

Evaluation of the Expanded Off-Line EBT System in Ohio

Moving to a Statewide EBT System Using Smart Cards for Food Stamps

FNS 53-3198-4-022

March 1999

Prepared for

Jenny Genser

USDA/FNS/OANE

3101 Park Center Drive

Alexandria, Virginia 22302

Prepared by

Paul Elwood

John Kirlin

Seth Cooper

Sandra Nolden

Christopher Logan, Abt Associates

Eugene Costa

Cheryl Owens, Phoenix Planning &
Evaluation

Internal Review

Project Director

Technical Reviewer

Management Reviewer

Acknowledgments

On behalf of the authors, I would like to thank the many individuals at the Ohio Department of Human Services (ODHS), the EBT vendors, and at FNS who assisted us in the preparation of this report.

Within ODHS, special thanks go to Mr. David Schwartz, the project director for the Direction CardK system. Mr. John Scaggs and Ms. Elinor Kohler of ODHS also assisted with our data collection efforts. We would also like to thank those county staff who provided information on county implementation efforts. There are too many staff to enumerate them all here, but we would especially like to express our gratitude to Janet Converse of the Montgomery County Department of Human Services (CDHS), K'Anna Black of the Miami CDHS, Linda O'Neal of the Clark CDHS, Charlotte Rangi of the Greene CDHS, and David Erbaugh of the Preble CDHS. These EBT coordinators were quite willing and gracious to spend time with us and explain the EBT implementation process during our site visits and follow-up telephone calls.

A team led by Citicorp Services, Inc. (Citibank) is responsible for the design, development, implementation and operation of the Direction CardK system. The Citibank project director is Mr. Marc Abramson, and he is assisted by Ms. Lucy Roberts. Both were quite willing to work with us as we endeavored to learn how the system operates and how it is being implemented. Other members of the Citibank team who have been equally helpful to us are Mr. Charles Feicht and Mr. Joseph McCorkhill of Century Technologies, Inc. (CENTECH), and Mr. John Bianco of Stored Value Systems (SVS).

At FNS, I would like to thank Ms. Joyce Kohler, who is FNS' EBT liaison for the State of Ohio. She helped us considerably in our efforts to understand the relationship between FNS and ODHS as the state embarked on this ambitious project. Most especially, however, I wish to thank Ms. Jenny Genser, who serves as the FNS project officer for the evaluation of the Direction CardK system. Ms. Genser has provided thoughtful guidance and considerable support to this evaluation. I would also like to thank those staff, past and present, within the FNS Office of Analysis and Evaluation who reviewed the draft of this report and provided many useful comments and suggestions. These reviewers include Mr. Steven Carlson, Ms. Julie Kresge, Ms. Margaret Andrews, and Ms. Carol Olander.

Finally, I wish to thank the other members of the evaluation's project team who contributed to this report. The project's technical reviewer is Mr. Chris Hamilton, and Ms. Carissa Climaco provided analytic support. Ms. Susan Byers Paxson produced this report and its graphics. I am also indebted to the support provided by Mr. Eugene Costa and his staff from Phoenix Planning & Evaluation, subcontractor to Abt Associates on this evaluation.

John Kirlin
Project Director

Contents

Executive Summary	1
Chapter 1: Introduction	7
1.1 Evaluation Objectives	7
1.2 On-Line and Off-Line EBT Systems	8
1.3 Previous Off-Line EBT Demonstrations	9
1.4 The Ohio Direction Card K System	10
1.5 Report Organization	11
Chapter 2: System Description and Operation	13
2.1 Introduction	13
2.2 Organizations	13
The Ohio Department of Human Services	13
County Departments of Human Services	13
The Citibank Team	14
The Food and Nutrition Service, USDA	14
2.3 Overview of the Direction Card K System	14
Smart Cards	15
System Processor Host Computer	15
State Recipient Information System	17
Card Management System	17
POS Equipment	17
Telecommunications Facilities	18
2.4 Operations Overview	19
Card Issuance and Training	19
Benefit Issuance and Collection	21
Benefit Redemption	23
Manual Transactions	23
Retailer Settlement	24
2.5 Differences Between the Direction Card K and PayEase Card Systems	25
Equipment	25
Operational Improvements	26
Reporting	27
Security	28
Chapter 3: System Design and Development	31
3.1 Introduction	31
3.2 Contract Procurement	31
3.3 System Design	33
System Design Activities	34
Detailed System Design Document	38
3.4 System Development	40
3.5 System Testing	41

Test Plans	42
Acceptance Test	43
Chapter 4: Design and Development Costs	45
4.1 Introduction	45
4.2 Research Design and Data Sources	45
4.3 Overview of Design and Development Costs	47
4.4 Vendor Design and Development Costs	48
Citibank	49
Century Technologies, Inc.	49
Stored Value Systems	50
4.5 Ohio Department of Human Services Design and Development Costs	50
4.6 County Design and Development Costs	51
4.7 Comparison of Design and Development Costs to the Pilot	52
Chapter 5: System Implementation	55
5.1 Introduction	55
5.2 Sequencing of System Implementation	56
5.3 Implementation Plan	58
5.4 Retailer Conversion Activities	60
5.5 County Conversion Activities	61
5.6 Recipient Conversion Activities	64
5.7 Implementation Problems	67
Software Problems	67
Hardware Problems	68
Chapter 6: Current System Operations	69
6.1 Introduction	69
6.2 Benefit Issuance and Collection Activities	70
6.3 Benefit Use	71
6.4 Settlement	73
6.5 Card Deployment	74
6.6 Customer Service	75
6.7 Conclusion	78
Appendix A: Glossary	79

Executive Summary

To explore the suitability of off-line electronic benefits transfer (EBT) as an alternative to paper issuance and on-line EBT issuance systems, the U.S. Department of Agriculture's Food and Nutrition Service (FNS) has supported the Ohio Department of Human Services (ODHS) in expanding off-line EBT issuance to all Food Stamp Program (FSP) recipients in the state. A pilot project in Dayton, Ohio and a demonstration of a combined WIC-EBT off-line system in Wyoming have clearly established the technical feasibility of off-line EBT for FSP benefit issuance. Both the Ohio and Wyoming pilot projects, however, were small in scale, and both incurred higher administrative costs than the paper coupon issuance systems they replaced.

Now nearing the latter stage of statewide implementation, the Ohio Direction Card[®] system will provide FSP benefits to about 300,000 households in 88 counties when it is fully operational in August 1999. This report describes how the new Direction Card[®] system works; the process undertaken by ODHS and its EBT vendor to design, develop, and test the system; early implementation experiences; and the cost of system design and development. The evaluation's final report will compare the ongoing administrative costs of system operations and system levels of benefit loss and diversion to those of on-line EBT systems and the Dayton pilot, as well as provide an estimate of system implementation costs.

Off-line Versus On-line EBT Systems

The most distinguishing feature of the Direction Card[®] system is that it is an off-line EBT system. Nearly all EBT systems operating in the country today are on-line systems that work very much like bank debit card systems. That is, recipients are issued magnetic stripe EBT cards that are used at food store point-of-sale (POS) terminals to access their FSP benefits. At the checkout counter, the recipient enters his or her personal identification number (PIN) in the terminal to authorize EBT payment of the food stamp purchase. The terminal immediately uses a telecommunications network to connect to the EBT system's host computer, which maintains a special EBT account for the recipient. If the PIN is verified and benefits remaining in the account are sufficient to cover the requested purchase, the transaction is authorized and the recipient's remaining balance is reduced by the amount of the sale. The retailer is reimbursed at the end of the day during system "settlement," which leads to an electronic transfer of funds from an EBT account maintained at the U.S. Treasury to the retailer's depository institution.

In contrast, an off-line EBT system maintains current information about a recipient's remaining balance within the card itself. Both Ohio and Wyoming use "smart cards," plastic cards the size of a credit or debit card, but which have a microprocessor and memory chip embedded within the card. These elements allow the card to store information and to perform a range of mathematical calculations and logic checks. This functionality allows all EBT transaction processing to be conducted within and between the POS terminal and EBT card; there is no need to immediately contact the system's host computer for PIN verification or remaining balance information, thereby speeding up the checkout process and eliminating system downtime due to telecommunications problems. During system settlement, information about the day's EBT purchases is transmitted over a telecommunications network to the host computer, which then initiates reimbursement to the retailer as in an on-line system.

Another important distinction between on-line and off-line EBT systems is that, because off-line systems use cards with greater data storage capacity than magnetic stripe cards, the potential exists to expand off-line systems to include a wider range of applications than on-line systems. The Wyoming off-line EBT system serves the Special Supplemental Food Program for Women, Infants, and Children (WIC) as well as the FSP, and some states are proposing to use smart cards to carry health data. The Ohio Department of Health and FNS currently are considering whether to add WIC to the Direction CardK system.

Selection of EBT Vendor

In February 1994, the ODHS issued a Request for Proposals (RFP) for the development, implementation, and operation of a statewide off-line EBT system. Responses to the RFP were received in July 1994, and Ohio awarded a contract to Citicorp Services, Inc. (Citibank) in September 1994. Work on system design and development was delayed, however, by a legal conflict that arose after another bidder, National City Processing Company (NPC), contended in court that the contract award process had been flawed. The procurement problems were resolved in April 1996 when Citibank added Stored Value Systems (SVS), a subsidiary of NPC, as one of its subcontractors for the EBT project. SVS is responsible for the design and development of the Direction CardK system, transaction processing at the system's host computer, retailer settlement, and operation of the EBT Customer Service Center. Citibank's other major subcontractor, Century Technologies, Inc. (CENTECH), is responsible for installing EBT equipment at retail and county office locations and training retailer and county staff in how to use the system.

The problems with the procurement process delayed the start of the design and development phase, but the resolution vastly simplified the design and development process by allowing Citibank to build its EBT system directly on the existing PayEase EBT system that NPC had developed for the Dayton pilot. As a result, the vendors were able to proceed with system development activities concurrently with the system design effort.

System Design

Although its basic design is quite similar to the predecessor PayEase EBT system, the Direction CardK system does contain a number of enhancements. The most significant is that the system takes advantage of a new generation of smart cards and POS terminals to improve system security. Using a smart card with more processing capacity than the one used in the PayEase system, the system's designers have moved critical security operations from the POS terminal to the smart card itself. This change was needed because ODHS required that retailers in the Direction CardK system be allowed to integrate EBT processing into their existing POS systems, if desired. (To date, however, none have done so because of the expense involved.) The Direction CardK terminals also can accept new software downloads via the telecommunications network from the system's host computer. This greatly facilitates the introduction of system upgrades.

In the PayEase system, retailers received a "negative file" during daily settlement. The file contained records of all EBT cards reported as lost, stolen or damaged and prevented these cards from being accepted at the POS terminal. Due to the larger size of the statewide Direction CardK system, smaller stores (i.e., those with only one POS terminal) now receive a regional negative file. (Multi-lane stores are

equipped with a personal computer with memory and processing capacity capable of handling a large, statewide negative file.) With regionalization, the negative file sent to a particular single-lane store includes only those cards reported as lost, stolen or damaged by recipients in the same or nearby counties. If recipients from outside the retailer's region attempt to use their EBT card at the store, the transaction must be authorized by a phone call to EBT Customer Service.

Another added feature of the Direction Card**K** system is that, in those counties serving at least 10,000 FSP recipients, county workers can use a special administrative terminal to access the EBT host directly to perform certain EBT functions (e.g., review transaction history for a recipient; obtain authorization to replace a lost, stolen or damaged card). In the PayEase system, county staff had to call Customer Service to perform these functions.

System Development and Testing

Even though much of the software required for the Direction Card**K** system had already been developed for the PayEase system, the changes in system design and equipment noted above required additional development effort. With a new smart card with increased functionality, the card's internal operations had to be programmed. Similarly, software programs had to be developed for the system's new POS terminals.

The host computer's software had to be changed to accommodate some of the new security features of the Direction Card**K** system. One major change was that store refunds and other "value-adding" transactions could no longer be written directly to the card. Instead, in order to protect the system from potential fraud and error, all value-adding transactions are sent to the host computer for verification and later downloading to the recipient's card. Other security-related changes include adding sequential host reference counters (HRCs) to all value-adding transactions and adding an industry-standard message authentication code (MAC) to all POS transactions.

