</sup>										
Rural		31,485		5,500		2,132		24,555				9,892		73,564	
Town		10,374		7,895		3,957		19,336				9,611		51,173	
Suburban		17,190		3,024		1,797		42,880				27,088		91,979	
City		26,213		13,331			153,733				37,482		238,685		
Missing		4,507		1,578		1,004		7,488				7,574	22,151		
			I	Меа	an monthly	participati	on rate, pe	ercentage	and numbe	er of house	holds				
	%	Ν	%	N	%	Ν	%	Ν	%	Ν	%	N	%	Ν	
Mean monthly percentage of households that made any SNAP Online purchase <sup>e</sup>	7.4	21,475	7.3	8,659	8.3	4,555	13.2	65,575	11.4	19,073	11.1	27,799	10.7	146,784	
					Меа	n monthly	participati	on, numb	er of house	holds					
Mean monthly number of house	eholds tha	nt made a	SNAP Onli	ne purcha	ise by urba	nicityº									
Rural	7,426 1,559					565		5,929			2,920			18,355	
Town		2,555		2,237	7 1,117			4,882			2,866		2,866		
Suburban		4,182		883	3 512			11,532 —				8,409		25,478	
City		6,224		3,533	2,101			41,343				11,548		64,586	
Missing	1,088 448			260	1,889 —			2,056			5,721				

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data and Anti-Fraud Locator using Electronic Benefit Transfer Retailer Transactions (ALERT) summary data, March 2020–March 2021.

Notes:

<sup>a</sup> Nebraska launched the SNAP Online purchasing pilot on April 2, 2020, therefore there are no transaction data for March 2020.

<sup>b</sup> The number of households that made any SNAP Online purchase is not reported by urbanicity for Oregon because Oregon did not report household address information.

<sup>c</sup> The percentage of households that made a SNAP Online purchase (SNAP Online participation rate) is the number of households that made a SNAP Online purchase during the study period (as reported in the OPP transaction data) as a percentage of all households that made a SNAP purchase (online, in-store, or both, as reported in the ALERT summary data) during the study period.

<sup>d</sup> The percentage of households that made a SNAP Online purchase and the mean monthly household participation rate could not be calculated by urbanicity as the ALERT summary data with the total number of SNAP transactions were not available by urbanicity.

<sup>e</sup> The mean monthly percentage of households that made a SNAP Online purchase is the monthly average number of households that made a SNAP Online purchase divided by the monthly average number of households that made any SNAP purchase.

#### Table C1.2 Rate of SNAP Household Participation in Online Purchasing in Alabama, March 2020–March 2021

	March 2020	April 2020	May 2020	June 2020ª	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Mean Monthly Percentage <sup>b</sup> March 2020- March 2021
Number of households														
Total households with any online or in-store SNAP purchase	214,918	242,981	283,616	341,847	340,055	312,447	285,180	291,645	292,561	290,969	283,088	299,778	295,119	290,323
Total households with any SNAP Online purchase	214	10,379	16,237	18,977	20,769	22,691	21,810	23,515	25,211	27,343	28,762	30,943	32,322	21,475
					Percent	age of hou	seholds m	aking any S	SNAP Onlir	ne purchas	9			
Household participation rate in SNAP Online purchasing <sup>c</sup>	0.1	4.3	5.7	5.6	6.1	7.3	7.6	8.1	8.6	9.4	10.2	10.3	11.0	7.4
				Ме	an monthl	y number o	of househo	lds that ma	ide a SNAP	Online pu	rchase			
Number of household	s participat	ting in SNA	P Online p	urchasing	by urbanic	city <sup>d</sup>								
Rural	81	3,857	5,863	7,315	7,586	8,077	7,647	7,962	8,508	9,114	9,632	10,186	10,704	7,426
Town	18	1,275	1,920	2,104	2,554	2,883	2,710	2,845	2,902	3,194	3,380	3,689	3,746	2,555
Suburban	39	1,970	3,074	3,814	4,061	4,404	4,206	4,615	4,969	5,400	5,588	5,962	6,262	4,182
City	69	2,757	4,596	4,909	5,618	6,208	6,108	6,889	7,515	8,203	8,678	9,461	9,898	6,224
Missing	7	520	784	835	950	1,119	1,139	1,204	1,317	1,432	1,484	1,645	1,712	1,088

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data and Anti-Fraud Locator Using Electronic Benefit Transfer Retailer Transfer Retailer Transactions (ALERT) summary data, March 2020–March 2021.

#### Notes:

<sup>a</sup> Alabama transaction data are missing for 1 day in June 2020.

<sup>b</sup> The mean monthly percentage of households that made a SNAP Online purchase is the monthly average number of households that made a SNAP Online purchase divided by the monthly average number of households that made any SNAP purchase.

<sup>c</sup> The percentage of households that made a SNAP Online purchase (SNAP Online participation rate) is the number of households that made a SNAP Online purchase in a particular month (as reported in the OPP transaction data) as a percentage of all households that made a SNAP purchase (online, in-store, or both, as reported in the ALERT summary data) in that month.

<sup>d</sup> The percentage of households that made a SNAP Online purchase could not be calculated by urbanicity as the ALERT summary data with the total number of SNAP transactions were not available by urbanicity.

#### Table C1.3 Rate of SNAP Household Participation in Online Purchasing in Iowa, March 2020–March 2021

	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020ª	Oct 2020	Nov 2020	Dec 2020	Jan 2021ª	Feb 2021	March 2021	Mean Monthly Percentage <sup>b</sup> March 2020- March 2021
Number of households														
Total households with any online or in-store SNAP purchase	88,867	102,673	110,931	105,077	121,479	173,746	152,620	133,302	117,396	112,110	106,756	106,138	106,702	118,292
Total households with any SNAP Online purchase	938	5,443	6,204	6,320	7,704	8,644	9,274	10,339	10,664	10,716	11,189	12,597	12,534	8,659
					Percent	tage of hou	seholds m	aking any S	SNAP Onlin	e purchase	;			
Household participation rate in SNAP Online purchasing°	1.1	5.3	5.6	6.0	6.3	5.0	6.1	7.8	9.1	9.6	10.5	11.9	11.7	7.3
				Ме	an monthl	y number o	of househo	lds that ma	de a SNAP	Online pur	chase			
Number of househol	ds participa	ating in SN	AP Online	purchasing	ı by urbani	city <sup>d</sup>								
Rural	180	1,003	1,152	1,137	1,423	1,598	1,648	1,917	1,974	1,974	1,959	2,148	2,152	1,559
Town	218	1,389	1,654	1,639	2,037	2,295	2,327	2,585	2,830	2,775	2,867	3,270	3,198	2,237
Suburban	87	511	607	613	741	877	983	1,065	1,114	1,127	1,198	1,255	1,296	883
City	397	2,216	2,451	2,595	3,096	3,392	3,839	4,276	4,232	4,262	4,597	5,305	5,266	3,533
Missing	56	324	340	336	407	482	477	496	514	578	568	619	622	448

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data and Anti-Fraud Locator Using Electronic Benefit Transfer Retailer Transfer Retailer Transactions (ALERT) summary data, March 2020–March 2021.

#### Notes:

<sup>a</sup> lowa transaction data are missing for 1 day in September 2020 and 2 days in January 2021.

<sup>b</sup> The mean monthly percentage of households that made a SNAP Online purchase is the monthly average number of households that made a SNAP Online purchase divided by the monthly average number of households that made any SNAP purchase.

<sup>c</sup> The percentage of households that made a SNAP Online purchase (SNAP Online participation rate) is the number of households that made a SNAP Online purchase in any month (as reported in the OPP transaction data) as a percentage of all households that made a SNAP purchase (online, in-store, or both, as reported in the ALERT summary data).

<sup>d</sup> The percentage of households that made a SNAP Online purchase could not be calculated by urbanicity as the ALERT summary data with the total number of SNAP transactions were not available by urbanicity.

#### Table C1.4 Rate of SNAP Household Participation in Online Purchasing in Nebraska, March 2020–March 2021

	March 2020ª	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Mean Monthly Percentage <sup>b</sup> March 2020- March 2021
Number of households														
Total households with any online or in-store SNAP purchase	_	50,346	54,750	52,256	50,393	67,156	59,979	54,922	50,837	57,218	53,640	56,309	57,565	55,448
Total households with any SNAP Online purchase	_	2,231	3,271	3,228	3,387	5,970	5,130	4,784	4,333	5,124	5,130	5,953	6,119	4,555
					Percent	tage of hou	seholds m	aking any S	SNAP Onlin	e purchase	;			
Household participation rate in SNAP Online purchasing <sup>c</sup>		4.4	6.0	6.2	6.7	8.9	8.6	8.7	8.5	9.0	9.6	10.6	10.6	8.2
				Ме	ean monthl	y number o	of househo	lds that ma	ide a SNAP	Online pu	chase			
Number of househol	ds particip	ating in SN	AP Online	purchasing	y by urbani	city <sup>d</sup>								
Rural		262	385	412	420	878	746	649	546	623	584	620	657	565
Town	_	560	792	789	843	1,551	1,320	1,184	1,090	1,285	1,217	1,354	1,415	1,117
Suburban	—	283	372	383	356	678	603	535	475	569	579	648	665	512
City	—	967	1,495	1,453	1,549	2,541	2,179	2,150	2,009	2,365	2,458	3,011	3,037	2,101
Missing	_	159	227	191	219	322	282	266	213	282	292	320	345	260

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data and Anti-Fraud Locator Using Electronic Benefit Transfer Retailer Transactions (ALERT) summary data, March 2020–March 2021.

#### Notes:

<sup>a</sup> Nebraska launched the SNAP Online purchasing pilot on April 2, 2020, therefore there are no transaction data for March 2020.

<sup>b</sup> The mean monthly percentage of households that made a SNAP Online purchase is the monthly average number of households that made a SNAP Online purchase divided by the monthly average number of households that made any SNAP purchase.

<sup>c</sup> The percentage of households that made a SNAP Online purchase (SNAP Online participation rate) is the number of households that made a SNAP Online purchase in any month (as reported in the OPP transaction data) as a percentage of all households that made a SNAP purchase (online, in-store, or both, as reported in the ALERT summary data).

<sup>d</sup> The percentage of households that made a SNAP Online purchase could not be calculated by urbanicity as the ALERT summary data with the total number of SNAP transactions were not available by urbanicity.

#### Table C1.5 Rate of SNAP Household Participation in Online Purchasing in New York, March 2020–March 2021

	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Mean Monthly Percentage <sup>a</sup> March 2020- March 2021
Number of households														
Total households with any online or in-store SNAP purchase	385,556	372,327	437,820	451,423	487,670	496,296	506,810	638,851	606,690	543,923	514,947	503,464	516,112	497,068
Total households with any SNAP Online purchase	22,789	28,171	42,287	49,741	55,169	59,117	66,091	82,734	81,212	81,560	89,596	94,063	99,939	65,575
					Percent	age of hou	seholds m	aking any S	SNAP Onlin	e purchase	;			
Household participation rate in SNAP Online purchasing <sup>b</sup>	5.9	7.6	9.7	11.0	11.3	11.9	13.0	13.0	13.4	15.0	17.4	18.7	19.4	13.2
				Me	an monthl	y number c	of househo	lds that ma	ide a SNAP	Online pur	chase			
Number of househol	ds participa	ating in SN	AP Online	purchasing	) by urbani	city <sup>c</sup>								
Rural	2,107	2,894	3,693	3,877	4,694	5,215	4,863	8,172	8,883	8,225	8,048	8,075	8,325	5,929
Town	1,945	2,283	2,825	3,200	3,723	4,072	4,008	6,281	6,823	6,649	6,987	7,241	7,433	4,882
Suburban	4,366	5,687	7,732	8,721	10,000	10,793	10,435	14,141	14,464	14,465	15,796	16,175	17,141	11,532
City	13,731	16,461	26,793	32,487	35,185	37,325	45,001	51,870	48,652	49,742	56,172	59,857	64,179	41,343
Missing	640	846	1,244	1,456	1,567	1,712	1,784	2,270	2,390	2,479	2,593	2,715	2,861	1,889

**Source:** Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data and Anti-Fraud Locator Using Electronic Benefit Transfer Retailer Transfer Retailer Transactions (ALERT) summary data, March 2020–March 2021.

#### Notes:

<sup>a</sup> The mean monthly percentage of households that made a SNAP Online purchase is the monthly average number of households that made a SNAP Online purchase divided by the monthly average number of households that made any SNAP purchase.

<sup>b</sup> The percentage of households that made a SNAP Online purchase (SNAP Online participation rate) is the number of households that made a SNAP Online purchase in any month (as reported in the OPP transaction data) as a percentage of all households that made a SNAP purchase (online, in-store, or both, as reported in the ALERT summary data).

<sup>c</sup> The percentage of households that made a SNAP Online purchase could not be calculated by urbanicity as the ALERT summary data with the total number of SNAP transactions were not available by urbanicity

#### Table C1.6 Rate of SNAP Household Participation in Online Purchasing in Oregon, March 2020–March 2021

	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Mean Monthly Percentage <sup>a</sup> March 2020- March 2021
							Number o	of househo	lds					
Total households with any online or in-store SNAP purchase Total households with any SNAP Online purchase	123,125 2,307	139,581 10,339	153,218 12,654	156,571 15,038	164,177 16,494	171,850 19,194	179,386 20,028	192,518 23,125	178,202 23,625	179,176 24,418	178,654 26,417	174,151 26,275	181,065 28,030	167,052 19,073
				Me	ean monthl	y number o	of househo	lds that ma	ide a SNAP	Online pu	rchase			
Household participation rate in SNAP Online purchasing <sup>b</sup>	1.9	7.4	8.3	9.6	10.0	11.2	11.2	12.0	13.3	13.6	14.8	15.1	15.5	11.4

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data and Anti-Fraud Locator Using Electronic Benefit Transfer Retailer Transactions (ALERT) summary data, March 2020–March 2021.

#### Notes:

<sup>a</sup> The mean monthly percentage of households that made a SNAP Online purchase is the monthly average number of households that made a SNAP Online purchase divided by the monthly average number of households that made any SNAP purchase.

<sup>b</sup> The percentage of households that made a SNAP Online purchase (SNAP Online participation rate) is the number of households that made a SNAP Online purchase in any month (as reported in the OPP transaction data) as a percentage of all households that made a SNAP purchase (online, in-store, or both, as reported in the ALERT summary data).

The number of households participating in SNAP Online purchasing is not reported by urbanicity because Oregon did not report household address information.

#### Table C1.7 Rate of SNAP Household Participation in Online Purchasing in Washington, March 2020–March 2021

	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Mean Monthly Percentage <sup>a</sup> March 2020- March 2021
		·	·				Number o	of househo	lds					
Total households with any online or in-store SNAP purchase	190,720	220,792	234,473	232,520	262,018	272,294	261,714	259,026	251,323	263,085	260,680	258,388	278,010	249,619
Total households with any SNAP Online purchase	7,813	16,213	19,004	20,390	25,915	28,701	29,277	30,378	31,865	34,581	37,000	38,064	42,184	27,799
					Percent	age of hou	seholds m	aking any S	SNAP Onlin	e purchase	;			
Household participation rate in SNAP Online purchasing <sup>b</sup>	4.1	7.3	8.1	8.8	9.9	10.5	11.2	11.7	12.7	13.1	14.2	14.7	15.2	11.1
				Ме	an monthl	y number c	of househo	lds that ma	de a SNAP	Online pur	chase			
Number of househol	ds participa	ating in SN	AP Online	purchasing	by urbani	city⁰								
Rural	920	1,875	2,039	2,136	2,837	3,149	3,092	3,177	3,320	3,602	3,735	3,825	4,254	2,920
Town	841	1,754	1,946	2,158	2,796	3,133	3,086	3,127	3,219	3,500	3,670	3,797	4,237	2,866
Suburban	2,319	4,838	5,673	6,151	7,720	8,596	8,929	9,245	9,622	10,510	11,322	11,510	12,876	8,409
City	3,160	6,492	7,936	8,449	10,616	11,675	12,018	12,611	13,368	14,403	15,590	16,115	17,686	11,548
Missing	573	1,254	1,410	1,496	1,946	2,148	2,152	2,218	2,336	2,566	2,683	2,817	3,131	2,056

**Source:** Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data and Anti-Fraud Locator Using Electronic Benefit Transfer Retailer Transfer Retailer Transactions (ALERT) summary data, March 2020–March 2021.

#### Notes:

<sup>a</sup> The mean monthly percentage of households that made a SNAP Online purchase is the monthly average number of households that made a SNAP Online purchase divided by the monthly average number of households that made any SNAP purchase.

<sup>b</sup> The percentage of households that made a SNAP Online purchase (SNAP Online participation rate) is the number of households that made a SNAP Online purchase in any month (as reported in the OPP transaction data) as a percentage of all households that made a SNAP purchase (online, in-store, or both, as reported in the ALERT summary data).

<sup>c</sup> The percentage of households that made a SNAP Online purchase could not be calculated by urbanicity as the ALERT summary data with the total number of SNAP transactions were not available by urbanicity.

#### C.2 SNAP Online Purchases per Month: Tables C2.1–C2.7

Tables C2.1 through C2.6 report how frequently households made SNAP Online purchases during the study period (March 2020–March 2021). This set of tables answers the following research question:

• What is the frequency of online purchases per household per month?

#### C.2.1 Guidance to Reading Table C2.1: Mean Monthly Frequency of SNAP Online Purchases by Households, March 2020–March 2021

Table C2.1 reports how often households made SNAP Online purchases per month during the study period. The table reports the percentage of households that made an average of one, two, three, four, or more than five purchases per month during the study period. The mean frequency of SNAP Online purchases for a household was calculated by taking the mean of the number of purchases per month across the study months. The rows were populated as follows:

- The **first row** reports counts and percentages of households with a mean frequency of purchases was equal to 1.
- The **second row** reports households with a mean frequency of purchases was greater than 1 but less than or equal to 2.
- The **third row** reports households with a mean frequency of purchases was greater than 2 but less than or equal to 3.
- The **fourth row** reports counts and percentages of households with a mean frequency of purchases was greater than 3 but less than or equal to 4.
- The **fifth row** reports households with a mean frequency of purchases was greater than 4.

*Example:* In Alabama, 41,952 households made, on average, one SNAP Online purchase per month over the 13-month study period. This represents 46.7 percent of all households that made any SNAP Online purchase in Alabama during the study period.

Nebraska implemented the SNAP Online Purchasing Pilot in April 2020; therefore, there is no March 2020 data for Nebraska (State-specific Table C2.4).

#### C.2.2 Guidance to Reading Tables C2.2–C2.7: Frequency of SNAP Online Purchases by Households per Month in the Pilot State, March 2020–March 2021

Tables C2.2 through C2.7 report frequency of household SNAP Online purchases for each of the six pilot States.

• These tables report the frequency of monthly household SNAP Online purchases by month during the study period. Tables report the total number of households that made 1 purchase in the specified month, and that number as a percentage of all households that made any SNAP Online purchase during the study period. They also report this information for households that made 2 purchases, 3 purchases, 4 purchases, and 5 or more purchases in the specified month. The last row of the table reports the total number of unique households making any SNAP Online purchase (one, two, three, four, or five or more purchases) during the study period. *Example (Table C2.2): In Alabama, 172 households made one SNAP Online purchase in March 2020. This represents 80.4 percent of all Alabama households that made any SNAP Online purchase in March 2020.* 

#### Table C2.1 Mean Monthly Frequency of SNAP Online Purchases by Households

	AI	abama	lowa		Nebraskaª		Ne	w York	0	regon	Was	hington	T	otal
	%	N	%	N	%	N	%	N	%	N	%	Ν	%	N
				Mear	n freque	ncy of partici	pation,	percentage a	nd numb	er of househ	olds			
Frequency of SNAP Online pu	irchases	per month b	y house	hold										
1 purchase	46.7	41,952	41.2	12,920	41.3	6,941	41.8	103,668	39.6	26,600	38.8	35,535	41.8	227,616
2 purchases	33.0	29,594	33.4	10,460	33.3	5,605	34.9	86,445	34.0	22,805	33.5	30,671	34.1	185,580
3 purchases	11.9	10,700	14.3	4,473	13.9	2,343	13.7	33,986	14.5	9,742	14.8	13,599	13.7	74,843
4 purchases	4.6	4,128	6.0	1,868	6.2	1,047	5.4	13,394	6.1	4,078	6.6	6,067	5.6	30,582
5 or more purchases	3.8	3,395	5.1	1,607	5.2	880	4.2	10,499	5.8	3,921	6.3	5,775	4.8	26,077
Total number of SNAP Online purchasing households	89,769 31,328 16,816 247,992 67,146 91,647										544	,698		

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

<sup>a</sup> Nebraska launched the SNAP Online purchasing pilot on April 2, 2020, therefore there are no transaction data for March 2020.

#### Table C2.2 Frequency of SNAP Online Purchases by Households per Month in Alabama, March 2020–March 2021

	March 2020	April 2020	May 2020	June 2020ª	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
						Pe	rcentage (N	l) of housel	nolds	·	·	·		
	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)
Frequency of SN	AP Online	purchases	per househ	old										
1 purchase	80.4	50.9	51.0	56.4	56.5	51.8	52.5	51.7	51.0	49.1	48.6	48.2	46.7	46.7
i purchase	(172)	(5,278)	(8,281)	(10,703)	(11,743)	(11,747)	(11,458)	(12,168)	(12,848)	(13,427)	(13,983)	(14,911)	(15,093)	(41,952)
2 purchasos	14.5	22.5	21.5	23.0	21.9	22.2	22.3	22.3	22.7	22.3	22.1	22.5	22.1	33.0
2 purchases	(31)	(2,338)	(3,497)	(4,370)	(4,545)	(5,035)	(4,858)	(5,234)	(5,714)	(6,088)	(6,368)	(6,969)	(7,159)	(29,594)
3 purchasos	4.2	11.2	10.9	10.6	9.9	11.4	11.2	11.2	11.1	11.9	12.2	12.4	12.4	11.9
5 purchases	(9)	(1,159)	(1,772)	(2,011)	(2,062)	(2,590)	(2,436)	(2,630)	(2,794)	(3,262)	(3,522)	(3,841)	(3,994)	(10,700)
1 purchases	0.9	6.0	5.9	5.0	5.0	6.4	6.0	6.2	6.5	6.9	7.0	7.1	7.4	4.6
4 purchases	(2)	(618)	(951)	(955)	(1,043)	(1,447)	(1,317)	(1,454)	(1,649)	(1,878)	(2,002)	(2,190)	(2,385)	(4,128)
5 or more	0.0	9.5	10.7	4.9	6.6	8.2	8.0	8.6	8.8	9.8	10.0	9.8	11.4	3.8
purchases	(0)	(986)	(1,736)	(938)	(1,376)	(1,872)	(1,741)	(2,029)	(2,206)	(2,688)	(2,887)	(3,032)	(3,691)	(3,395)
						Тс	otal number	r of househ	olds					
Total number of SNAP Online purchasing households	214	10,379	16,237	18,977	20,769	22,691	21,810	23,515	25,211	27,343	28,762	30,943	32,322	89,769

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

<sup>a</sup> Alabama transaction data are missing for 1 day in June 2020.

#### Table C2.3 Frequency of SNAP Online Purchases by Households per Month in Iowa, March 2020–March 2021

	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020ª	Oct 2020	Nov 2020	Dec 2020	Jan 2021ª	Feb 2021	March 2021	Total March 2020- March 2021
					·	Pe	rcentage (N	) of housel	nolds	·	·			
	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)
Frequency of SM	AP Online	purchases	per househ	old										
1 purchase	77.6 (728)	46.6 (2,534)	45.4 (2,815)	47.7 (3,016)	47.2 (3,633)	46.1 (3,981)	49.0 (4,547)	46.5 (4,807)	46.6 (4,974)	46.5 (4,980)	45.9 (5,131)	44.5 (5,610)	44.4 (5,559)	41.2 (12,920)
2 purchases	15.8 (148)	22.6 (1,230)	22.6 (1,403)	22.7 (1,436)	23.1 (1,780)	22.1 (1,914)	22.8 (2,118)	22.6 (2,341)	23.6 (2,522)	22.3 (2,387)	22.8 (2,552)	23.1 (2,911)	22.1 (2,768)	33.4 (10,460)
3 purchases	4.3	12.1	12.1 (749)	12.7	12.6 (972)	13.1 (1,131)	12.3 (1,139)	12.7	12.4 (1,322)	12.3 (1,317)	12.8 (1,431)	13.2 (1.662)	13.2 (1,653)	14.3 (4,473)
4 purchases	1.8 (17)	6.9 (373)	7.5 (465)	7.2 (456)	7.4 (567)	8.1	7.1	7.7 (798)	7.0 (749)	7.8 (833)	7.6 (854)	8.1 (1,018)	7.7	6.0 (1,868)
5 or more purchases	0.5	11.9 (646)	12.4 (772)	9.6 (608)	9.8 (752)	10.7 (922)	8.8 (814)	10.5 (1,082)	10.3 (1,097)	11.2 (1,199)	10.9 (1,221)	11.1 (1,396)	12.7 (1,592)	5.1 (1,607)
						To	otal numbe	r of househ	olds					
Total number of SNAP Online purchasing households	938	5,443	6,204	6,320	7,704	8,644	9,274	10,339	10,664	10,716	11,189	12,597	12,534	31,328

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

<sup>a</sup> lowa transaction data are missing for 1 day in September 2020 and 2 days in January 2021.

#### Table C2.4 Frequency of SNAP Online Purchases by Households per Month in Nebraska, March 2020–March 2021

	March 2020ª	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021ª	Feb 2021	March 2021	Total March 2020- March 2021
				·			ercentage (	N) of house	holds	·				
	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (NI)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)
Erequency of SI		ne nurchas	es per hous	ehold	(11)	(14)	(14)	(14)	(11)	(11)	(11)	(11)	(11)	(11)
i requency of Si		16 2	43 6	45 2	50.6	43.8	51.6	52.9	55.7	45.6	<u>4</u> 9 9	43.7	43.4	413
1 purchase	_	(1,031)	(1,425)	(1,459)	(1,714)	(2,613)	(2,645)	(2,533)	(2,412)	(2,339)	(2,558)	(2,599)	(2,655)	(6,941)
0 nurshaaaa	_	22.8	23.1	23.7	21.0	22.6	21.7	22.1	21.6	22.7	21.5	23.1	22.2	33.3
2 purchases	_	(509)	(756)	(764)	(711)	(1,348)	(1,114)	(1,056)	(936)	(1,162)	(1,103)	(1,377)	(1,357)	(5,605)
2 nurshaaaa	—	11.0	12.5	12.5	11.1	13.0	12.0	11.0	9.4	11.5	11.2	12.6	13.4	13.9
5 purchases	—	(245)	(408)	(404)	(377)	(776)	(618)	(526)	(409)	(587)	(575)	(748)	(817)	(2,343)
1 purchases	_	7.6	7.6	7.9	7.6	8.0	6.8	5.6	5.9	7.5	6.9	7.9	7.5	6.2
4 purchases	_	(169)	(247)	(254)	(257)	(479)	(349)	(269)	(255)	(382)	(354)	(469)	(461)	(1,047)
5 or more	_	12.4	13.3	10.7	9.7	12.6	7.9	8.4	7.4	12.8	10.5	12.8	13.5	5.2
purchases	_	(277)	(435)	(347)	(328)	(754)	(404)	(400)	(321)	(654)	(540)	(760)	(829)	(880)
							Total numbe	er of househ	olds					
Total number of SNAP Online purchasing households	_	2,231	3,271	3,228	3,387	5,970	5,130	4,784	4,333	5,124	5,130	5,953	6,119	16,816

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

<sup>a</sup> Nebraska launched the SNAP Online purchasing pilot on April 2, 2020, therefore there are no transaction data for March 2020.

#### Table C2.5 Frequency of SNAP Online Purchases by Households per Month in New York, March 2020–March 2021

	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
						Pe	rcentage (N	l) of housel	nolds		·	·		
	% (N)													
Frequency of SM	NAP Online	purchases	per househ	old										
1 purchase	63.9 (14,555)	52.1 (14,687)	45.7 (19,346)	46.6 (23,163)	47.7 (26,321)	47.7 (28,227)	50.4 (33,342)	49.8 (41,214)	50.8 (41,241)	49.8 (40,603)	47.7 (42,718)	46.7 (43,912)	45.3 (45,234)	41.8 (103,668)
2 purchases	20.8 (4,732)	21.9 (6,180)	22.3 (9,449)	22.7 (11,315)	22.7 (12,546)	23.3 (13,796)	24.0 (15,832)	24.0 (19,893)	23.1 (18,758)	22.8 (18,582)	23.1 (20,709)	23.4 (22,013)	23.2 (23,189)	34.9 (86,445)
3 purchases	8.3 (1,883)	10.9 (3,066)	12.3 (5,199)	12.5 (6,228)	12.6 (6,954)	12.8 (7,539)	12.0 (7,923)	12.2 (10,108)	11.8 (9,565)	11.8 (9,644)	12.6 (11,318)	12.6 (11,888)	13.1 (13,098)	13.7 (33,986)
4 purchases	3.5 (803)	6.3 (1,773)	7.3 (3,074)	7.1 (3,540)	6.9 (3,810)	6.9 (4,099)	6.2 (4,105)	6.4 (5,315)	6.4 (5,225)	6.7 (5,481)	7.0 (6,305)	7.3 (6,875)	7.6 (7,568)	5.4 (13,394)
5 or more purchases	3.6 (816)	8.8 (2,465)	12.3 (5,219)	11.0 (5,495)	10.0 (5,538)	9.2 (5,456)	7.4 (4,889)	7.5 (6,204)	7.9 (6,423)	8.9 (7,250)	9.5 (8,546)	10.0 (9,375)	10.9 (10,850)	4.2 (10,499)
						T	otal numbe	r of househ	olds					
Total number of SNAP Online purchasing households	22,789	28,171	42,287	49,741	55,169	59,117	66,091	82,734	81,212	81,560	89,596	94,063	99,939	247,992

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021.