Other system development activities included: preparation of training materials and procedures for county staff, retailers, and recipients; preparation of user manuals for county staff and retailers; development of standard retailer EBT participation agreements; and development of procedures for installing EBT equipment at retail and county office locations.

System development efforts took place in the summer and fall of 1996. FNS, the system vendor, and ODHS then prepared for a three-day test of the system in December. Due to the extensive testing and operational experience with the predecessor PayEase system, the test of the Direction Card**K** system focused on those aspects of the system which had been changed. Only minor problems were noted during the test, and FNS formally approved the system on December 17, 1996.

The cost to design, develop and test the Direction Card**K** system is estimated at \$2.4 million. This figure represents the incremental costs of designing and developing the statewide system and does not include the system design and development costs of the pilot system (which were of approximately the same magnitude.) The sheer size of the Ohio caseload, and the administrative fragmentation that accompanies a county-administered FSP, has required the development of complex logistical systems to support system rollout. As a result, about 60 percent of the \$2.4 million in development costs was incurred by CENTECH.

System Implementation

The overall success of the design and development effort was evident in the smooth transition to the new system in January 1997. Households and retailers that had participated in the pilot PayEase system in Montgomery County were the first to convert to the Direction CardK system. Then, in August 1997, Montgomery County staff began to convert remaining food stamp recipients from outside the pilot area to EBT. The county's entire FSP caseload was converted to EBT by January 1998.

Beginning in the summer of 1997, Citibank and its subcontractors began to convert other counties in the southwestern portion of Ohio. The first step was typically an EBT information meeting for county retailers, during which time CENTECH representatives and ODHS staff explained the new system and addressed technical and programmatic questions. CENTECH then mailed information packages to all FSP-authorized retailers in a county, together with retailer POS agreements. Once a retailer returned a signed agreement, SVS established an EBT account on the host system for the retailer, and CENTECH shipped EBT equipment to the store. A CENTECH crew then installed the equipment. Finally, CENTECH staff visited the store (or its regional or corporate office) to train its employees on how to use the new system.

At approximately the same time within each county, CENTECH staff contacted the county DHS office and scheduled a date for a site visit. The site visit included a one-hour presentation, a video describing the Direction CardK system, and a demonstration of the off-line EBT equipment. CENTECH staff also determined the office's wiring and equipment needs during the site visit. Thereafter, CENTECH ordered and installed the EBT equipment and trained county staff in all EBT functions for which they were responsible, including card issuance and recipient training.

By June 1998, conversion was complete or underway in 19 counties, including Hamilton County in which Cincinnati is located. In the period between January 1997 and June 1998, the system issued approximately \$76.0 million of food stamp benefits in nearly 537,000 transactions. There were approximately 48,000 food stamp cases on the system in June, representing about 15 percent of the statewide caseload.

System Operations

The first 18 months of system operations have been relatively free of problems. Some county staff have had difficulty with their EBT equipment, however, and a pervasive problem during recipient training has been absenteeism, with many counties reporting that only one-quarter to one-half of their FSP recipients show up for their initial appointments to receive training and their Direction CardsK. County staff and system operators also identified a significant problem with the HRC sequencing of value-adding transactions. In certain situations, problems with the assignment of the counter prevented clients from accessing an end-of-month supplemental benefit until the next month's regular benefit had been accessed. This problem, which was serious but affected a limited number of recipients, was corrected in September 1998.

Next Steps

Since information about implementation experiences was collected for this report, conversion activities have continued in Ohio. In July 1998, county staff in Franklin County (Columbus) and Cuyahoga County (Cleveland) began converting recipients to EBT. Together with Montgomery County, three of the state's largest metropolitan areas are now fully converted or well on their way toward EBT conversion. Retailer and county conversion activities are expected to be completed throughout the state by August 1999, with recipient conversion continuing into early 2000.

As noted earlier, the state and FNS are considering whether to add a WIC demonstration to the Direction Card[®] system. The state also plans to pilot test the addition of its Temporary Assistance for Needy Families (TANF) program to EBT in 1999. Either of these additions would represent a significant change for the system. Adding TANF would make the Direction Card[®] system more similar to multi-program EBT systems implemented in other states with on-line systems. If WIC is added, the state will be taking advantage of the increased multi-program functionality offered by a smart-card based, off-line EBT system.

One of the primary goals of the evaluation is to determine the FSP costs of operating a statewide, off-line EBT system and to compare these costs to statewide on-line EBT systems. Another goal is to document the process of system implementation and system operations, and problems encountered, so that FNS and other states will have more information upon which to base future decisions about EBT system choice. Thus, the next two years will be important for the Direction Card[®] system as the evaluation monitors system implementation, system operations, administrative costs, and the impact of possible changes in programs served on operations and cost. The evaluation's final report, scheduled for release in mid-2001, will address these significant issues.

Chapter 1

Introduction

In 1994, the Food and Nutrition Service (FNS) of the U.S. Department of Agriculture authorized expansion of a pilot electronic benefits transfer (EBT) system operating in Dayton, Ohio. The pilot system was the first EBT system to employ off-line technology to deliver program benefits in the Food Stamp Program (FSP). As described later in this chapter, “off-line” EBT systems differ from “on-line” systems in several important ways. FNS authorized the expansion so that the technical and cost feasibility of a large-scale, off-line EBT system could be tested.

1.1 Evaluation Objectives

FNS awarded a contract to Abt Associates Inc. in September 1994 to evaluate the expanded EBT system.¹ The evaluation has the following four objectives:

- 1) Describe any additional development, the implementation, and operation of the off-line EBT system as it expands beyond the pilot site.
- 2) Quantify and compare the administrative costs of the expanded off-line EBT system with those of the pilot EBT demonstration in Ohio, with an off-line EBT demonstration in Wyoming, and with other on-line EBT systems.
- 3) Quantify and compare losses and diversions of the expanded off-line EBT system with those of the pilot demonstration and with other on-line EBT systems.
- 4) Assess the conditions under which a statewide, off-line EBT system is most likely to achieve cost-neutrality and cost effectiveness.

The Ohio Department of Human Services (ODHS) is currently in the last year of a three-year rollout of the expanded EBT system, which it calls the Direction Card**K** system. This report addresses the first objective above by describing the new system and the process that ODHS and its EBT vendors followed to develop and implement the Direction Card**K** system. The report also presents estimates of the costs incurred to design and develop the new system. The evaluation’s remaining objectives will be addressed in its final report, which will be prepared after the system is rolled out and operating throughout the state.²

1 Contract #53-3198-4-022, Evaluation of Expanded Off-Line EBT (Ohio).

2 The scheduled release date for the evaluation’s final report is the summer of 2001.

1.2 On-Line and Off-Line EBT Systems

FNS has been fostering the development and use of on-line EBT systems since the early 1980s. An on-line EBT system works very much like debit card (also called bank card or ATM card) systems offered by financial institutions. The food stamp recipient is issued a plastic card that has a magnetic stripe affixed to the back of the card. A limited amount of information about the recipient and the card is encoded on the stripe; typically this information includes the recipient's name, a unique card number, a unique EBT account number related to the card (which is known as the primary account number, or PAN), and the recipient's personal identification number (PIN), which is encrypted for security purposes. The EBT account linked to the card and recipient is established by the EBT system processor. All FSP issuance amounts are posted to this electronic account.

When the recipient uses the EBT card to buy food at a program-authorized retailer, the PIN must be entered into a special EBT terminal at the point of sale (POS) to verify the recipient's identity. The requested food stamp purchase amount is then key entered into the EBT terminal, and a message is sent immediately to the EBT system's host computer over a regular or dedicated telephone line. The host computer verifies that the correct PIN has been entered and checks to see if the recipient's EBT account has enough funds to cover the requested purchase amount. If it does, then the purchase transaction is authorized and the amount is debited from the recipient's account balance. Later in the day, the retailer is reimbursed for all EBT transactions during system "settlement," when an electronic funds transfer is used to move funds from the EBT vendor's account at a financial institution to the retailer's financial institution. The retailer's financial institution then credits the retailer's account for the prior day's transactions.

An off-line EBT system differs from an on-line system in several ways. First, current information about the recipient's balance of food stamp benefits is maintained in the EBT card itself rather than at the system's host computer. Because the card's data storage requirements in an off-line system are greater than can be provided with a magnetic stripe card, a different card technology is needed. The most commonly used technology is the "smart card," which has a microprocessor and memory chip embedded in the plastic. When the recipient uses the smart card to buy groceries, the EBT card is inserted into the EBT terminal and the PIN is entered. Software within the terminal and card perform a PIN verification. Once the PIN is verified, the store clerk enters the requested food stamp purchase amount into the EBT terminal. This information is passed to the smart card, which compares the requested purchase amount to the balance information stored in the card. If the remaining balance is sufficient to cover the planned purchase, the transaction is authorized and the remaining balance is reduced by the amount of the purchase. No phone call to the host computer is needed to authorize the purchase transaction. Instead, the EBT terminal (or a small computer linked to all the EBT terminals in a store) dials into the system host computer once a day to transmit information about the day's EBT transactions. The host computer uses this information to initiate system settlement so the retailer can be reimbursed for the day's transactions. The information also is used to maintain a "shadow" EBT balance for each recipient. This shadow balance, which does not reflect purchases made during the day until retailers upload their daily files to the host computer, is used to restore benefits to a recipient if his or her EBT card becomes lost, stolen or damaged.

1.3 Previous Off-Line EBT Demonstrations

The expansion of the off-line EBT system in Ohio is taking place in the context of two prior off-line EBT demonstrations for FNS. The first is the EBT pilot demonstration in Dayton, Ohio. In 1990, FNS awarded a contract to National City Processing Company (NPC) to design, develop, implement, and operate a demonstration off-line EBT system in Dayton. The purpose of the demonstration was to test the technical and financial feasibility of using off-line EBT technology for delivering food stamp benefits. Seventeen months later, in February 1992, food stamp recipients began using the system. By June 1992, the off-line EBT system, called “PayEase,” was fully operational and delivering food stamp benefits to over 10,000 recipient households.

An evaluation of the Dayton EBT pilot concluded that the PayEase system was technically viable and that, compared to paper benefit issuance, it reduced recipient, food retailer, and financial institution costs to participate in the FSP. The PayEase system also reduced levels of benefit loss and diversion, again compared to the paper issuance system. The administrative cost of the PayEase system, however, was nearly triple the cost of the paper issuance system it replaced. Nevertheless, the evaluation concluded that a potential for significant cost reductions existed, especially in a statewide system where economies of scale could be realized.³

In 1991, the State of Wyoming conducted a small pilot test of a smart card-based, off-line EBT system delivering benefits for the Special Supplemental Food Program for Women, Infants and Children (WIC). In 1993, with support and funding from FNS, Wyoming initiated a larger EBT demonstration involving both the WIC and FSP programs. Wyoming selected NPC to design and develop the “PayWest” system. The system, which was implemented in the spring of 1995, serves all WIC and FSP clients in Natrona County (Casper), and also serves all WIC clients in six other Wyoming counties. The fundamental difference between the PayWest system in Wyoming and the PayEase system in Ohio arises from differences between the WIC and FSP programs. Although FSP benefits are dollar denominated and can be spent on any food stamp-eligible food items in program-authorized stores, WIC benefits are a prescription for a specific list and quantity of food items. Thus, unlike the food stamp PayEase system in Ohio, the PayWest system has to compare the specific items being purchased against the WIC participant’s food prescription. Information about the food prescription is loaded and stored on the PayWest smart card.

The evaluation of the Wyoming EBT demonstration concluded that the PayWest system was technically feasible and that its reliability matched that of early EBT demonstrations of on-line systems. It offered more customer services than the paper system it replaced, especially for WIC clients, and program participants almost universally viewed the EBT system as a more convenient, secure, and dignified way to deliver benefits than either WIC checks or food stamp coupons. It was, however, considerably more expensive to operate than the paper delivery systems it replaced. The evaluation concluded that several

3 Gary L. Glickman *et al.*, *Evaluation of the Off-Line Electronic Benefits Transfer Demonstration: Summary of Findings*, Rockville, MD: Phoenix Planning & Evaluation, Ltd., May 1994.

factors, including operating the system on a larger scale, could dramatically reduce system operating costs.⁴

1.4 The Ohio Direction CardK System

Based on its experience with the PayEase system in Dayton, the Ohio Department of Human Services (ODHS) became “convinced of the efficiency and cost effectiveness of off-line technology, as well as its acceptability to recipients, retailers, and financial institutions.”⁵ ODHS therefore decided that it wanted to implement a statewide EBT system using off-line technology. The expanded system initially would issue food stamp benefits, although there was also interest in adding other programs to the system, including WIC and cash benefit programs.