#### Table C2.6 Frequency of SNAP Online Purchases by Households per Month in Oregon, March 2020–March 2021

	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
					·	Pe	rcentage (N	I) of housel	nolds					
	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)
Frequency of SN	AP Online	purchases	per househ	old										
1 purchase	71.0	47.0	46.2	44.6	46.8	45.8	48.2	45.1	46.3	46.3	43.3	43.7	42.9	39.6
i purchase	(1,637)	(4,856)	(5,841)	(6,705)	(7,716)	(8,799)	(9,656)	(10,423)	(10,935)	(11,308)	(11,434)	(11,495)	(12,013)	(26,600)
2 purchasos	19.3	23.0	22.0	22.8	22.9	23.0	22.7	22.8	23.0	22.3	22.5	22.7	22.0	34.0
2 purchases	(446)	(2,382)	(2,778)	(3,435)	(3,776)	(4,411)	(4,545)	(5,273)	(5,426)	(5,451)	(5,935)	(5,954)	(6,169)	(22,805)
3 purchasos	5.9	12.4	12.8	12.4	12.7	13.0	12.1	12.8	12.2	12.4	13.0	13.4	13.3	14.5
5 purchases	(137)	(1,281)	(1,619)	(1,871)	(2,089)	(2,504)	(2,426)	(2,949)	(2,881)	(3,025)	(3,424)	(3,519)	(3,732)	(9,742)
1 purchases	1.9	6.6	7.4	7.8	7.0	7.5	7.3	7.9	7.4	7.3	8.2	7.9	8.1	6.1
4 purchases	(44)	(684)	(931)	(1,169)	(1,147)	(1,432)	(1,471)	(1,835)	(1,737)	(1,772)	(2,165)	(2,079)	(2,280)	(4,078)
5 or more	1.9	11.0	11.7	12.4	10.7	10.7	9.6	11.4	11.2	11.7	13.1	12.3	13.7	5.8
purchases	(43)	(1,136)	(1,485)	(1,858)	(1,766)	(2,048)	(1,930)	(2,645)	(2,646)	(2,862)	(3,459)	(3,228)	(3,836)	(3,921)
						Т	otal numbe	r of househ	olds					
Total number of SNAP Online purchasing households	2,307	10,339	12,654	15,038	16,494	19,194	20,028	23,125	23,625	24,418	26,417	26,275	28,030	67,146

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021.

#### Table C2.7 Frequency of SNAP Online Purchases by Households per Month in Washington, March 2020–March 2021

	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
					·	Pe	rcentage (N	l) of housel	nolds			·		
	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)
Frequency of SM	AP Online	purchases	per househ	old										
1 nurchase	64.0	43.2	44.6	46.0	44.2	43.2	45.4	44.9	45.7	44.5	42.9	43.9	40.5	38.8
i purchase	(4,997)	(7,008)	(8,475)	(9,387)	(11,453)	(12,412)	(13,282)	(13,625)	(14,565)	(15,391)	(15,885)	(16,724)	(17,084)	(35,535)
2 purchasos	20.1	22.6	22.0	22.3	22.0	22.3	22.6	22.2	22.4	22.4	22.7	23.2	21.8	33.5
z purchases	(1,568)	(3,658)	(4,190)	(4,540)	(5,709)	(6,400)	(6,616)	(6,736)	(7,135)	(7,730)	(8,405)	(8,828)	(9,178)	(30,671)
3 purchasos	8.4	12.8	13.1	12.8	12.4	13.1	13.1	13.2	13.0	12.9	13.1	13.5	13.4	14.8
5 purchases	(654)	(2,068)	(2,489)	(2,611)	(3,214)	(3,753)	(3,830)	(4,009)	(4,128)	(4,447)	(4,863)	(5,135)	(5,653)	(13,599)
1 purchases	3.8	7.7	8.0	8.0	8.0	8.2	7.6	8.0	7.5	7.9	8.4	7.9	8.8	6.6
4 purchases	(299)	(1,242)	(1,527)	(1,624)	(2,078)	(2,347)	(2,228)	(2,438)	(2,390)	(2,719)	(3,108)	(3,013)	(3,731)	(6,067)
5 or more	3.8	13.8	12.2	10.9	13.4	13.2	11.3	11.8	11.4	12.4	12.8	11.5	15.5	6.3
purchases	(295)	(2,237)	(2,323)	(2,228)	(3,461)	(3,789)	(3,321)	(3,570)	(3,647)	(4,294)	(4,739)	(4,364)	(6,538)	(5,775)
						Тс	otal numbe	r of househ	olds					
Total number of SNAP Online purchasing households	7,813	16,213	19,004	20,390	25,915	28,701	29,277	30,378	31,865	34,581	37,000	38,064	42,184	91,647

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021.
# C.3 Refunds and Reversals in Online Purchasing: Tables C3.1a–C3.7b

Tables C3.1a through C3.7a report the proportion of online refunds and online reversals as a percentage of all SNAP Online transactions during the study period (March 2020–March 2021). They also report the distribution of refunds across urbanicity categories, which are defined in Exhibit 7 of the *Analysis Plan Update Memorandum*. Urbanicity categories were assigned to household addresses. Tables C3.1b through C3.7b report the rate of online refunds and online reversals as a percentage of all online transactions within that urbanicity category. Urbanicity is missing if household address information was missing or could not be geocoded.

This set of tables answers the following research question:

• How many refunds are issued to SNAP EBT cards?

This series of tables report the number of transactions (refund, reversal, or total) and not the dollar value of those transactions.

Nebraska implemented the SNAP Online Purchasing Pilot in April 2020; therefore, there is no March 2020 data for Nebraska (State-specific Tables C3.4a and C3.4b).

Household addresses were not reported for Oregon. As household addresses were used to determine the urbanicity category for transactions, Oregon data were not included in this breakdown in this series of tables (Tables C3.1a and C3.1b).

The number of total transactions reported in the following tables is lower than the number reported in the *Preliminary Analytic Tables* (submitted in November 2021). The *Preliminary Analytic Tables* erroneously included VOID transactions in total transactions. Total transactions in the following tables include purchases, refunds, and reversals only.

#### C.3.1 Guidance to Reading Table C3.1a: Refunds and Reversals as Proportion of Transactions in Online Purchasing by Urbanicity

- The **first panel** reports the number of online refunds issued.
- The **first row** reports the total number of online refunds issued and as a percentage of the total number of SNAP Online transactions. *Example: In Alabama, there were 527,154 online refund transactions during the study period. This represents 39.9 percent of all SNAP Online transactions during this time in Alabama.*
- The **next five rows** report the number of online refunds issued by urbanicity and as a proportion of all online refunds. The proportion of online refunds made by households in rural areas, for example, is calculated by dividing the number of online refund transactions in rural areas by all online refund transactions. *Example: In Alabama, 168,731 online refunds were issued to households in rural areas during the study period. This represents 32.0 percent of all online refund transactions during this time in Alabama.*

The second panel reports the number of online reversals issued.

- The **first row** reports the total number of reversals issued and as a percentage of the total number of SNAP Online transactions. *Example: In Alabama, there were 9,730 online reversal transactions during the study period. This represents 0.7 percent of all SNAP Online transactions during this time in Alabama.*
- The **next five rows** report the number of online reversals issued by urbanicity and as a proportion of all online reversals. The proportion of online reversals made by households in rural areas, for

example, is calculated by dividing the number of online reversal transactions in rural areas by all online reversal transactions. *Example: In Alabama, 2,592 online reversals were issued to households in rural areas during the study period. This represents 26.6 percent of all online reversal transactions during this time in Alabama.* 

The third panel reports the total number of SNAP Online transactions during the study period.

# C.3.2 Guidance to Reading Table C3.1b: Rates of Refund and Reversal Transactions in Online Purchasing and Rate by Urbanicity

- The **first panel** reports, for each of the urbanicity categories, the number and rate of online refunds and online reversals. The rate of online refunds in rural areas, for example, is calculated by dividing the number of online refund transactions in rural areas by the total number of online transactions in rural areas. *Example: In Alabama, there were 168,731 online refund transactions made by households in rural areas during the study period. This represents 38.9 percent of all SNAP Online transactions made in rural areas in Alabama during this time.*
- The **last panel** reports the distribution of online transactions across urbanicity categories. Example: In Alabama, 433,204 SNAP online transactions were made by households in rural areas during the study period. This represents 32.8 percent of all SNAP Online transactions during this time in Alabama.

# C.3.3 Guidance to Reading Tables C3.2a–6.7a: Refunds and Reversals as a Proportion of Transactions in Online Purchasing by Urbanicity in the Pilot State, March 2020– March 2021

Tables C3.2a through C3.7a report the monthly proportion of refunds and reversals in online purchasing for each of the six pilot States by urbanicity.

• This series of State-specific tables reports, for each month, the proportion of SNAP online refund and online reversal transactions by urbanicity category. The rows and panels for this table match those of the cross-state table (Table C3.1a) above. The data are reported for each month of the study period. *Example (Table C3.2a): In Alabama, there were 61 online refunds issued in March 2020. This represents 16.4 percent of all SNAP Online transactions in March 2020 in Alabama. In Alabama, 14 online refunds were issued to households in rural areas in March 2020. This represents 23.0 percent of all refund transactions in March 2020 in Alabama.* 

#### C.3.4 Guidance to Reading Tables C3.2b–C3.7b: Refund and Reversal Transactions in Online Purchasing and Rate by Urbanicity in the Pilot State, March 2020–March 2021

Tables C3.2b through C3.7b report the monthly rate of refunds and reversals in online purchasing by urbanicity for each of the six pilot States.

• This series of State-specific tables reports, for each month, the number and rate of online refunds and online reversals within an urbanicity category. The rows for this table match those of the first panel of the cross-state table (Table C3.1b) above. The data are reported for each month of the study period. *Example (Table C3.2b) In Alabama, there were 14 online refund transactions made by households in rural areas in March 2020. This represents 11.2 percent of all SNAP Online transactions made in rural areas in Alabama during this time.* 

### Table C3.1a Refunds and Reversals as a Proportion of Transactions in Online Purchasing by Urbanicity

	Alaba	ama	lov	va	Nebra	askaª	New	York	Oreg	on <sup>b</sup>	Washi	ngton	То	tal
	%	Ν	%	Ν	%	Ν	%	N	%	Ν	%	Ν	%	Ν
						Percenta	ge and nun	nber of trar	sactions					
Online refunds issued to SNAP EBT cards	39.9	527,154	35.5	185,443	35.6	91,053	28.7	935,728	31.9	349,293	30.9	493,111	32.1	2,581,782
Rural	32.0	168,731	16.0	29,754	10.2	9,248	12.6	117,723	—	_	10.0	49,278	16.8	374,734
Town	11.5	60,604	24.2	44,847	24.6	22,411	11.4	106,367	—	_	10.8	53,436	12.9	287,665
Suburban	21.0	110,928	11.2	20,755	12.8	11,665	22.7	212,717	—	_	30.9	152,126	22.8	508,191
City	30.6	161,495	44.0	81,512	47.8	43,525	50.0	467,643	—	—	40.9	201,684	42.8	955,859
Missing urbanicity <sup>c</sup>	4.8	25,396	4.6	8,575	4.6	4,204	3.3	31,278	—	_	7.4	36,587	4.7	106,040
						Percenta	ge and nun	nber of trar	sactions					
Online reversals issued to SNAP EBT cards	0.7	9,730	0.8	3,980	0.0	5	0.7	23,581	0.0	13	0.0	22	0.5	37,331
Rural	26.6	2,592	13.4	532	40.0	2	9.7	2,289	—	_	4.5	1	14.5	5,416
Town	10.0	969	24.2	962	40.0	2	13.7	3,238	—	_	9.1	2	13.9	5,173
Suburban	21.8	2,118	9.4	375	20.0	1	23.6	5,564	—	_	36.4	8	21.6	8,066
City	37.1	3,609	50.3	2,001	0.0	0	49.6	11,703	—	_	45.5	10	46.4	17,323
Missing urbanicity <sup>c</sup>	4.5	442	2.8	110	0.0	0	3.3	787	—	_	4.5	1	3.6	1,340
						N	lumber of t	ransaction	s					
Total number of SNAP Online transactions	1,320	,683	521,	988	255,	496	3,263	3,134	1,093	,252	1,596	,405	8,050	0,958

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

Orders that are split and fulfilled by different locations appear in the data as different transactions. As the data do not include the order number, it was not possible to link transactions to the same order. Therefore, reversals and refunds from the same order, but split into different transactions, were counted separately.

<sup>a</sup> Nebraska launched the SNAP Online purchasing pilot on April 2, 2020, therefore there are no transaction data for March 2020.

<sup>b</sup> Online refunds and reversals are not reported by urbanicity for Oregon because Oregon did not report household address information.

<sup>c</sup> Urbanicity data are missing if the household address is missing or could not be geocoded.

# Table C3.1b Rate of Refund and Reversal Transactions in Online Purchasing and Rate by Urbanicity<sup>a</sup>

	Alab	oama	lov	wa	Nebra	aska <sup>b</sup>	New	York	Ore	gon <sup>c</sup>	Wash	ington	То	tal
	%	N	%	Ν	%	N	%	Ν	%	N	%	N	%	Ν
					Rat	e and nun	ber of trar	nsactions,	by urbani	city				
Rural														
Online refunds issued to SNAP EBT cards	38.9	168,731	33.9	29,754	33.3	9,248	33.3	117,723	_	-	31.3	49,278	35.4	374,734
Online reversals issued to SNAP EBT cards	0.6	2,592	0.6	532	0.0	2	0.6	2,289	_	_	0.0	1	0.5	5,416
Total rural transactions (N)	433	,204	87,8	858	27,8	809	353,	395	-		157	,309	1,059	,575
Town											-			
Online refunds issued to SNAP EBT cards	39.1	60,604	34.8	44,847	35.0	22,411	34.1	106,367	_	_	32.8	53,436	35.0	287,665
Online reversals issued to SNAP EBT cards	0.6	969	0.7	962	0.0	2	1.0	3,238	-	-	0.0	2	0.6	5,173
Total town transactions (N)	154	,830	129,	040	63,9	963	311,	739	-	_	163	,104	822,	676
Suburban					·								·	
Online refunds issued to SNAP EBT cards	40.3	110,928	36.4	20,755	37.3	11,665	31.7	212,717	_	_	30.6	152,126	33.1	508,191
Online reversals issued to SNAP EBT cards	0.8	2,118	0.7	375	0.0	1	0.8	5,564	_	_	0.0	8	0.5	8,066
Total suburban transactions (N)	275	,460	57,0	009	31,3	285	671,	448	-	_	497	,826	1,533	,028
City														
Online refunds issued to SNAP EBT cards	40.9	161,495	36.5	81,512	36.3	43,525	25.6	467,643	_	-	30.3	201,684	29.6	955,859
Online reversals issued to SNAP EBT cards	0.9	3,609	0.9	2,001	0.0	0	0.6	11,703	_	_	0.0	10	0.5	17,323
Total city transactions (N)	394	,441	223,	084	120	,036	1,828	3,002	-	_	666	,170	3,231	,733
Missing urbanicity <sup>c</sup>														
Online refunds issued to SNAP EBT cards	40.5	25,396	34.3	8,575	33.9	4,204	31.7	31,278	_	_	32.7	36,587	34.1	106,040
Online reversals issued to SNAP EBT cards	0.7	442	0.4	110	0.0	0	0.8	787	_	_	0.0	1	0.4	1,340
Total transactions with missing urbanicity <sup>d</sup> (N)	62,	748	24,9	997	12,4	403	98,5	550	-	_	111	,996	310,	694

	Alab	ama	lov	va	Nebra	aska⁵	New	York	Ore	gon <sup>c</sup>	Washi	ngton	То	tal
	%	N	%	Ν	%	N	%	N	%	N	%	Ν	%	N
					Percen	itage and i	number of	transactio	ns, by urb	anicity				
Rural	32.8	433,204	16.8	87,858	10.9	27,809	10.8	353,395	_	_	9.9	157,309	13.2	1,059,575
Town	11.7	154,830	24.7	129,040	25.0	63,963	9.6	311,739		—	10.2	163,104	10.2	822,676
Suburban	20.9	275,460	10.9	57,009	12.2	31,285	20.6	671,448		—	31.2	497,826	19.0	1,533,028
City	29.9	394,441	42.7	223,084	47.0	120,036	56.0	1,828,002		—	41.7	666,170	40.1	3,231,733
Missing urbanicity <sup>d</sup>	4.8	62,748	4.8	24,997	4.9	12,403	3.0	98,550		—	7.0	111,996	3.9	310,694
Total transactions (N)	1,320	0,683	521,	988	255,	496	3,263	3,134	-	-	1,596	6,405	6,957	7,706

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

Orders that are split and fulfilled by different locations appear in the data as different transactions. As the data do not include the order number, it was not possible to link transactions to the same order. Therefore, reversals and refunds from the same order, but split into different transactions, were counted separately.

<sup>a</sup> Urbanicity categories are based on households' home addresses and classified according to National Center for Education Statistics' EDGE Locale Boundaries (Geverdt, 2019).

<sup>b</sup> Nebraska launched the SNAP Online purchasing pilot on April 2, 2020, therefore there are no transaction data for March 2020.

<sup>c</sup> Because Oregon did not report household address information, online refunds and reversals and rate are not reported by urbanicity.

<sup>d</sup> Urbanicity data are missing if the household address is missing or could not be geocoded.

# Table C3.2aRefunds and Reversals as a Proportion of Transactions in Online Purchasing by Urbanicity in Alabama, March 2020–<br/>March 2021

	March 2020	April 2020	May 2020	June 2020ª	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)
	()	()	()	()	(••)	Perc	entage (N)	of transac	tions	()	()	(••)	()	()
Online refunds issued	16.4	37.0	39.5	38.3	38.9	38.9	39.2	40.1	41.6	40.8	40.9	40.4	40.0	39.9
to SNAP EBT cards	(61)	(18,863)	(30,771)	(34,558)	(31,945)	(38,875)	(37,125)	(43,019)	(49,862)	(55,470)	(59,566)	(62,500)	(64,539)	(527,154)
Dural	23.0	36.6	33.0	35.8	34.2	32.8	32.4	31.4	31.3	31.0	30.6	30.8	30.7	32.0
Rurai	(14)	(6,913)	(10,168)	(12,363)	(10,933)	(12,759)	(12,027)	(13,506)	(15,593)	(17,171)	(18,204)	(19,260)	(19,820)	(168,731)
Town	4.9	12.2	12.2	11.0	12.0	12.4	12.0	12.0	10.9	11.1	11.3	11.3	11.0	11.5
TOWIT	(3)	(2,310)	(3,764)	(3,795)	(3,843)	(4,804)	(4,464)	(5,158)	(5,418)	(6,168)	(6,720)	(7,054)	(7,103)	(60,604)
Suburban	18.0	19.7	19.7	20.9	20.5	20.2	20.5	20.7	21.5	22.2	21.9	21.1	21.2	21.0
Guburban	(11)	(3,714)	(6,077)	(7,215)	(6,552)	(7,861)	(7,624)	(8,891)	(10,728)	(12,338)	(13,061)	(13,167)	(13,689)	(110,928)
City	52.5	27.0	30.6	28.1	28.8	29.6	29.9	30.9	31.6	30.7	31.4	31.9	32.1	30.6
Oity	(32)	(5,100)	(9,402)	(9,698)	(9,188)	(11,518)	(11,115)	(13,286)	(15,756)	(17,054)	(18,696)	(19,959)	(20,691)	(161,495)
Missing	1.6	4.4	4.4	4.3	4.5	5.0	5.1	5.1	4.7	4.9	4.8	4.9	5.0	4.8
lineoning	(1)	(826)	(1,360)	(1,487)	(1,429)	(1,933)	(1,895)	(2,178)	(2,367)	(2,739)	(2,885)	(3,060)	(3,236)	(25,396)
-		T				Perc	entage (N)	of transac	tions					1
Online reversals issued	0.3	0.5	0.4	0.5	0.3	0.3	0.6	0.8	0.7	0.8	1.0	1.2	0.9	0.7
to SNAP EBT cards	(1)	(259)	(306)	(491)	(206)	(323)	(555)	(826)	(891)	(1,149)	(1,454)	(1,812)	(1,457)	(9,730)
Rural	100.0	35.5	27.1	35.2	38.8	21.1	26.3	27.7	28.2	26.2	26.0	22.7	26.0	26.6
	(1)	(92)	(83)	(173)	(80)	(68)	(146)	(229)	(251)	(301)	(378)	(411)	(379)	(2,592)
Town	0.0	13.5	14.1	12.6	11.2	9.9	8.5	9.8	12.0	10.4	8.4	9.1	9.1	10.0
	(0)	(35)	(43)	(62)	(23)	(32)	(47)	(81)	(107)	(120)	(122)	(164)	(133)	(969)
Suburban	0.0	15.4	21.2	19.6	14.6	20.7	25.0	25.5	22.9	20.8	19.5	23.3	(22.0	21.8
	(0)	(40)	(65)	(96)	(30)	(67)	(139)	(211)	(204)	(239)	(284)	(423)	(320)	(2,118)
City	0.0	30.9	33.3 (100)	30.5	32.0	42.1	34.4 (404)	32.6	32.4	31.1	41.0 (500)	41.2	37.8	37.1
-	(0)	(80)	(102)	(150)	(00)	(130)	(191)	(209)	(289)	(433)	(390)	(740)	(331)	(3,609)
Missing	0.0	4.0 (12)	4.Z (12)	Z.U (10)	3.4 (7)	0.Z	0.0 (20)	4.4 (26)	4.5 (40)	4.9 (FG)	5. I (74)	3.0 (60)	ا .C (ا/رح)	4.0
	(0)	(12)	(13)	(10)	(7)	(20) Tot	(JZ) al number	(JO)	(40)	(00)	(74)	(00)	(74)	(442)
Total number of CNAD						101		ortransact	lions					
Online transactions	373	51,039	77,865	90,175	82,036	99,960	94,751	107,257	119,836	135,977	145,532	154,676	161,206	1,320,683

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

Orders that are split and fulfilled by different locations appear in the data as different transactions. As the data do not include the order number, it was not possible to link transactions to the same order. Therefore, reversals and refunds from the same order, but split into different transactions, were counted separately.

<sup>a</sup> Alabama transaction data are missing for 1 day in June 2020.

# Table C3.2b Rate of Refund and Reversal Transactions in Online Purchasing and Rate by Urbanicity<sup>a</sup> in Alabama, March 2020– March 2021

	March 2020	April 2020	May 2020	June 2020⋼	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)
	(••)	(••)	(11)	(••)	R	ate and nu	mber of tra	nsactions	by urbanic	city	(••)	(11)	(11)	(14)
Rural														
Online refunds issued	11.2	36.1	38.4	37.3	37.7	37.8	38.3	39.3	40.7	39.9	39.9	39.8	39.4	38.9
to SNAP EBT cards	(14)	(6,913)	(10,168)	(12,363)	(10,933)	(12,759)	(12,027)	(13,506)	(15,593)	(17,171)	(18,204)	(19,260)	(19,820)	(168,731)
to SNAP EBT cards	0.8 (1)	0.5 (92)	0.3 (83)	0.5 (173)	0.3 (80)	0.2 (68)	0.5 (146)	(229)	0.7 (251)	(301)	0.8 (378)	0.8 (411)	0.8 (379)	0.6 (2,592)
Total rural SNAP Online transactions (N)	125	19,128	26,506	33,141	28,984	33,742	31,424	34,388	38,307	43,024	45,674	48,408	50,353	433,204
Town		•			•		•							
Online refunds issued to SNAP FBT cards	10.7 (3)	35.8 (2 310)	38.4 (3 764)	37.8 (3 795)	38.6 (3 843)	38.3 (4 804)	38.3 (4 464)	39.1 (5 158)	40.0 (5 418)	39.9 (6 168)	40.9 (6 720)	39.8 (7 054)	39.4 (7 103)	39.1 (60.604)
Online reversals issued	0.0	0.5	0.4	0.6	0.2	0.3	0.4	0.6	0.8	0.8	0.7	0.9	0.7	0.6
to SNAP EBT cards	(0)	(35)	(43)	(62)	(23)	(32)	(47)	(81)	(107)	(120)	(122)	(164)	(133)	(969)
Total town SNAP Online transactions (N)	28	6,450	9,808	10,038	9,955	12,546	11,642	13,183	13,559	15,476	16,427	17,708	18,010	154,830
Suburban							•							
Online refunds issued	13.8	37.3 (3.714)	40.0 (6.077)	38.5 (7.215)	39.5 (6 552)	38.9 (7.861)	39.2 (7.624)	40.0 (8 891)	41.8 (10.728)	41.9 (12 338)	41.6 (13.061)	40.5 (13 167)	40.2	40.3
Online reversals issued	0.0	0.4	0.4	0.5	(0,002)	0.3	0.7	0.9	0.8	0.8	0.9	1.3	0.9	0.8
to SNAP EBT cards	(0)	(40)	(65)	(96)	(30)	(67)	(139)	(211)	(204)	(239)	(284)	(423)	(320)	(2,118)
Total suburban SNAP Online transactions (N)	80	9,967	15,206	18,753	16,593	20,186	19,427	22,231	25,677	29,426	31,368	32,498	34,048	275,460
City											L I			I
Online refunds issued	24.8	38.2	41.1	39.7	40.3	40.3	40.4	41.3	43.1	41.2	41.5	41.0	40.7	40.9
to SNAP EBT cards	(32)	(5,100)	(9,402)	(9,698)	(9,188)	(11,518)	(11,115)	(13,286)	(15,756)	(17,054)	(18,696)	(19,959)	(20,691)	(161,495)
Online reversals issued to SNAP EBT cards	0.0 (0)	0.6 (80)	0.4 (102)	0.6 (150)	0.3 (66)	0.5 (136)	0.7 (191)	0.8 (269)	0.8 (289)	1.0 (433)	1.3 (596)	1.5 (746)	1.1 (551)	0.9 (3,609)
Total city SNAP Online transactions (N)	129	13,347	22,875	24,400	22,816	28,610	27,496	32,173	36,596	41,441	45,039	48,641	50,878	394,441

	March 2020	April 2020	May 2020	June 2020 <sup>ь</sup>	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)
Missing urbanicity <sup>c</sup>														
Online refunds issued	9.1	38.5	39.2	38.7	38.7	39.6	39.8	41.2	41.5	41.4	41.1	41.2	40.9	40.5
to SNAP EBT cards	(1)	(826)	(1,360)	(1,487)	(1,429)	(1,933)	(1,895)	(2,178)	(2,367)	(2,739)	(2,885)	(3,060)	(3,236)	(25,396)
Online reversals issued	0.0	0.6	0.4	0.3	0.2	0.4	0.7	0.7	0.7	0.8	1.1	0.9	0.9	0.7
to SNAP EBT cards	(0)	(12)	(13)	(10)	(7)	(20)	(32)	(36)	(40)	(56)	(74)	(68)	(74)	(442)
Total SNAP Online														
transactions with missing	11	2,147	3,470	3,843	3,688	4,876	4,762	5,282	5,697	6,610	7,024	7,421	7,917	62,748
urbanicity <sup>c</sup> (N)														

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

Orders that are split and fulfilled by different locations appear in the data as different transactions. As the data do not include the order number, it was not possible to link transactions to the same order. Therefore, reversals and refunds from the same order, but split into different transactions, were counted separately.

<sup>a</sup> Urbanicity categories are based on households' home addresses and classified according to National Center for Education Statistics' EDGE Locale Boundaries (Geverdt, 2019).

<sup>b</sup> Alabama transaction data are missing for 1 day in June 2020.

<sup>c</sup> Urbanicity is missing if the household address is missing or could not be geocoded.