In February 1994, ODHS issued a Request for Proposals (RFP) for the development, implementation and operation of a statewide, off-line EBT system. ODHS awarded the EBT contract to Citicorp Services, Inc. (Citibank) on September 20, 1995, and contract work began October 30. A suit seeking an injunction against the award was filed soon thereafter, however, and a lengthy period of legal activities and negotiations ensued. Citibank ultimately submitted a revised proposal with a new set of subcontractors, which was acceptable to all parties, and contract work resumed in July 1996. Seven months later, on January 1, 1997, recipients in Dayton converted to the new Direction CardK system. Since that time, the new system has been rolled out throughout the rest of Montgomery County and in a number of other Ohio counties. Exhibit 1-1 presents key dates for the process of designing, developing, and implementing the statewide EBT system in Ohio.

1.5 Report Organization

This report has several objectives. The first is to describe how the new Direction CardK system works. To this end, Chapter Two describes the Direction CardK system and identifies those areas in which the new system differs in design and operation from the pilot PayEase system. The report also documents the process by which the Direction CardK system was designed and developed, which is the subject of Chapter Three. Chapter Four presents the results of an analysis of the costs of designing and developing the Direction CardK system. Chapter Five documents the process of implementing the system, both in Montgomery County where the pilot system operated, and in other counties where EBT is a totally new method for delivering FSP benefits. (No information on implementation costs is presented herein because implementation efforts will not be completed until late 1999.)⁶ Finally, Chapter Six describes system operations in June 1998, providing a “snapshot” of system characteristics in the second year of the three-year process of statewide implementation. A glossary of acronyms and technical terms is included as an appendix.

4 William Hamilton *et al.*, *Costs and Impacts of the Wyoming Smartcard EBT System*, Cambridge, MA: Abt Associates Inc., May 1997.

5 Ohio Department of Human Services, Food Stamp Electronic Benefits Transfer System RFP, February 28, 1994, p. 3.

6 The evaluation’s final report will provide estimates of implementation costs, as well as ongoing operating costs and levels of benefit loss and diversion within the Direction CardK system. These estimates will be compared to those for the pilot PayEase system and for on-line EBT systems.

Exhibit 1-1**Key Events in Design, Development, and Implementation of the Direction CardK System**

September 1990	FNS awards NPC a contract to design, develop, implement, and operate a demonstration off-line EBT system in Dayton, Ohio.
February 1992	First recipients converted to pilot PayEase EBT system.
July 1993	ODHS submits to FNS a Planning Advanced Planning Document (PAPD) for statewide rollout of off-line EBT.
February 1994	ODHS issues RFP for the development, implementation and operation of the Ohio Electronic Benefit Transfer Food Stamp benefits distribution system.
July 1994	Citibank submits its proposal to the RFP.
September 1995	ODHS signs EBT contract with Citibank.
October 1995	NPC files suit against ODHS and Citibank. Initial kick-off meeting for the Ohio EBT project.
January 1996	Judge rules in favor of NPC, directs Ohio to re-solicit cost proposals from Citibank and NPC.
April 1996	Citibank submits revised Final Proposal with NPC as a subcontractor.
June 1996	Ohio approves revised proposal.
July 1996	Second kick-off meeting for the Ohio EBT project.
October 1996	Citibank submits final version of Detailed System Design Document.
December 1996	Citibank team begins three-day acceptance test of EBT system. FNS approves Direction CardK system.
January 1997	Direction CardK system begins operations.
September 1997	Expansion begins in Montgomery County

Chapter 2

System Description and Operation

2.1 Introduction

The Direction CardK program represents the first statewide initiative to use smart cards for off-line EBT applications. This program builds on the state's EBT pilot project, known as the PayEase system, that was used to deliver FSP benefits to a segment of the food stamp population in Montgomery County.¹ Once completed, the Direction CardK system will provide access to food stamp benefits for over 300,000 households across all 88 counties in Ohio.

2.2 Organizations

The design, development, implementation, and operation of the Direction CardK system for the delivery of food stamp benefits involved the coordination of several public and private organizations. Their principal roles and responsibilities are outlined below.

The Ohio Department of Human Services

The ODHS administers the federally-funded FSP, serving all households who meet the eligibility criteria based on income and household size. The ODHS administers the contract with the EBT service provider—Citicorp Services, Inc. (Citibank)—and assumes all contract management functions. In this capacity it serves to assure that the system being developed satisfies the requirements outlined in its RFP and contract. Its data center operates and maintains the state's integrated public assistance system (known as the Client Registry Information System – Enhanced, or CRIS-E) that interfaces with the EBT service provider's computer system on a daily and monthly basis to effect the transfer of issuance data and other information necessary to operate the EBT system.

County Departments of Human Services

In Ohio, the 88 County Departments of Human Services (CDHS) assume direct responsibility for FSP administration. Five different operational areas within each CDHS are affected by EBT. The five areas are:

- Caseworkers, who determine recipient eligibility during certifications and recertifications. Caseworkers gather data from recipients during the eligibility process to help establish a record on the EBT system and to authorize issuance of an initial Direction CardK.

¹ The PayEase EBT system became operational in March 1992 and delivered food stamp benefits to a segment of the food stamp population in Montgomery County. The demonstration was split into five distinct phases, lasting over 30 months. Design of the system began in September 1990, and development was complete by December 1991. The system began operations in March 1992, with all recipients in the demonstration area converted by June 1992. This project ran through December 31, 1996 before converting to the Direction CardK system.

- The Fiscal Control Office, or FCO, which performs all terminal-based transactions that update the Direction CardK or the EBT host computer, including card issuance and card replacement.
- The Assistance Control Office, or ACO, which provides EBT training to recipients and assists them with account balance problems. The ACO also provides authorization to the FCO to replace cards and performs administrative actions that would change a balance on a recipient's card.
- The Cashier Office, which handles the process of converting EBT balances to food stamp coupons when recipients move to an area not served by the Direction CardK system.
- The Accounting Office, which is responsible for the security and accountability of the inventory of smart cards maintained in the office. In some counties this may be handled by the FCO supervisor.

The Citibank Team

The Citibank team consists of Citibank and its subcontractors, Stored Value Systems, Inc. (SVS) and Century Technologies, Inc. (CENTECH).² Citibank, as the prime contractor, serves as the project manager and is responsible for providing the state with EBT services in accordance with its contract. SVS is primarily responsible for the design, development and integration of all software and hardware for system operations, including the EBT host system, retailer POS terminals, and the card management system (CMS) in each CDHS office. SVS is also responsible for the actual operation of the EBT host system, customer service for both retailers and recipients, retailer settlement services, all communications facilities, and the generation of all fiscal and management reports. CENTECH is primarily responsible for all contacts with retailers, including initial visits, sign-up, equipment installation and servicing, and training; and contact with each CDHS office, including installation and servicing of CMS and POS equipment, training of workers in each operational area, and supplying card inventory.

The Food and Nutrition Service, USDA

FNS is the federal agency charged with the administration of the FSP nationally. Through its local field offices, FNS authorizes retailers to participate in the FSP and, when necessary, withdraws such authorization. FNS provides store authorization numbers and other retailer information to the Citibank team for entry into the EBT system.

2.3 Overview of the Direction CardK System

The Direction CardK system comprises six main components that interact to provide recipients with their food stamp benefits, including the provision of the monthly FSP allotment, the capture and

² SVS, a wholly-owned subsidiary of NPC, was created at about the same time that Citibank added NPC to its EBT project team.

processing of EBT transactions, and the reimbursement of participating retailers. These six components are:

- recipients' smart cards
- the system processor's host computer
- the state's recipient information system (CRIS-E)
- the card management system (CMS) at county offices
- retailer point-of-sale (POS) equipment; and
- telecommunications facilities.

Together, these six components support a number of different types of EBT transactions. Some of these transactions involve credits or debits to retailer and recipient accounts, whereas others provide information without any change in value to retailer or recipient accounts. To facilitate later discussion of system design and operations, these transaction types are defined in Exhibit 2-1.³ In the discussion that follows, "staged" transactions are those that either provide a credit to the recipient's Direction CardK or cannot be completed immediately because the EBT terminal is not working (or both). When a staged transaction is initiated at a retailer's location, the credit is not applied immediately to the card. Instead, information is passed to the host computer, which then downloads the credit to selected retail locations and the recipient's CDHS for subsequent collection by the recipient.

The six main components of the Direction CardK are described below.

Smart Cards

Each FSP recipient in the state will be provided with a smart card that is used to access their benefits at authorized retailers.⁴ This card, named the Direction CardK, contains an embedded microprocessor chip that interacts with retailer POS systems when recipients shop. The card maintains the recipient's current benefit balance and information on the ten most recent transactions in which the card was used (e.g., purchase, balance inquiry, refund). In addition to the embedded chip, the blue and white Direction CardK contains the state-approved logo and design graphics, the required regulatory disclosure statements on the back of the card, and a laser-engraved personal account number (PAN).

System Processor Host Computer

The EBT host computer is located at the SVS facility in Louisville, Kentucky. It consists of four "fault-tolerant" processors; such processors include internal back-up of all critical components to ensure continuous processing capability. Additional processors will be added, as necessary, during the statewide rollout to satisfy performance standards for central file processing. (This system also supports the Wyoming EBT system.) There is also a two-processor backup system located at SVS' customer service center facility in El Paso, Texas. The EBT host system is dedicated to EBT functionality, including

3 The descriptions for these transactions are adopted from the Direction CardK reference manual supplied by Citibank to retailers participating in the system.

4 The card being used for the statewide rollout of EBT is the PayFlex purse card manufactured by Schlumberger, Inc. The PayFlex card has 1 kilobyte of data storage that can have multiple purses and allows for enhanced security functionality.

Exhibit 2-1

Direction CardK Transaction Types

Terminal sign-on and sign-off, which allow cashiers to log on and log off the EBT terminal in their checkout lane.

Food stamp purchase, which is used when a food stamp client wants to use his or her food stamp EBT benefits to pay for program-eligible food items.

Food stamp purchase reversal, which gives the cashier the ability to negate, with the client present, an incorrect amount on a just-completed purchase transaction.

Food stamp refund, which is a staged transaction to be used when a food stamp client returns items originally purchased with food stamps. It requires a manager password.

Food stamp refund reversal, which is used to negate a just-completed food stamp refund transaction. It is used when the value of the refund transaction was incorrect.

Balance inquiry, which allows recipients to determine the amount of food stamp benefits remaining on the card.

Food stamp manual purchase, which stages a debit for the purchase amount to be subtracted from the recipient's EBT card at a later date. It is to be used only when the EBT terminal is not working. Recipients are limited to one manual purchase transaction not to exceed \$50 outstanding at any given time.

Food stamp manual refund, which stages a credit for the amount of the refund to be added to the recipient's card. It is to be used only when the EBT terminal is not working.

Forced credit, which stages a credit to the recipient's card if the recipient is accidentally overcharged.

Delivery debit, which debits the recipient's Direction CardK for the amount of the sale. It is used by retailers who do not have EBT terminals (e.g., route vendors who deliver milk or produce directly to a recipient's home).

The descriptions for these transactions are adopted from the Direction CardK reference manual supplied by Citibank to retailers participating in the system.

For security purposes, some transactions (e.g., refunds and all manual transactions) require the intervention of the manager through entry of a manager's password. Purchase and refund reversals require that the transaction being reversed be the last transaction posted to the card, the last transaction performed at the POS terminal, and that the retailer has not yet settled for the day.

initial account setup of recipient information from CRIS-E and the CMS, receipt of issuance-related data from CRIS-E and its delivery to recipient-selected issuance collection locations, Direction CardK updating, retailer settlement, downloading of data to retailer systems and the CMS, customer service, and reporting.

State Recipient Information System

CRIS-E is the state's integrated public assistance system. It determines eligibility and then calculates benefits for all state and federal public assistance programs for which a recipient is eligible, based on the information entered by caseworkers in each CDHS office. On a daily and monthly basis, CRIS-E provides the necessary data to the CMS and the EBT host system to support card issuance and to provide recipients with their benefit allotments.

Card Management System

The CMS consists of one personal computer (PC) and one DataCard POS terminal. The system resides in the FCO in each CDHS office and is primarily used to issue Direction Cards^K to recipients. Clerk-level activities using the CMS include card issuance and replacement, card unlock, changing a recipient's personal identification number (PIN), converting card balances to coupons (when the recipient is present), re-presentation debits, and delivery debits.⁵ CMS functions requiring greater security and supervisory action include dealing with forgotten PINs, converting card balances to coupons (when the recipient is not present), return of benefits, daily settlement, changing a recipient's number, reviewing manual debits, card recycling, disposition of returned or damaged cards, and card inventory and control.

The CMS provides on-line access to necessary information in CRIS-E and has dial-up access to the EBT host. At the end of each day, all information entered into the CMS is uploaded to the EBT host.

POS Equipment

Retailers participating in the Ohio EBT system are provided with DataCard POS equipment capable of accepting the Direction Card^K. The POS terminal equipment configuration deployed at retailer sites is different for each of three types of retailers: single-lane stores, multi-lane stores, and route vendors.⁶

Single-lane retailers receive one DataCard 680 terminal, a VeriFone P250 printer, and a pedestal mount to hold the terminal. The DataCard 680 is a "stand-alone" terminal consisting of a built-in modem for communication to the EBT host during daily settlement, 2 megabytes of memory for database and transaction file storage, a display, a magnetic stripe and smart card reader, and a keyboard.

Multi-lane retailers are provided with a local area network-based POS configuration. The in-lane configuration consists of a DataCard 485 POS terminal, a VeriFone P250 printer, and a pedestal mount. Multi-lane retailers also receive one terminal controller (a personal computer) and one network interface

5 If a retailer processes a manual purchase transaction for an amount that is subsequently discovered to be greater than the recipient's remaining balance, then the retailer is liable for the excess amount. The retailer, however, can "re-present" the transaction in following months after additional benefits have been added to the recipient's card. This is done by mailing a re-presentation form to EBT Customer Service, which forwards the form to the appropriate CDHS office for evaluation. If approved, the CDHS office processes a re-presentation transaction, which leads to a retailer credit and a staged debit to the recipient's card. Program rules state that up to \$50 may be deducted from the recipient's EBT account in the first month (\$10 if the recipient receives less than \$50 per month). Thereafter, the maximum deduction is \$10 or 10 percent of the regular recurring allotment, whichever is greater.

6 See FNS regulations at 7 CFR 274.12(g)(4)(ii) for the regulatory requirements related to EBT POS terminal equipment.

controller for each 30 lanes of installed POS equipment. Like the DataCard 680, the DataCard 485 contains a display, a magnetic stripe and smart card reader, and a keyboard. All databases, transaction files, and the modem for communicating with the EBT host reside in the PC. In addition, a balance inquiry device is provided to all multi-lane retailers redeeming over \$30,000 a month in food stamp benefits to allow recipients to verify the food stamp balance on their Direction CardK prior to shopping.

Route vendors deliver milk, produce, or other food items directly to customers' homes, and hence cannot use a regular POS terminal. They therefore receive one DataCard 680 POS terminal, along with two battery packs to power the terminal. The terminal is programmed to provide the same functionality as is present in a single-lane retailer site, except for receipt printing capability. In lieu of a printed receipt, the terminal displays the necessary information for preparation of a manual receipt.

In August 1998, the Citibank Team began to deploy DataCard "Jigsaw" terminals instead of the DataCard terminals described above. The Jigsaw terminal provides the same functionality as the older models, but is smaller and sturdier.

Because of retailers' concerns regarding scarce counter space in the checkout lanes, and to facilitate a more efficient checkout process, an "integrated" solution is also available to retailers in lieu of the Ohio EBT system's "stand-beside" POS configurations (DataCard 680 or 485). The integrated solution allows retailers to modify their existing POS systems, which can accept credit cards and debit bank cards, to accept the off-line Direction CardK. This approach requires retailers to attach a PIN-pad and a smart card reader to either their in-lane debit/credit terminals or their electronic cash registers (ECRs). The integrated solution also requires each retailer to decide whether to eliminate or keep the EBT store controller personal computer. If this is eliminated, the retailer is responsible for maintaining the programs and files that currently reside on the EBT store controller and establishing the data transfers between the controller and the PIN-pad and smart card reader. If the EBT store controller is maintained, the retailer is only responsible for routing the messages from the PIN-pad and smart card reader to the EBT store controller.

Regardless of the approach they take, retailers that choose an integrated solution need to modify their existing systems' software. A detailed specification is available to retailers to assist them in identifying the necessary modifications. To date, no retailers have selected the integrated solution approach.

Telecommunications Facilities

The EBT system's host computer exchanges data via telecommunications facilities with several organizations: ODHS' CRIS-E system, the card management system at each CDHS office, FNS, the system's concentrator bank (to support automated clearinghouse settlement), and participating retailers. SVS uses a shared CompuServe network to support the required communications with these organizations. The EBT host computer accesses this network through four dedicated communications lines to CompuServe; each line can handle up to 56 kilobytes of data per second (kbps).

A dedicated 56 kbps line is used to support the large batch data transfers between the EBT host and the CRIS-E system. Each day, the EBT system transmits transaction data to CRIS-E and receives issuance information for recipients.

At least once a day, the host computer establishes a direct connection to each participating retailer and CDHS office. In single-lane retailer stores, where data transfer requirements are much smaller, the modems built into the DataCard terminals handle up to 2400 bytes of data per second. The back-room PCS provided to multi-lane retailers use a 14.4 kbps modem. For both single-lane and multi-lane retailers, regular telephone lines are used to transfer data back and forth to the host during daily settlement.

The PC-based CMS in each CDHS office uses a 14.4 kbps modem to transfer information to the EBT host over the CompuServe network. Additionally, in the larger CDHS offices, terminals in the ACO are equipped to access the EBT host system on-line via CompuServe private dial.

In order to obtain up-to-date information on the authorization status of FSP retailers, SVS and CENTECH use a dial-up telephone line to FNS' Minneapolis data center to access the Retailer EBT Data Exchange (REDE) system. The system identifies both authorized retailers in EBT states and retailers in adjacent, non-EBT states that have received FNS' permission to accept food stamp EBT benefits.

Finally, the EBT host routes retailer settlement data via a dial-up line to NPC's host computer, which in turn transfers the data to National City Bank in Columbus (the system's concentrator bank) for origination of automated clearinghouse (ACH) credits to retailers' depository institutions. This routing of data through NPC allows the use of an existing private T-1 data network to transfer the data from NPC to National City Bank.

2.4 Operations Overview

Card Issuance and Training

Once a recipient has been certified or recertified by a caseworker, the recipient is provided with a card authorization form indicating the recipient's name, recipient ID number, and other information (see Exhibit 2-2). If the recipient has not previously been issued a card, then the recipient is instructed to go to the FCO area.⁷ There the FCO worker, using the CMS, identifies the recipient via the password identification information that is contained in the CRIS-E system. If the recipient is positively identified, the worker will automatically transfer the necessary information in CRIS-E into the CMS and proceed with card issuance.

⁷ A recipient who was being recertified and already had a card from a previous certification would be directed to the ACO. There, the ACO would verify that the recipient remembered his or her PIN and that the card was still operational.

Exhibit 2-2

Card Authorization Form

CARD AUTHORIZATION FORM

Assistance Group Name		Recipient Number	Date
Case Number	Food Stamp Category	Sequence	Verified SSN

Approved Applicant (no change) Reason _____

Reissue ID (no change—old ID expired)

Approved Applicant or Recipient: Duplicate Issue Fee \$ _____

Name or Case Number Change (no change if old ID turned in).....

Prior Name _____

Prior Case Number _____

Unit/Worker's Authorization	CSLD	Fee Paid	Rec'd By	Investor's Authorization (duplicate ID)
		\$		
Recipient's Signature			Date	Recipient Verification

ID Issued By	Date Issued	ID Received By (recipient's signature)

WELCOME TO DIRECTION CARD

What is Direction Card?

A new computerized system for issuing food stamp benefits using a smart card.

How to Access Your Food Stamp Benefits?

To access your food stamp benefits, you must:

- Bring this referral
- Come to the Direction Card office on or before the date in the black box below

Your food stamp benefits will be available effective:

Distribution: Original to Photo ID
Copy 1 to Recipient
Copy 2 to Case file
ODHS #107 (REV. 11-94)—Direction Card Referral Only

Where to Come and What to Expect?

At the Direction Card office you will be given your Direction Card and training on how to use it.

Note: If you do not pick up your Direction Card and access your food stamp benefits before the end of the month, your benefits will be lost for that month.

01-063-96

The worker removes a Direction Card⁸ from inventory, updates the inventory control log, and inserts the card into the card reader input/output (I/O) device, which is attached to the CMS. The I/O device reads the card automatically and adds the card number to the recipient set-up information. The recipient selects and inputs a five-digit PIN. The system requires double entry of the PIN before it is written to the card.⁸ Upon completion of PIN selection, the FCO worker helps the recipient identify a maximum of three authorized retailer locations at which the recipient can collect food stamp benefits by having them posted to the card. The FCO worker then enters these selections into the CMS. The CMS automatically selects the local CDHS office as the fourth location at which the recipient can collect food stamp benefits.⁹ Each evening, the information contained on the CMS is transferred to the EBT host system over the CompuServe network.

The card replacement procedure is similar to new card issuance, although a card replacement authorization form (Exhibit 2-3) must be completed by an ACO worker. Once the form is complete, the recipient goes to the FCO area, and an FCO worker follows the card replacement procedures.

New EBT clients receive training during the card issuance visit on how to use the EBT system. During training, which lasts about one hour and is conducted by ACO personnel, recipients attend a classroom session, watch a video, and obtain “hands-on” experience by completing a practice exercise using actual POS equipment.

Benefit Issuance and Collection

Each day, Ohio’s CRIS-E system transfers FSP issuance information for individual recipients to the EBT host. The host processes the issuance information and readies it for downloading to the recipient’s CDHS offices and those retailer locations selected by the recipient for benefit collection. Supplemental benefits are downloaded during the next daily settlement process, whereas regular recurring benefits are held by the host until the assigned issuance date. (Recurring monthly benefits are staggered for collection by recipients over the first five to 15 calendar days of each month, depending on county.)

During the retailer’s daily settlement of its POS system, a two-way exchange of data occurs between the retailer and the EBT host. EBT transaction data are uploaded from the retailer’s system to the host, and the EBT host downloads issuance records and other staged transaction for recipient collection. Staged transactions include refunds, purchase reversals, re-presentation debits, and manual transactions processed by retailers for purchases, forced credits, and delivery debits. “Negative files” are also downloaded to retailers during the settlement process. Negative files contain the primary account number (PAN) of damaged, lost, stolen, or suspect cards, and are used to prevent transactions with these cards until the negative flag has been removed.

8 The card issuance process writes an encrypted PIN to the card’s memory using a data encryption standard (DES) process.

9 Although the system allows a recipient to go to any one of four locations to collect each month’s FSP allotment, controls are in place to ensure that any given allotment is posted to the card only once. As the benefit amount is written to the card, a sequential code known as the host reference counter (HRC) is updated in the card’s memory. This code prevents multiple access to the same allotment.

Exhibit 2-3

ACO/FCO Authorization Form

OHIO DIRECTION ACO/FCO AUTHORIZATION FORM

Recipient Name:	Date:
-----------------	-------

CARD REPLACEMENT:
Card #:
Auth #:
Ck Digit:
Case No.
No. Of Rep. Cards:
Date of Block

COMMENTS:

COUPON CONVERSION Recipient Present
Card #:
Card Bal:
Amount:
Auth #:
Ck Digit:

COUPON CONVERSION Recipient Not Present	Last Trans Date
Card #:	
Card Bal:	
Amount:	FCO Provides
Auth #:	
Ck Digit:	

RETURN OF BENEFITS
Card #:
Card Bal:
Amount:
Auth #:
Ck Digit:

NEG FLAG REMOVAL
Card #:
Auth #:
Ck Digit:

ELPASO Approves

ACO Signature:

Distribution: Original - ACO
Copy - FCO

MCDHS #107-C (REV. 8-97)

Benefits may be “collected” (i.e., written to the card at the recipient’s selected issuance site location) and become available to recipients on a specified benefit availability date. Benefits are added automatically to the card when the recipient performs any transaction at the POS terminal, such as a balance inquiry or purchase transaction.¹⁰ All benefits must be collected by the last day of a benefit month, although the benefits do not have to be used during the benefit month. That is, once posted to the card, unused benefits can be carried over from one month to the next.