# Table C3.3aRefunds and Reversals as a Proportion of Transactions in Online Purchasing by Urbanicity in Iowa, March 2020–<br/>March 2021

	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020ª	Oct 2020	Nov 2020	Dec 2020	Jan 2021ª	Feb 2021	March 2021	Total March 2020- March 2021
	% (NI)	% (NI)	% (NI)	% (NI)	% (NI)	% (NI)	% (NI)	% (NI)	% (NI)	% (NI)	% (NI)	% (NI)	% (NI)	% (N)
	(N)	(N)	(N)	(N)	(N)	(N) Doro	(IN) Approximation (NI)	(N)	(IN) tiono	(N)	(N)	(N)	(N)	(11)
Online refunde issued	20.1	33.6	36.4	35.6	34.8	25 O	entage (N)	01 transac	36.5	35.7	35.5	35.2	34.6	25.5
to SNAP EBT cards	(803)	(0 172)	(10 870)	(9 726)	(11 252)	(1/ 155)	(1/ 3/1)	(16 784)	(18 130)	(18 /05)	(18 952)	(21 032)	(20 012)	(185 //3)
U SNAF LDT Calus	(003)	(3,172)	(10,073)	(3,720)	(11,252)	16.7	16 /	(10,704)	(10,130)	(10,403)	(10,952)	(21,352)	(20,912)	16.0
Rural	(131)	(1 544)	(1 831)	(1 621)	(1 882)	(2 366)	(2 349)	(2 707)	(3 124)	(3 039)	(2 861)	(3 170)	(3 129)	(29 754)
	24.5	24.5	25.2	23.9	25.2	25.4	24.0	24.2	25.0	24.1	23.6	23.4	23.2	24.2
Town	(197)	(2.249)	(2.737)	(2.325)	(2.837)	(3.597)	(3.437)	(4.057)	(4.528)	(4.430)	(4,465)	(5.143)	(4.845)	(44.847)
0 1 1 1	12.5	10.0	10.3	10.7	10.0	11.0	12.0	12.2	11.5	11.1	11.6	11.2	11.3	11.2
Suburban	(100)	(917)	(1,117)	(1,043)	(1,121)	(1,555)	(1,722)	(2,048)	(2,093)	(2,038)	(2,194)	(2,447)	(2,360)	(20,755)
City	42.8	42.9	43.0	44.1	43.5	42.2	43.3	43.2	41.8	43.3	45.0	46.6	46.0	44.0
City	(344)	(3,939)	(4,681)	(4,292)	(4,899)	(5,977)	(6,214)	(7,254)	(7,570)	(7,978)	(8,526)	(10,225)	(9,613)	(81,512)
Missing	3.9	5.7	4.7	4.6	4.6	4.7	4.3	4.3	4.5	5.0	4.8	4.3	4.6	4.6
wissing	(31)	(523)	(513)	(445)	(513)	(660)	(619)	(718)	(815)	(920)	(906)	(947)	(965)	(8,575)
						Perc	entage (N)	of transac	tions					
Online reversals issued	1.4	0.7	0.4	0.5	0.3	0.3	0.3	0.6	0.7	0.7	1.2	1.4	1.1	0.8
to SNAP EBT cards	(35)	(177)	(105)	(136)	(84)	(124)	(121)	(298)	(340)	(375)	(633)	(875)	(677)	(3,980)
Rural	8.6	13.6	12.4	16.2	13.1	13.7	16.5	17.4	16.2	14.1	12.5	11.9	11.7	13.4
	(3)	(24)	(13)	(22)	(11)	(17)	(20)	(52)	(55)	(53)	(79)	(104)	(79)	(532)
Town	14.3	26.0	24.8	26.5	23.8	35.5	30.6	29.5	30.9	28.3	16.7	20.3	24.4	24.2
	(5)	(46)	(26)	(36)	(20)	(44)	(37)	(88)	(105)	(106)	(106)	(178)	(165)	(962)
Suburban	20.0	10.7	11.4	8.1	6.0	6.5	9.9	10.4	7.4	10.1	10.6	9.9	7.8	9.4
	(7)	(19)	(12)	(11)	(5)	(8)	(12)	(31)	(25)	(38)	(67)	(87)	(53)	(375)
Citv	57.1	45.2	48.6	46.3	52.4	41.1	41.3	39.6	42.6	42.7	57.5	55.2	54.9	50.3
	(20)	(80)	(51)	(63)	(44)	(51)	(50)	(118)	(145)	(160)	(364)	(483)	(372)	(2,001)
Missing	0.0	4.5	2.9	2.9	4.8	3.2	1.7	3.0	2.9	4.8	2.7	2.6	1.2	2.8
, in the second	(0)	(8)	(3)	(4)	(4)	(4)	(2)	(9)	. (10)	(18)	(17)	(23)	(8)	(110)
						lot	al number (	of transact	ions					
Online transactions	2,504	27,173	29,897	27,293	32,342	39,395	39,532	46,647	49,731	51,542	53,320	62,242	60,370	521,988

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

Orders that are split and fulfilled by different locations appear in the data as different transactions. As the data do not include the order number, it was not possible to link transactions to the same order. Therefore, reversals and refunds from the same order, but split into different transactions, were counted separately.

<sup>a</sup> lowa transaction data are missing for 1 day in September 2020 and 2 days in January 2021.

Table C3.3b	Rate of Refund and Reversal	<b>Transactions in Online</b>	Purchasing by	Urbanicity <sup>a</sup> in lowa	, March 2020–March 2021
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	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020⋼	Oct 2020	Nov 2020	Dec 2020	Jan 2021ª	Feb 2021	March 2021	Total March 2020- March 2021
	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)
	( )	()	( )		R	ate and nu	mber of tra	nsactions,	by urbanic	city	( )			
Rural														
Online refunds issued to SNAP EBT cards	29.2 (131)	33.1 (1,544)	35.4 (1,831)	34.5 (1,621)	33.3 (1,882)	34.0 (2,366)	34.8 (2,349)	33.9 (2,707)	35.5 (3,124)	34.2 (3,039)	33.1 (2,861)	33.1 (3,170)	32.6 (3,129)	33.9 (29,754)
Online reversals issued to SNAP EBT cards	0.7 (3)	0.5 (24)	0.3 (13)	0.5 (22)	0.2 (11)	0.2 (17)	0.3 (20)	0.7 (52)	0.6 (55)	0.6 (53)	0.9 (79)	1.1 (104)	0.8 (79)	0.6 (532)
Total rural SNAP Online transactions (N)	449	4,671	5,168	4,704	5,656	6,958	6,756	7,976	8,804	8,897	8,638	9,582	9,599	87,858
Town														
Online refunds issued to SNAP EBT cards	32.0 (197)	32.9 (2,249)	35.9 (2,737)	34.9 (2,325)	33.8 (2,837)	34.5 (3,597)	35.3 (3,437)	35.0 (4,057)	36.1 (4,528)	34.8 (4,430)	35.3 (4,465)	34.7 (5,143)	33.7 (4,845)	34.8 (44,847)
Online reversals issued	0.8	0.7	0.3	0.5	0.2	0.4	0.4	0.8	0.8	0.8	0.8	1.2	1.1	0.7
to SNAP EBT cards	(5)	(46)	(26)	(36)	(20)	(44)	(37)	(88)	(105)	(106)	(106)	(178)	(165)	(962)
Total town SNAP Online transactions (N)	616	6,846	7,631	6,666	8,401	10,417	9,731	11,593	12,536	12,730	12,649	14,826	14,398	129,040
Suburban														-
Online refunds issued to SNAP EBT cards	37.5 (100)	33.7 (917)	36.0 (1,117)	37.1 (1,043)	36.3 (1,121)	37.2 (1,555)	37.4 (1,722)	38.3 (2,048)	36.8 (2,093)	35.6 (2,038)	36.3 (2,194)	35.9 (2,447)	35.7 (2,360)	36.4 (20,755)
Online reversals issued	2.6	0.7	0.4	0.4	0.2	0.2	0.3	0.6	0.4	0.7	1.1	1.3	0.8	0.7
to SNAP EBT cards	(7)	(19)	(12)	(11)	(5)	(8)	(12)	(31)	(25)	(38)	(67)	(87)	(53)	(375)
Total suburban SNAP Online transactions (N)	267	2,725	3,107	2,814	3,092	4,183	4,604	5,345	5,687	5,723	6,037	6,818	6,607	57,009
City														
Online refunds issued to SNAP EBT cards	32.5 (344)	34.6 (3,939)	37.4 (4,681)	36.5 (4,292)	36.1 (4,899)	37.7 (5,977)	37.3 (6,214)	36.9 (7,254)	37.1 (7,570)	37.1 (7,978)	36.4 (8,526)	36.2 (10,225)	35.6 (9,613)	36.5 (81,512)
Online reversals issued to SNAP EBT cards	1.9 (20)	0.7 (80)	0.4 (51)	0.5 (63)	0.3 (44)	0.3 (51)	0.3 (50)	0.6 (118)	0.7 (145)	0.7 (160)	1.6 (364)	1.7 (483)	1.4 (372)	0.9 (2,001)
Total city SNAP Online transactions (N)	1,059	11,371	12,503	11,757	13,577	15,874	16,664	19,642	20,431	21,532	23,439	28,232	27,003	223,084

	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020⁵	Oct 2020	Nov 2020	Dec 2020	Jan 2021ª	Feb 2021	March 2021	Total March 2020- March 2021
	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)
Missing urbanicity <sup>c</sup>														
Online refunds issued	27.4	33.5	34.5	32.9	31.7	33.6	34.8	34.3	35.9	34.6	35.4	34.0	34.9	34.3
to SNAP EBT cards	(31)	(523)	(513)	(445)	(513)	(660)	(619)	(718)	(815)	(920)	(906)	(947)	(965)	(8,575)
Online reversals issued	0.0	0.5	0.2	0.3	0.2	0.2	0.1	0.4	0.4	0.7	0.7	0.8	0.3	0.4
to SNAP EBT cards	(0)	(8)	(3)	(4)	(4)	(4)	(2)	(9)	(10)	(18)	(17)	(23)	(8)	(110)
Total SNAP Online														
transactions with missing urbanicityc(N)	113	1,560	1,488	1,352	1,616	1,963	1,777	2,091	2,273	2,660	2,557	2,784	2,763	24,997

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

Orders that are split and fulfilled by different locations appear in the data as different transactions. As the data do not include the order number, it was not possible to link transactions to the same order. Therefore, reversals and refunds from the same order, but split into different transactions, were be counted separately.

<sup>a</sup> Urbanicity categories are based on households' home addresses and classified according to National Center for Education Statistics' EDGE Locale Boundaries (Geverdt, 2019).

<sup>b</sup> lowa transaction data are missing for 1 day in September 2020 and 2 days in January 2021.

<sup>c</sup> Urbanicity is missing if the household address is missing or could not be geocoded.

# Table C3.4aRefunds and Reversals as a Proportion of Transactions in Online Purchasing by Urbanicity in Nebraska, March2020–March 2021

	March 2020ª	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)
						Pe	ercentage (I	N) of transa	ictions					
Online refunds issued		32.1	36.4	35.8	36.5	36.3	35.8	36.3	36.5	35.5	35.5	35.2	35.1	35.6
to SNAP EBT cards	_	(3,434)	(5,978)	(5,279)	(5,200)	(10,675)	(7,476)	(6,896)	(6,520)	(9,485)	(8,300)	(10,896)	(10,914)	) (91,053)
Burol	_	10.0	10.4	9.7	10.7	11.8	12.1	11.5	11.4	9.7	9.2	8.0	8.7	/ 10.2
Rulai	—	(344)	(624)	(513)	(558)	(1,257)	(908)	(791)	(744)	(924)	(766)	(870)	(949)	) (9,248)
Town	—	23.7	23.3	23.8	24.8	27.7	25.9	26.1	24.7	25.4	24.0	22.9	22.6	i 24.6
TOWIT	—	(813)	(1,393)	(1,256)	(1,288)	(2,953)	(1,937)	(1,800)	(1,612)	(2,412)	(1,988)	(2,496)	(2,463)	) (22,411)
Suburban	—	13.5	13.0	14.2	11.9	12.8	12.7	12.6	12.9	13.0	12.8	12.2	12.9	) 12.8
Suburban	—	(465)	(775)	(748)	(621)	(1,369)	(949)	(866)	(841)	(1,233)	(1,062)	(1,333)	(1,403)	) (11,665)
City	—	46.9	47.3	46.7	47.0	43.4	44.7	45.3	47.0	47.6	49.5	52.7	51.7	′ 47.8
Oity	—	(1,611)	(2,830)	(2,467)	(2,445)	(4,634)	(3,344)	(3,122)	(3,065)	(4,513)	(4,107)	(5,747)	(5,640)	) (43,525)
Missing	—	5.9	6.0	5.6	5.5	4.3	4.5	4.6	4.0	4.2	4.5	4.1	4.2	2 4.6
	_	(201)	(356)	(295)	(288)	(462)	(338)	(317)	(258)	(403)	(377)	(450)	(459)	) (4,204)
						Pe	ercentage (I	N) of transa	ictions					
Online reversals issued		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	) 0.0
to SNAP EBT cards	—	(0)	(0)	(1)	(0)	(2)	(0)	(0)	(1)	(1)	(0)	(0)	(0)	) (5)
Rural	—	0	0	100.0	0	50.0	0	0	0.0	0.0	0	0	0	) 40.0
	—	(0)	(0)	(1)	(0)	(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	) (2)
Town	—	0	0	0.0	0	50.0	0	0	100.0	0.0	0	0	0	40.0
10001	—	(0)	(0)	(0)	(0)	(1)	(0)	(0)	(1)	(0)	(0)	(0)	(0)	) (2)
Suburban	—	0	0	0.0	0	0.0	0	0	0.0	100.0	0	0	0	) 20.0
Ouburbain	—	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1)	(0)	(0)	(0)	) (1)
City	—	0	0	0.0	0	0.0	0	0	0.0	0.0	0	0	0	0.0
Oity	—	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	) (0)
Missing	—	0	0	0.0	0	0.0	0	0	0.0	0.0	0	0	0	0.0
Wildoning	_	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	) (0)
						Т	otal numbe	r of transad	ctions					
Total number of SNAP Online transactions	—	10,708	16,429	14,756	14,255	29,407	20,868	19,021	17,885	26,681	23,400	30,989	31,097	, 255,496

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

Orders that are split and fulfilled by different locations appear in the data as different transactions. As the data do not include the order number, it was not possible to link transactions to the same order. Therefore, reversals and refunds from the same order, but split into different transactions, were counted separately.

<sup>a</sup> Nebraska launched the SNAP Online Purchasing Pilot on April 2, 2020, therefore there are no transaction data for March 2020.

Table C3.4b	Rate of Refund and Reversal	<b>Transactions in Online</b>	Purchasing by Urbanicity	<sup>a</sup> in Nebraska, March 2020–March 2021
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	March 2020♭	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)
	(/	(/	()	(/	R	ate and nu	mber of tra	nsactions.	by urbanio	city	(/	(/	(**)	(/
Rural														
Online refunds issued	—	28.3	35.3	32.8	33.9	33.8	33.6	34.2	34.7	32.4	32.6	32.4	33.3	33.3
to SNAP EBT cards	_	(344)	(624)	(513)	(558)	(1,257)	(908)	(791)	(744)	(924)	(766)	(870)	(949)	(9,248)
Online reversals issued	—	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
to SNAP EBT cards	_	(0)	(0)	(1)	(0)	(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(2)
Total rural SNAP Online transactions (N)	-	1,215	1,770	1,565	1,646	3,723	2,700	2,310	2,147	2,849	2,350	2,687	2,847	27,809
Town														
Online refunds issued	_	30.5	34.8	34.4	35.6	36.7	35.3	36.8	36.1	34.9	34.8	33.9	34.5	35.0
to SNAP EBT cards	—	(813)	(1,393)	(1,256)	(1,288)	(2,953)	(1,937)	(1,800)	(1,612)	(2,412)	(1,988)	(2,496)	(2,463)	(22,411)
Online reversals issued	—	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
to SNAP EBT cards	_	(0)	(0)	(0)	(0)	(1)	(0)	(0)	(1)	(0)	(0)	(0)	(0)	(2)
Total town SNAP Online transactions (N)	-	2,664	4,005	3,656	3,615	8,055	5,495	4,887	4,463	6,905	5,720	7,359	7,139	63,963
Suburban														•
Online refunds issued	_	34.1	39.2	39.4	39.3	38.1	37.2	37.8	37.8	36.7	36.1	36.1	36.9	37.3
to SNAP EBT cards	_	(465)	(775)	(748)	(621)	(1,369)	(949)	(866)	(841)	(1,233)	(1,062)	(1,333)	(1,403)	(11,665)
Online reversals issued	—	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
to SNAP EBT cards	_	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1)	(0)	(0)	(0)	(1)
Total suburban SNAP Online transactions (N)	-	1,364	1,978	1,898	1,582	3,595	2,554	2,292	2,223	3,361	2,940	3,694	3,804	31,285
City														
Online refunds issued	—	33.5	37.0	36.1	37.0	36.7	36.6	36.3	37.0	36.6	36.3	36.1	35.5	36.3
to SNAP EBT cards	_	(1,611)	(2,830)	(2,467)	(2,445)	(4,634)	(3,344)	(3,122)	(3,065)	(4,513)	(4,107)	(5,747)	(5,640)	(43,525)
Online reversals issued	—	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
to SNAP EBT cards	_	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Total city SNAP Online transactions (N)	-	4,815	7,644	6,825	6,603	12,628	9,131	8,598	8,291	12,346	11,320	15,928	15,907	120,036

	March 2020 <sup>ь</sup>	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)
Missing urbanicity <sup>c</sup>														
Online refunds issued	-	30.9	34.5	36.3	35.6	32.9	34.2	33.9	33.9	33.0	35.2	34.1	32.8	33.9
to SNAP EBT cards	—	(201)	(356)	(295)	(288)	(462)	(338)	(317)	(258)	(403)	(377)	(450)	(459)	(4,204)
Online reversals issued	—	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
to SNAP EBT cards	_	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Total SNAP Online														
transactions with missing	_	650	1,032	812	809	1,406	988	934	761	1,220	1,070	1,321	1,400	12,403
urbanicity <sup>c</sup> (N)														

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

Orders that are split and fulfilled by different locations appear in the data as different transactions. As the data do not include the order number, it was not possible to link transactions to the same order. Therefore, reversals and refunds from the same order, but split into different transactions, were counted separately.

<sup>a</sup> Urbanicity categories are based on households' home addresses and classified according to National Center for Education Statistics' EDGE Locale Boundaries (Geverdt, 2019).

<sup>b</sup>Nebraska launched the SNAP online purchasing pilot on April 2, 2020, therefore there are no transaction data for March 2020.

<sup>c</sup> Urbanicity is missing if the household address is missing or could not be geocoded.

# Table C3.5aRefunds and Reversals as a Proportion of Transactions in Online Purchasing by Urbanicity in New York, March2020–March 2021

	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
	% (NI)	% (NI)	% (NI)	% (NI)	% (NI)	% (NI)	% (NI)	% (NI)	% (NI)	% (NI)	% (NI)	% (NI)	% (NI)	% (NI)
	(N)	(N)	(N)	(N)	(N)	(IN) Doro	(IN) Lontogo (NI)	(IN)	(N)	(N)	(N)	(N)	(N)	
Online refunds issued	20.5	24.5	27.4	26.5	28.0	Perc 29 G	entage (N)			20.0	20.7	20.4	20.0	20.7
to SNAD EPT cords	(20.971)	24.0 (25.743)	27.4 (18.201)	20.0 (51.638)	20.0	20.0 (63.325)	2.12 (N80.03)	(80.003)	(02 462)	30.0 (04 401)	20.7 (101 212)	29.4 (113.027)	20.0 (113 701)	(035 728)
U SINAF EDT CATUS	(20,071)	(20,740)	(40,201)	(31,030)	(09,000)	(03,325)	(00,904)	(09,993) 13.2	(92,402)	(94,491)	(101,312)	(113,927)	12 0	(930,720)
Rural	(2 177)	(3 771)	(6 266)	(5 753)	(6 822)	(7 905)	(6 863)	(11 803)	(13 /06)	(13 060)	(12 038)	(13 160)	(13 610)	(117 723)
	10.2	13.3	10 5	9.3	9.5	10.4	10.0	11 1	12 7	12.3	12,330)	11 5	11.8	11.4
Town	(2 139)	(3 411)	(5077)	(4 816)	(5 611)	(6 598)	(6 121)	(10 003)	(11 788)	(11 637)	(12 634)	(13 151)	(13 381)	(106.367)
	22.1	25.9	24.7	22.6	22.3	23.1	21.4	21.4	23.3	23.1	23.1	22.3	22.4	22.7
Suburban	(4.609)	(6.668)	(11.914)	(11.679)	(13,163)	(14.638)	(13.032)	(19.223)	(21.581)	(21.831)	(23.412)	(25,444)	(25.523)	(212,717)
O'I	53.7	42.2	48.0	53.5	53.1	50.6	54.2	51.1	46.0	47.4	48.5	51.4	50.5	50.0
City	(11,210)	(10,851)	(23,123)	(27,630)	(31,384)	(32,032)	(33,061)	(46,003)	(42,518)	(44,758)	(49,133)	(58,537)	(57,403)	(467,643)
Missian	3.5	4.0	3.8	3.4	3.5	3.4	3.1	3.2	3.3	3.4	3.2	3.2	3.3	3.3
wissing	(736)	(1,042)	(1,821)	(1,760)	(2,080)	(2,152)	(1,907)	(2,871)	(3,079)	(3,205)	(3,195)	(3,626)	(3,804)	(31,278)
						Perc	entage (N)	of transac	tions					
Online reversals issued	1.2	0.8	0.5	0.2	0.1	0.2	0.2	0.3	0.4	0.5	1.3	1.5	1.3	0.7
to SNAP EBT cards	(803)	(829)	(936)	(403)	(283)	(376)	(548)	(945)	(1,070)	(1,632)	(4,678)	(5,664)	(5,414)	(23,581)
Rural	9.1	10.1	10.1	16.4	13.4	13.3	14.8	16.6	15.8	11.9	9.5	9.2	5.8	9.7
	(73)	(84)	(95)	(66)	(38)	(50)	(81)	(157)	(169)	(195)	(445)	(521)	(315)	(2,289)
Town	10.3	9.3	8.4	17.9	11.3	16.0	17.3	16.7	17.7	13.9	14.1	15.4	11.6	13.7
	(83)	(77)	(79)	(72)	(32)	(60)	(95)	(158)	(189)	(227)	(661)	(875)	(630)	(3,238)
Suburban	33.1	43.7	39.2	23.6	23.7	28.7	22.6	20.2	25.5	23.6	22.6	19.4	21.6	23.6
	(266)	(362)	(367)	(95)	(67)	(108)	(124)	(191)	(273)	(385)	(1,059)	(1,100)	(1,167)	(5,564)
City	43.6	31.4	37.2	37.0	37.5	38.6	42.7	40.8	37.6	47.5	52.0	53.0	57.5	49.6
,	(350)	(260)	(348)	(149)	(106)	(145)	(234)	(386)	(402)	(776)	(2,432)	(3,000)	(3,115)	(11,703)
Missing	3.9 (24)	5.5 (46)	0.C (47)	5.Z (21)	14.1	3.5 (12)	Z.0 (1.4)	0.0 (52)	3.5 (27)	3.0	./ (01)	3.U (160)	3.5 (107)	3.3 (707)
	(31)	(40)	(47)	(21)	(40)	(13)	(14) al number	(33) of trop oot	(37)	(49)	(01)	(100)	(107)	(101)
Total number of CNAD						lota	arnumber	or transact	IONS					
Online transactions	68,372	104,894	175,706	194,930	210,559	221,457	223,974	299,070	302,407	315,484	353,253	387,121	405,907	3,263,134

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021.

Notes: Orders that are split and fulfilled by different locations appear in the data as different transactions. As the data do not include the order number, it was not possible to link transactions to the same order. Therefore, reversals and refunds from the same order, but split into different transactions, were counted separately.

Table C3.5b	Rate of Refund and Reversa	Transactions in Online	Purchasing by Urbanicity <sup>a</sup>	in New York, March 2020–March 2021
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	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
	% (NI)	% (NI)	% (NI)	% (N)	% (N)	% (NI)	% (NI)	% (NI)	% (NI)	% (NI)	% (NI)	% (N)	% (NI)	% (NI)
	(N)	(N)	(11)	(11)	(11)	(III) ato and nuu	(N) mbor of tra	neactione	(N)	(IN)	(11)	(11)	(1)	
Rural	_	_	_	_					by urbanit	Jity	_	_	_	
Online refunds issued	32.2	28.1	32.8	31.2	32.8	33.6	33.6	35.4	35.1	33.9	33.3	32.7	32.9	33.3
to SNAP EBT cards	(2,177)	(3,771)	(6,266)	(5,753)	(6,822)	(7,905)	(6,863)	(11,893)	(13,496)	(13,060)	(12,938)	(13,169)	(13,610)	(117,723)
Online reversals issued	1.1	0.6	0.5	0.4	0.2	0.2	0.4	0.5	0.4	0.5	1.1	1.3	0.8	0.6
to SNAP EBT cards	(73)	(84)	(95)	(66)	(38)	(50)	(81)	(157)	(169)	(195)	(445)	(521)	(315)	(2,289)
Total rural SNAP Online transactions (N)	6,763	13,419	19,095	18,444	20,776	23,496	20,444	33,553	38,415	38,553	38,876	40,253	41,308	353,395
Town														
Online refunds issued	34.2	30.4	33.4	31.1	32.7	33.9	34.1	35.8	36.0	35.3	34.4	33.6	34.0	34.1
to SNAP EBT cards	(2,139)	(3,411)	(5,077)	(4,816)	(5,611)	(6,598)	(6,121)	(10,003)	(11,788)	(11,637)	(12,634)	(13,151)	(13,381)	(106,367)
Online reversals issued	1.3	0.7	0.5	0.5	0.2	0.3	0.5	0.6	0.6	0.7	1.8	2.2	1.6	1.0
to SNAP EBT cards	(83)	(77)	(79)	(72)	(32)	(60)	(95)	(158)	(189)	(227)	(661)	(875)	(630)	(3,238)
Total town SNAP Online transactions (N)	6,257	11,238	15,195	15,502	17,182	19,441	17,957	27,933	32,753	32,926	36,765	39,180	39,410	311,739
Suburban														
Online refunds issued	31.2	26.4	30.7	30.5	31.1	31.6	31.4	32.9	33.5	32.9	31.7	32.2	31.1	31.7
to SNAP EBT cards	(4,609)	(6,668)	(11,914)	(11,679)	(13,163)	(14,638)	(13,032)	(19,223)	(21,581)	(21,831)	(23,412)	(25,444)	(25,523)	(212,717)
Online reversals issued	1.8	1.4	0.9	0.2	0.2	0.2	0.3	0.3	0.4	0.6	1.4	1.4	1.4	0.8
to SNAP EBT cards	(266)	(362)	(367)	(95)	(67)	(108)	(124)	(191)	(273)	(385)	(1,059)	(1,100)	(1,167)	(5,564)
Online transactions (N)	14,762	25,296	38,784	38,354	42,371	46,265	41,521	58,447	64,427	66,332	73,796	78,958	82,135	671,448
City			1							1				
Online refunds issued	29.2	21.2	23.8	23.6	25.4	25.5	24.0	27.0	27.0	26.7	25.4	26.9	24.9	25.6
Online revenuela insued	(11,210)	(10,651)	(23,123)	(27,030)	(31,384)	(32,032)	(33,001)	(40,003)	(42,518)	(44,758)	(49,133)	(38,337)	(57,403)	(407,043)
to SNAP EBT cards	(350)	(260)	0.4 (348)	(149)	(106)	(145)	0.2 (234)	0.2 (386)	(402)	0.5 (776)	1.3 (2,432)	(3,000)	۲.3 (3,115)	0.6 (11,703)
Total city SNAP Online transactions (N)	38,455	51,218	97,059	116,850	123,721	125,544	137,802	170,402	157,572	167,879	193,499	217,251	230,750	1,828,002

	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)
Missing urbanicity <sup>b</sup>														
Online refunds issued	34.5	28.0	32.7	30.4	32.0	32.1	30.5	32.9	33.3	32.7	31.0	31.6	30.9	31.7
to SNAP EBT cards	(736)	(1,042)	(1,821)	(1,760)	(2,080)	(2,152)	(1,907)	(2,871)	(3,079)	(3,205)	(3,195)	(3,626)	(3,804)	(31,278)
Online reversals issued	1.5	1.2	0.8	0.4	0.6	0.2	0.2	0.6	0.4	0.5	0.8	1.5	1.5	0.8
to SNAP EBT cards	(31)	(46)	(47)	(21)	(40)	(13)	(14)	(53)	(37)	(49)	(81)	(168)	(187)	(787)
Total SNAP Online														
transactions with missing	2,135	3,723	5,573	5,780	6,509	6,711	6,250	8,735	9,240	9,794	10,317	11,479	12,304	98,550
urbanicity <sup>b</sup> (N)														

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

Orders that are split and fulfilled by different locations appear in the data as different transactions. As the data do not include the order number, it was not possible to link transactions to the same order. Therefore, reversals and refunds from the same order, but split into different transactions, were counted separately.

<sup>a</sup> Urbanicity categories are based on households' home addresses and classified according to National Center for Education Statistics' EDGE Locale Boundaries (Geverdt, 2019).

<sup>b</sup> Urbanicity is missing if the household address is missing or could not be geocoded

# Table C3.6 Refunds and Reversals as a Proportion of Transactions in Online Purchasing in Oregon, March 2020–March 2021

	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
	% (NI)	% (NI)	% (NI)	% (NI)	% (N)	% (NI)	% (NI)	% (NI)	% (NI)	% (NI)	% (N)	% (NI)	% (NI)	% (NI)
	(N)	(N)	(N)	(N)	(N)	(N) Per	centage (N)	of transact	tions	(N)	(N)	(N)	(N)	(N)
Online refunds issued to SNAP EBT cards	28.8 (1,841)	31.7 (15,110)	31.5 (17,391)	28.5 (18,750)	29.5 (19,775)	31.1 (24,894)	33.6 (28,430)	33.1 (33,625)	33.3 (34,737)	32.4 (35,029)	32.3 (39,349)	33.1 (40,748)	31.0 (39,614)	31.9 (349,293)
Online reversals issued to SNAP EBT cards	0.0 (0)	0.0 (0)	0.0 (3)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (1)	0.0 (5)	0.0 (0)	0.0 (0)	0.0 (4)	0.0 (0)	0.0 (13)
						То	tal number	of transacti	ions					
Total number of SNAP Online transactions	6,401	47,734	55,136	65,844	66,936	79,993	84,500	101,708	104,381	108,180	121,883	122,944	127,612	1,093,252

**Source:** Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. **Notes:** Refunds and reversals are not reported by urbanicity because Oregon did not report household address information. Orders that are split and fulfilled by different locations appear in the data as different transactions. As the data do not include the order number, it was not possible to link transactions to the same order. Therefore, reversals and refunds from the same order, but split into different transactions, were counted separately.

# Table C3.7aRefunds and Reversals as a Proportion of Transactions in Online Purchasing by Urbanicity in Washington, March2020–March 2021

	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)
	(11)	(14)	(11)	(14)	(14)	(II) Perc	entage (N)	of transac	tions	(11)	(11)	(11)	(1)	(11)
Online refunds issued	33.9	30.9	32.2	30.3	29.1	30.2	30.8	31.3	32.3	31.7	31.0	31.2	29 5	30.9
to SNAP FBT cards	(8 747)	(25 409)	(27 810)	(25,700)	(33 639)	(38 232)	(37 783)	(40 639)	(44 800)	(49 049)	(50,921)	(51 998)	(58 384)	(493 111)
B .	12.5	10.7	10.2	10.0	10.8	11.0	9.8	10.2	9.8	9.8	9.5	9.5	9.3	10.0
Rural	(1,090)	(2,712)	(2,839)	(2,558)	(3,636)	(4,188)	(3,720)	(4,126)	(4,407)	(4,789)	(4,824)	(4,960)	(5,429)	(49,278)
T	10.7	11.1	11.7	10.8	11.3	12.0	11.4	10.9	10.7	10.7	10.7	10.2	9.8	10.8
Iown	(937)	(2,829)	(3,243)	(2,780)	(3,810)	(4,588)	(4,304)	(4,431)	(4,784)	(5,239)	(5,464)	(5,278)	(5,749)	(53,436)
Suburban	30.2	31.6	30.4	31.1	29.7	30.1	31.4	30.7	30.5	31.0	31.2	30.9	31.5	30.9
Suburban	(2,640)	(8,017)	(8,463)	(7,994)	(9,985)	(11,491)	(11,848)	(12,466)	(13,666)	(15,217)	(15,874)	(16,068)	(18,397)	(152,126)
City	39.3	39.4	40.0	41.0	40.4	39.2	39.9	41.0	41.8	41.1	40.9	42.2	42.1	40.9
Oity	(3,435)	(10,012)	(11,121)	(10,525)	(13,588)	(14,984)	(15,092)	(16,671)	(18,730)	(20,158)	(20,835)	(21,927)	(24,606)	(201,684)
Missing	7.4	7.2	7.7	7.2	7.8	7.8	7.5	7.2	7.2	7.4	7.7	7.2	7.2	7.4
Wilsoning	(645)	(1,839)	(2,144)	(1,843)	(2,620)	(2,981)	(2,819)	(2,945)	(3,213)	(3,646)	(3,924)	(3,765)	(4,203)	(36,587)
						Perc	entage (N)	of transac	tions					_
Online reversals issued	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
to SNAP EBT cards	(0)	(0)	(1)	(3)	(0)	(3)	(0)	(4)	(6)	(1)	(0)	(1)	(3)	(22)
Rural	0	0	0.0	0.0	0	0.0	0	25.0	0.0	0.0	0	0.0	0.0	4.5
	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1)	(0)	(0)	(0)	(0)	(0)	(1)
Town	0	0	0.0	0.0	0	0.0	0	25.0	0.0	0.0	0	0.0	33.3	9.1
-	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1)	(0)	(0)	(0)	(0)	(1)	(2)
Suburban	0	0	0.0	66.7	0	33.3	0	25.0	50.0	0.0	0	0.0	33.3	36.4
	(0)	(0)	(0)	(2)	(0)	(1)	(0)	(1)	(3)	(0)	(0)	(0)	(1)	(8)
City	0	0	100.0	33.3	0	00.7 (2)	0	25.0 (1)	50.0	100.0	0	0.0	33.3	45.5
	(0)	(0)	(1)	(1)	(0)	(2)	(0)	(1)	(3)	(1)	(0)	(0)	(1)	(10)
Missing	(0)	(0)	0.0 (0)	(0)	(0)	(0)	(0)	0.0 (0)	0.0 (0)	0.0 (0)	(0)	(1)	(0)	4.5
	(0)	(0)	(0)	(0)	(0)	(0) Tot	(U) al numbor	(U) of transpot	ione	(0)	(0)	(י)	(0)	(1)
Total number of SNAD						101			10115					
Online transactions	25,820	82,268	86,391	84,840	115,501	126,800	122,772	130,043	138,886	154,590	164,377	166,513	197,604	1,596,405

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

Orders that are split and fulfilled by different locations appear in the data as different transactions. As the data do not include the order number, it was not possible to link transactions to the same order. Therefore, reversals and refunds from the same order, but split into different transactions, were counted separately.

Table C3.7bRate of Refund and Reversal Transactions in Online Purchasing by Urbanicity<sup>a</sup> in Washington, March 2020–March2021

	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)
					R	ate and nu	mber of tra	nsactions,	, by urbanic	city				
Rural														
Online refunds issued	34.9 (1.090)	30.5 (2 712)	32.5 (2 839)	30.7 (2 558)	30.6 (3.636)	31.9 (4 188)	31.5 (3.720)	31.8 (4 126)	32.2 (4 407)	31.8 (4 789)	31.8 (4 824)	31.1 (4 960)	29.2 (5.429)	31.3 (49 278)
Online reversals issued to SNAP EBT cards	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total rural SNAP Online transactions (N)	3,120	8,904	8,748	8,333	11,873	13,139	11,825	12,979	13,666	15,043	15,150	15,952	18,577	157,309
Town														•
Online refunds issued to SNAP EBT cards	34.2 (937)	31.4 (2.829)	35.0 (3.243)	31.5 (2,780)	30.7 (3,810)	32.6 (4,588)	32.9 (4,304)	33.0 (4,431)	33.9 (4,784)	34.3 (5.239)	33.8 (5,464)	32.8 (5.278)	30.9 (5,749)	32.8 (53,436)
Online reversals issued	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
to SNAP EBT cards	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1)	(0)	(0)	(0)	(0)	(1)	(2)
Total town SNAP Online transactions (N)	2,736	9,003	9,273	8,834	12,407	14,074	13,077	13,431	14,128	15,261	16,167	16,083	18,630	163,104
Suburban														
Online refunds issued to SNAP EBT cards	33.5 (2,640)	30.9 (8,017)	31.9 (8,463)	30.6 (7,994)	28.5 (9,985)	29.5 (11,491)	30.6 (11,848)	30.8 (12,466)	31.9 (13,666)	31.2 (15,217)	30.5 (15,874)	31.1 (16,068)	29.3 (18,397)	30.6 (152,126)
Online reversals issued	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
to SNAP EBT cards	(0)	(0)	(0)	(2)	(0)	(1)	(0)	(1)	(3)	(0)	(0)	(0)	(1)	(8)
Total suburban SNAP Online transactions (N)	7,891	25,972	26,536	26,130	35,037	38,939	38,699	40,526	42,778	48,698	52,028	51,697	62,895	497,826
City														
Online refunds issued to SNAP EBT cards	33.4 (3,435)	30.7 (10,012)	31.3 (11,121)	29.6 (10,525)	28.5 (13,588)	29.1 (14,984)	29.8 (15,092)	30.7 (16,671)	31.9 (18,730)	31.1 (20,158)	30.1 (20,835)	30.8 (21,927)	29.2 (24,606)	30.3 (201,684)
Online reversals issued to SNAP EBT cards	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 (10)
Total city SNAP Online transactions (N)	10,291	32,604	35,485	35,538	47,679	51,458	50,592	54,274	58,753	64,789	69,276	71,292	84,139	666,170

	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)
Missing urbanicity <sup>b</sup>														
Online refunds issued	36.2	31.8	33.8	30.7	30.8	32.4	32.9	33.3	33.6	33.8	33.4	32.8	31.5	32.7
to SNAP EBT cards	(645)	(1,839)	(2,144)	(1,843)	(2,620)	(2,981)	(2,819)	(2,945)	(3,213)	(3,646)	(3,924)	(3,765)	(4,203)	(36,587)
Online reversals issued	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
to SNAP EBT cards	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1)	(0)	(1)
Total SNAP Online														
transactions with missing	1,782	5,785	6,349	6,005	8,505	9,190	8,579	8,833	9,561	10,799	11,756	11,489	13,363	111,996
urbanicity <sup>b</sup> (N)														

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

Orders that are split and fulfilled by different locations appear in the data as different transactions. As the data do not include the order number, it was not possible to link transactions to the same order. Therefore, reversals and refunds from the same order, but split into different transactions, were counted separately.

<sup>a</sup> Urbanicity categories are based on households' home addresses and classified according to National Center for Education Statistics' EDGE Locale Boundaries (Geverdt, 2019).

<sup>b</sup> Urbanicity is missing if the household address is missing or could not be geocoded.

### C.4 Hotspot Analysis Tables: Tables C4, C5a, and C5b

One of the goals of the SOPE analysis was to identify delivery "hotspots." The evaluation defines a hotspot as an address that receives deliveries for SNAP Online purchases from a larger-than-typical number of SNAP households. For these tabulations, the study team defined a hotspot as a delivery address that received orders from five or more households. The unit of analysis for these tabulations is unique delivery addresses receiving at least one SNAP Online order during the study period; each delivery address is counted only once in the tables regardless of how many SNAP Online orders or how many households it was associated with during the study period. Table C4 presents data on delivery address frequencies by number of households using the delivery address, including frequencies of hotspots for each pilot State and overall. Table C5a tabulates the proportion of hotspots by urbanicity, calculated as hotspots in an urbanicity category as a percentage of all hotspots in a pilot State. Table C5b tabulates the rate of hotspot addresses, or hotspots as a percentage of delivery addresses, within an urbanicity. These hotspot tables are not reported for Oregon for which household address data was not reported.

These three tables answer the following research questions:

- If a delivery is not made to a participant's home address or an FNS authorized retailer, is the delivery address used by enough other participants that the pattern is suspicious; i.e., the address is a "hotspot"? How often does this pattern occur?
- How many delivery/shipping addresses match the address of an authorized store (based on a comparison to FNS's Store Tracking and Redemption System (STARS))? If possible, how many SNAP EBT customer names match the names of authorized store owners (based on a comparison of the data in STARS)?

#### C.4.1 Guidance to Reading Table C4: Relationship Between SNAP Online Purchase Delivery Address and Household Address

• The **first panel** differentiates one-to-one matches of delivery address and household address from delivery addresses that received deliveries from multiple household addresses or household addresses that do not match the delivery address. The evaluation made this distinction because the one-to-one matches of delivery address and household address were not included in the hotspot analysis.

The **first row** of this panel reports the number and percent of delivery addresses that match the household address and where delivery address was *only* associated with its matching household address (i.e., a household only had their SNAP Online purchases delivered to their home and no other household had a SNAP Online purchase delivered to that home). *Example: In Alabama, 45.9 percent of all delivery addresses matched a household address and only received deliveries from that one household. This percentage represents 16,995 delivery addresses.* 

The **second row** of this panel reports the number and percent of the remainder of delivery addresses. It includes any delivery address associated with multiple household addresses — including when the delivery address matched a household address but *also* received SNAP Online purchases from other households. This row also includes delivery addresses that received orders from only one household, but the delivery address did not match the household address. *Example: In Alabama, 54.1 percent of all delivery addresses received SNAP Online purchases from more than one household and/or that delivery address did not match the address of the household that had a SNAP Online purchase delivered there. This percentage represents 20,014 delivery addresses.* 

The **last row** of this panel reports a sum of the first and second rows and is a tally of all unique delivery addresses that received SNAP Online orders during the study period.

• The **second panel** reports how many households delivered to a unique delivery address. Note that this panel only includes the delivery addresses in the second row of the first panel. In other words, this second panel excludes any delivery addresses that had a one-to-one relationship with matching household address.

The **first five rows** of this panel report the number of delivery addresses that received at least one SNAP Online delivery from 1 household, 2 households, 3 households, 4 households, or 5 or more households. Delivery addresses that received deliveries from 5 or more households are reported as hotspots in these tables. *Example: In Alabama, 72.5 percent of delivery addresses received deliveries from just one household and the delivery address was not the same as the household address. This percentage represents 14,520 delivery addresses.* 

The **last row** of this panel reports the sum of the other rows of this panel. It matches the second row of the first panel. It reports the total number of unique delivery addresses where the household and delivery address differed and/or multiple households delivered to the delivery address.

• The third panel reports the total number of hotspots and the rate of hotspots within each pilot State.

The **first row** of this panel reports the percentage of total unique delivery addresses within each pilot State that were hotpots and the number of hotspots this represents. *Example: In Alabama, 0.6 percent of all unique delivery addresses were hotspots. This percentage represents 222 hotspots.* 

The **second row** of this panel reports the total number of unique delivery addresses within a pilot State.

• The **fourth panel** reports the hotspots identified within the pilot States. This panel only includes delivery addresses in the fifth row of the second panel: Hotspots (deliveries from 5 or more households).

The **first row** of this panel reports all hotspot delivery addresses that matched a SNAP authorized retailer address.

The **second row** of this panel reports all hotspot delivery addresses that matched a store owner's home address. These were owners of stores that were SNAP authorized retailers.

The **third row** of this panel reports all other hotspot delivery addresses. These were hotspots that did not match the address of a SNAP authorized retailer or a store owner's home address.

The **final row** of this panel reports the total of all the rows above. This reports the total number of hotspots and matches the fifth row of the second panel: Hotspots (5 or more households).

#### C.4.2 Guidance to Reading Table C5a: Proportion of Hotspots by Urbanicity

This table reports all hotspot delivery addresses identified in Table C4 (see above). It reports each hotspot address within an urbanicity category as determined by geocoding. The four urbanicity categories, Rural, Town, Suburban and City are defined in Exhibit 7 of the *Analysis Plan Update Memorandum*. This table also reports the proportion of hotspots by urbanicity. The proportion of hotspots located in rural areas, for example, was calculated by dividing the number of hotspots in rural areas by the total number of hotspots. *Example: In Alabama, 18.0 percent of hotspots were located in rural areas. This percentage represents 40 hotspots*.

The final row of this table reports the total number of hotspots by pilot State.

### C.4.3 Guidance to Reading Table C5b: Rate of Hotspots and Rate by Urbanicity

This table reports, for each of the urbanicity categories, the rate and number of hotspot addresses within the urbanicity. The rate of hotspots in rural areas, for example, was calculated by dividing the number of hotspots in rural areas by the total number of unique delivery addresses in rural areas. *Example: In Alabama, the rate of hotspots in rural areas was 0.4 percent. This percentage represents 40 hotspots in rural areas in Alabama.* 

The final row of this table reports the total number of unique delivery addresses by pilot State.

#### Table C4 Relationship Between Delivery Address and Household Address

	Alab	ama	lo	wa	Nebra	askaª	New	York	Ore	gon <sup>ь</sup>	Washi	ngton	To	tal
	%	N	%	Ν	%	N	%	Ν	%	N	%	Ν	%	N
			Perce	ntage ar	nd numbe	r of delive	ry address	es that ma	tch or di	ffer from	househole	d address	es	
Delivery address uniquely matches household (i.e., no other households deliver to that address)	45.9	16,995	52.4	9,168	62.3	5,041	50.3	113,983	-	-	55.7	38,076	51.3	183,263
Delivery address differs from household address and/or multiple households deliver to the delivery address	54.1	20,014	47.6	8,314	37.7	3,056	49.7	112,519		-	44.3	30,247	48.7	174,150
Total unique delivery addresses (N) <sup>c</sup>	37,	009	17,4	482	8,0	97	226,	502	-	_	68,3	323	357,	413
	Among	delivery	address	es that c	liffer from p	househol ercentage	d addresse and numb	es and/or w er by hous	vhere mi sehold fr	ultiple ho equency	useholds	deliver to	the delivery	v address,
Delivery address used by:														
1 household	72.5	14,520	77.2	6,417	75.6	2,311	68.9	77,559		—	69.9	21,134	70.0	121,941
2 households	21.0	4,196	17.8	1,477	19.9	607	24.2	27,247	_	—	22.6	6,840	23.2	40,367
3 households	4.0	796	3.2	266	3.0	91	4.7	5,238	_	—	4.3	1,303	4.4	7,694
4 households	1.4	280	1.0	87	0.6	19	1.2	1,380	_	—	1.5	457	1.3	2,223
Hotspots (5 or more households) <sup>d</sup>	1.1	222	0.8	67	0.9	28	1.0	1,095	_	—	1.7	513	1.1	1,925
Unique delivery addresses where household and delivery address differ and/or multiple households deliver to the delivery address (N)	20,	014	8,3	314	3,0	956	112,	519	-	_	30,2	247	174,	150
				Ν	umber of	hotspots a	and percen	tage of all	unique	delivery a	addresses			
Total number of hotspots	0.6	222	0.4	67	0.3	28	0.5	1,095		—	0.8	513	0.5	1,925
Total unique delivery addresses (N) <sup>c</sup>	37,	009	17,4	482	8,0	97	226,	502	-	_	68,3	323	357,	413
					Percent	tage and n	umber of h	notspots by	y deliver	y locatio	n type			
Hotspot delivery address is a:														
SNAP authorized retailer	0.0	0	0.0	0	0.0	0	0.0	0	_	—	0.0	0	0.0	0
Store owner's home address	4.1	9	1.5	1	0.0	0	4.6	50	_	_	4.7	24	4.4	84
Other <sup>e</sup>	95.9	213	98.5	66	100.0	28	95.4	1,045	_	—	95.3	489	95.6	1,841
Number of hotspots (N)	22	22	6	7	2	8	1,0	95	-	_	51	3	1,9	25

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data and FNS's Store Tracking and Redemption System (STARS) retailer data, March 2020–March 2021.

Notes:

This table includes transactions reported as commercial delivery or direct delivery only. Pick-up deliveries were excluded from the hotspot analysis as pick-up locations are expected to be associated with many different household addresses (i.e., many households pick up orders from the same retailer location). All Amazon transactions were reported as commercial deliveries in the OPP transaction data, even when the customer picked up their order. As it was not possible to differentiate Amazon orders that were picked up (e.g., at an Amazon Fresh location or an Amazon Hub Locker) from those that were delivered, delivery addresses for Amazon orders that were picked up were also included in this analysis.

<sup>a</sup> Nebraska launched the SNAP Online purchasing pilot on April 2, 2020, therefore there are no transaction data for March 2020.

<sup>b</sup> Oregon data are excluded from this table because Oregon did not report household address information.

<sup>c</sup> SNAP households may deliver to more than one unique delivery address. There were 310,328 unique households in total, with 58,906 households (19.0%) associated with 2 or more delivery addresses. <sup>d</sup> For the purposes of our analysis, a hotspot is defined as a delivery address to which five or more unique SNAP households deliver SNAP Online purchases. Note this does not correspond to a hotspot as commonly understood in GIS analysis as an area where high or low values cluster spatially.

e Hotspot addresses that do not match to a SNAP retailer address or a SNAP retailer owner home address.

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#### Table C5a Proportion of Hotspots by Urbanicity

	Ala	bama	lc	owa	Net	oraskaª	Nev	w York	Ore	gon <sup>ь</sup>	Wash	nington	Т	otal
	%	N	%	N	%	N	%	Ν	%	N	%	Ν	%	N
				Per	centage a	and number	of hotsp	ot delivery a	ddresses,	by urbanio	city⁰			
Rural	18.0	40	9.0	6	0.0	0	5.4	59		_	9.7	50	8.1	155
Town	5.4	12	9.0	6	3.6	1	9.0	99		_	13.3	68	9.7	186
Suburban	23.0	51	7.5	5	7.1	2	21.3	233		_	31.8	163	23.6	454
City	53.6	119	74.6	50	89.3	25	64.3	704		_	45.2	232	58.7	1,130
Total number of hotspots (N)	2	222		67		28	1	,095	_	_	5	513	1,	925

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

The hotspot analysis included transactions reported as commercial delivery or direct delivery only. Pick-up deliveries were excluded as pick-up locations are expected to be associated with many different household addresses (i.e., many households pick up orders from the same retailer location). All Amazon transactions were reported as commercial deliveries in the OPP transaction data, even when the customer picked up their order. As it was not possible to differentiate Amazon orders that were picked up (e.g., at an Amazon Fresh location or an Amazon Hub Locker) from those that were delivered, delivery addresses for Amazon orders that were picked up were also included in this analysis.

For the purposes of our analysis, a hotspot is defined as a delivery address to which five or more unique SNAP households deliver SNAP Online purchases. Note this does not correspond to a hotspot as commonly understood in GIS analysis as an area where high or low values cluster spatially.

<sup>a</sup> Nebraska launched the SNAP Online purchasing pilot on April 2, 2020, therefore there are no transaction data for March 2020.

<sup>b</sup> Oregon data are excluded from this table because Oregon did not report household address information.

<sup>c</sup> Urbanicity categories are based on delivery address, and classified according to National Center for Education Statistics' EDGE Locale Boundaries (Geverdt, 2019).

#### Table C5b Rate of Hotspots and Rate by Urbanicity

	Alat	ama		owa		Nebra	askaª	New	York	Ore	gon⁵	Washi	ngton	Тс	otal
	%	N	%		N	%	Ν	%	N	%	N	%	Ν	%	N
					Rate	e and nur	nber of h	otspot de	livery add	dresses, k	oy urbanic	city∘			
Rural								_		-					
Rural hotspots	0.4	40	0.	2	6	0.0	0	0.4	59	—	—	0.7	50	0.4	155
Total unique rural delivery addresses (N)	9,6	691	3	,142		94	9	15,	378	-	_	7,3	99	36,	559
Town								_							
Town hotspots	0.3	12	0.	2	6	0.1	1	0.8	99	—	—	1.1	68	0.7	186
Total unique town delivery addresses (N)	3,6	629	3	,287		1,2	21	12,	825	-	_	6,3	15	27,	277
Suburban								_							
Suburban hotspots	0.5	51	0.	2	5	0.2	2	0.5	233	—	—	0.7	163	0.5	454
Total unique suburban delivery addresses (N)	9,9	967	2	,803		1,2	14	51,	123	-	_	23,6	572	88,	779
City								_							
City hotspots	0.9	119	0.	6	50	0.5	25	0.5	704	—	—	0.7	232	0.6	1,130
Total unique city delivery addresses (N)	13,	722	8	,250		4,7	13	147	,176	-	_	30,9	37	204	,798
Missing urbanicity <sup>d</sup>			-					-							
Hotspots with missing urbanicity		0			0		0		0	—	—		0		0
Total unique delivery addresses with missing urbanicity (N)		C		0		C	)		0	-	_	0			0
							Total ı	unique de	livery add	Iresses					
Total unique delivery addresses (N)	37,	009	17	7,482		8,0	97	226	,502	-		68,3	323	357	,413

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

The hotspot analysis included transactions reported as commercial delivery or direct delivery only. Pick-up deliveries were excluded as pick-up locations are expected to be associated with many different household addresses (i.e., many households pick up orders from the same retailer location). All Amazon transactions were reported as commercial deliveries in the OPP transaction data, even when the customer picked up their order. As it was not possible to differentiate Amazon orders that were picked up (e.g., at an Amazon Fresh location or an Amazon Hub Locker) from those that were delivered, delivery addresses for Amazon orders that were picked up were also included in this analysis.

For the purposes of our analysis, a hotspot is defined as a delivery address to which five or more unique SNAP households deliver SNAP Online purchases. Note this does not correspond to a hotspot as commonly understood in GIS analysis as an area where high or low values cluster spatially.

<sup>a</sup> Nebraska launched the SNAP Online purchasing pilot on April 2, 2020, therefore there are no transaction data for March 2020.

<sup>b</sup> Oregon data are excluded from this table because Oregon did not report household address information.

<sup>c</sup> Urbanicity categories are based on delivery address, and classified according to National Center for Education Statistics' EDGE Locale Boundaries (Geverdt, 2019).

<sup>d</sup> Urbanicity data are missing if the household address is missing or could not be geocoded.

# C.5 Fulfillment Method: Tables C6.1a–C6.7b

This set of tables reports the OPP transaction data by fulfillment method used for SNAP Online transactions. The tables report three fulfillment methods:

- 1. **Pick-up**: the customer picks up their order at the retailer.
- 2. Direct delivery: the retailer delivers to the customer.
- 3. **Commercial delivery**: Amazon was the only pilot retailer with commercial delivery transactions, and all Amazon transactions were commercial delivery, whether the customer picked up their order at an Amazon Hub or Amazon Fresh location, or the order was delivered to the customer's address.<sup>21</sup>

This set of tables answers the following research question:

• What kinds of delivery type are used by online retailers (home delivery categorized by ZIP code, pick up in store-by-store location, pick-up/delivery at set alternate location, method of shipping by ZIP code)? (Analysis of purchases, pick-ups, and deliveries by rural, urban, and suburban areas will be sufficient to address this question. To the extent possible, deliveries will be disaggregated between different shipping methods identified in the data.)

The tables also report the number and percent of transactions associated with each fulfillment method by urbanicity classification as well as the rate of each fulfillment method within an urbanicity category. The evaluation calculated urbanicity for these tables based on the household address. Therefore, data are missing when household address information was missing or could not be geocoded.

Nebraska implemented the SNAP Online Purchasing Pilot in April 2020; therefore, there is no March 2020 data for Nebraska (State specific Tables C6.4a/b).

Household addresses were not reported for Oregon. As household addresses were used to determine the urbanicity category for transactions, Oregon data were not included in this breakdown in this series of tables (Table C6.1 and Table C6.6).

# C.5.1 Guidance to Reading Table C6.1a: Proportion of Online Fulfillment Method by Urbanicity

- The **first panel** reports the number and percentage of purchase transactions identified as being in each of the three fulfillment categories listed above. *Example: In Alabama, 549,500 SNAP Online transactions were pick-ups. These represent 70.1 percent of all SNAP Online purchase transactions in Alabama.*
- The **second panel** reports, for each of the fulfillment types, the number and proportion of purchase transactions that fell into each of the four urbanicity categories as described above. The proportion of pick-ups in rural areas, for example, is calculated by dividing the number of pick-up transactions in rural areas by the total number of pick-up transactions across all urbanicity categories. *Example: In Alabama, 207,022 pick-up SNAP Online transactions were placed by households with household addresses in rural areas. These represent 37.7 percent of all pick-up SNAP Online transactions in Alabama.*

<sup>&</sup>lt;sup>21</sup> All Amazon transactions were reported as *commercial deliveries* in the OPP transaction data, even when the customer picked up the order. Thus, it was not possible to differentiate Amazon orders that were picked up (at an Amazon Hub or Amazon Fresh location) from those that were delivered to a customer address. Both are included in counts of commercial delivery transactions.

#### C.5.2 Guidance to Reading Table C6.1b: Fulfillment Method for SNAP Online Transactions by Urbanicity

- The **first panel** reports, for each of the urbanicity categories, the number and rate of transactions by fulfillment type. The rate of pick-up transactions in rural areas, for example, is calculated by dividing the number of pick-up transactions in rural areas by the total number of purchase transactions in rural areas. *Example: In Alabama, 207,022 SNAP Online transactions in rural areas were pick-ups. These represent 79.1 percent of all transactions in rural areas in Alabama.*
- The **last panel** reports the number and percentage of purchase transactions that fell into each of the four urbanicity categories. *Example: In Alabama, 261,881 purchase transactions were placed by households with household addresses in rural areas. These represent 33.4 percent of all SNAP Online purchase transactions in Alabama.*

# C.5.3 Guidance to Reading Tables C6.2a–C6.7a: Proportion of Online Order Fulfillment by Urbanicity in the Pilot State, March 2020–March 2021

Tables C6.2a through C6.7a report monthly fulfillment type data for SNAP Online purchases for each of the six pilot States.

• This series of State-specific tables reports, for each month, the proportion of SNAP Online orders that occur in each urbanicity category, by fulfillment method. The rows and panels for this table match those of the cross-state table (Table C6.1a) above. The data are reported for each month of the study period. *Example (Table C6.2a, first panel): In March 2020, 13 Alabama SNAP Online transactions were pick-ups. This represents 4.2 percent of all Alabama SNAP Online transactions in March 2020. Example (Table C6.2a, second panel): In March 2020, 3 Alabama SNAP Online pick-up transactions were placed by households with household addresses in rural areas. These represent 23.1 percent of all pick-up transactions in Alabama.* 

# C.5.4 Guidance to Reading Tables C6.2b–C6.7b: Proportion of Online Order Fulfillment by Urbanicity in the Pilot State, March 2020–March 2021

Tables C6.2b through C6.7b report the rate of monthly fulfillment type data for SNAP Online purchases for each of the six pilot States within each urbanicity category.