The EBT host also downloads the issuance and staged transaction files to each CDHS office as the offices perform their daily settlements. Recipients can collect benefits at the CDHS office as well as at selected retailer sites. Recipients might elect to collect their benefits at the CDHS office if they have other business there. Also, benefit issuances may be available sooner at the CDHS office than at selected retailers because benefit issuances are not downloaded to retailers until the retailer initiates settlement at the end of the day.

Benefit Redemption

Food stamp benefits are redeemed through the execution of EBT purchase transactions. The recipient inserts the card into the POS terminal and enters a PIN. Upon a successful PIN verification, the POS terminal displays the recipient’s FSP balance on the card. The cashier rings the grocery order, and at the conclusion of the transaction, the cashier enters the food stamp purchase amount. The POS terminal displays the purchase amount for the recipient to validate. The recipient validates a correct total by pressing the “yes” key on the keypad. If the “no” key is pressed, a new purchase amount must be entered by the cashier and the recipient must again validate the transaction. Both an EBT receipt and a cash register receipt are provided to the customer. The EBT receipt indicates the beginning card balance, the purchase amount, and the ending card balance.¹¹ Because the system uses smart card technology, the transaction is recorded both on the recipient’s smart card and on the retailer’s system. Each recipient’s smart card retains a transaction history comprised of the last ten transactions executed, and the retailer’s system retains all POS transactions in memory until retailer settlement occurs. At settlement, the transaction data are uploaded from the retailer to the EBT host. The account balance for each recipient is maintained on the EBT host and on the Direction CardK. Therefore, with the off-line system, there are two balances for each recipient: a card balance and a EBT host-derived balance. The host-derived balance, however, will not reflect transactions performed since retailer settlement.

Manual Transactions

Retailers can perform manual transactions for recipients when the store is experiencing system or equipment problems. Manual transactions differ from regular transactions because the Direction CardK is not used. Instead, the store calls EBT Customer Service to request approval for the transaction; the retailer provides the recipient name, PAN, purchase amount, store number, and the type of manual

10 It may appear that the off-line EBT system design places greater demand on recipients than an on-line system because the recipient must go to a collection location to have benefits loaded onto the card. (In an on-line system, benefits are automatically posted to the recipient’s account maintained by the host computer.) These benefits, however, are loaded onto the card during transactions that recipients would perform anyway.

11 The receipt will also reflect any automatically posted activity, such as issuances, other staged credits (e.g., refunds), and staged debits for manual transactions in calculating the ending card balance.

transaction¹² to the Customer Service agent. Customer Service enters the transaction information into the EBT host. The system checks the negative file, the host-derived balance, and any outstanding manual transactions for the card. If the transaction is approved, based on the host-derived balance, the EBT host assigns the transaction an authorization number, provides a check digit (a number generated through a mathematical algorithm that is used to verify that the underlying information was entered into the system correctly), and places the transaction in a pending file. The Customer Service agent provides the authorization number to the store cashier, who completes a manual transaction receipt. The recipient signs the receipt, and the retailer provides one copy to the recipient and keeps the other copy.

When the system becomes available, the information from the manual purchase receipt must be entered into the retailer's POS system. The entry of the manual transaction information into the system requires the use of the manager's password. The one exception is for delivery debits, which are used to accommodate the inclusion of certain special types of retailers, such as "meals on wheels" and certain food cooperatives, without providing a special mobile terminal. Because these retailers do not have EBT equipment, they provide their receipts to the CDHS, and the transaction information is entered into the system by the FCO.

Retailers receive credit for manual purchases and delivery debits after the EBT host receives an acknowledgment that the transaction has been written to the recipient's card. Manual refunds and forced credits are "settled" from a retailer's settlement on the day they are entered into the POS system.

Retailer Settlement

The process for reimbursing retailers for food stamp redemptions begins with the retailer's daily settlement with the EBT host. The retailer chooses a convenient time for performing the end-of-day settlement transaction. Retailers can activate settlement each day, but many retailers choose automatic daily settlement, with settlement initiated automatically at a specific time each day. When retailers settle, the POS system accesses the EBT host. All POS transactions conducted at the store since the last settlement are uploaded to the EBT host, and the negative files, issuance records, and other data are downloaded to the retailer. Upon receipt of the retailer settlement data, the EBT host verifies that the retailer identification is valid and that the detail records in the batch equal the totals in the header and trailer records. The host also assigns a settlement reference number that is unique to the retailer and to the batch. A confirmation receipt indicating a successful settlement is printed at the retailer terminal. The receipt includes the retailer name, address, and phone number; the settlement amount; and the settlement reference number. Successfully performing end-of-day settlement clears all transaction data from the retailer's system.

The Federal Reserve system maintains an automated clearinghouse (ACH) network for handling electronic funds transfers between member banks, and this network is used to reimburse retailers for the net total of their daily EBT settlement. After the Direction Card^K system settles with each retailer at the end of the day, the EBT host prepares an ACH file with records indicating each retailer's depository institution and the amount of funds to be deposited to the retailer's account. SVS sends this ACH file to National City Bank—Columbus (NCB), which serves as the system's concentrator bank. In both on-line

¹² Codes are used to identify four types of manual transaction: purchases, refunds, forced credits, and delivery debits.

and off-line EBT systems, the “concentrator” bank must be a member of the ACH network. The concentrator bank serves as an intermediary in the settlement process, temporarily providing funds for transfer to retailers’ accounts and then being reimbursed from an EBT account maintained at the U. S. Treasury.

NCB sends the file to the ACH network. The network debits NCB’s account at its Federal Reserve Bank for the total value of the daily settlement and transfers funds to each retailer’s depository institution. The off-set for the transfer of funds from NCB to the retailers’ receiving depository institution will be a credit to NCB’s federal reserve account. The credit results from a request made each day to the Automated Standard Application for Payments (ASAP) system operated by the Department of Treasury. The ASAP system verifies that funds are available through the state’s EBT letter of credit. Once the availability of funds is confirmed, the Department of Treasury sends the ACH credit entry to NCB’s account at the Federal Reserve Bank, completing the reimbursement process.

2.5 Differences Between the Direction CardK and PayEase Card Systems

The Direction CardK system is built directly on the PayEase system. The differences between the two systems represent a set of incremental improvements to the PayEase system. Several of the changes were identified during the PayEase pilot operations, and some were partially implemented or tested prior to the start of the Direction CardK’s statewide rollout. Other changes resulted directly from the specifications issued in the state’s RFP for a statewide EBT system. Taken together, the changes are designed to provide a more efficient, effective, and secure system.

The basic differences between the Direction CardK and PayEase systems can be grouped into four main areas: equipment, operational improvements, reporting, and security. The main changes within each of the four areas are summarized below.

Equipment

- ***New smart card.*** The Direction CardK system uses the PayFlex smart card from Schlumberger. This card replaces the Schlumberger ME2000 card used for the PayEase system. The PayFlex smart card was selected because it provides the range of features needed to be compliant with EMV standards,¹³ the capability to establish several “electronic purses”¹⁴ for use with multiple benefit programs, and the ability to provide for an increased level of security over value-adding transactions. (For instance, the chip within the PayFlex card can be programmed to perform the security functions that were previously performed by the POS software during the PayEase pilot.)

13 Europay, Master Card and Visa (EMV) have jointly defined a set of standards for use of smart cards in payment systems. See “EMV ‘96, Integrated Circuit card Specification for Payment Systems,” May 31, 1998.

14 An electronic purse is an application in a card where value can be stored.

- **Host system upgrade.** In order to meet the processing and performance standards requirements of a statewide EBT system, the EBT host system was upgraded to Tandem's Himalaya family of systems, with K2002 RISC-based processors replacing the Tandem CLX Model 800 processor used for the PayEase system. The system will initially have four processors; additional processors will be added as needed during the rollout.
- **POS terminal equipment.** The PayEase pilot used a POS configuration based on retrofitted VeriFone equipment. Significant software development was required to enable the system to exchange data with the smart card reader. During the pilot, a multi-lane DataCard 485 POS platform was tested and implemented in several large stores. The application was then adapted to a single-lane configuration using the DataCard 680, and tested in one store. The DataCard POS platform operated successfully and is being used in all retailer locations for the statewide Direction CardK system.
- **Remote software download.** The DataCard POS platform makes it possible to remotely download new software releases for all POS terminals and the personal computers used in multi-lane stores. This capability was tested and used in those stores that had the DataCard POS platform installed during the PayEase pilot.
- **New balance inquiry terminal.** In order to provide recipients with easy access to their card balances, a separate stand-alone balance inquiry terminal was developed using a VeriFone SC45 card reader/PIN device. This device can be placed anywhere within a retail establishment.

Operational Improvements

- **Elimination of manager cards.** The PayEase pilot used a manager card to complete POS functions requiring the added security of supervisory personnel intervention, e.g., refund or manual transactions. This approach became somewhat problematic as the cards and PINs were frequently lost and the cards sometimes failed, resulting in delays in the checkout lane.

The Direction CardK system eliminates the use of manager cards and instead uses manager passwords. As many as ten manager passwords can be assigned by each retailer at any given time.

- **Elimination of duplicate card lock.** Duplicate card lock prevents the issuing of multiple cards to the same recipient. In the PayEase pilot, the EBT host was programmed to suspend any card setup record received from the CMS if the recipient ID was already on the EBT host and was associated with an active card. The second card was effectively "locked," because no benefits would be directed to it. Benefits received by the EBT host from CRIS-E would be directed to the card associated with the first setup record. Any card that was locked would be reported to customer service, which would then contact the CDHS office that issued the second card.

Although effective in a confined pilot area, many believed that the existing process would prove too cumbersome to manage once the state began to implement statewide, and

recipients moved and changed households over a greater geographic area not under the control of one CDHS office. Therefore, in the Direction CardK system, the EBT host was modified to not lock the newly-issued card when an active one existed on the EBT host. Instead, the EBT host automatically performs a card replacement transaction when a duplicate card condition exists. This process transfers any remaining value to the new card and blocks the previous card.

- ***Regionalization of negative file.*** The PayEase pilot sent all negative records to all retailers. With the planned growth of the Direction CardK system to statewide operations, it was recognized that the size of the statewide negative file would probably exceed the memory capabilities of the DataCard terminals used by single-lane retailers. The concept of “regionalization” was therefore developed to minimize the size of the negative file needed at single-lane locations.

Under regionalization, single-lane retailers receive a negative file that contains records of blocked cards issued only to recipients at CDHS offices within the retailer’s region. Regions are defined as being, at a minimum, the retailer’s current county plus the immediately surrounding counties. Depending on the combined size of the caseload served by these counties, additional counties at the edge of the region might be included as well.

A code designating the retailer’s region is downloaded to single-lane terminals. In addition, a code indicating the recipient’s county of residence is added to the memory within the recipient’s Direction CardK. At the start of each EBT transaction at a single-lane retailer, the POS terminal compares the retailer’s region to the county code on the recipient’s card. If there is a match, the transaction continues processing. If there is not a match, the terminal requests entry of an authorization number. The retailer must call Customer Service to determine that the card is valid and to receive an authorization number. Once this number is received and entered, the transaction can proceed.

As described in Chapter 5, the system began implementing the regionalization feature when retailers in the Cleveland area began converting to EBT.

- ***Forced clear batch.*** A “batch” is a group of EBT transactions that has not been sent from the retailer’s POS system to the EBT host for settlement. The PayEase pilot allowed retailers to clear their batches from their POS systems with the use of a manager card. To eliminate an inadvertent erasure of the POS database prior to the completion of a successful settlement, an authorization code from Customer Service is now required as part of the process to initiate the clearing of a batch from the POS system.
- ***On-line terminal access to the EBT host.*** To enhance the efficiency of ACO workers in the larger county offices, these staff are being provided with on-line access to the EBT host.