• This series of State-specific tables reports, for each month, the rate of SNAP Online orders fulfilled by each method within an urbanicity category. The rows and panels for this table match those of the cross-state table (Table C6.1b) above. The data are reported for each month of the study period. *Example (Table C6.2b first panel): In Alabama, 3 pick-up SNAP Online transactions were placed by households with household addresses in rural areas. These represent 2.7 percent of all SNAP Online purchase transactions in rural areas in Alabama.* 

#### Table C6.1a Proportion of Online Order Fulfillment Method by Urbanicity<sup>a</sup>

	Alab	ama	lov	va	Nebra	lska⁵	New	York	Ore	gonc	Washi	ngton	Т	otal
	%	N	%	N	%	N	%	N	%	N	%	N	%	Ν
				Pe	rcentage ar	nd numbei	r of transa	actions, by	fulfillmen	t method				
Pick-up <sup>d</sup>	70.1	549,500	65.9	219,039	63.6	104,568	20.2	466,216	41.2	306,467	40.4	446,212	38.5	2,092,002
Direct delivery <sup>e</sup>	18.1	141,545	16.6	55,060	22.2	36,501	18.6	428,180	19.5	145,303	18.3	201,720	18.6	1,008,309
Commercial delivery (i.e., all Amazon transactions) <sup>f</sup>	11.8	92,754	17.6	58,466	14.2	23,369	61.2	1,409,429	39.3	292,176	41.3	455,340	42.9	2,331,534
Total purchase transactions (N)	783,	799	332,	565	164,	438	2,303,825		743	,946	1,103,272		5,43	1,845
			ŀ	Percentag	e and numl	ber of tran	sactions,	by fulfillm	ent metho	od and urb	anicity			
Pick-up <sup>d</sup>														
Rural	37.7	207,022	18.8	41,161	13.2	13,760	29.8	138,977	—	—	13.8	61,674	25.9	462,594
Town	13.6	74,532	29.8	65,358	31.4	32,848	22.6	105,368		—	16.0	71,297	19.6	349,403
Suburban	18.9	104,039	9.7	21,306	11.8	12,290	24.1	112,584		—	27.6	123,207	20.9	373,426
City	24.9	137,027	36.2	79,318	37.9	39,599	18.7	87,308	1	_	33.4	148,891	27.6	492,143
Missing <sup>g</sup>	4.9	26,880	5.4	11,896	5.8	6,071	4.7	21,979		_	9.2	41,143	6.0	107,969
Total pick-up transactions (N)	549,	500	219,039		104,568		466	5,216	_	_	446	,212	1,78	5,535
Direct delivery <sup>e</sup>											-			
Rural	14.3	20,270	4.0	2,201	2.2	791	6.0	25,533	_	—	3.5	7,055	6.5	55,850
Town	5.9	8,405	3.6	2,003	10.0	3,643	10.8	46,253	_	—	1.4	2,816	7.3	63,120
Suburban	27.4	38,760	17.0	9,375	15.4	5,617	32.7	139,831	_		36.4	73,500	30.9	267,083
City	48.6	68,763	73.4	40,431	70.9	25,891	48.2	206,174	—	—	55.0	110,879	52.4	452,138
Missing <sup>g</sup>	3.8	5,347	1.9	1,050	1.5	559	2.4	10,389	—	—	3.7	7,470	2.9	24,815
Total direct delivery transactions (N)	141,	545	55,0	060	36,5	501	428	8,180	-	_	201	,720	863	,006
Commercial delivery (i.e., all Amazo	on transacti	ons) <sup>f</sup>					-							
Rural	37.3	34,589	24.3	14,210	17.2	4,008	4.9	68,873	—	—	8.6	39,301	7.9	160,981
Town	11.1	10,320	27.1	15,870	21.6	5,059	3.6	50,513	_		7.8	35,553	5.8	117,315
Suburban	21.1	19,615	8.9	5,198	7.3	1,712	14.2	200,752	_		32.7	148,985	18.5	376,262
City	25.4	23,547	33.9	19,822	47.2	11,021	74.9	1055174	_		45.0	204,706	64.4	1314270
Missing <sup>g</sup>	5.0	4,683	5.8	3,366	6.7	1,569	2.4	34,117	_	—	5.9	26,795	3.5	70,530
Total commercial delivery transactions (N)	92,7	92,754		58,466		23,369		1,409,429		_		455,340		9,358

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

<sup>a</sup> Urbanicity categories are based on households' home addresses and classified according to National Center for Education Statistics' EDGE Locale Boundaries (Geverdt, 2019).

<sup>b</sup> Nebraska launched the SNAP Online purchasing pilot on April 2, 2020, therefore there are no transaction data for March 2020.

° Fulfillment method is not reported by urbanicity for Oregon because Oregon did not report household address information.

<sup>d</sup> Pick-up is when a customer picks up their order at the retailer.

<sup>e</sup> Direct delivery is when the retailer provides their own delivery.

<sup>f</sup> All commercial delivery transactions in the OPP transaction data were Amazon purchases. All Amazon purchases were reported in the OPP transaction data as a commercial delivery, regardless of whether the order was delivered or picked up. As a result, the study team cannot differentiate Amazon purchases that were picked up from purchases delivered commercially in the data. Both are included in the counts of commercial delivery transactions.

<sup>g</sup> Urbanicity data are missing if the household address is missing or could not be geocoded.

# Table C6.1b Rate of Online Order Fulfillment Method by Urbanicity<sup>a</sup>

	Alab	Alabama		va	Nebr	aska <sup>b</sup>	New York		Oregon <sup>c</sup>		Washington		То	tal
	%	N	%	Ν	%	N	%	N	%	N	%	N	%	N
				Rate	and numb	er of trans	actions, b	y urbanici	ity and ful	lfillment m	ethod			
Rural														
Pick-up <sup>d</sup>	79.1	207,022	71.5	41,161	74.1	13,760	59.5	138,977		_	57.1	61,674	68.1	462,594
Direct delivery <sup>e</sup>	7.7	20,270	3.8	2,201	4.3	791	10.9	25,533	_	_	6.5	7,055	8.2	55,850
Commercial Delivery (i.e., all Amazon transactions) <sup>f</sup>	13.2	34,589	24.7	14,210	21.6	4,008	29.5	68,873	-	-	36.4	39,301	23.7	160,981
Total rural purchase transactions (N)	261,	881	57,5	572	18,	559	233	,383		<u> </u>	108	,030	679	,425
Town														
Pick-up <sup>d</sup>	79.9	74,532	78.5	65,358	79.1	32,848	52.1	105,368	_	—	65.0	71,297	65.9	349,403
Direct delivery <sup>e</sup>	9.0	8,405	2.4	2,003	8.8	3,643	22.9	46,253	_	—	2.6	2,816	11.9	63,120
Commercial Delivery (i.e., all Amazon transactions) <sup>f</sup>	11.1	10,320	19.1	15,870	12.2	5,059	25.0	50,513	-	-	32.4	35,553	22.1	117,315
Total town purchase transactions (N)	93,2	257	83,2	231	41,	550	202	,134	-	_	109	,666	529	,838
Suburban														
Pick-up <sup>d</sup>	64.1	104,039	59.4	21,306	62.6	12,290	24.8	112,584		—	35.6	123,207	36.7	373,426
Direct delivery <sup>e</sup>	23.9	38,760	26.1	9,375	28.6	5,617	30.9	139,831	-	-	21.3	73,500	26.3	267,083
Commercial Delivery (i.e., all Amazon transactions) <sup>f</sup>	12.1	19,615	14.5	5,198	8.7	1,712	44.3	200,752	-	-	43.1	148,985	37.0	376,262
Total suburban purchase transactions (N)	162,	414	35,8	379	19,619		453,167		-		345,692		1,016	6,771
City														
Pick-up <sup>d</sup>	59.7	137,027	56.8	79,318	51.8	39,599	6.5	87,308	—	—	32.1	148,891	21.8	492,143
Direct delivery <sup>e</sup>	30.0	68,763	29.0	40,431	33.8	25,891	15.3	206,174	—	—	23.9	110,879	20.0	452,138
Commercial Delivery (i.e., all Amazon transactions) <sup>f</sup>	10.3	23,547	14.2	19,822	14.4	11,021	78.2	1,055,174	-	-	44.1	204,706	58.2	1,314,270
Total city purchase transactions (N)	229,	337	139,	571	76,	511	1,348	8,656		_	464	,476	2,258	8,551
Missing urbanicity <sup>g</sup>														
Pick-up <sup>d</sup>	72.8	26,880	72.9	11,896	74.0	6,071	33.1	21,979		—	54.6	41,143	53.1	107,969
Direct delivery <sup>e</sup>	14.5	5,347	6.4	1,050	6.8	559	15.6	10,389		—	9.9	7,470	12.2	24,815
Commercial Delivery (i.e., all Amazon transactions) <sup>f</sup>	12.7	4,683	20.6	3,366	19.1	1,569	51.3	34,117	Ι	_	35.5	26,795	34.7	70,530
Total purchase transactions with missing urbanicity (N)	36,9	910	16,3	16,312		8,199		66,485		_		75,408		,314

	Alab	Alabama		lowa		Nebraska <sup>b</sup>		New York		Oregon⁰		Washington		otal
	%	N	%	Ν	%	N	%	N	%	N	%	N	%	N
					Percen	tage and <b>ı</b>	number of	f transactio	ons, by urt	panicity				
Rural	33.4	261,881	17.3	57,572	11.3	18,559	10.1	233,383	_	_	9.8	108,030	12.5	679,425
Town	11.9	93,257	25.0	83,231	25.3	41,550	8.8	202,134		_	9.9	109,666	9.8	529,838
Suburban	20.7	162,414	10.8	35,879	11.9	19,619	19.7	453,167		_	31.3	345,692	18.7	1,016,771
City	29.3	229,337	42.0	139,571	46.5	76,511	58.5	1,348,656		_	42.1	464,476	41.6	2,258,551
Missing urbanicity <sup>g</sup>	4.7	36,910	4.9	16,312	5.0	8,199	2.9	66,485		_	6.8	75,408	3.7	203,314
Total purchase transactions (N)	783	783,799 33		332,565		164,438		2,303,825		_		1,103,272		7,899

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

<sup>a</sup> Urbanicity categories are based on households' home addresses and classified according to National Center for Education Statistics' EDGE Locale Boundaries (Geverdt, 2019).

<sup>b</sup> Nebraska launched the SNAP Online purchasing pilot on April 2, 2020, therefore there are no transaction data for March 2020.

<sup>c</sup> Because Oregon did not report household address information, fulfillment method and rate are not reported by urbanicity.

<sup>d</sup> Pick-up is when a customer picks up their order at the retailer.

<sup>e</sup> Direct delivery is when the retailer provides their own delivery.

<sup>f</sup> All commercial delivery transactions in the OPP transaction data were Amazon purchases. All Amazon purchases were reported in the OPP transaction data as a commercial delivery, regardless of whether the order was delivered or picked up. As a result, the study team cannot differentiate Amazon purchases that were picked up from purchases delivered commercially in the data. Both are included in the counts of commercial delivery transactions.

<sup>g</sup> Urbanicity data are missing if the household address is missing or could not be geocoded.

# Table C6.2a Proportion of Online Order Fulfillment Method by Urbanicity in Alabama, March 2020–March 2021

	March 2020	April 2020	May 2020	June 2020ª	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
	% (NI)	% (NI)	% (NI)	% (NI)	%	% (NI)	%	%	%	% (NI)	% (NI)	%	%	% (NI)
	(N)	(N)	(N)	(N)	(N) Derc	(N) entage (N	(IN) ) transacti	(N) ions by fu	(N) Ifillment n	(N) nethod	(N)	(N)	(N)	(N)
	4 2	81.4	75.4	76 1	70.6	73 5	72 0	69 7	71 9	70 4	66.9	65.2	63 1	70 1
Pick-up <sup>ь</sup>	(13)	(25,967)	(35,285)	(41,942)	(35,231)	(44,639)	(41,111)	(44,222)	(49,647)	(55,834)	(56,552)	(58,938)	(60,119)	(549,500)
Direct delivery:	4.5	7.8	9.9	10.9	12.7	13.7	15.3	17.5	19.0	20.5	22.9	23.8	24.8	18.1
	(14)	(2,505)	(4,638)	(5,994)	(6,338)	(8,330)	(8,704)	(11,074)	(13,144)	(16,301)	(19,366)	(21,489)	(23,648)	(141,545)
Commercial delivery (i.e., all	91.3	10.8	14.7	13.0	16.7	12.8	12.7	12.8	9.1	9.1	10.2	11.0	12.0	11.8
Amazon transactions) <sup>d</sup>	(284)	(3,445)	(6,865)	(7,190)	(8,316)	(7,793)	(7,256)	(8,116)	(6,292)	(7,223)	(8,594)	(9,937)	(11,443)	(92,754)
Total purchase transactions (N)	311	31,917	46,788	55,126	49,885	60,762	57,071	63,412	69,083	79,358	84,512	90,364	95,210	783,799
				Pe	rcentage (	(N) transa	ctions, by	fulfillment	t method a	and urban	icity <sup>e</sup>			
Pick-up <sup>b</sup>														
Rural	23.1	40.8	37.4	39.9	38.7	37.6	37.8	37.0	37.0	36.7	37.4	37.1	37.1	37.7
	(3)	(10,588)	(13,182)	(16,727)	(13,652)	(16,777)	(15,543)	(16,348)	(18,379)	(20,515)	(21,166)	(21,862)	(22,280)	(207,022)
Town	0.0	13.6	13.8	12.2	13.5	14.3	13.9	14.2	13.3	13.5	13.4	13.9	13.4	13.6
	(0)	(3,520)	(4,852)	(5,103)	(4,748)	(6,372)	(5,707)	(6,290)	(6,611)	(7,522)	(7,577)	(8,198)	(8,032)	(74,532)
Suburban	15.4 (2)	18.5 (/ 701)	18.3 (6.467)	19.7 (8.266)	19.0 (6.688)	18.7 (8 345)	18.9 (7 788)	19.0 (8 387)	19.3 (9.567)	19.3 (10 753)	18.9 (10.675)	18.6 (10.982)	18.8 (11 328)	18.9 (104 039)
	61 5	23.1	26.2	24 0	(0,000) 24.4	24 5	24.3	24.7	25.4	25.3	25.1	25.4	25.5	24 9
City	(8)	(5.994)	(9.234)	(10.074)	(8.584)	(10.944)	(9.971)	(10.931)	(12.589)	(14,139)	(14.218)	(14.996)	(15.345)	(137.027)
N4116	0.0	4.1	4.4	4.2	4.4	4.9	5.1	5.1	5.0	5.2	5.2	4.9	5.2	4.9
Missing	(0)	(1,074)	(1,550)	(1,772)	(1,559)	(2,201)	(2,102)	(2,266)	(2,501)	(2,905)	(2,916)	(2,900)	(3,134)	(26,880)
Total pick-up transactions (N)	13	25,967	35,285	41,942	35,231	44,639	41,111	44,222	49,647	55,834	56,552	58,938	60,119	549,500
Direct delivery <sup>c</sup>														-
Rural	35.7	13.2	13.8	16.0	14.8	13.7	13.5	13.3	14.2	13.7	14.2	14.9	15.0	14.3
	(5)	(330)	(639)	(961)	(935)	(1,144)	(1,177)	(1,477)	(1,867)	(2,237)	(2,755)	(3,198)	(3,545)	(20,270)
Town	14.3	6.6	5.3	6.1	6.8	6.3	6.9	6.5	5.5	5.5	5.7	5.6	6.1	5.9
	(2)	(166)	(248)	(368)	(432)	(521)	(601)	(716)	(722)	(890)	(1,098)	(1,206)	(1,435)	(8,405)
Suburban	0.0	25.0	25.1	26.9	27.1	27.6	26.1	26.8	28.2	28.4	28.0	27.3	27.4	27.4
	(U) 50.0	(020)	(1,100)	(1,012)	(1,719)	(2,298)	(2,209)	(2,970)	(3,701)	(4,020)	(0,431)	(0,000)	(0,474)	(38,760)
City	50.0 (7)	(1.326)	52.1 (2 443)	47.0 (2.818)	47.1 (2 984)	40.4 (4 031)	49.0 (4 310)	49.7 (5.509)	40.4 (6.360)	40.0 (7 955)	40.3 (9.350)	40.2 (10.366)	47.0 (11 304)	40.0 (68 763)
	0.0	2.3	3 1	3 9	4 2	4 0	<u>(</u> ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	3.6	3.8	3.6	3.8	4 0	3.8	3.8
Missing <sup>f</sup>	(0)	(57)	(142)	(235)	(268)	(336)	(347)	(402)	(494)	(591)	(732)	(853)	(890)	(5,347)
Total direct delivery transactions (N)	14	2,505	4,638	5,994	6,338	8,330	8,704	11,074	13,144	16,301	19,366	21,489	23,648	141,545

	March 2020	April 2020	May 2020	June 2020ª	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)
Commercial delivery (i.e., all Amaz	on transa	ctions) <sup>d</sup>												
Pural	35.9	35.0	35.5	40.6	40.7	38.4	34.9	34.8	35.2	38.8	36.9	37.0	37.8	37.3
Ruiai	(102)	(1,205)	(2,434)	(2,917)	(3,384)	(2,994)	(2,531)	(2,828)	(2,217)	(2,800)	(3,171)	(3,677)	(4,329)	(34,589)
Томп	8.1	12.2	13.1	9.9	10.9	10.5	11.3	11.6	11.1	10.7	10.6	10.9	11.4	11.1
TOWIT	(23)	(419)	(901)	(710)	(909)	(817)	(823)	(938)	(701)	(776)	(910)	(1,086)	(1,307)	(10,320)
Suburban	23.6	23.1	20.8	21.8	19.3	20.7	22.1	21.8	23.5	20.3	22.3	20.7	19.5	21.1
Suburban	(67)	(796)	(1,431)	(1,564)	(1,604)	(1,615)	(1,607)	(1,772)	(1,477)	(1,468)	(1,917)	(2,060)	(2,237)	(19,615)
City	28.9	24.6	24.7	23.1	24.0	25.4	26.3	26.8	25.5	25.8	25.4	25.9	26.1	25.4
City	(82)	(847)	(1,694)	(1,660)	(1,994)	(1,981)	(1,909)	(2,178)	(1,602)	(1,860)	(2,179)	(2,574)	(2,987)	(23,547)
Missingf	3.5	5.2	5.9	4.7	5.1	5.0	5.3	4.9	4.7	4.4	4.9	5.4	5.1	5.0
wissing <sup>.</sup>	(10)	(178)	(405)	(339)	(425)	(386)	(386)	(400)	(295)	(319)	(417)	(540)	(583)	(4,683)
Total commercial delivery transactions (N)	284	3,445	6,865	7,190	8,316	7,793	7,256	8,116	6,292	7,223	8,594	9,937	11,443	92,754

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

<sup>a</sup> Alabama transaction data are missing for 1 day in June 2020.

<sup>b</sup> Pick-up is when a customer picks up their order at the retailer.

<sup>c</sup> Direct delivery is when the retailer provides their own delivery.

<sup>d</sup> All commercial delivery transactions in the OPP transaction data were Amazon purchases. All Amazon purchases were reported in the OPP transaction data as a commercial delivery, regardless of whether the order was delivered or picked up. As a result, the study team cannot differentiate Amazon purchases that were picked up from purchases delivered commercially in the data. Both are included in the counts of commercial delivery transactions.

e Urbanicity categories are based on households' home addresses and classified according to National Center for Education Statistics' EDGE Locale Boundaries (Geverdt, 2019).

<sup>f</sup> Urbanicity is missing if the household address is missing or could not be geocoded.

# Table C6.2b Rate of Online Order Fulfillment Method by Urbanicity<sup>a</sup> in Alabama, March 2020–March 2021

	March 2020	April 2020	May 2020	June 2020⋼	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)
	()	(**)	(**)	Rate (a	and numb	er) of trar	sactions	, by urbar	nicity and	fulfillmen	t method			(/
Rural														
Diak up:	2.7	87.3	81.1	81.2	76.0	80.2	80.7	79.2	81.8	80.3	78.1	76.1	73.9	79.1
	(3)	(10,588)	(13,182)	(16,727)	(13,652)	(16,777)	(15,543)	(16,348)	(18,379)	(20,515)	(21,166)	(21,862)	(22,280)	(207,022)
Direct deliverv <sup>d</sup>	4.5	2.7	3.9	4.7	5.2	5.5	6.1	7.2	8.3	8.8	10.2	11.1	11.8	7.7
	(5)	(330)	(639)	(961)	(935)	(1,144)	(1,177)	(1,477)	(1,867)	(2,237)	(2,755)	(3,198)	(3,545)	(20,270)
Commercial delivery (i.e., all Amazon	92.7	9.9	15.0	14.2	18.8	14.3	13.1	13.7	9.9	11.0	11.7	12.8	14.4	13.2
transactions) <sup>e</sup>	(102)	(1,205)	(2,434)	(2,917)	(3,384)	(2,994)	(2,531)	(2,828)	(2,217)	(2,800)	(3,171)	(3,677)	(4,329)	(34,589)
Total rural purchase transactions (N)	110	12,123	16,255	20,605	17,971	20,915	19,251	20,653	22,463	25,552	27,092	28,737	30,154	261,881
Town									[]				1	
Pick-up <sup>c</sup>	0.0	85.7	80.9	82.6	78.0	82.6	80.0	79.2	82.3	81.9	79.1	78.2	74.5	79.9
	(0)	(3,520)	(4,852)	(5,103)	(4,748)	(6,372)	(5,707)	(6,290)	(6,611)	(7,522)	(7,577)	(8,198)	(8,032)	(74,532)
Direct deliverv <sup>d</sup>	8.0	4.0	4.1	6.0	7.1	6.8	8.4	9.0	9.0	9.7	11.5	11.5	13.3	9.0
	(2)	(166)	(248)	(368)	(432)	(521)	(601)	(716)	(722)	(890)	(1,098)	(1,206)	(1,435)	(8,405)
Commercial delivery (i.e., all Amazon	92.0	10.2	15.0	11.5	14.9	10.6	11.5	11.8	8.7	8.4	9.5	10.4	12.1	11.1
transactions) <sup>e</sup>	(23)	(419)	(901)	(710)	(909)	(817)	(823)	(938)	(701)	(776)	(910)	(1,086)	(1,307)	(10,320)
I otal town purchase transactions (N)	25	4,105	6,001	6,181	6,089	7,710	7,131	7,944	8,034	9,188	9,585	10,490	10,774	93,257
Suburban	0.0	77.4	74.0	70.0	00.0	00.4	00.0	00.0	010	00.0	50.0	50.4	50.5	01.1
Pick-up <sup>c</sup>	2.9	(1.1	(1.3	(2.2	66.8	68.1	66.8 (7 700)	63.9	64.9	63.8	59.2	58.1	56.5	64.1
	(2)	(4,791)	(6,467)	(8,266)	(6,688)	(8,345)	(7,788)	(8,387)	(9,567)	(10,753)	(10,675)	(10,982)	(11,328)	(104,039)
Direct delivery <sup>d</sup>	0.0	10.1	12.9	14.1	17.2	18.7	19.5	22.6	25.1	27.5	30.1 (5.424)	31.0	32.3	23.9
	(0)	(626)	(1,100)	(1,612)	(1,719)	(2,298)	(2,269)	(2,970)	(3,701)	(4,628)	(5,431)	(5,866)	(0,474)	(38,760)
transactions)	97.1	12.0 (706)	10.0 (1 424)	13.7 (1 EGA)	10.0	13.Z	13.0 (1.607)	13.3 (1 770)	(1 477)	0.7	10.0 (1.017)	(2,060)	(0.027)	(10.615)
Total suburban nurshaga transactions (N)	(07)	(790)	(1,431)	(1,304)	(1,004)	(1,010)	(1,007)	(1,772)	(1,477)	(1,400)	(1,917)	(2,000)	(2,237)	(19,010)
City	09	0,213	9,004	11,442	10,011	12,200	11,004	13,129	14,740	10,049	10,023	10,900	20,039	102,414
City	8.2	73 /	60.1	60.2	63.3	64.5	61.6	58.7	61.3	50.0	55.2	53.7	51.9	50.7
Pick-up <sup>c</sup>	(8)	(5 004)	(0.234)	(10 074)	(8 584)	(10 0//)	(0 071)	(10 031)	(12 580)	(1/ 130)	(1/ 218)	(1/ 006)	(15 3/5)	(137 027)
	(0)	(0,004)	(3,234)	10,074)	(0,304)	23.8	26.6	29.6	30.0	33.2	36.3	(14,330)	38.1	30.0
Direct delivery <sup>d</sup>	(7)	(1.326)	(2 443)	(2 818)	(2 984)	(4 031)	(4 310)	(5 509)	(6.360)	(7 955)	(9.350)	(10.366)	(11 304)	(68 763)
Commercial delivery (i.e., all Amazon	84 5	10.4	12 7	11 4	14 7	11 7	11 8	11 7	7 8	7 8	8 5	9.2	10 1	10.3
transactions) <sup>e</sup>	(82)	(847)	(1,694)	(1,660)	(1.994)	(1.981)	(1.909)	(2,178)	(1,602)	(1.860)	(2,179)	(2,574)	(2.987)	(23 547)
Total city purchase transactions (N)	97	8,167	13,371	14,552	13,562	16,956	16,190	18,618	20,551	23,954	25,747	27,936	29,636	229,337

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	March 2020	April 2020	May 2020	June 2020 <sup>ь</sup>	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)
Missing urbanicity <sup>f</sup>														
Pick-up <sup>c</sup>	0.0	82.0	73.9	75.5	69.2	75.3	74.1	73.9	76.0	76.1	71.7	67.6	68.0	72.8
	(0)	(1,074)	(1,550)	(1,772)	(1,559)	(2,201)	(2,102)	(2,266)	(2,501)	(2,905)	(2,916)	(2,900)	(3,134)	(26,880)
Direct deliverv <sup>d</sup>	0.0	4.4	6.8	10.0	11.9	11.5	12.2	13.1	15.0	15.5	18.0	19.9	19.3	14.5
	(0)	(57)	(142)	(235)	(268)	(336)	(347)	(402)	(494)	(591)	(732)	(853)	(890)	(5,347)
Commercial delivery (i.e., all Amazon	100.0	13.6	19.3	14.5	18.9	13.2	13.6	13.0	9.0	8.4	10.3	12.6	12.7	12.7
transactions) <sup>e</sup>	(10)	(178)	(405)	(339)	(425)	(386)	(386)	(400)	(295)	(319)	(417)	(540)	(583)	(4,683)
Total purchase transactions with missing urbanicity <sup>f</sup> (N)	10	1,309	2,097	2,346	2,252	2,923	2,835	3,068	3,290	3,815	4,065	4,293	4,607	36,910
					Percen	ntage and	number o	of transact	tions, by ı	urbanicity	1			
Dural	35.4	38.0	34.7	37.4	36.0	34.4	33.7	32.6	32.5	32.2	32.1	31.8	31.7	33.4
	(110)	(12,123)	(16,255)	(20,605)	(17,971)	(20,915)	(19,251)	(20,653)	(22,463)	(25,552)	(27,092)	(28,737)	(30,154)	(261,881)
Томп	8.0	12.9	12.8	11.2	12.2	12.7	12.5	12.5	11.6	11.6	11.3	11.6	11.3	11.9
	(25)	(4,105)	(6,001)	(6,181)	(6,089)	(7,710)	(7,131)	(7,944)	(8,034)	(9,188)	(9,585)	(10,490)	(10,774)	(93,257)
Suburban	22.2	19.5	19.4	20.8	20.1	20.2	20.4	20.7	21.3	21.2	21.3	20.9	21.0	20.7
	(69)	(6,213)	(9,064)	(11,442)	(10,011)	(12,258)	(11,664)	(13,129)	(14,745)	(16,849)	(18,023)	(18,908)	(20,039)	(162,414)
City	31.2	25.6	28.6	26.4	27.2	27.9	28.4	29.4	29.7	30.2	30.5	30.9	31.1	29.3
	(97)	(8,167)	(13,371)	(14,552)	(13,562)	(16,956)	(16,190)	(18,618)	(20,551)	(23,954)	(25,747)	(27,936)	(29,636)	(229,337)
Missing urbanicity <sup>f</sup>	3.2	4.1	4.5	4.3	4.5	4.8	5.0	4.8	4.8	4.8	4.8	4.8	4.8	4.7
	(10)	(1,309)	(2,097)	(2,346)	(2,252)	(2,923)	(2,835)	(3,068)	(3,290)	(3,815)	(4,065)	(4,293)	(4,607)	(36,910)
Total purchase transactions (N)	311	31,917	46,788	55,126	49,885	60,762	57,071	63,412	69,083	79,358	84,512	90,364	95,210	783,799

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

<sup>a</sup> Urbanicity categories are based on households' home addresses and classified according to National Center for Education Statistics' EDGE Locale Boundaries (Geverdt, 2019).

<sup>b</sup> Alabama transaction data are missing for 1 day in June 2020.

<sup>c</sup> Pick-up is when a customer picks up their order at the retailer.

<sup>d</sup> Direct delivery is when the retailer provides their own delivery.

e All commercial delivery transactions in the OPP transaction data were Amazon purchases. All Amazon purchases were reported in the OPP transaction data as a commercial delivery, regardless of whether the order was delivered or picked up. As a result, the study team cannot differentiate Amazon purchases that were picked up from purchases delivered commercially in the data. Both are included in the counts of commercial delivery transactions.