Reporting

- ***On-line history.*** The availability of on-line transaction history was increased to 120 days for statewide rollout. Only 90 days of history was available during the PayEase pilot.
- ***Lost and stolen cards.*** A daily report of lost and stolen cards was created that includes the PAN, recipient number, reason code, date and time reported, and totals by reason. Prior to this enhancement, county workers manually tracked cards reported as lost and stolen. In addition, the EBT host will automatically provide the numbered replacement for a lost or stolen card anytime an authorization is requested for a card replacement.
- ***Stale-date notices.*** The Direction CardK system includes the capability to establish a dollar value parameter to determine which records are included in stale-date notices sent to recipients. Both systems automatically generate stale-date notices for cards that have a balance but have been inactive for 60 or 90 days. With the Direction CardK system the state can set a threshold amount, below which a notice would not be sent to recipients.
- ***POS card history.*** Under the new system, an additional field of information is being recorded for each transaction maintained on the card, namely, the Category of Public Assistance (COPA) designator. The Direction CardK system must accommodate multiple benefit programs, unlike the food stamp-only PayEase pilot. With a multi-program card, the additional COPA information is necessary to allow recipients to identify what type of benefits are being used for each transaction.

Security

- ***Additional use of key security.*** The PayEase pilot included a “key” encryption strategy for all value-adding transactions that were generated by the EBT host and added to the card at the POS.¹⁵ Because the Direction CardK system will serve a much larger number of recipients and retailers, system designers believed that two additional security measures were merited. The first was to add a unique key to each card. This would ensure that, in the very unlikely event that the key was “decoded” for one card, the entire system would not be in jeopardy. The second was to add an industry-standard method of message authentication (MAC)¹⁶ to POS transactions as they are created and stored on the retailer’s POS system. Special keys maintained on the cards would be used to create the MAC that would be “decoded” when the transaction reached the EBT host.
- ***Staging of purchase refunds and reversals.*** In the PayEase pilot, a recipient received immediate credit (i.e., value added back to the card) for all purchase transactions that were reversed and for refunds of all or part of a prior purchase. With the Direction CardK

15 A “key” in encryption is a data string that, when combined with a source of data and an algorithm, produces output that is unreadable until it is decrypted.

16 Message authentication refers to any method used to determine the source of data and whether the data was intentionally or unintentionally altered during the transmission process.

system, these transactions are still allowed, but they are not instantaneous. First, the transactions are uploaded from the POS system to the EBT host and then downloaded to the recipients' chosen issuance sites for posting to the card. This process allows for all value-adding transactions to be verified by the EBT host and the card prior to its entry into the EBT system. This change was added as an additional security measure that would be necessary if retailers were to integrate their store cashier systems to interact directly with the Direction CardK. With integrated systems there would be no other method to prevent retailers from adding value into the system.

Chapter 3

System Design and Development

3.1 Introduction

As noted in the previous chapter, the Direction Card^K EBT system differs somewhat from its predecessor, the pilot PayEase system. Thus, before the state and vendors could begin statewide expansion, they needed to modify the design of the existing EBT system and develop the new software. This chapter discusses the activities involved in this design and development effort. It is organized into the following four sections:

- contract procurement;
- system design;
- system development; and
- system testing.

3.2 Contract Procurement

The RFP for the off-line EBT project originally allocated a little over 14 months for system design and development activities. With a planned contract start date of October 3, 1994, this meant that the EBT vendor was to begin installing equipment in Montgomery County by early December 1995. Recipient conversion in Montgomery County was to begin by April 1996. A series of unexpected delays in the procurement process, however, put the project about 18 months behind schedule, with recipient conversion in Montgomery County starting in September 1997. A number of factors contributed to the delay, including extensions to the due date for vendor proposals, delays in awarding the contract, and delays caused by the lawsuit. Exhibit 3-1 presents key milestones in the procurement process.

The initial procurement process itself took about one year longer than expected. Ohio issued two addenda to the RFP, which pushed the due date for vendors' proposals back about two months. The first addendum indicated that the Ohio Department of Health would be considering using the EBT system for the delivery of WIC benefits (although vendors did not need to make an immediate response), and that EBT terminals deployed in retail stores had to be capable of performing third-party on-line functions as well as off-line transactions. The second addendum clarified the process by which vendor proposals would be evaluated. Even after proposals were received in July 1994, the process of reviewing and evaluating the proposals, and then negotiating a final contract, took until September 20, 1995. Owing to the novelty of the proposed off-line technology, the evaluation panel had numerous questions that had to be addressed before a contractor could be selected.

The one-year delay created some concern due to the contract status of the pilot EBT system in Montgomery County. FNS' contract with NPC for PayEase operations was originally scheduled to end March 1, 1993. When it was clear that ODHS wanted to continue pilot operations until a statewide system could be procured, FNS agreed to extend its contract with NPC.

Exhibit 3-1**Key Procurement and Contract Events**

1993

March 1 Original end date for PayEase demonstration. FNS agrees to extend its contract with NPC by eight months, with ODHS assuming responsibility for contract costs.

November 1 FNS extends contract with NPC by five months

1994

February 28 ODHS issues RFP for development, implementation, and operation of the Ohio EBT system

April 1 FNS extends contract with NPC by nine months

May 12 ODHS issues RFP Addendum #1

June 27 ODHS issues RFP Addendum #2

July 21 Vendors submit their proposals to ODHS

1995

January 1 FNS extends contract with NPC by six months

January 17 Citibank responds to ODHS clarification request

July 1 FNS extends contract with NPC for fifth and last time

September 20 ODHS signs EBT contract with Citibank

October 27 NPC files suit against Citibank and the state

November 9 Preliminary hearing on NPC's legal action begins

1996

January 18 Judge rules in favor of NPC, directs Ohio to re-solicit cost proposals from Citibank and NPC

April 25 Citibank submits revised Final Proposal, including NPC as subcontractor

June 17 Ohio approves revised proposal

September 3 FNS contract with NPC expires. Ohio contracts with NPC to continue pilot operations until December 31, 1996

December 17 FNS approves Direction CardK system

1997

January 1 Direction CardK system begins operations

After ODHS awarded the EBT contract to Citibank in September 1995, efforts to begin development of the statewide EBT system slowed, and then stopped, due to a legal challenge to ODHS's contract award to Citibank. On October 27, 1995, just three days before the scheduled kick-off meeting for the Ohio EBT project, NPC filed a lawsuit seeking a preliminary injunction to prevent Ohio from pursuing development of a statewide EBT system with Citibank. The basis of the suit was an allegation that Citibank's cost proposal had not been prepared strictly in accordance with the requirements of the RFP,

making it difficult for the state to compare NPC's and Citibank's proposed costs. During a preliminary hearing in November, the court found no grounds for issuing a temporary restraining order or a preliminary injunction, but it did warn Citibank that any continued contract activity would be at its own risk. Then, in January 1996, the court found in favor of NPC and directed the state to re-solicit cost proposals from Citibank and NPC.

A period of negotiations ensued between Citibank and a new subsidiary of NPC, Stored Value Systems (SVS). Citibank agreed to drop its plan to develop an off-line EBT system from scratch and to include SVS as a subcontractor in its proposal to Ohio. Under this proposed contractual arrangement, SVS would serve as processor for all EBT transactions, whereas Citibank would remain as prime contractor. Century Technologies, Inc. (CENTECH), another subcontractor to Citibank, would be responsible for deploying and maintaining POS devices at retailer locations and in county welfare offices.

Citibank submitted its revised proposal to Ohio in April 1996, and Ohio approved the proposal on June 17, 1996. A second kick-off meeting for the project was held on July 9. Thus, the lawsuit delayed the start of contract activities by about eight months. During the entire procurement period (i.e., from March 1, 1994 through September 3, 1996), FNS extended its contract with NPC a total of five times. The State of Ohio then contracted with SVS to continue operating the pilot EBT system in Montgomery County through the end of 1996, in order to provide time to design and develop the new Direction CardK system.

3.3 System Design

Usually there are three distinct phases associated with moving from a paper benefit issuance system to an EBT system: the design phase, the development phase (which includes system testing), and the implementation phase. Although these phases are normally carried out more or less in succession, design and development activities for Ohio's Direction CardK system were co-mingled for two reasons. First, the pilot EBT system had already been designed and needed only a few design modifications before statewide expansion. Second, the developer of the pilot system was part of the Citibank project team, and the team had full access to software already developed for the pilot system.

As described below, an EBT system's design phase encompasses two major tasks. The first task is to decide exactly how the system will meet the EBT functional requirements specified in FSP regulations and the vendor's contract. The second is to prepare a "detailed system design document" to explain the planned design to state and federal officials. Although other activities are often initiated during the design phase to ensure completion before the system is implemented, they are not central to the design process.¹ Exhibit 3-2 identifies the critical design and development milestones.

¹ These other activities, which are discussed later in the chapter, include development of various materials, including a system implementation plan, training materials, and draft language for EBT contracts with retailers.

Table 3-2**Key System Design and Development Events**

July 1993	ODHS submits Planning Advanced Planning document to FNS
February 1994	ODHS issues RFP for the Ohio EBT food stamp benefits distribution system
September 1995	ODHS signs EBT contract with Citibank
October 1995	Initial kick-off meeting for the Ohio EBT project
June 1996	Ohio approves revised proposal
July 1996	Second kick-off meeting for the Ohio EBT project (discussed planned changes to system) County Advisory Board members observe demonstration of pilot system in Montgomery County
August 1996	County Advisory Board meets with ODHS and vendors to discuss planned system design Citibank submits draft Detailed System Design Document First formal meeting with retailer groups to discuss system design issues
September 1996	Citibank submits revised Detailed System Design Document
October 1996	Citibank team meets with Ohio and FNS to work through final questions regarding system design Citibank submits final version of Detailed System Design Document Second formal meeting with retailer groups to discuss system design issues FNS responds with comments on draft Acceptance Test Plan
December 1996	Citibank team begins three-day acceptance test of EBT system FNS approves Direction CardK system
January 1997	Direction CardK system begins operations
February 1997	Citibank submits the Direction CardK Risk Analysis Report

System Design Activities

The RFP for the EBT project delineated the functional specifications for the planned system (i.e., what the system had to do) as well as other design requirements, including required levels of system performance, processing speeds, reliability, security, disaster preparedness, and client ease of use. Initial design work on these requirements began as early as late 1995, when the original Citibank project team met first with ODHS and then with retailers to discuss the planned EBT system. These design activities came to a halt on January 18, 1996, however, when the court directed the state to re-solicit cost proposals from Citibank and NPC.

Design efforts began again when representatives from Citibank, SVS, CENTECH, and ODHS met for the project's second kick-off meeting on July 9, 1996. The design task was now quite different than before. Instead of designing and developing an off-line EBT system from scratch, the new Citibank team

could base its efforts on the pilot system already developed by SVS. Although this clearly represented a significant reduction in needed design effort, eight months had passed since the project's initial kick-off meeting. The new system had to be developed, tested, and ready to process EBT transactions in less than six months (i.e., by January 1, 1997).

The Citibank team brought to the meeting a document describing both proposed general enhancements to the pilot system and modifications requested by the RFP. (Some of the general enhancements had already been implemented by SVS as part of the pilot.) Team members went through the proposed changes one by one during the meeting, seeking agreement from ODHS and FNS representatives so that work on the Detailed System Design Document could begin. Changes receiving the most attention are listed in Exhibit 3-3.

Exhibit 3-3

Proposed Changes to System Design

Eliminate the need for a manager card to initiate special functions at retail outlets—use manager passwords instead.

Adopted.

“Regionalize” the system’s negative file for single-lane retailers.

Adopted.

Ensure a recipient’s ability to obtain a transaction history at the store upon request.

Adopted.

Enable EBT cards to handle two PIN numbers so that a designated “alternate shopper” could use the card.

Not adopted. Citibank indicated that this FNS request would not be possible if the card was to conform to industry standards adopted for smart card functionality and security.

Eliminate immediate store refunds to a client’s card.

Adopted.

Although not discussed much at the meeting, several new features of the system would entail significant design and development effort. All of the Verifone POS terminals used during the pilot were to be replaced with DataCard POS terminals, and the system would switch to new smart cards. These changes were not simply equipment upgrades. The Verifone POS terminals handled much of the pilot system's transaction processing and security functions. Because the RFP for the new system required that retailers be offered an “integrated” terminal solution if they wanted one terminal to handle both (off-line) EBT and (on-line) commercial credit or debit operations, the EBT vendor would no longer have complete control over terminals handling EBT transactions. For security reasons, the Citibank team therefore needed to move processing and security functionality out of the terminal and into the card itself. The new card manufactured by Schlumberger could handle this added functionality. Furthermore, it had the capacity to maintain and process benefit information for more than one program, which was crucial in light of ODHS' interest in ultimately adding other programs to the EBT system.