<sup>f</sup> Urbanicity is missing if the household address is missing or could not be geocoded.
## Table C6.3a Proportion of Online Order Fulfillment Method by Urbanicity in Iowa, March 2020–March 2021

	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020ª	Oct 2020	Nov 2020	Dec 2020	Jan 2021ª	Feb 2021	March 2021	Total March 2020- March 2021
	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)
	(14)	(11)	(••)	(1)	Perc	entage (N	) transacti	ons. bv fu	ulfillment r	nethod	(14)	(1)	(14)	(11)
Pick-up⁵	66.6 (1.110)	76.6	72.4	70.6	64.4	69.9 (17.563)	69.2 (17 342)	67.8	69.1 (21.592)	67.5	61.8 (20.836)	57.8 (22.777)	58.0	65.9 (219.039)
Direct delivery <sup>c</sup>	6.2 (103)	9.3	(13,033) 9.1 (1,718)	(12,303) 9.8 (1,710)	(13,334) 10.4 (2,194)	(17,303) 11.2 (2,814)	(17,342) 12.5 (3,134)	(20,030) 14.5	15.8	(22,120) 17.1 (5 500)	(20,030) 22.2 (7,504)	25.0	24.6 (9.551)	(213,053) 16.6
Commercial delivery (i.e., all Amazon	27.2	(1,001) 14.1 (2,519)	18.5	19.6 (2,412)	<u>(2,134)</u> 25.1	(2,014) 18.9 (4,720)	( <u>3,134</u> ) 18.3 ( <u>4,504</u> )	( <del>4</del> ,200) 17.8 (5.240)	(4,343) 15.1 (4,726)	(5,000)	(7,304) 16.0 (5,205)	(3,043) 17.3	( <u>3,331)</u> 17.4 (6,754)	(53,000) 17.6
Total purchase transactions (N)	1,666	17,824	18,913	17,431	21,006	25,116	25,070	29,565	31,261	32,762	33,735	39,435	38,781	332,565
	,	,	, ,	Pe	rcentage	(N) transa	ctions, by	fulfillmen	t method a	and urban	icity <sup>e</sup>	,	,	, ,
Pick-up <sup>ь</sup>														-
Rural	17.1 (190)	17.7 (2,414)	17.9 (2,451)	17.9 (2,200)	18.3 (2,476)	18.5 (3,255)	18.4 (3,185)	18.4 (3,688)	20.0 (4,328)	19.7 (4,363)	19.4 (4,038)	18.5 (4,214)	19.4 (4,359)	18.8 (41,161)
Town	25.3 (281)	28.2	28.8	27.7	29.4	30.5	28.6	30.0 (6.003)	30.2	30.1	30.4 (6.343)	31.4	30.6 (6.877)	29.8 (65.358)
Suburban	10.3	9.4	9.7	9.8	9.4	10.0	10.9	10.0 (2.013)	10.1	9.6	9.6 (2.008)	9.2	9.0	9.7 (21.306)
City	43.1	38.7 (5.281)	38.4	39.1 (4 814)	37.8 (5.122)	35.6	37.3 (6.464)	36.4 (7.292)	34.3 (7.416)	34.7 (7.683)	34.9 (7.262)	35.3 (8.034)	35.4 (7.958)	36.2 (79 318)
Missing <sup>f</sup>	4.2	( <u>0,201</u> ) 6.0 (810)	( <u>3,234</u> ) 5.3 (720)	5.5 (677)	<u>(0,122)</u> 5.1	(0,200) 5.3 (025)	(0,404) 4.9 (844)	(1,232)	<u>(7, - 10)</u> 5.3 (1 140)	(1,000) 5.8 (1,287)	(1,202)	(0,004) 5.6 (1,268)	(1,330) 5.6 (1,249)	(11,896)
Total pick-up transactions (N)	1,110	13,645	13,699	12,309	13,534	17,563	17,342	20,036	21,592	22,120	20,836	22,777	22,476	219,039
Direct delivery <sup>e</sup>	1.0	2.0	6.2	2.6	2.4	10	4.0	4.4	4.0	2.6	1 1	4.1	2.0	4.0
Rural	(2)	2.0 (47)	0.3 (108)	(61)	3.4 (75)	4.2 (118)	4.0 (125)	4.4 (190)	4.0 (197)	(203)	(307)	4.1 (406)	(362)	(2,201)
Town	0.0 (0)	0.8 (14)	0.5 (8)	1.3 (23)	2.5 (55)	3.3 (92)	2.4 (76)	2.3 (97)	2.8 (136)	2.8 (154)	4.4 (328)	5.0 (492)	5.5 (528)	3.6 (2,003)
Suburban	15.5 (16)	15.7 (261)	16.6 (285)	15.5 (265)	14.0 (307)	16.2 (456)	17.5 (550)	19.2 (820)	19.1 (943)	18.4	16.8	16.2	16.6	17.0 (9.375)
City	73.8	78.8	73.6	77.0	78.4	74.4	74.3	72.2	72.3	73.0	72.9 (5.468)	72.9	72.5 (6 924)	(40 431)
Missing <sup>f</sup>	8.7	1.8	3.1	2.6	1.7	1.9	(2,523) 1.7	(0,032) 1.9	1.9	2.2	(0,+00) 1.9	1.8	(0,324) 1.6	(1.050)
Total direct delivery transactions (N)	(9) 103	(30) 1,661	(53) 1,718	(45) 1,710	2,194	(53) 2,814	(54) 3,134	(81) 4,280	(92) 4,943	5,599	(143) 7,504	9,849	9,551	55,060

	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020ª	Oct 2020	Nov 2020	Dec 2020	Jan 2021ª	Feb 2021	March 2021	Total March 2020- March 2021
	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (NI)	% (NI)	% (NI)	% (N)	% (NI)	% (NI)	% (NI)
Commercial delivery (i.e., all Amazo	on transact	tions) <sup>d</sup>	(14)	(11)	(11)	(14)	(11)	(11)	(N)	(11)	(N)	(11)	(11)	(N)
Pural	27.2	25.5	21.9	23.4	23.0	25.4	23.4	25.5	23.3	24.6	25.1	24.8	24.7	24.3
Ruiai	(123)	(642)	(765)	(800)	(1,212)	(1,202)	(1,077)	(1,339)	(1,100)	(1,239)	(1,353)	(1,688)	(1,670)	(14,210)
Томр	29.4	27.2	26.0	25.6	28.5	27.9	26.6	25.7	26.2	27.4	26.1	27.3	29.4	27.1
TOWIT	(133)	(684)	(910)	(875)	(1,505)	(1,323)	(1,223)	(1,348)	(1,240)	(1,381)	(1,407)	(1,858)	(1,983)	(15,870)
Suburban	6.6	9.9	10.6	8.3	7.4	8.5	9.3	8.2	9.6	9.7	9.5	8.5	8.5	8.9
Suburban	(30)	(250)	(369)	(284)	(393)	(402)	(429)	(433)	(454)	(489)	(510)	(578)	(577)	(5,198)
City	31.1	30.3	35.8	37.3	34.0	31.5	35.0	35.9	36.5	32.2	33.7	34.0	31.6	33.9
City	(141)	(762)	(1,253)	(1,272)	(1,792)	(1,491)	(1,607)	(1,886)	(1,725)	(1,623)	(1,819)	(2,315)	(2,136)	(19,822)
Missipat	5.7	7.1	5.7	5.3	7.1	6.8	5.6	4.6	4.4	6.2	5.7	5.4	5.7	5.8
Wissing.	(26)	(180)	(199)	(181)	(376)	(321)	(258)	(243)	(207)	(311)	(306)	(370)	(388)	(3,366)
Total commercial delivery transactions (N)	453	2,518	3,496	3,412	5,278	4,739	4,594	5,249	4,726	5,043	5,395	6,809	6,754	58,466

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

<sup>a</sup> lowa transaction data are missing for 1 day in September 2020 and 2 days in January 2021.

<sup>b</sup> Pick-up is when a customer picks up their order at the retailer.

<sup>c</sup> Direct delivery is when the retailer provides their own delivery.

<sup>d</sup> All commercial delivery transactions in the OPP transaction data were Amazon purchases. All Amazon purchases were reported in the OPP transaction data as a commercial delivery, regardless of whether the order was delivered or picked up. As a result, the study team cannot differentiate Amazon purchases that were picked up from purchases delivered commercially in the data. Both are included in the counts of commercial delivery transactions.

e Urbanicity categories are based on households' home addresses and classified according to National Center for Education Statistics' EDGE Locale Boundaries (Geverdt, 2019).

<sup>f</sup> Urbanicity is missing if the household address is missing or could not be geocoded.

# Table C6.3b Rate of Online Order Fulfillment Method by Urbanicity<sup>a</sup> in Iowa, March 2020–March 2021

	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020 <sup>ь</sup>	Oct 2020	Nov 2020	Dec 2020	Jan 2021♭	Feb 2021	March 2021	Total March 2020- March 2021
	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	(N)	(N)	(N)	(N) Rete	(N)	(N)	(N)	(N)	(N) isity and f	(N) ulfillmont	(N) mothod	(N)	(N)	(N)
Rural	_	_	_	Rale		er of trans	sactions,	by urban	icity and i	umment	method	_	_	
	60.3	77.8	73.7	71 9	65.8	71 1	72.6	70 7	76.9	75.2	70.9	66.8	68.2	71.5
Pick-up <sup>c</sup>	(190)	(2.414)	(2.451)	(2.200)	(2.476)	(3.255)	(3.185)	(3.688)	(4.328)	(4.363)	(4.038)	(4.214)	(4.359)	(41,161)
Direct deliveryd	0.6	1.5	3.2	2.0	2.0	2.6	2.8	3.6	3.5	3.5	5.4	6.4	5.7	3.8
	(2)	(47)	(108)	(61)	(75)	(118)	(125)	(190)	(197)	(203)	(307)	(406)	(362)	(2,201)
Commercial delivery (i.e., all Amazon	39.0	20.7	23.0	26.1	32.2	26.3	24.5	25.7	19.6	21.3	23.7	26.8	26.1	24.7
transactions) <sup>e</sup>	(123)	(642)	(765)	(800)	(1,212)	(1,202)	(1,077)	(1,339)	(1,100)	(1,239)	(1,353)	(1,688)	(1,670)	(14,210)
Total rural purchase transactions (N)	315	3,103	3,324	3,061	3,763	4,575	4,387	5,217	5,625	5,805	5,698	6,308	6,391	57,572
Town	07.0	047	04.4	70.4	74.0	70.4	70.0	00.0	00.0	04.0	70 5	75.0	70.0	70.5
Pick-up <sup>c</sup>	67.9 (281)	84.7 (3.853)	81.1 (3.050)	(3 407)	(2.084)	/9.1 (5.361)	/9.2 (/ 058)	80.6 (6.003)	82.6 (6.527)	81.3 (6.650)	78.5 (6 343)	(7.155) (7.155)	(6 977)	(65 358)
	(201)	(3,033)	(3,950)	(3,407)	(3,904)	(3,301)	(4,950)	(0,003)	(0,527)	(0,039)	(0,545)	(7,100)	<u>(0,077)</u> 5.6	(05,550)
Direct delivery <sup>d</sup>	(0)	(14)	(8)	(23)	(55)	(92)	(76)	(97)	(136)	(154)	(328)	(492)	(528)	(2.003)
Commercial delivery (i.e., all Amazon	32.1	15.0	18.7	20.3	27.1	19.5	19.5	18.1	15.7	16.9	17.4	19.5	21.1	19.1
transactions) <sup>e</sup>	(133)	(684)	(910)	(875)	(1,505)	(1,323)	(1,223)	(1,348)	(1,240)	(1,381)	(1,407)	(1,858)	(1,983)	(15,870)
Total town purchase transactions (N)	414	4,551	4,868	4,305	5,544	6,776	6,257	7,448	7,903	8,194	8,078	9,505	9,388	83,231
Suburban		•												
	71.3	71.4	66.9	68.8	64.4	67.3	65.9	61.6	60.9	58.3	53.2	49.2	48.5	59.4
FICK-up <sup>3</sup>	(114)	(1,278)	(1,324)	(1,211)	(1,266)	(1,762)	(1,891)	(2,013)	(2,172)	(2,128)	(2,008)	(2,106)	(2,033)	(21,306)
Direct deliverv <sup>d</sup>	10.0	14.6	14.4	15.1	15.6	17.4	19.2	25.1	26.4	28.2	33.3	37.3	37.8	26.1
	(16)	(261)	(285)	(265)	(307)	(456)	(550)	(820)	(943)	(1,030)	(1,258)	(1,600)	(1,584)	(9,375)
Commercial delivery (i.e., all Amazon	18.8	14.0	18.7	16.1	20.0	15.3	14.9	13.3	12.7	13.4	13.5	13.5	13.8	14.5
transactions) <sup>e</sup>	(30)	(250)	(369)	(284)	(393)	(402)	(429)	(433)	(454)	(489)	(510)	(578)	(577)	(5,198)
Total suburban purchase transactions (N)	160	1,789	1,978	1,760	1,966	2,620	2,870	3,266	3,569	3,647	3,776	4,284	4,194	35,879
City			<u> </u>							4				
Pick-up <sup>c</sup>	68.8	(5.004)	67.6	65.0	59.3	63.6	62.2	59.4	58.3	57.4	49.9	45.8	46.8	56.8
	(478)	(5,281)	(5,254)	(4,814)	(5,122)	(6,260)	(6,464)	(7,292)	(7,416)	(7,683)	(7,262)	(8,034)	(7,958)	(79,318)
Direct delivery <sup>d</sup>	(76)	17.8 (1.300)	10.3	17.8	(1 7 2 0)	21.3 (2.005)	22.4 (2.320)	25.2 (3.002)	20.1 (3.575)	30.5 (1 088)	37.0 (5768)	40.9 (7 175)	40.7	29.0 (40.431)
Commercial delivery (i.e., all Amazon	20.3	10 /	16 1	17.2	20.8	(2,090)	(2,329)	(3,092)	(3,575)	(4,000)	(0,400)	(1,175)	(0,924) 12 6	(40,431)
transactions)e	(141)	(762)	(1 253)	(1 272)	(1 792)	(1 491)	(1 607)	(1 886)	(1 725)	(1.623)	(1 819)	(2.315)	(2 136)	(19 822)
Total city purchase transactions (N)	695	7.352	7,771	7,402	8.634	9,846	10,400	12,270	12,716	13,394	14,549	17,524	17.018	139,571

	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020⋼	Oct 2020	Nov 2020	Dec 2020	Jan 2021⋼	Feb 2021	March 2021	Total March 2020- March 2021
	%	%	%	%	%	%	%	%	%	%	%	%	%	% (NI)
Missing urbenisitus	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)
	57.2	70.0	74.4	75.0	60.4	74.0	72.0	76.0	70.4	747	70 E	60.0	60.0	70.0
Pick-up <sup>c</sup>	57.3 (47)	79.6 (819)	(720)	75.0 (677)	62.4 (686)	(925)	73.0 (844)	76.2 (1.040)	79.4 (1 149)	74.7 (1 287)	72.5 (1.185)	69.9 (1 268)	(1 249)	72.9 (11 896)
	11.0	29	5.5	5.0	34	4 1	4 7	5.9	64	7 2	8.8	9.7	8.5	64
Direct delivery <sup>d</sup>	(9)	(30)	(53)	(45)	(37)	(53)	(54)	(81)	(92)	(124)	(143)	(176)	(153)	(1,050)
Commercial delivery (i.e., all Amazon	31.7	17.5	20.5	20.0	34.2	24.7	22.3	17.8	14.3	18.1	18.7	20.4	21.7	20.6
transactions) <sup>e</sup>	(26)	(180)	(199)	(181)	(376)	(321)	(258)	(243)	(207)	(311)	(306)	(370)	(388)	(3,366)
Total purchase transactions with missing urbanicity <sup>f</sup> (N)	82	1,029	972	903	1,099	1,299	1,156	1,364	1,448	1,722	1,634	1,814	1,790	16,312
					Percen	tage and	number o	of transact	tions, by ι	urbanicity				
Bural	18.9	17.4	17.6	17.6	17.9	18.2	17.5	17.6	18.0	17.7	16.9	16.0	16.5	17.3
	(315)	(3,103)	(3,324)	(3,061)	(3,763)	(4,575)	(4,387)	(5,217)	(5,625)	(5,805)	(5,698)	(6,308)	(6,391)	(57,572)
Town	24.8	25.5	25.7	24.7	26.4	27.0	25.0	25.2	25.3	25.0	23.9	24.1	24.2	25.0
	(414)	(4,551)	(4,868)	(4,305)	(5,544)	(6,776)	(6,257)	(7,448)	(7,903)	(8,194)	(8,078)	(9,505)	(9,388)	(83,231)
Suburban	9.6	10.0	10.5	10.1	9.4	10.4	11.4	11.0	11.4	11.1	11.2	10.9	10.8	10.8
	(160)	(1,789)	(1,978)	(1,760)	(1,966)	(2,620)	(2,870)	(3,266)	(3,569)	(3,647)	(3,776)	(4,284)	(4,194)	(35,879)
City	41.7	41.2	41.1	42.5	41.1	39.2	41.5	41.5	40.7	40.9	43.1	44.4	43.9	42.0
	(695)	(7,352)	(7,771)	(7,402)	(8,634)	(9,846)	(10,400)	(12,270)	(12,716)	(13,394)	(14,549)	(17,524)	(17,018)	(139,571)
Missing urbanicity	4.9	5.8	5.1	5.2	5.2	5.2	4.6	4.6	4.6	5.3	4.8	4.6	4.6	4.9
	(82)	(1,029)	(972)	(903)	(1,099)	(1,299)	(1,156)	(1,364)	(1,448)	(1,722)	(1,634)	(1,814)	(1,790)	(16,312)
Total purchase transactions (N)	1,666	17,824	18,913	17,431	21,006	25,116	25,070	29,565	31,261	32,762	33,735	39,435	38,781	332,565

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

<sup>a</sup> Urbanicity categories are based on households' home addresses and classified according to National Center for Education Statistics' EDGE Locale Boundaries (Geverdt, 2019).

<sup>b</sup> lowa transaction data are missing for 1 day in September 2020 and 2 days in January 2021.

<sup>c</sup> Pick-up is when a customer picks up their order at the retailer.

<sup>d</sup> Direct delivery is when the retailer provides their own delivery.

e All commercial delivery transactions in the OPP transaction data were Amazon purchases. All Amazon purchases were reported in the OPP transaction data as a commercial delivery, regardless of whether the order was delivered or picked up. As a result, the study team cannot differentiate Amazon purchases that were picked up from purchases delivered commercially in the data. Both are included in the counts of commercial delivery transactions.

<sup>f</sup> Urbanicity is missing if the household address is missing or could not be geocoded.

## Table C6.4a Proportion of Online Order Fulfillment Method by Urbanicity in Nebraska, March 2020–March 2021

	March 2020ª	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)
	(/	()	(/	()	Perc	centage (	) transact	tions. by f	ulfillment	method	(**)	(/	(/	(**)
Pick-up⁵	—	70.8	69.8	67.7	64.0	71.3	71.3	68.1	67.1	61.2	58.9	53.2	54.7	63.6
· · · · · · · · · · · · · · · · · · ·		(0,10Z) 13.6	(7,294)	(0,410)	(3,792) 17.4	(13,354)	(9,544)	(0,200) 19.9	(7,020)	(10,525)	(0,007)	(10,000)	(11,030)	(104,508)
Direct delivery⁰	_	(987)	(1.540)	(1.576)	(1.572)	(2.802)	(2.206)	(2.277)	(2.316)	(4,169)	(4.310)	(6.554)	(6.192)	(36,501)
Commercial delivery (i.e., all Amazon	_	15.6	15.5	15.6	18.7	13.7	12.3	13.1	12.5	14.5	12.6	14.2	14.6	14.2
transactions) <sup>d</sup>	—	(1,135)	(1,617)	(1,482)	(1,691)	(2,574)	(1,642)	(1,593)	(1,422)	(2,501)	(1,903)	(2,854)	(2,955)	(23,369)
Total purchase transactions (N)	—	7,274	10,451	9,476	9,055	18,730	13,392	12,125	11,364	17,195	15,100	20,093	20,183	164,438
				Pe	ercentage	(N) transa	ictions, by	/ fulfillmer	nt method	and urba	nicity <sup>e</sup>			
Pick-up <sup>b</sup>		10.1						· · - 1			10.0		10.1	10.0
Rural	—	(622)	10.8 (795)	(751)	14.0 (800)	(1 907)	14.9 (1.426)	14.5	14.8	(1 262)	13.3	(1 266)	(1 240)	(12,760)
		(022)	(765)	30.5	(009)	(1,097) 31.8	(1,420)	(1,193)	(1,120) 30.7	(1,302)	(1,103)	(1,200) 33 3	(1,340) 31 9	(13,700) 31.4
Town	_	(1.427)	(2.086)	(1.955)	(1.799)	(4.240)	(2.958)	(2.540)	(2.343)	(3.492)	(2.928)	(3.559)	(3.521)	(32.848)
	_	13.1	11.6	12.4	10.7	11.5	11.9	11.7	12.0	12.6	12.2	11.1	11.0	11.8
Suburban	—	(677)	(844)	(796)	(621)	(1,530)	(1,133)	(962)	(918)	(1,327)	(1,083)	(1,183)	(1,216)	(12,290)
City	-	40.1	41.7	39.2	37.8	37.2	36.7	37.7	37.6	36.1	35.9	38.0	38.9	37.9
Ony	—	(2,064)	(3,038)	(2,516)	(2,191)	(4,966)	(3,507)	(3,110)	(2,871)	(3,796)	(3,188)	(4,061)	(4,291)	(39,599)
Missing <sup>f</sup>	—	7.0	7.4	6.2	6.4	5.4	5.4	5.5	4.8	5.2	5.7	5.8	6.1	5.8
	_	(362)	(541)	(400)	(372)	(721)	(520)	(450)	(368)	(548)	(505)	(616)	(668)	(6,071)
Direct deliverut		5,152	7,294	6,418	5,792	13,354	9,544	8,255	7,620	10,525	8,887	10,685	11,036	104,568
		21	32	2.6	27	2.5	2.8	3.0	2.6	21	23	14	16	2.2
Rural	_	(21)	(50)	(41)	(43)	(69)	(61)	(68)	(61)	(88)	(100)	(90)	(99)	(791)
Томп	—	17.8	12.5	10.0	11.1	12.2	9.7	10.9	9.9	11.0	9.4	8.2	8.2	10.0
100011	—	(176)	(192)	(158)	(175)	(343)	(213)	(248)	(229)	(459)	(404)	(539)	(507)	(3,643)
Suburban	—	14.1	15.3	15.7	14.2	17.6	16.5	15.5	14.8	14.8	14.6	15.2	15.8	15.4
	_	(139)	(235)	(247)	(224)	(494)	(364)	(352)	(343)	(615)	(628)	(995)	(981)	(5,617)
City	—	64.9	67.1 (1.024)	69.7	(1 102)	65.7	68.8	68.6	(1.5	/0.4 (2.027)	(2.115)	(4.0	(3.2	(0.9
		(041)	(1,034)	(1,098)	(1,103)	(1,040)	(1,518) 2 2	(1,502)	(1,000)	(2,937)	(3,115)	(4,003) 1 0	(4,534)	(20,091)
Missing <sup>f</sup>	_	(10)	(29)	2.0 (32)	(27)	∠.0 (56)	∠.3 (50)	∠.⊺ (47)	1.2 (27)	(70)	(63)	۲.۲ (77)	(71)	(559)
Total direct delivery transactions (N)	_	987	1,540	1,576	1,572	2,802	2,206	2,277	2,316	4,169	4,310	6,554	6,192	36,501

	March 2020ª	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
	% (NI)	%	%	%	%	%	% (NI)	% (NI)	% (NI)	% (NI)	%	% (NI)	%	% (NI)
Commercial delivery (i.e., all Amazo	(N)	(N) tions)d	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)
	JII II alisac	20 1	10.2	17.5	14.0	10.4	10.6	16.0	15.0	10.0	15.0	16.2	15.5	17.0
Rural	_	(228)	(311)	(259)	(236)	(499)	(305)	(258)	(216)	(475)	(301)	(461)	(459)	(4,008)
-		21.9	20.7	19.4	20.9	20.1	23.6	18.8	19.5	21.7	21.0	26.8	21.9	21.6
Iown	—	(248)	(334)	(287)	(353)	(518)	(387)	(299)	(278)	(542)	(400)	(765)	(648)	(5,059)
Ou hurth an		7.3	7.7	7.2	6.9	7.8	6.6	7.0	8.5	7.4	8.8	6.4	6.9	7.3
Suburban	_	(83)	(124)	(107)	(116)	(202)	(108)	(112)	(121)	(185)	(167)	(183)	(204)	(1,712)
0.4	_	44.0	45.9	50.2	51.1	46.2	46.4	50.5	49.2	44.0	47.8	44.4	48.8	47.2
City	—	(499)	(742)	(744)	(864)	(1,188)	(762)	(804)	(699)	(1,100)	(910)	(1,267)	(1,442)	(11,021)
Missingf	_	6.8	6.6	5.7	7.2	6.5	4.9	7.5	7.6	8.0	6.6	6.2	6.8	6.7
Missing.	—	(77)	(106)	(85)	(122)	(167)	(80)	(120)	(108)	(199)	(125)	(178)	(202)	(1,569)
Total commercial delivery transactions (N)	_	1,135	1,617	1,482	1,691	2,574	1,642	1,593	1,422	2,501	1,903	2,854	2,955	23,369

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

<sup>a</sup> Nebraska launched the SNAP Online purchasing pilot on April 2, 2020, therefore there are no transaction data for March 2020.

<sup>b</sup> Pick-up is when a customer picks up their order at the retailer.

<sup>c</sup> Direct delivery is when the retailer provides their own delivery.

<sup>d</sup> All commercial delivery transactions in the OPP transaction data were Amazon purchases. All Amazon purchases were reported in the OPP transaction data as a commercial delivery, regardless of whether the order was delivered or picked up. As a result, the study team cannot differentiate Amazon purchases that were picked up from purchases delivered commercially in the data. Both are included in the counts of commercial delivery transactions.

e Urbanicity categories are based on households' home addresses and classified according to National Center for Education Statistics' EDGE Locale Boundaries (Geverdt, 2019)

<sup>f</sup> Urbanicity is missing if the household address is missing or could not be geocoded.