Another issue discussed during the design phase was what came to be known as the “association/disassociation” issue. The basic point here was what to do if a food stamp household split into two program-eligible households. Initial solutions offered by SVS and ODHS were considered to be too convoluted. Eventually, however, an agreed-upon process was adopted shortly before the system’s acceptance test. The new process required both software changes at the system’s host computer and procedural changes at the county office.

Input from County Advisory Board

After the initial EBT contract award to Citibank, ODHS formed a County Advisory Board to provide input to the EBT planning and implementation process. Montgomery County took the lead in organizing the board, which includes representatives from six counties within the state.² Board members met in Montgomery County in July 1996 to observe a demonstration of the pilot EBT system. They then met the following month with ODHS and the Citibank team to discuss the proposed design of the new system. Because most of the board members had no experience with EBT, much of the meeting was spent clarifying how the Direction Card^K system would work. Although the more experienced Montgomery County representative focused her attention on the proposed changes in system design, ultimately there was little or no critical review or feedback from the Board on the proposed design.

Input from Retailers

ODHS also sought input from several retail groups in Ohio, including the Ohio Grocers Association (OGA), the Ohio Council of Retail Merchants, and key supermarket chains. Despite the success of the off-line pilot, OGA and a number of retailers initially tried to dissuade ODHS from pursuing an off-line system for statewide expansion, arguing that on-line technologies were already proven and more compatible with grocers’ POS systems. Once the decision to go with an off-line system had been adopted, however, the retailer groups worked with the state on system design, cost, and implementation issues.

The main features of the planned design were presented to the retailer groups at an August 23, 1996 meeting, following distribution of the draft Detailed System Design Document. The OGA’s EBT Task Force then responded with a document entitled “General Concerns and Positions.” The task force identified the following major concerns:

- The state and Citibank were trying to implement the system too quickly to allow OGA and the retailer community sufficient time to review the system design, its operating rules, and specifications for equipment configurations.
- There was little or no information available regarding when the system would be implemented in different parts of the state.
- No written procedures were available for how cross-border transactions would be handled.

2 The six counties are Montgomery, Belmont, Cuyahoga, Franklin, Hamilton, and Henry.

- There was little or no information about plans for “retailer integration,” which referred to how off-line (EBT) and on-line (commercial debit and credit) functions would be integrated into a single terminal.
- The state was not planning to pay for deploying POS equipment at all checkout lanes in most multi-lane stores.

ODHS immediately responded with a letter addressing the retailer concerns. The letter noted that the rushed schedule applied only to the conversion of retailers in Montgomery County to the new system. Thereafter, more time would be available for retailers to review documents and provide comments. With regard to cross-border shopping, the letter said that county offices would conduct surveys of recipients to determine whether any out-of-state stores needed to be included in the system. The letter also said that ODHS and Citibank would be offering retailers several options regarding transaction integration, but that specific rules had not yet been developed. Finally, with respect to lane coverage, the letter indicated that ODHS would be complying with FNS rules that tie the number of lanes to be equipped (at no cost to the retailer) to the monthly level of food stamp redemptions at the store.

A second meeting with the retailer community took place in October 1996. Several of the retailers’ original concerns remained (e.g., lane coverage and integration of on-line and off-line functions), and others were brought to the attention of ODHS. In particular, the new issues were:

- staging of purchase reversal refunds; and
- regionalization of negative file.

Retailers did not like the planned staging of refund credits to client accounts, because clients would not have access to the refunded benefits for at least a day or two. Not only did this represent a potential loss of sales to the store, it also meant that store employees would likely be dealing with angry clients.³ Retailers also were concerned about plans to regionalize the system’s negative file. They worried that checkout productivity would be reduced due to the need to call Customer Service when an out-of-region client shopped at their store. ODHS’ response to retailers’ concerns about the staging of purchase reversals and the regionalization of negative files was to explain that security concerns necessitated the adoption of these design features.

A third meeting with the OGA occurred late in January 1997. By this time most purely design issues had been dealt with, so retailer concerns switched to issues relating to system implementation, including:

- Citibank’s proposed retailer agreements;
- equipment footprints;
- service agreements; and
- costs associated with additional terminals and supplies.

3 For example, suppose a client with \$47 of benefits in her EBT card attempted to buy \$4.50 in groceries, but the store clerk inadvertently keyed \$45.00 as the EBT purchase amount. She would not be able to access the refunded benefits until they were posted to her card at a selected store a day or two later.

Retailers also were concerned that the off-line system left them vulnerable to losses related to manual transactions. In an on-line EBT system, manual transactions are permitted when the store's EBT terminal is not working or when communications with the host computer cannot be established. In these situations the retailer has the option of calling customer service for manual authorization of the requested transaction. If customer service can access the EBT database, the availability of sufficient funds in the recipient's account can be checked and authorization provided. If customer service cannot access the database, then the recipient's remaining balance is unknown and the store assumes the risk of not being reimbursed if it proceeds with the transaction.⁴

In an off-line EBT system, in contrast, customer service does not know the recipient's current remaining balance; that information is contained only in the recipient's EBT card. Therefore, if an EBT terminal is not working, there is no way of knowing whether the recipient's remaining EBT balance is sufficient to cover the intended purchase. For this reason the system limits manual transactions to \$50, and retailers assume full risk for not being reimbursed. It is the retailer's option of whether to process manual transactions.

Manual transactions are likely to be needed less often in an off-line system than in an on-line system, because an off-line system does not rely on communications with the host computer to gain authorization.

Detailed System Design Document

A basic federal requirement for EBT systems is the preparation of a Detailed System Design Document. The box below shows a summary of the Ohio RFP's requirements for system design documentation.

System design documentation will consist of two parts:

1. The Functional Description shall describe the operating environment of the project, focusing on procedures and work flow. It shall address procedures, a summary of improvements over the paper coupon issuance process, and organizational, operational, and developmental impacts of an off-line EBT project.
2. The System Specification shall address the design of system components. It shall identify the selected technology and include system performance requirements, expected data accuracy and validity. It will identify data elements, system interfaces, system security and the total system component configuration.*

* RFP, pp. 64-65.

⁴ If the retailer proceeds with the transaction and it is subsequently learned that the recipient's account did not have sufficient funds to cover the transaction, the retailer may be able to collect funds in later months in a process known as "re-presentation." In re-presentation, a limited amount of funds can be subtracted from a recipient's FSP allotment in later months.

Preparation and review of system design documents has often been problematic and time-consuming for EBT vendors. One reason for these difficulties has been that vendors are reluctant to provide information on the detailed specifications of their proprietary software, especially in a document that enters the public domain. Another reason is the multiple layers of extensive review such documents receive. The detailed information and extensive reviews have been necessary because system design documentation is used by FNS to prepare for system testing, which is the point at which FNS certifies the operation of an EBT system.

As in previous efforts to design EBT systems, final approval of Citibank's Detailed System Design Document also proved difficult and time-consuming. According to document reviewers, the biggest problem was a lack of sufficient detail on exactly how the system would operate. A cumbersome review process, however, also contributed to delays in approving a final system design.

SVS had primary responsibility for preparing the Detailed System Design Document. The first draft of the document was submitted by Citibank to ODHS on August 20, 1996 (just in time for the previously mentioned August 23 meeting with retailers). According to reviewers at ODHS, the document was too much a restatement of the April 1996 proposal and lacked the detail—including flow charts—needed to evaluate the planned system fully. Citibank then submitted a revised and—according to ODHS—much improved document on September 13. A meeting in Columbus was convened on October 7, 1996 to go over ODHS' and FNS' remaining comments on the system design. Most of the meeting centered on detailed design questions posed by representatives from Booz•Allen and Hamilton.⁵ These questions sought clarification on security issues (e.g., system use of passwords, separation of critical functions, use and management of encryption keys) and communications protocols between terminals and the host computer. By the end of the meeting, FNS and Booz•Allen seemed satisfied with the information they had received. The final version of the document was submitted on October 15, 1996, and subsequently approved by FNS and ODHS.

Aside from the need for greater detail on planned system design and operations, several issues were discussed during the document review process. One was ODHS' request that FNS waive the requirement that all stores authorized to participate in the FSP be equipped with EBT terminals. Because of cost considerations, ODHS did not want to deploy POS terminals in stores redeeming less than \$100 in food stamp sales per month. ODHS instead wanted these retailers to process manual transactions for their limited number of food stamp sales. FNS rejected the request because, as described earlier, customer service has no way of knowing a recipient's current EBT balance when processing manual transactions in an off-line EBT system. In addition, this cost-cutting feature was not in ODHS' negotiated contract with Citibank. Adopting this policy would have reduced costs to the EBT vendor, but not the cost to the government.

A second issue was the previously discussed problem about how store terminals could handle large negative files. The regionalization of negative files was not popular with retailers or FNS because it required single-lane retailers (whose POS terminals could not handle a statewide negative file) to phone

5 The consulting firm of Booz•Allen and Hamilton was under contract to FNS to help evaluate the technical and security aspects of the Ohio EBT system.

for verification when recipients tried to shop outside their region. Despite these concerns, the final design includes the ability to implement regionalization, if needed.⁶

A final issue was more fundamental. Citibank and ODHS believed that some of FNS' and Booz•Allen's comments on the Detailed System Design Document were too oriented towards on-line EBT systems. They argued that off- and on-line EBT systems are sufficiently different that documentation requirements for the two types of systems should not have to be identical. This debate continued into efforts to test the system, as described later in this chapter.

3.4 System Development

As mentioned previously, the Citibank team was able to proceed with system development even while the design process was occurring. The major software development tasks were:

- programming the new PayFlex smart card to perform the transaction processing functions previously done in the POS terminal;
- writing software to create system files for use by FNS;⁷ and
- programming the new PayFlex card and the host computer to support the addition of host reference counters (HRCs).

The addition of HRCs added considerably to the complexity, and the security, of the system. HRCs ensure that the both the card and the host processor process the same sequence of credit transactions, by establishing a sequence number for each credit transaction and using that sequence number to calculate the message authentication code (MAC) for that transaction. The card will not accept out-of-sequence credit transactions, and only the host and the card have both the HRC and the encryption algorithm used to calculate the MAC. The POS terminal does not have the capability to generate credit transactions; it simply stores credit transactions generated by the host. This makes it extremely difficult to add value to the card without establishing an auditable trail on the host system. In a major change from the predecessor PayEase system, the Direction CardK relies on the card rather than terminal to perform these secure message authentication functions.

The security features of the new system were documented in a key deliverable produced by the Citibank EBT team, the Direction CardK Risk Analysis Plan. The risk analysis document discusses the potential security risks to the system and how each is addressed by the Direction CardK system design. The risk analysis plan was submitted to ODHS in February 1997.

6 ODHS and Citibank decided to implement the system's regionalization feature in September 1998, when Cuyahoga County (Cleveland) began converting recipients to EBT. By this point the system's negative file had grown too large for the data to be stored in single-lane retailers' EBT terminals.

7 All EBT processors are required to submit state-level files to FNS each month that detail all transactions processed during the month. FNS uses these data to identify potential instances of food stamp trafficking.

Also included under system development activities were several tasks that CENTECH performed as part of preparation for roll out, many of which took the whole duration of the design and development phase. These activities included:

- development of the Implementation Plan (described in Chapter 5);
- development of retailer agreements and a system for executing them;
- development of a procedural approach to conducting site surveys;
- development of a technical and procedural approach to installing equipment;
- development of a technical and procedural approach to equipment maintenance;
- development of the inventory control and distribution system for hardware and cards;
- documenting these systems and approaches and training staff;
- development of the County Training Manual and the procedures documented therein; and
- development of the Retailer Training Manual and the procedures documented therein.

CENTECH had no previous experience in planning or preparing for a state-wide EBT rollout, so it had to start “from scratch” in determining what needed to be done, how, and how quickly. For this reason, these system development efforts were more labor-intensive, and therefore more costly, than might otherwise have been expected. Particularly time-consuming were the development and documentation of all the technical and procedural approaches to support the installation and maintenance of equipment. In addition, CENTECH prepared several iterations of both the County Training Manual and the Retailer Training Manual in response to changes suggested by ODHS.