## Table C6.4b Rate of Online Order Fulfillment Method by Urbanicity<sup>a</sup> in Nebraska, March 2020–March 2021

$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$
(N)
Rare and number of transactions, by urbanicity and nummer method           Rural           Pick-upc         -         71.4         68.5         71.5         74.4         77.0         79.6         78.5         80.3         70.8         74.7         69.7         70.6         74.1           Direct deliveryd         -         (622)         (785)         (751)         (809)         (1,897)         (1,426)         (1,193)         (1,126)         (1,362)         (1,183)         (1,266)         (1,340)         (13,760)           Direct deliveryd         -         2.4         4.4         3.9         4.0         2.8         3.4         4.5         4.3         4.6         6.3         5.0         5.2         4.3           Commercial delivery (i.e., all Amazon         -         (21)         (50)         (41)         (43)         (69)         (61)         (68)         (61)         (88)         (100)         (90)         (99)         (791)           Commercial delivery (i.e., all Amazon         -         26.2         27.1         24.6         21.7         20.2         17.0         15.4         24.7         19.0         25.4         24.2         21.6           Total rural purchase transactions
Nutation       -       71.4       68.5       71.5       74.4       77.0       79.6       78.5       80.3       70.8       74.7       69.7       70.6       74.1         Pick-upc       -       (622)       (785)       (751)       (809)       (1,897)       (1,426)       (1,193)       (1,126)       (1,362)       (1,183)       (1,266)       (1,340)       (13,760)         Direct deliveryd       -       2.4       4.4       3.9       4.0       2.8       3.4       4.5       4.3       4.6       6.3       5.0       5.2       4.3         Commercial delivery (i.e., all Amazon       -       26.2       27.1       24.6       21.7       20.2       17.0       17.0       15.4       24.7       19.0       25.4       24.2       21.6         transactions)e       -       (228)       (311)       (259)       (236)       (499)       (305)       (258)       (216)       (475)       (301)       (461)       (459)       (4.008)         Total rural purchase transactions (N)       -       871       1,146       1,051       1,088       2,465       1,792       1,519       1,403       1,925       1,584       1,817       1,898       18,559     <
Pick-upc       -       (622)       (785)       (751)       (809)       (1,897)       (1,426)       (1,322)       (1,183)       (1,266)       (1,340)       (13,760)         Direct deliveryd       -       2.4       4.4       3.9       4.0       2.8       3.4       4.5       4.3       4.6       6.3       5.0       5.2       4.3         Direct deliveryd       -       (21)       (50)       (41)       (43)       (69)       (61)       (68)       (61)       (88)       (100)       (90)       (99)       (791)         Commercial delivery (i.e., all Amazon       -       26.2       27.1       24.6       21.7       20.2       17.0       17.0       15.4       24.7       19.0       25.4       24.2       21.6         transactions) <sup>e</sup> -       (228)       (311)       (259)       (236)       (499)       (305)       (258)       (216)       (475)       (301)       (461)       (459)       (4,008)         Total rural purchase transactions (N)       -       871       1,146       1,051       1,088       2,465       1,792       1,519       1,403       1,925       1,584       1,817       1,898       18,559         Town
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$
Direct deliveryd         -         (21)         (50)         (41)         (43)         (69)         (61)         (68)         (100)         (90)         (99)         (791)           Commercial delivery (i.e., all Amazon         -         26.2         27.1         24.6         21.7         20.2         17.0         17.0         15.4         24.7         19.0         25.4         24.2         21.6           Commercial delivery (i.e., all Amazon         -         (228)         (311)         (259)         (236)         (499)         (305)         (258)         (216)         (475)         (301)         (461)         (459)         (4,008)           Total rural purchase transactions (N)         -         871         1,146         1,051         1,088         2,465         1,792         1,519         1,403         1,925         1,584         1,817         1,898         18,559           Town         -         (1,427)         (2,086)         (1,955)         (1,799)         (4,240)         (2,958)         (2,540)         (2,343)         (3,492)         (2,928)         (3,559)         (3,521)         (32,848)           Direct deliveryd         -         9.5         7.4         6.6         7.5         6.7 <td< td=""></td<>
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$
transactions)e       -       (228)       (311)       (259)       (236)       (499)       (305)       (258)       (216)       (475)       (301)       (461)       (459)       (4,008)         Total rural purchase transactions (N)       -       871       1,146       1,051       1,088       2,465       1,792       1,519       1,403       1,925       1,584       1,817       1,898       18,559         Town       -       (1,427)       (2,086)       (1,955)       (1,799)       (4,240)       (2,958)       (2,540)       (2,343)       (3,492)       (2,928)       (3,559)       (3,521)       (32,848)         Direct delivery <sup>d</sup> -       9,5       7,4       6.6       7,5       6.7       6.0       8.0       8.0       10.2       10.8       11.1       10.8       8.8         Direct delivery <sup>d</sup> -       (1,76)       (192)       (158)       (175)       (343)       (213)       (248)       (229)       (459)       (404)       (539)       (507)       (3,643)         Commercial delivery (i.e., all Amazon       -       13.4       12.8       12.0       15.2       10.2       10.9       9.7       9.8       12.1       10.7       15.7       13
Total rural purchase transactions (N)       —       871       1,146       1,051       1,088       2,465       1,792       1,519       1,403       1,925       1,584       1,817       1,898       18,559         Town       —       77.1       79.9       81.5       77.3       83.1       83.1       82.3       82.2       77.7       78.5       73.2       75.3       79.1         Pick-up <sup>c</sup> —       (1,427)       (2,086)       (1,955)       (1,799)       (4,240)       (2,958)       (2,540)       (2,343)       (3,492)       (2,928)       (3,559)       (3,521)       (32,848)         Direct delivery <sup>d</sup> —       9.5       7.4       6.6       7.5       6.7       6.0       8.0       8.0       10.2       10.8       11.1       10.8       8.8         Direct delivery <sup>d</sup> —       (176)       (192)       (158)       (175)       (343)       (213)       (248)       (229)       (459)       (404)       (539)       (507)       (3,643)         Commercial delivery (i.e., all Amazon       —       13.4       12.8       12.0       15.2       10.2       10.9       9.7       9.8       12.1       10.7       15.7       13.9       12
Town           Pick-up <sup>c</sup> -         77.1         79.9         81.5         77.3         83.1         83.1         82.2         77.7         78.5         73.2         75.3         79.1           Pick-up <sup>c</sup> -         (1,427)         (2,086)         (1,955)         (1,799)         (4,240)         (2,958)         (2,540)         (2,343)         (3,492)         (2,928)         (3,559)         (3,521)         (32,848)           Direct delivery <sup>d</sup> -         9.5         7.4         6.6         7.5         6.7         6.0         8.0         10.2         10.8         11.1         10.8         8.8           Commercial delivery (i.e., all Amazon         -         13.4         12.8         12.0         15.2         10.2         10.9         9.7         9.8         12.1         10.7         15.7         13.9         12.2           transactions) <sup>a</sup> -         (248)         (334)         (287)         (353)         (518)         (387)         (299)         (278)         (542)         (400)         (765)         (648)         (5,059)           Total town purchase transactions (N)         -         1,851         2,612         2,400         2,327         5,101
Pick-upc         -         77.1         79.9         81.5         77.3         83.1         83.1         82.3         82.2         77.7         78.5         73.2         75.3         79.1           Pick-upc         -         (1,427)         (2,086)         (1,955)         (1,799)         (4,240)         (2,958)         (2,540)         (2,343)         (3,492)         (2,928)         (3,559)         (3,521)         (32,848)           Direct deliveryd         -         9.5         7.4         6.6         7.5         6.7         6.0         8.0         10.2         10.8         11.1         10.8         8.8           Commercial delivery (i.e., all Amazon         -         (176)         (192)         (158)         (175)         (343)         (213)         (248)         (229)         (404)         (539)         (507)         (3,643)           Commercial delivery (i.e., all Amazon         -         13.4         12.8         12.0         15.2         10.2         10.9         9.7         9.8         12.1         10.7         15.7         13.9         12.2           transactions) <sup>e</sup> -         (248)         (334)         (287)         (353)         (518)         (387)         (299)
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$
Direct deliveryd         -         9.5         7.4         6.6         7.5         6.7         6.0         8.0         10.2         10.8         11.1         10.8         8.8           Direct deliveryd         -         (176)         (192)         (158)         (175)         (343)         (213)         (248)         (229)         (459)         (404)         (539)         (507)         (3,643)           Commercial delivery (i.e., all Amazon         -         13.4         12.8         12.0         15.2         10.2         10.9         9.7         9.8         12.1         10.7         15.7         13.9         12.2           transactions) <sup>e</sup> -         (248)         (334)         (287)         (353)         (518)         (387)         (299)         (278)         (542)         (400)         (765)         (648)         (5,059)           Total town purchase transactions (N)         -         1,851         2,612         2,400         2,327         5,101         3,558         3,087         2,850         4,493         3,732         4,863         4,676         41,550           Suburban         -         75.3         70.2         69.2         64.6         68.7         70.6         67.
Direct derivery       -       (176)       (192)       (158)       (175)       (343)       (213)       (248)       (229)       (459)       (404)       (539)       (507)       (3,643)         Commercial delivery (i.e., all Amazon       -       13.4       12.8       12.0       15.2       10.2       10.9       9.7       9.8       12.1       10.7       15.7       13.9       12.2         transactions)e       -       (248)       (334)       (287)       (353)       (518)       (387)       (299)       (278)       (542)       (400)       (765)       (648)       (5,059)         Total town purchase transactions (N)       -       1,851       2,612       2,400       2,327       5,101       3,558       3,087       2,850       4,493       3,732       4,863       4,676       41,550         Suburban       -       -       75.3       70.2       69.2       64.6       68.7       70.6       67.5       66.4       62.4       57.7       50.1       50.6       62.6
Commercial delivery (i.e., all Amazon       —       13.4       12.8       12.0       15.2       10.2       10.9       9.7       9.8       12.1       10.7       15.7       13.9       12.2         transactions)e       —       (248)       (334)       (287)       (353)       (518)       (387)       (299)       (278)       (542)       (400)       (765)       (648)       (5,059)         Total town purchase transactions (N)       —       1,851       2,612       2,400       2,327       5,101       3,558       3,087       2,850       4,493       3,732       4,863       4,676       41,550         Suburban
transactions)e       —       (248)       (334)       (287)       (353)       (518)       (387)       (299)       (278)       (542)       (400)       (765)       (648)       (5,059)         Total town purchase transactions (N)       —       1,851       2,612       2,400       2,327       5,101       3,558       3,087       2,850       4,493       3,732       4,863       4,676       41,550         Suburban       —       75.3       70.2       69.2       64.6       68.7       70.6       67.5       66.4       62.4       57.7       50.1       50.6       62.6
Total town purchase transactions (N)         —         1,851         2,612         2,400         2,327         5,101         3,558         3,087         2,850         4,493         3,732         4,863         4,676         41,550           Suburban         —         75.3         70.2         69.2         64.6         68.7         70.6         67.5         66.4         62.4         57.7         50.1         50.6         62.6
Suburban 75.3 70.2 69.2 64.6 68.7 70.6 67.5 66.4 62.4 57.7 50.1 50.6 62.6 62.6
Direct delivery <sup>d</sup> $-$ 15.5 19.5 21.5 23.3 22.2 22.7 24.7 24.8 28.9 33.4 42.1 40.9 28.6 (2017) (201
$\begin{bmatrix} \text{Commercial delivery (i.e., all Amazon} & - & 9.2 & 10.3 & 9.3 & 12.1 & 9.1 & 6.7 & 7.9 & 8.8 & 8.7 & 8.9 & 7.8 & 8.5 & 8.7 & 10.0$
10  tai suburban purchase transactions (N) = 899 1,203 1,150 961 2,226 1,605 1,426 1,382 2,127 1,878 2,361 2,401 19,619
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Direct deliveryd 20.0 21.0 20.2 20.0 20.2 20.0 31.1 37.0 40.2 47.7 44.2 30.0 20.4 50.0 (4 50.0 10 50.0 10 50.0 (4 50.0 10 50.0
- (041) (1,034) (1,036) (1,037) (1,0
$\begin{bmatrix} 13.0 & 13.4 & 17.1 \\ 13.9 & 13.2 & 14.7 & 13.4 & 14.0 & 12.0 & 12.4 & 14.0 & 14.0 \\ 14.9 & 13.9 & 13.2 & 14.7 & 13.4 & 14.0 & 12.0 & 12.4 & 14.0 & 14.0 \\ 14.9 & 14.9 & 14.0 $
$\frac{(1,02)}{(1,02)} = \frac{(1,02)}{(1,02)} = (1$

	March 2020⋼	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)
Missing urbanicity <sup>e</sup>														
Pick-up <sup>c</sup>	_	80.6 (362)	80.0 (541)	77.4 (400)	71.4 (372)	76.4 (721)	80.0 (520)	72.9 (450)	73.2 (368)	67.1 (548)	72.9 (505)	70.7 (616)	71.0 (668)	74.0 (6,071)
Direct delivery <sup>d</sup>	_	2.2 (10)	4.3 (29)	6.2 (32)	5.2 (27)	5.9 (56)	7.7	7.6	5.4 (27)	8.6 (70)	9.1 (63)	8.8 (77)	7.5	6.8 (559)
Commercial delivery (i.e., all Amazon transactions) <sup>e</sup>	_	17.1 (77)	15.7 (106)	16.4 (85)	23.4 (122)	17.7 (167)	12.3 (80)	19.4 (120)	21.5 (108)	24.4 (199)	18.0 (125)	20.4 (178)	21.5 (202)	19.1 (1,569)
Total purchase transactions with missing urbanicity <sup>r</sup> (N)	—	449	676	517	521	944	650	617	503	817	693	871	941	8,199
					Percen	tage and	number o	of transact	tions, by i	urbanicity	,			
Rural		12.0 (871)	11.0 (1,146)	11.1 (1,051)	12.0 (1,088)	13.2 (2,465)	13.4 (1,792)	12.5 (1,519)	12.3 (1,403)	11.2 (1,925)	10.5 (1,584)	9.0 (1,817)	9.4 (1,898)	11.3 (18,559)
Town	-	25.4 (1,851)	25.0 (2,612)	25.3 (2,400)	25.7 (2,327)	27.2 (5,101)	26.6 (3,558)	25.5 (3,087)	25.1 (2,850)	26.1 (4,493)	24.7 (3,732)	24.2 (4,863)	23.2 (4,676)	25.3 (41,550)
Suburban	_	12.4 (899)	11.5 (1,203)	12.1 (1,150)	10.6 (961)	11.9 (2,226)	12.0 (1,605)	11.8 (1,426)	12.2 (1,382)	12.4 (2,127)	12.4 (1,878)	11.8 (2,361)	11.9	11.9 (19,619)
City		44.0 (3,204)	46.1 (4,814)	46.0 (4,358)	45.9 (4,158)	42.7 (7,994)	43.2 (5,787)	45.2 (5,476)	46.0 (5,226)	45.6 (7,833)	47.8 (7,213)	50.7 (10,181)	50.9	46.5 (76,511)
Missing urbanicity <sup>f</sup>	_	6.2 (449)	6.5 (676)	5.5 (517)	5.8 (521)	5.0 (944)	4.9 (650)	5.1 (617)	4.4 (503)	4.8 (817)	4.6 (693)	4.3 (871)	4.7 (941)	5.0 (8,199)
Total purchase transactions (N)	_	7,274	10,451	9,476	9,055	18,730	13,392	12,125	11,364	17,195	15,100	20,093	20,183	164,438

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

<sup>a</sup>Urbanicity categories are based on households' home addresses and classified according to National Center for Education Statistics' EDGE Locale Boundaries (Geverdt, 2019).

<sup>b</sup> Nebraska launched the SNAP Online purchasing pilot on April 2, 2020, therefore there are no transaction data for March 2020.

<sup>c</sup> Pick-up is when a customer picks up their order at the retailer.

<sup>d</sup> Direct delivery is when the retailer provides their own delivery.

<sup>e</sup> All commercial delivery transactions in the OPP transaction data were Amazon purchases. All Amazon purchases were reported in the OPP transaction data as a commercial delivery, regardless of whether the order was delivered or picked up. As a result, the study team cannot differentiate Amazon purchases that were picked up from purchases delivered commercially in the data. Both are included in the counts of commercial delivery transactions.

<sup>f</sup> Urbanicity is missing if the household address is missing or could not be geocoded.

## Table C6.5a Proportion of Online Order Fulfillment Method by Urbanicity in New York, March 2020–March 2021

	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
	%	%	% (NI)	%	%	%	% (NI)	%	% (NI)	% (NI)	% (NI)	% (NI)	% (NI)	% (NI)
	(N)	(N)	(N)	(N)	(IN) Iorcontago	(N) (and nun	(N) abor) of tr	(N) ansaction	(N) s. by fulfill	(N) Imont mot	(N) bod	(N)	(N)	(N)
	22.8	28.1	20.8	16.9	16 4	20 4	18 0	22 1	25 5	23 Q	19.8	17 9	16.8	20.2
Pick-up <sup>a</sup>	(10,624)	(21,996)	(26,321)	(24,188)	(24,727)	(32,204)	(29,271)	(45,958)	(53,205)	(52,532)	(48,919)	(47,960)	(48,311)	(466,216)
Direct deliver/h	11.3	9.9	9.6	11.5	12.4	13.8	14.1	16.0	18.0	20.0	24.9	26.6	26.5	18.6
	(5,254)	(7,740)	(12,210)	(16,444)	(18,797)	(21,758)	(22,914)	(33,236)	(37,586)	(43,781)	(61,509)	(71,046)	(75,905)	(428,180)
Commercial delivery (i.e., all Amazon	66.0	62.0	69.6	71.6	71.2	65.8	67.9	62.0	56.5	56.1	55.3	55.5	56.7	61.2
transactions)º	(30,820)	(48,586)	(88,038)	(102,257)	(107,692)	(103,794)	(110,257)	(128,938)	(118,084)	(123,048)	(136,835)	(148,524)	(162,556)	(1,409,429)
Total purchase transactions (N)	46,698	78,322	126,569	142,889	151,216	157,756	162,442	208,132	208,875	219,361	247,263	267,530	286,772	2,303,825
				Percenta	ge (and nເ	umber) of	transactio	ns, by ful	fillment m	ethod and	l urbanicit	У <sup>d</sup>		
Pick-up <sup>a</sup>														
Rural	23.0	26.9	27.0	26.8	28.8	29.4	27.8	30.6	31.3	32.1	31.2	30.6	30.7	29.8
	(2,444)	(5,918)	(7,115)	(6,481)	(7,116)	(9,464)	(8,145)	(14,063)	(16,639)	(16,850)	(15,276)	(14,653)	(14,813)	(138,977)
Town	23.8	23.5	21.8	22.3	21.9	22.5	22.6	23.1	23.3	22.9	23.0	22.1	21.6	22.6
	(2,526)	(5,162)	(5,728)	(5,383)	(5,425)	(7,238)	(6,602)	(10,597)	(12,400)	(12,040)	(11,255)	(10,594)	(10,418)	(105,368)
Suburban	26.3 (2 796)	27.8 (6 104)	28.4 (7 467)	26.0 (6 279)	25.5 (6.310)	25.3 (8 160)	24.9 (7 277)	23.4 (10 741)	23.1 (12.314)	22.7 (11 935)	22.9 (11 194)	22.7 (10 880)	23.0 (11 127)	24.1 (112 584)
	23.0	17.1	18.0	20.6	18.7	18.0	20.1	18.9	17.9	17.5	18.0	19.7	19.5	18.7
City	(2.439)	(3.760)	(4.731)	(4.974)	(4.625)	(5.809)	(5.895)	(8.678)	(9.519)	(9.211)	(8.820)	(9.426)	(9.421)	(87.308)
	3.9	4.8	4.9	4.4	5.1	4.8	4.6	4.1	4.4	4.8	4.9	5.0	5.2	4.7
Missing <sup>e</sup>	(419)	(1,052)	(1,280)	(1,071)	(1,251)	(1,533)	(1,352)	(1,879)	(2,333)	(2,496)	(2,374)	(2,407)	(2,532)	(21,979)
Total pick-up transactions (N)	10,624	21,996	26,321	24,188	24,727	32,204	29,271	45,958	53,205	52,532	48,919	47,960	48,311	466,216
Direct delivery <sup>b</sup>														
Pural	4.1	5.0	5.3	5.8	5.9	5.7	5.2	5.6	6.4	6.0	6.2	6.3	6.1	6.0
	(218)	(388)	(650)	(946)	(1,117)	(1,238)	(1,188)	(1,867)	(2,391)	(2,614)	(3,841)	(4,475)	(4,600)	(25,533)
Town	5.5	5.8	6.6	6.5	7.8	8.7	9.0	9.4	11.0	11.1	12.4	12.9	12.3	10.8
10111	(290)	(449)	(804)	(1,075)	(1,458)	(1,891)	(2,063)	(3,136)	(4,119)	(4,864)	(7,607)	(9,169)	(9,328)	(46,253)
Suburban	44.0	47.5	44.0	38.7	36.1	36.5	33.4	33.1	34.6	33.4	30.6	29.1	28.5	32.7
	(2,310)	(3,676)	(5,378)	(6,360)	(6,777)	(7,943)	(7,643)	(10,996)	(13,009)	(14,602)	(18,834)	(20,690)	(21,613)	(139,831)
City	44.4	39.6	41.3	46.4	4/.4	46.7	50.1	49.4	45.6	47.2	48.6	49.3	50.7	48.2
	(2,332)	(3,062)	(5,040)	(7,624)	(8,910)	(10,156)	(11,484)	(16,402)	(17,140)	(20,653)	(29,915)	(35,009)	(38,447)	(206,174)
Missing <sup>e</sup>	2.0 (104)	2.1 (165)	2.8 (338)	2.7 (439)	2.8 (535)	2.4 (530)	(536)	2.5 (835)	2.5 (927)	2.4 (1.048)	2.1 (1.312)	2.4 (1.703)	2.5 (1 917)	(10.389)
Total direct delivery transactions (N)	5,254	7,740	12,210	16,444	18,797	21,758	22,914	33,236	37,586	43,781	61,509	71,046	75,905	428,180

	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)
Commercial delivery (i.e., all Amazo	on transact	tions)°	(14)	(11)	(11)	(11)	(11)		(11)	(11)	(11)		(11)	(11)
Pural	6.0	6.7	5.6	5.1	5.3	4.7	3.8	4.3	4.8	4.7	4.7	5.0	4.9	4.9
Itulai	(1,851)	(3,258)	(4,969)	(5,198)	(5,683)	(4,839)	(4,167)	(5,573)	(5,720)	(5,834)	(6,376)	(7,435)	(7,970)	(68,873)
Томп	4.0	4.4	4.0	4.1	4.3	3.5	2.8	3.1	3.6	3.4	3.4	3.6	3.5	3.6
TOWIT	(1,219)	(2,139)	(3,507)	(4,156)	(4,656)	(3,654)	(3,076)	(4,039)	(4,257)	(4,158)	(4,608)	(5,391)	(5,653)	(50,513)
Suburban	15.5	17.5	15.5	13.6	14.9	14.9	12.2	13.4	14.6	14.3	14.1	14.0	14.0	14.2
Suburban	(4,781)	(8,486)	(13,658)	(13,941)	(16,054)	(15,416)	(13,445)	(17,296)	(17,250)	(17,579)	(19,297)	(20,844)	(22,705)	(200,752)
City	71.8	68.5	72.5	74.8	73.1	74.6	79.0	76.7	74.5	75.2	75.4	74.9	75.3	74.9
City	(22,124)	(33,285)	(63,817)	(76,473)	(78,696)	(77,402)	(87,128)	(98,933)	(87,993)	(92,481)	(103,199)	(111,279)	(122,364)	(1,055,174)
Missinge	2.7	2.9	2.4	2.4	2.4	2.4	2.2	2.4	2.4	2.4	2.5	2.4	2.4	2.4
INISSII IQ°	(845)	(1,418)	(2,087)	(2,489)	(2,603)	(2,483)	(2,441)	(3,097)	(2,864)	(2,996)	(3,355)	(3,575)	(3,864)	(34,117)
Total commercial delivery transactions (N)	30,820	48,586	88,038	102,257	107,692	103,794	110,257	128,938	118,084	123,048	136,835	148,524	162,556	1,409,429

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

<sup>a</sup> Pick-up is when a customer picks up their order at the retailer.

<sup>b</sup> Direct delivery is when the retailer provides their own delivery.

• All commercial delivery transactions in the OPP transaction data were Amazon purchases. All Amazon purchases were reported in the OPP transaction data as a commercial delivery, regardless of whether the order was delivered or picked up. As a result, the study team cannot differentiate Amazon purchases that were picked up from purchases delivered commercially in the data. Both are included in the counts of commercial delivery transactions.

<sup>d</sup> Urbanicity categories are based on households' home addresses and classified according to National Center for Education Statistics' EDGE Locale Boundaries (Geverdt, 2019).

• Urbanicity is missing if the household address is missing or could not be geocoded.

# Table C6.5b Rate of Online Order Fulfillment Method by Urbanicity<sup>a</sup> New York, March 2020–March 2021

	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
	% (NI)	%	% (NI)	% (NI)	% (NI)	%	%	% (NI)	% (NI)	%	% (NI)	% (NI)	% (NI)	% (NI)
	(N)	(N)	(N)	(N) Roto	(N) and numb	(N)	(N)	(N)	(N) isity and f	(N) Julfillmont	(N) mothod	(N)	(N)	(N)
Rural	_	_	_	Rale	anu numu	er of traff	sactions,	by urban	icity and i	umment	methoa	_	_	
	54.2	61.9	55 9	51.3	51 1	60.9	60.3	65.4	67.2	66.6	59.9	55.2	54 1	59 5
Pick-up <sup>b</sup>	(2.444)	(5.918)	(7.115)	(6.481)	(7.116)	(9.464)	(8.145)	(14.063)	(16.639)	(16.850)	(15.276)	(14.653)	(14.813)	(138.977)
Dine et de livre e	4.8	4.1	5.1	7.5	8.0	8.0	8.8	8.7	9.7	10.3	15.1	16.8	16.8	10.9
Direct delivery <sup>c</sup>	(218)	(388)	(650)	(946)	(1,117)	(1,238)	(1,188)	(1,867)	(2,391)	(2,614)	(3,841)	(4,475)	(4,600)	(25,533)
Commercial delivery (i.e., all Amazon	41.0	34.1	39.0	41.2	40.8	31.1	30.9	25.9	23.1	23.1	25.0	28.0	29.1	29.5
transactions) <sup>d</sup>	(1,851)	(3,258)	(4,969)	(5,198)	(5,683)	(4,839)	(4,167)	(5,573)	(5,720)	(5,834)	(6,376)	(7,435)	(7,970)	(68,873)
Total rural purchase transactions (N)	4,513	9,564	12,734	12,625	13,916	15,541	13,500	21,503	24,750	25,298	25,493	26,563	27,383	233,383
Town														
Pick-up <sup>b</sup>	62.6	66.6	57.1	50.7	47.0	56.6	56.2	59.6	59.7	57.2	48.0	42.1	41.0	52.1
· · · · · · · · · · · · · · · · · · ·	(2,526)	(5,162)	(5,728)	(5,383)	(5,425)	(7,238)	(6,602)	(10,597)	(12,400)	(12,040)	(11,255)	(10,594)	(10,418)	(105,368)
Direct delivery <sup>c</sup>	7.2	5.8	0.8 (004)	10.1	12.6	14.8	17.6	17.6	19.8	23.1	32.4	36.5	36.7	22.9
	(290)	(449)	(804)	(1,075)	(1,458)	(1,891)	(2,063)	(3,136)	(4,119)	(4,864)	(7,607)	(9,169)	(9,328)	(46,253)
trapagetionald	30.Z (1.210)	27.0 (2.120)	34.9 (2.507)	39.Z	40.4 (4 656)	28.0	20.2 (2.076)	(4 020)	20.5 (4.257)	(1 150)	19.0	Z1.4 (5 201)	ZZ.3	25.U (50 512)
Total town purchase transactions (NI)	(1,219)	(2,139)	(3,507)	10 61/	(4,000)	(3,034)	(3,070)	(4,039)	(4,257)	21 062	(4,000)	25 154	25 300	202 13/
Suburban	4,000	7,730	10,035	10,014	11,555	12,705	11,741	11,112	20,770	21,002	23,470	23,134	20,000	202,134
	28.3	33.4	28.2	23.6	21 7	25.9	25.7	27.5	28.9	27 1	22.7	20.8	20.1	24.8
Pick-up <sup>b</sup>	(2 796)	(6 104)	(7 467)	(6 279)	(6 310)	(8 160)	(7 277)	(10 741)	(12 314)	(11.935)	(11 194)	(10 880)	(11 127)	(112 584)
	23.4	20.1	20.3	23.9	23.3	25.2	26.9	28.2	30.6	33.1	38.2	39.5	39.0	30.9
Direct delivery <sup>c</sup>	(2,310)	(3,676)	(5,378)	(6,360)	(6,777)	(7,943)	(7,643)	(10,996)	(13,009)	(14,602)	(18,834)	(20,690)	(21,613)	(139,831)
Commercial delivery (i.e., all Amazon	48.4	46.5	51.5	52.4	55.1	48.9	47.4	44.3	40.5	39.8	39.1	39.8	41.0	44.3
transactions) <sup>d</sup>	(4,781)	(8,486)	(13,658)	(13,941)	(16,054)	(15,416)	(13,445)	(17,296)	(17,250)	(17,579)	(19,297)	(20,844)	(22,705)	(200,752)
Total suburban purchase transactions (N)	9,887	18,266	26,503	26,580	29,141	31,519	28,365	39,033	42,573	44,116	49,325	52,414	55,445	453,167
City														
Pick-unb	9.1	9.4	6.4	5.6	5.0	6.2	5.6	7.0	8.3	7.5	6.2	6.1	5.5	6.5
	(2,439)	(3,760)	(4,731)	(4,974)	(4,625)	(5,809)	(5,895)	(8,678)	(9,519)	(9,211)	(8,820)	(9,426)	(9,421)	(87,308)
Direct deliverv <sup>c</sup>	8.7	7.6	6.8	8.6	9.7	10.9	11.0	13.2	14.9	16.9	21.1	22.5	22.6	15.3
	(2,332)	(3,062)	(5,040)	(7,624)	(8,910)	(10,156)	(11,484)	(16,402)	(17,140)	(20,653)	(29,915)	(35,009)	(38,447)	(206,174)
Commercial delivery (i.e., all Amazon	82.3	83.0	86.7	85.9	85.3	82.9	83.4	79.8	76.7	75.6	72.7	71.5	71.9	78.2
transactions) <sup>d</sup>	(22,124)	(33,285)	(63,817)	(76,473)	(78,696)	(77,402)	(87,128)	(98,933)	(87,993)	(92,481)	(103,199)	(111,279)	(122,364)	(1,055,174)
I otal city purchase transactions (N)	26,895	40,107	73,588	89,071	92,231	93,367	104,507	124,013	114,652	122,345	141,934	155,714	170,232	1,348,656

	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
	%	%	%	%	%	%	%	%	%	%	%	%	%	% (NI)
Miasing unbenicity	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)
wissing urbanicity <sup>e</sup>	20.0	20.0	24.5	00.0	00 5	22.7	24.0	20.2	20.4	20.0	22.7	24.2	20 5	22.4
Pick-up <sup>b</sup>	30.6 (419)	39.9 (1.052)	34.5 (1 280)	26.8 (1.071)	28.5 (1 251)	33.7 (1.533)	31.2 (1.352)	32.3 (1 879)	38.1	38.2 (2 496)	33.7 (2.374)	31.3 (2 407)	30.5 (2.532)	33.1 (21 979)
	76	63	9.1	11 0	12.2	11 7	12 4	14 4	15 1	16.0	18.6	22,101/	23.1	15.6
Direct delivery <sup>c</sup>	(104)	(165)	(338)	(439)	(535)	(530)	(536)	(835)	(927)	(1,048)	(1,312)	(1,703)	(1,917)	(10,389)
Commercial delivery (i.e., all Amazon	61.8	53.8	56.3	62.2	59.3	54.6	56.4	53.3	46.8	45.8	47.6	46.5	46.5	51.3
transactions) <sup>d</sup>	(845)	(1,418)	(2,087)	(2,489)	(2,603)	(2,483)	(2,441)	(3,097)	(2,864)	(2,996)	(3,355)	(3,575)	(3,864)	(34,117)
Total purchase transactions with missing urbanicity <sup>e</sup> (N)	1,368	2,635	3,705	3,999	4,389	4,546	4,329	5,811	6,124	6,540	7,041	7,685	8,313	66,485
					Percen	itage and	number o	of transact	tions, by ເ	urbanicity				
Rural	9.7	12.2	10.1	8.8	9.2	9.9	8.3	10.3	11.8	(25, 209)	10.3	9.9	9.5	10.1
	(4,513)	(9,504)	(12,734)	(12,023)	(13,910)	(15,541) 0 1	(13,500)	(21,503)	(24,750)	(23,290)	(20,490)	(20,303)	(27,303)	(233,303)
Town	(4 035)	9.9 (7 750)	7.9 (10.039)	7.4 (10.614)	7.0 (11 539)	0. I (12 783)	2. <i>1</i> (11 741)	0.5 (17 772)	9.9 (20 776)	9.0 (21 062)	9.5 (23 470)	9.4 (25 154)	(25 399)	0.0 (202 134)
	21.2	23.3	20.9	18.6	19.3	20.0	17.5	18.8	20.4	20.1	19.9	19.6	19.3	19.7
Suburban	(9,887)	(18,266)	(26,503)	(26,580)	(29,141)	(31,519)	(28,365)	(39,033)	(42,573)	(44,116)	(49,325)	(52,414)	(55,445)	(453,167)
0:1.	57.6	51.2	58.1	62.3	61.0	59.2	64.3	59.6	54.9	55.8	57.4	58.2	59.4	58.5
City	(26,895)	(40,107)	(73,588)	(89,071)	(92,231)	(93,367)	(104,507)	(124,013)	(114,652)	(122,345)	(141,934)	(155,714)	(170,232)	(1,348,656)
	2.9	3.4	2.9	2.8	2.9	2.9	2.7	2.8	2.9	3.0	2.8	2.9	2.9	2.9
	(1,368)	(2,635)	(3,705)	(3,999)	(4,389)	(4,546)	(4,329)	(5,811)	(6,124)	(6,540)	(7,041)	(7,685)	(8,313)	(66,485)
Total purchase transactions (N)	46,698	78,322	126,569	142,889	151,216	157,756	162,442	208,132	208,875	219,361	247,263	267,530	286,772	2,303,825

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

<sup>a</sup> Urbanicity categories are based on households' home addresses and classified according to National Center for Education Statistics' EDGE Locale Boundaries (Geverdt, 2019).

<sup>b</sup> Pick-up is when a customer picks up their order at the retailer.

<sup>c</sup> Direct delivery is when the retailer provides their own delivery.

<sup>d</sup> All commercial delivery transactions in the OPP transaction data were Amazon purchases. All Amazon purchases were reported in the OPP transaction data as a commercial delivery, regardless of whether the order was delivered or picked up. As a result, the study team cannot differentiate Amazon purchases that were picked up from purchases delivered commercially in the data. Both are included in the counts of commercial delivery transactions.

<sup>e</sup> Urbanicity is missing if the household address is missing or could not be geocoded.

Table C6.6	Proportion of Online	Order Fulfillment Metho	od in Oregon, Marcl	h 2020–March 2021
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	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021	
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	
	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	
	Percentage (N) transactions, by fulfillment method														
Diek una	46.9	54.6	45.9	38.3	38.0	44.8	45.1	42.9	43.3	41.7	39.1	36.4	35.4	41.2	
Fick-up <sup>a</sup>	(2,139)	(17,801)	(17,305)	(18,049)	(17,928)	(24,667)	(25,312)	(29,213)	(30,169)	(30,533)	(32,252)	(29,936)	(31,163)	(306,467)	
Direct delivery	9.2	15.2	14.5	13.2	13.3	14.8	18.5	18.8	20.4	21.6	22.5	25.0	24.4	19.5	
Direct delivery?	(421)	(4,951)	(5,473)	(6,215)	(6,269)	(8,162)	(10,357)	(12,817)	(14,237)	(15,823)	(18,549)	(20,533)	(21,496)	(145,303)	
Commercial delivery	43.9	30.3	39.6	48.5	48.7	40.4	36.4	38.3	36.2	36.6	38.4	38.6	40.2	39.3	
(i.e., all Amazon transactions)⁰	(2,000)	(9,872)	(14,964)	(22,830)	(22,964)	(22,270)	(20,401)	(26,052)	(25,233)	(26,795)	(31,733)	(31,723)	(35,339)	(292,176)	
Total purchase transactions (N)	4,560	32,624	37,742	47,094	47,161	55,099	56,070	68,082	69,639	73,151	82,534	82,192	87,998	743,946	

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

Fulfillment method is not reported by urbanicity because Oregon did not report household address information.

<sup>a</sup> Pick-up is when a customer picks up their order at the retailer.

<sup>b</sup> Direct delivery is when the retailer provides their own delivery.

• All commercial delivery transactions in the OPP transaction data were Amazon purchases. All Amazon purchases were reported in the OPP transaction data as a commercial delivery, regardless of whether the order was delivered or picked up. As a result, the study team cannot differentiate Amazon purchases that were picked up from purchases delivered commercially in the data. Both are included in the counts of commercial delivery transactions.

# Table C6.7aProportion of Online Order Fulfillment Method by Urbanicity in Washington, March 2020–March 2021

	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)
	(14)	(11)	(N)	(14)	Perc	entage (N	) transact	ions, by f	ulfillment	method	(14)	(1)	(1)	
Diek was	54.5	54.4	47.5	44.3	37.3	44.0	42.3	39.5	41.5	40.4	37.4	35.2	33.5	40.4
Pick-upª	(9,303)	(30,941)	(27,825)	(26,215)	(30,523)	(38,992)	(35,953)	(35,298)	(39,031)	(42,652)	(42,477)	(40,354)	(46,648)	(446,212)
Direct deliverv⁵	7.9	13.0	13.0	13.4	12.6	13.8	16.0	18.2	19.8	20.5	22.0	23.9	23.4	18.3
	(1,344)	(7,380)	(7,627)	(7,943)	(10,278)	(12,221)	(13,589)	(16,296)	(18,647)	(21,599)	(24,912)	(27,347)	(32,537)	(201,720)
Commercial delivery (i.e., all Amazon	37.6	32.6	39.5	42.2	50.2	42.2	41.7	42.3	38.7	39.1	40.6	40.9	43.1	41.3
Tetal purchase transactions (N)	(0,420)	(18,538)	(23,128)	(24,979)	(41,061)	(37,352)	(35,447)	(37,806)	(36,402)	(41,289)	(40,007)	(40,813)	(60,032)	(455,340)
Total purchase transactions (N)	17,073	50,859	56,560	59,137	01,002		64,969	89,400	94,080	105,540	113,450	114,514	139,217	1,103,272
Percentage (N) transactions, by fulfillment method and urbanicity <sup>d</sup>														
Ріск-ир∝	12.6	12.1	12.1	12.0	12.2	1/1	12 5	14.2	11.2	14.0	12.7	111	115	12.0
Rural	(1.266)	(4.051)	(3.636)	(3.371)	(4.070)	(5.481)	(4.839)	(5.031)	(5,594)	(5.951)	(5.818)	(5.815)	(6.751)	(61,674)
_	13.4	14.6	15.1	14.9	15.8	16.4	16.3	16.2	16.0	16.0	16.7	16.6	16.6	16.0
Iown	(1,249)	(4,509)	(4,209)	(3,911)	(4,817)	(6,385)	(5,877)	(5,714)	(6,245)	(6,810)	(7,105)	(6,706)	(7,760)	(71,297)
Outwelter	30.0	30.3	27.9	28.0	26.8	26.4	27.5	27.4	27.1	27.4	27.7	27.1	27.5	27.6
Suburban	(2,791)	(9,369)	(7,774)	(7,339)	(8,195)	(10,304)	(9,896)	(9,688)	(10,594)	(11,705)	(11,781)	(10,956)	(12,815)	(123,207)
City	35.3	33.9	34.9	35.5	34.9	33.9	33.6	33.3	33.2	33.1	31.9	32.2	31.7	33.4
City	(3,281)	(10,497)	(9,713)	(9,312)	(10,667)	(13,217)	(12,069)	(11,740)	(12,958)	(14,102)	(13,551)	(13,001)	(14,783)	(148,891)
Missinge	7.7	8.1	9.0	8.7	9.1	9.2	9.1	8.9	9.3	9.6	9.9	9.6	9.7	9.2
	(716)	(2,515)	(2,493)	(2,282)	(2,774)	(3,605)	(3,272)	(3,125)	(3,640)	(4,084)	(4,222)	(3,876)	(4,539)	(41,143)
Total pick-up transactions (N)	9,303	30,941	27,825	26,215	30,523	38,992	35,953	35,298	39,031	42,652	42,477	40,354	46,648	446,212
Direct delivery <sup>b</sup>									- 1					
Rural	3.0	(222)	4.1	3.9 (211)	4.3	3.8	3.6	3.3 (542)	3.5 (656)	3.2	3.3	3.5	3.3	3.5
	(40)	(200)	(312)	(311)	(443)	(409)	(400)	(343)	(000)	(090)	(010)	(970)	(1,077)	(7,055)
Town	(1)	(20)	(29)	(64)	(57)	(105)	(146)	(202)	(245)	(312)	(461)	2.0 (546)	(628)	(2.816)
	33.7	39.2	36.7	34.4	36.0	36.9	37.1	36.9	36.6	36.9	36.2	35.4	36.4	36.4
Suburban	(453)	(2,892)	(2,802)	(2,735)	(3,699)	(4,512)	(5,048)	(6,019)	(6,834)	(7,966)	(9,010)	(9,675)	(11,855)	(73,500)
Oth	60.1	54.7	55.0	57.9	54.9	54.6	53.9	54.6	55.1	54.9	55.1	55.2	54.6	55.0
City	(808)	(4,038)	(4,196)	(4,597)	(5,638)	(6,677)	(7,325)	(8,901)	(10,272)	(11,850)	(13,737)	(15,091)	(17,749)	(110,879)
Missinge	3.1	2.7	3.8	3.0	4.3	3.7	4.3	3.9	3.4	3.6	3.6	3.9	3.8	3.7
	(42)	(197)	(288)	(236)	(441)	(458)	(585)	(631)	(640)	(773)	(886)	(1,065)	(1,228)	(7,470)
Total direct delivery transactions (N)	1,344	7,380	7,627	7,943	10,278	12,221	13,589	16,296	18,647	21,599	24,912	27,347	32,537	201,720

	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)
(n)														
Pural	11.3	10.3	8.5	8.4	9.1	8.0	7.8	8.7	8.3	8.7	8.0	9.0	8.9	8.6
Ruiai	(724)	(1,908)	(1,961)	(2,093)	(3,724)	(3,001)	(2,781)	(3,278)	(3,009)	(3,605)	(3,690)	(4,207)	(5,320)	(39,301)
Tour	8.5	8.9	7.7	8.3	9.1	8.0	7.8	8.2	7.8	7.0	6.8	7.6	7.5	7.8
TOWIT	(549)	(1,645)	(1,792)	(2,079)	(3,723)	(2,996)	(2,750)	(3,083)	(2,854)	(2,900)	(3,137)	(3,553)	(4,492)	(35,553)
Suburban	31.2	30.7	32.4	32.3	32.0	33.8	33.6	32.7	32.1	33.4	33.3	32.0	33.0	32.7
Suburbali	(2,007)	(5,694)	(7,497)	(8,060)	(13,158)	(12,631)	(11,907)	(12,352)	(11,681)	(13,810)	(15,363)	(14,998)	(19,827)	(148,985)
City	43.1	43.5	45.2	44.4	43.3	44.4	45.4	44.9	46.1	45.2	45.9	45.4	45.0	45.0
City	(2,767)	(8,057)	(10,454)	(11,103)	(17,786)	(16,578)	(16,106)	(16,961)	(16,790)	(18,678)	(21,153)	(21,273)	(27,000)	(204,706)
Miccipae	5.9	6.7	6.2	6.6	6.5	5.7	5.4	5.6	5.7	5.6	5.9	5.9	5.7	5.9
wissing.	(379)	(1,234)	(1,424)	(1,644)	(2,670)	(2,146)	(1,903)	(2,132)	(2,068)	(2,296)	(2,724)	(2,782)	(3,393)	(26,795)
Total commercial delivery transactions (N)	6,426	18,538	23,128	24,979	41,061	37,352	35,447	37,806	36,402	41,289	46,067	46,813	60,032	455,340

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

<sup>a</sup> Pick-up is when a customer picks up their order at the retailer.

<sup>b</sup> Direct delivery is when the retailer provides their own delivery.

• All commercial delivery transactions in the OPP transaction data were Amazon purchases. All Amazon purchases were reported in the OPP transaction data as a commercial delivery, regardless of whether the order was delivered or picked up. As a result, the study team cannot differentiate Amazon purchases that were picked up from purchases delivered commercially in the data. Both are included in the counts of commercial delivery transactions.

<sup>d</sup> Urbanicity categories are based on households' home addresses and classified according to National Center for Education Statistics' EDGE Locale Boundaries (Geverdt, 2019).

• Urbanicity is missing if the household address is missing or could not be geocoded.

# Table C6.7b Rate of Online Order Fulfillment Method by Urbanicity<sup>a</sup> in Washington, March 2020–March 2021

	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	% (N)
	(14)	(14)	(11)	Rate a	and numb	er of tran	sactions	hv urhan	icity and f	(יי) fulfillment	method	(11)	(14)	(11)
Rural	_	_		natet			5000000	by arban			memou	_	_	
	62.4	65.4	61.5	58.4	49.4	61.2	59.7	56.8	60.4	58.0	56.3	52.9	51.3	57.1
Pick-up <sup>₅</sup>	(1,266)	(4,051)	(3,636)	(3,371)	(4,070)	(5,481)	(4,839)	(5,031)	(5,594)	(5,951)	(5,818)	(5,815)	(6,751)	(61,674)
Direct deliver a	2.0	3.8	5.3	5.4	5.4	5.2	6.0	6.1	7.1	6.8	7.9	8.8	8.2	6.5
	(40)	(233)	(312)	(311)	(443)	(469)	(485)	(543)	(656)	(698)	(818)	(970)	(1,077)	(7,055)
Commercial delivery (i.e., all Amazon	35.7	30.8	33.2	36.2	45.2	33.5	34.3	37.0	32.5	35.2	35.7	38.3	40.5	36.4
transactions) <sup>d</sup>	(724)	(1,908)	(1,961)	(2,093)	(3,724)	(3,001)	(2,781)	(3,278)	(3,009)	(3,605)	(3,690)	(4,207)	(5,320)	(39,301)
Total rural purchase transactions (N)	2,030	6,192	5,909	5,775	8,237	8,951	8,105	8,852	9,259	10,254	10,326	10,992	13,148	108,030
Town														1
Pick-up <sup>b</sup>	69.4	73.0	69.8	64.6	56.0	67.3	67.0	63.5	66.8	68.0	66.4	62.1	60.2	65.0
	(1,249)	(4,509)	(4,209)	(3,911)	(4,817)	(6,385)	(5,877)	(5,714)	(6,245)	(6,810)	(7,105)	(6,706)	(7,760)	(71,297)
Direct deliverv <sup>c</sup>	0.1	0.3	0.5	1.1	0.7	1.1	1.7	2.2	2.6	3.1	4.3	5.1	4.9	2.6
	(1)	(20)	(29)	(64)	(57)	(105)	(146)	(202)	(245)	(312)	(461)	(546)	(628)	(2,816)
Commercial delivery (i.e., all Amazon	30.5	26.6	29.7	34.3	43.3	31.6	31.3	34.3	30.5	28.9	29.3	32.9	34.9	32.4
	(549)	(1,645)	(1,792)	(2,079)	(3,723)	(2,996)	(2,750)	(3,083)	(2,854)	(2,900)	(3,137)	(3,553)	(4,492)	(35,553)
I otal town purchase transactions (N)	1,799	6,174	6,030	6,054	8,597	9,486	8,773	8,999	9,344	10,022	10,703	10,805	12,880	109,666
Suburban	<b>52 0</b>	<b>F</b> O O	12 0	40.5	20.7	27.5	26.0	24.5	26.4	25.0	22.6	20.0	20.0	25.6
Pick-up <sup>₅</sup>	00.Z	02.Z	43.0 (7 774)	40.0	JZ.7 (0 105)	07.0 (10.204)	(0 906)	04.0 (0 600)	30.4 (10 504)	30.0 (11 705)	JZ.U (11 701)	(10.056)	20.0 (10.015)	(102 207)
	(2,791)	(9,309)	(1,114)	(7,339)	(0,195)	(10,304)	(9,090)	(9,000)	(10,394)	(11,705)	2/ 0	(10,950)	26.6	(123,207)
Direct delivery <sup>c</sup>	(453)	(2 802)	(2 802)	(2 735)	(3 600)	(1 512)	(5.048)	21.3 (6.010)	(6.834)	(7 966)	(0 010)	(9.675)	(11 855)	(73 500)
Commercial delivery (i.e., all Amazon	38.2	31 7	(2,002)	(2,733)	(3,033)	46.0	(0,040)	44 0	40.1	41 2	42 5	42 1	44 6	43.1
transactions)d	(2 007)	(5 694)	(7 497)	(8 060)	(13 158)	(12 631)	(11 907)	(12 352)	(11 681)	(13810)	(15 363)	(14 998)	(19 827)	(148 985)
Total suburban purchase transactions (N)	5.251	17,955	18.073	18,134	25.052	27.447	26.851	28.059	29,109	33,481	36,154	35.629	44.497	345.692
City	0,201	,				,	_0,001	_0,000					,	0.0,001
	47.9	46.5	39.9	37.2	31.3	36.2	34.0	31.2	32.4	31.6	28.0	26.3	24.8	32.1
Ріск-ир	(3,281)	(10,497)	(9,713)	(9,312)	(10,667)	(13,217)	(12,069)	(11,740)	(12,958)	(14,102)	(13,551)	(13,001)	(14,783)	(148,891)
Direct deliver a	11.8	17.9	17.2	18.4	16.5	18.3	20.6	23.7	25.7	26.6	28.4	30.6	29.8	23.9
	(808)	(4,038)	(4,196)	(4,597)	(5,638)	(6,677)	(7,325)	(8,901)	(10,272)	(11,850)	(13,737)	(15,091)	(17,749)	(110,879)
Commercial delivery (i.e., all Amazon	40.4	35.7	42.9	44.4	52.2	45.5	45.4	45.1	42.0	41.9	43.7	43.1	45.4	44.1
transactions) <sup>d</sup>	(2,767)	(8,057)	(10,454)	(11,103)	(17,786)	(16,578)	(16,106)	(16,961)	(16,790)	(18,678)	(21,153)	(21,273)	(27,000)	(204,706)
Total city purchase transactions (N)	6,856	22,592	24,363	25,012	34,091	36,472	35,500	37,602	40,020	44,630	48,441	49,365	59,532	464,476

	March 2020	April 2020	May 2020	June 2020	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	Total March 2020- March 2021
	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)
wissing urbanicity*           63.0         63.7         50.3         54.8         47.1         58.1         56.8         57.1         57.0         50.0         40.6         54.6														
Pick-up <sup>b</sup>	63.0	63.7	59.3	54.8	47.1	58.1	56.8	53.1	57.3	57.1	53.9	50.2	49.6	54.6
	(716)	(2,515)	(2,493)	(2,282)	(2,774)	(3,605)	(3,272)	(3,125)	(3,640)	(4,084)	(4,222)	(3,876)	(4,539)	(41,143)
Direct deliverv <sup>c</sup>	3.7	5.0	6.8	5.7	7.5	7.4	10.2	10.7	10.1	10.8	11.3	13.8	13.4	9.9
	(42)	(197)	(288)	(236)	(441)	(458)	(585)	(631)	(640)	(773)	(886)	(1,065)	(1,228)	(7,470)
Commercial delivery (i.e., all Amazon	33.3	31.3	33.9	39.5	45.4	34.6	33.0	36.2	32.6	32.1	34.8	36.0	37.0	35.5
transactions) <sup>d</sup>	(379)	(1,234)	(1,424)	(1,644)	(2,670)	(2,146)	(1,903)	(2,132)	(2,068)	(2,296)	(2,724)	(2,782)	(3,393)	(26,795)
Total purchase transactions with missing	1,137	3,946	4,205	4,162	5,885	6,209	5,760	5,888	6,348	7,153	7,832	7,723	9,160	75,408
					Doroon	togo ond	numbor o	ftrancas	tiona huu	urbonioitu				
	44.0	40.0	40.4	0.0	Percen	itage and					0.4	0.0	0.4	0.0
Rural	11.9	10.9	10.1	9.8	10.1	10.1	9.5	9.9	9.8	9.7	9.1	9.6	9.4	9.8
	(2,030)	(6,192)	(5,909)	(5,775)	(8,237)	(8,951)	(8,105)	(8,852)	(9,259)	(10,254)	(10,326)	(10,992)	(13,148)	(108,030)
Town	10.5	10.9	10.3	10.2	10.5	10.7	10.3	10.1	9.9	9.5	9.4	9.4	9.3	9.9
	(1,799)	(6,174)	(6,030)	(6,054)	(8,597)	(9,486)	(8,773)	(8,999)	(9,344)	(10,022)	(10,703)	(10,805)	(12,880)	(109,666)
Suburban	30.8	31.6	30.9	30.7	30.6	31.0	31.6	31.4	30.9	31.7	31.9	31.1	32.0	31.3
	(5,251)	(17,955)	(18,073)	(18,134)	(25,052)	(27,447)	(26,851)	(28,059)	(29,109)	(33,481)	(36,154)	(35,629)	(44,497)	(345,692)
City	40.2	39.7	41.6	42.3	41.6	41.2	41.8	42.1	42.5	42.3	42.7	43.1	42.8	42.1
City	(6,856)	(22,592)	(24,363)	(25,012)	(34,091)	(36,472)	(35,500)	(37,602)	(40,020)	(44,630)	(48,441)	(49,365)	(59,532)	(464,476)
	6.7	6.9	7.2	7.0	7.2	7.0	6.8	6.6	6.7	6.8	6.9	6.7	6.6	6.8
	(1,137)	(3,946)	(4,205)	(4,162)	(5,885)	(6,209)	(5,760)	(5,888)	(6,348)	(7,153)	(7,832)	(7,723)	(9,160)	(75,408)
Total purchase transactions (N)	17,073	56,859	58,580	59,137	81,862	88,565	84,989	89,400	94,080	105,540	113,456	114,514	139,217	1,103,272

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

<sup>a</sup> Urbanicity categories are based on households' home addresses and classified according to National Center for Education Statistics' EDGE Locale Boundaries (Geverdt, 2019).

<sup>b</sup> Pick-up is when a customer picks up their order at the retailer.

<sup>c</sup> Direct delivery is when the retailer provides their own delivery.

<sup>d</sup> All commercial delivery transactions in the OPP transaction data were Amazon purchases. All Amazon purchases were reported in the OPP transaction data as a commercial delivery, regardless of whether the order was delivered or picked up. As a result, the study team cannot differentiate Amazon purchases that were picked up from purchases delivered commercially in the data. Both are included in the counts of commercial delivery transactions.

<sup>e</sup> Urbanicity is missing if the household address is missing or could not be geocoded.

# Appendix D. State Maps

This series of maps show the percentage of purchase transactions within each five-digit postal ZIP code for each fulfillment type.

Alabama fulfillment type percentages are presented in Maps D1–D3, Iowa in D4–D6, Nebraska in D7–9, New York in D10–12, and Washington fulfillment type percentages are presented in Maps D13–15.

- Maps D1 (Alabama), D4 (Iowa), D7 (Nebraska), D10 (New York), and D13 (Washington) show the percentage of total purchase transactions with a fulfillment type of commercial delivery (i.e., all Amazon transactions). ZIP codes where fulfillment rates on the maps show as NA (not applicable) are ZIP codes where no households made a SNAP Online purchase.
- Maps D2 (Alabama), D5 (Iowa), D8 (Nebraska), D11 (New York), and D14 (Washington) show the proportion of purchase transactions with a fulfillment type of pick-up. The percentages in the map on the left/top include commercial delivery transactions (i.e., all Amazon transactions) in their denominator. The percentages in the map on the right/bottom exclude commercial delivery transactions (i.e., all Amazon transactions) from the denominator as it was not possible to differentiate Amazon orders that were picked up (e.g., at an Amazon Fresh location or an Amazon Hub Locker) from those that were delivered (i.e., both are included in counts of commercial delivery transactions). ZIP codes where fulfillment rates on the maps show as NA (not applicable) are either ZIP codes where no households made a SNAP Online purchase, or on the maps excluding Amazon, are ZIP codes where only Amazon fulfilled SNAP Online orders.
- Maps D3 (Alabama), D6 (Iowa), D8 (Nebraska), D12 (New York), and D15 (Washington) show the proportion of purchase transactions with a fulfillment type of direct delivery. The percentages in the map on the left/top include commercial delivery transactions (i.e., all Amazon transactions) in their denominator. The percentages in the map on the right/bottom exclude commercial delivery transactions (i.e., all Amazon transactions) from the denominator as it was not possible to differentiate Amazon orders that were picked up (e.g., at an Amazon Fresh location or an Amazon Hub Locker) from those that were delivered (i.e., both are included in counts of commercial delivery transactions). ZIP codes where fulfillment rates on the map show as NA (not applicable) are either ZIP codes where no households made a SNAP Online purchase, or in the map excluding Amazon, are ZIP codes where only Amazon fulfilled SNAP Online orders.



# Map D1 Rate of Online Order Fulfillment Through Commercial Delivery (i.e., Amazon) in Alabama, March 2020–March 2021

**Source:** Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021.

#### Notes:

Commercial delivery (i.e., all Amazon transactions) rates are shown as a percentage of all purchase transactions within a five-digit postal ZIP code.

ZIP codes where fulfillment rates were "NA" (not applicable) are ZIP codes where no households made a SNAP Online purchase.



### Map D2 Rate of Online Order Fulfillment Through Pick-up in Alabama, March 2020–March 2021

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

Pick-up transactions in the map on the left are shown as a percentage of all purchase transactions within a five-digit postal ZIP code. Pick-up transactions in the map on the right are shown as a percentage of purchase transactions excluding those fulfilled by commercial delivery (i.e., all Amazon transactions), within a five-digit postal ZIP code.



### Map D3 Rate of Online Order Fulfillment Through Direct Delivery in Alabama, March 2020–March 2021

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

Direct delivery transactions in the map on the left are shown as a percentage of all purchase transactions, within a five-digit postal ZIP code. Direct delivery transactions in the map on the right are shown as a percentage of purchase transactions excluding those fulfilled by commercial delivery (i.e., all Amazon transactions), within a five-digit postal ZIP code.

# Map D4 Rate of Online Order Fulfillment Through Commercial Delivery (i.e., Amazon) in Iowa, March 2020–March 2021



**Source:** Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021.

#### Notes:

Commercial delivery (i.e., all Amazon transactions) rates are shown as a percentage of all purchase transactions within a five-digit postal ZIP code.

ZIP codes where fulfillment rates were "NA" (not applicable) are ZIP codes where no households made a SNAP Online purchase.



Map D5 Rate of Online Order Fulfillment Through Pick-up in Iowa, March 2020–March 2021

**Source:** Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021.

#### Notes:

Pick-up transactions in the map on the left are shown as a percentage of all purchase transactions within a five-digit postal ZIP code. Pick-up transactions in the map on the right are shown as a percentage of purchase transactions excluding those fulfilled by commercial delivery (i.e., all Amazon transactions), within a five-digit postal ZIP code.



# Map D6 Rate of Online Order Fulfillment Through Direct Delivery in Iowa, March 2020–March 2021

**Source:** Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021.

#### Notes:

Direct delivery transactions in the map on the left are shown as a percentage of all purchase transactions, within a five-digit postal ZIP code. Direct delivery transactions in the map on the right are shown as a percentage of purchase transactions excluding those fulfilled by commercial delivery (i.e., all Amazon transactions), within a five-digit postal ZIP codes.





**Source:** Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021.

Notes:

Commercial delivery (i.e., all Amazon transactions) rates are shown as a percentage of all purchase transactions within a five-digit postal ZIP code.

ZIP codes where fulfillment rates were "NA" (not applicable) are ZIP codes where no households made a SNAP Online purchase.



## Map D8 Rate of Online Order Fulfillment Through Pick-up in Nebraska, March 2020– March 2021

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021.

#### Notes:

Pick-up transactions in the map on the left are shown as a percentage of all purchase transactions within a five-digit postal ZIP code. Pick-up transactions in the map on the right are shown as a percentage of purchase transactions excluding those fulfilled by commercial delivery (i.e., all Amazon transactions), within a five-digit postal ZIP code.



# Map D9 Rate of Online Order Fulfillment Through Direct Delivery in Nebraska, March 2020–March 2021

**Source:** Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021.

#### Notes:

Direct delivery transactions in the map on the left are shown as a percentage of all purchase transactions, within a five-digit postal ZIP code. Direct delivery transactions in the map on the right are shown as a percentage of purchase transactions excluding those fulfilled by commercial delivery (i.e., all Amazon transactions), within a five-digit postal ZIP code.

# Map D10 Rate of Online Order Fulfillment Through Commercial Delivery (i.e., Amazon) in New York, March 2020–March 2021

Map D10 displays a map of New York and the rate of online order fulfillment through commercial delivery (i.e., Amazon) from March 2020 to March 2021. The commercial delivery rate is categorized using seven colors provided in a legend in the upper left: 0% (white), >0%-20% (blue), >20%-40% (green), >40%-60% (purple), >60%-80% (orange), >80% (red), and N/A (gray) for ZIP codes where no households made a SNAP Online purchase. The map is scattered with blue, red, green, orange, white, gray, and purple patches throughout. Cities appear mostly green, except New York City, which is red and orange. The red and orange areas generally are more concentrated to the southern part of the State.



Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021.

#### Notes:

Commercial delivery (i.e., all Amazon transactions) rates are shown as a percentage of all purchase transactions within a five-digit postal ZIP code.

ZIP codes where fulfillment rates were "NA" (not applicable) are ZIP codes where no households made a SNAP Online purchase.



Map D11 Rate of Online Order Fulfillment Through Pick-up in New York, March 2020–March 2021

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

Pick-up transactions in the map on the left are shown as a percentage of all purchase transactions within a five-digit postal ZIP code. Pick-up transactions in the map on the right are shown as a percentage of purchase transactions excluding those fulfilled by commercial delivery (i.e., all Amazon transactions), within a five-digit postal ZIP code.



Map D12 Rate of Online Order Fulfillment Through Direct Delivery in New York, March 2020–March 2021

Source: Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021. Notes:

Direct delivery transactions in the map on the left are shown as a percentage of all purchase transactions, within a five-digit postal ZIP code. Direct delivery transactions in the map on the right are shown as a percentage of purchase transactions excluding those fulfilled by commercial delivery (i.e., all Amazon transactions), within a five-digit postal ZIP code.



# Map D13 Rate of Online Order Fulfillment Through Commercial Delivery (i.e., Amazon) in Washington, March 2020–March 2021

**Source:** Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021.

#### Notes:

Commercial delivery (i.e., all Amazon transactions) rates are shown as a percentage of all purchase transactions within a five-digit postal ZIP code. ZIP codes where fulfillment rates were "NA" (not applicable) are ZIP codes where no households made a SNAP Online purchase.



# Map D14 Rate of Online Order Fulfillment Through Pick-up in Washington, March 2020–March 2021

**Source:** Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021.

#### Notes:

Pick-up transactions in the map on the left are shown as a percentage of all purchase transactions within a five-digit postal ZIP code. Pick-up transactions in the map on the right are shown as a percentage of purchase transactions excluding those fulfilled by commercial delivery (i.e., all Amazon transactions), within a five-digit postal ZIP code.



Map D15 Rate of Online Order Fulfillment Through Direct Delivery in Washington, March 2020–March 2021

**Source:** Evaluation of Technology Modernization for SNAP Benefit Redemption Through Online Transactions; Online Purchasing Pilot (OPP) EBT transaction data, March 2020–March 2021.

#### Notes:

Direct delivery transactions in the map on the left are shown as a percentage of all purchase transactions, within a five-digit postal ZIP code. Direct delivery transactions in the map on the right are shown as a percentage of purchase transactions excluding those fulfilled by commercial delivery (i.e., all Amazon transactions), within a five-digit postal ZIP code.

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