3.5 System Testing

Any new EBT system delivering food stamp benefits must be certified by FNS before it can be implemented. This certification process hinges on the system’s “acceptance test,” which is usually a multi-day event consisting of the following major components:

- An exercise of all system functions and allowable transactions, following a pre-arranged script, with subsequent review of the system’s management reports to ensure that all transactions were correctly processed.
- A period of “what-if” testing, during which time test participants try a series of unscripted actions to make sure that the system correctly processes **any** attempted transaction or activity.
- A “stress test” of the system, to ensure that telecommunication links and processing flows can handle expected levels of system use under full implementation.
- A “live transaction” test, during which time limited food stamp benefits are posted to a small number of client accounts, EBT cards are issued to the clients, the clients use their cards in a few EBT-equipped stores to purchase groceries, and retailers’ bank accounts are then reimbursed for the EBT sales.

The acceptance test is usually preceded by a “functional demonstration,” which occurs after basic development work has been completed. As noted earlier, however, FNS agreed to an ODHS request that the requirement for a functional demonstration of the Direction CardK system be waived due to the similarity between the pilot and new EBT systems and the need for an accelerated design and development schedule. FNS also agreed that the system’s acceptance test could focus on the functional differences between the old and new systems.

Test Plans

Citibank, as the prime contractor to ODHS for the expanded system, had ultimate responsibility for preparing the system’s Acceptance Test Plan, and Citibank edited, formatted, and produced the final document. SVS, however, took the lead in proposing the testing strategy, developing the test scripts, and writing the majority of the document. SVS’ task of developing the test plan was made easier due to the fact that they were able to use as a model an existing Acceptance Test Plan developed for SVS’ off-line EBT system in Wyoming.

The Acceptance Test Plan shall include an acceptance test schedule, test procedures, and test data for evaluating the project. It shall include the methodology to be used to verify that the off-line EBT system operates in accordance with Food Stamp Program and RFP specifications. The document shall summarize all details necessary to operate the off-line system including system component configurations at each retailer.

* RFP, p. 66.

The initial draft of the Acceptance Test Plan was submitted to FNS on October 18, 1996, approximately seven weeks before the scheduled start of the test. FNS responded with its comments a week later. FNS expressed concern over Citibank’s request that all plans for what-if tests be submitted two weeks in advance of the test, noting that it is often during the testing period itself that evaluators identify new scenarios to be tested. FNS also requested additional test scenarios and scripts to cover system functionality not addressed in the draft plan. Several of the requests dealt with system security, an issue that became somewhat controversial during the testing period. After several iterations of revisions to the test plan and subsequent comments, the final Acceptance Test Plan was distributed to test participants at the beginning of the testing period.

The effects of the compressed design and development period were clearly evident as the parties prepared for the December acceptance test. The test could not be delayed because transaction processing in Montgomery County had to be converted to the new system before January 1, 1997, the date when FNS’ contract with SVS for pilot operations was set to expire. At the same time, however, Citibank did not have an approved Detailed System Design Document until November. The Citibank team was worried about the lack of approval because any last-minute changes to system design would necessarily require a change to test plans. As in most efforts to implement EBT systems, the time leading up to the acceptance test became quite stressful for all parties.

Acceptance Test

The acceptance test of the Ohio EBT System took place at SVS' headquarters in Louisville, Kentucky, over a three-day period beginning December 9, 1996. Representatives from ODHS, Citibank, SVS, CENTECH, FNS, and Booz•Allen were in attendance.⁸ To test changes in the EBT card and transaction processing flows, POS terminals were set up at SVS to represent a variety of system locations, including a 12-lane retailer, several single-lane retailers, the Montgomery County Fiscal Control Office (FCO) Card Management System (CMS), the county's Assistance Control Office (ACO) Issuance Terminal, FNS, Customer Service, and the state CRIS-E Certification System.

Five "test teams," composed of three individuals per team, were selected to test various system functions. Over the three days of testing, participants followed specific test scripts and testing procedures established by SVS. After system initialization and setup on the first day, each day generally began with a review of system reports on the previous day's activities. This was followed by scripted tests of changed functionality within the system and then what-if testing. Stress testing of the host capacity for large volumes of POS transactions was not done because off-line systems do not authorize each transaction at the host. Sizing for the host capacity for handling retailer batches, reconciliation, report generation, and state file transmissions was discussed. The host was sized to handle 66 percent of the total projected caseload, which was considered acceptable.⁹ Live testing is usually done for several cases loaded with about \$30.00 each. This demonstrates posting, debiting, and settlement operations. Live testing was considered unnecessary because of the extensive and on-going operations of the Dayton pilot and the lack of system changes in these functional areas.

With respect to the what-if testing, representatives from Booz•Allen had developed an extensive list of what-if test scenarios, many of which were hand-carried to the test. ODHS and SVS both reported that not having these test scenarios prior to the test was a problem because SVS was not able to prepare the system in the necessary manner. Also, although SVS had built time into the schedule for what-if testing, they were not prepared for the large number of tests that Booz•Allen requested. Nevertheless, all testing was completed within the three scheduled days.

One issue arose during the acceptance test relating to the security of the system. Booz•Allen and FNS requested that certain security tests of the system be performed, especially in light of the fact that many security-related details of the system did not appear in the Detailed System Design Document. In particular, Booz•Allen wanted more detailed information on communications protocols, the message authentication codes (MACs) used in the EBT cards and back-room PCs in multi-lane stores, and management of security keys.¹⁰ SVS and ODHS believed that it was not necessary to provide such detailed information, especially because the pilot EBT system had experienced few security problems. SVS was also concerned that, in order to respond fully to Booz•Allen's request for security testing and review, SVS would have to divulge proprietary business information. Rather than providing this

8 Representatives from Abt Associates Inc. and Phoenix Planning & Evaluation were also in attendance.

9 There would be ample time to increase the capacity of the host, as needed, as the system was rolled out throughout the state on a county-by-county basis.

10 Security keys are the tools used to manage encryption and de-encryption of protected data.

information, SVS proposed that Booz•Allen attempt to directly breach the security of the card and the back-room PC.¹¹

In the end, Booz•Allen and SVS had extensive discussions about the security key management, MACing, and encryption techniques used for the PC and other elements of the system, and SVS was not required to provide code or documents revealing their proprietary data. Some tests were made to evaluate the robustness of the security measures, and these were determined to be sufficient.

In general, the acceptance test went quite well with only nine problems reported. Problems that occurred during the test were reported on Acceptance Test Incident (ATI) reports and were assigned a priority of between 1 and 4 (with 1 being the most serious and 4 being the least serious). Five of the nine problems were categorized as level 3 (“minor functional deficiency”) and four were categorized as level 4 (“cosmetic deficiency”). All nine problems were corrected during the three days of the test. A week after the test, Booz•Allen recommended approval of the system to FNS.

Although the test was deemed successful, Booz•Allen representatives said they would have preferred a five-day test period, both to give more time for what-if testing and because some off-line system functions require multiple days to completely process. They also would have preferred a two-week period after the test to review and evaluate system reports. ODHS and Citibank stressed the need for a timely approval, however, to allow conversion activities to proceed.

FNS formally approved the system on December 17, 1996. This approval was contingent upon SVS’ successful resolution of all ATIs and presentation of proof thereof (regression script and results), as well as making appropriate changes to resolve report discrepancies identified in the Booz•Allen report on the acceptance test. These resolutions and changes were accomplished to the satisfaction of Booz•Allen and FNS.

11 The back-room PC is used for data storage and communications with the host computer. It is configured without a monitor or keyboard.

Chapter 4

Design and Development Costs

4.1 Introduction

A primary objective of this evaluation is to quantify the administrative costs associated with the statewide expansion of the off-line EBT system in Ohio and to compare these costs with those of the pilot demonstration. Ultimately, the evaluation will examine design and development, implementation, and operating costs of the Direction CardK system. An analysis of the Direction CardK design and development costs is the subject of this chapter. Implementation and system operating costs will be examined in the evaluation's final report.

This evaluation estimates that the costs of the resources used in the design and development of the statewide Direction CardK system in Ohio were \$2.4 million. This estimate includes costs associated with modifying the pilot off-line EBT system for statewide expansion (i.e., designing a system to meet the functional requirements of a statewide EBT system); making significant changes to card, terminal, and host system software; and testing the system. The design and development costs also include costs associated with planning and developing procedures for EBT system implementation.

The costs presented in this chapter represent the **incremental** design and development costs for the expansion from the pilot EBT system in Dayton to the statewide EBT system, as incurred during the period of July 1996 through April 1997.¹ Much of the system design and development work necessary to establish a functioning off-line EBT system in Ohio was performed as part of the initial pilot project and is not included in the current analysis. The costs presented here represent the costs of updating and modifying the pilot system for statewide use, plus the costs of preparations for statewide implementation.

The pilot system was designed, developed, and operated by NPC for FNS. NPC also designed, developed, and operated the off-line PayWest EBT system in Wyoming. Clearly, because NPC's successor, SVS, is on the EBT vendor team, the design and development costs of the expansion to statewide off-line EBT are less than they would have been if the system had been designed and developed independent of the existing systems in Ohio and Wyoming.

4.2 Research Design and Data Sources

The primary data sources for the analysis of design and development costs are reports prepared by the vendor (Citibank, and its subcontractors, SVS and CENTECH) and data provided by ODHS. It is important to note that the vendors reported their resource costs, that is, costs that they actually incurred, irrespective of their billing arrangement with ODHS. All labor costs presented in this chapter include

¹ The costs presented here do not include any costs the vendor incurred between the time the initial contract was awarded in September 1995 (and contested by NPC, resulting in a rebidding of the project) and the time the present contract was awarded in June 1996.

fringe benefits. Overhead costs were identified by the vendors, but not by the state or county departments of human services.

The vendors reported their resource costs for July 1996 through April 1997. The vendors' cost reports followed a standardized format developed by Abt Associates that shows line-item detail for labor (including fringe), telecommunications, travel, office space and equipment, supplies, miscellaneous, administrative terminals, retailer supplies, and indirect costs (including overhead and administration).² From July 1996 through December 1996, the vendors focused on designing, developing, and converting to the new version of the EBT system, which became operational on January 1, 1997. The period from January 1997 through April 1997 included both implementation activity and several development-related tasks required before system expansion could begin in May.

Although this period was defined as the design and development phase, some resources were spent on implementation and operations activities during the design and development phase. We separated costs for the period into three functional categories: design and development, implementation, and operations, and asked each of the three vendor firms to provide information about the allocation of staff time among the three functional categories. These reports not only provided information on the allocation of the effort among design and development, implementation, and operations activities, but also provided information about the level of staff effort on the project during the period.

Data on ODHS costs consist of standard cost reports that show detailed information on costs for personnel, computers, travel, and miscellaneous. Labor costs were allocated to the EBT project based on the planned level of staff effort identified in the July 1996 Implementation Advanced Planning Document (IAPD). In other words, these are budgeted rather than actual costs. Non-labor costs were those allocated directly to the EBT project by the ODHS accounting department. The state incurred design and development costs primarily during the period of July 1996 through December 1996, and only costs for that period are included in this analysis.

The design and development costs incurred by CDHS were limited to the time spent by the six county staff who served on the County Advisory Board. Costs for CDHS participation on the County Advisory Board were estimated using information from Montgomery County about the cost of providing a Montgomery County representative to the board.

The cost estimates in this chapter do not include any expenses incurred by FNS for oversight of the Ohio EBT project. Unlike the approach used in previous EBT evaluations, the study design explicitly excludes FNS costs, which are considered to be immaterial to future decisions about the choice of EBT technology. FNS did, however, conduct oversight activities through the efforts of headquarters staff, Midwest Regional Office staff, and technical assistance contractors.

2 The SVS cost report did not include fringe in its labor costs and did not provide overhead costs. We adjusted SVS' labor and overhead costs based on fringe and overhead multipliers used by NPC before NPC formed SVS.

4.3 Overview of Design and Development Costs

Total design and development costs for the Direction CardK system were \$2.40 million, as shown in Exhibit 4-1. The EBT vendor team incurred the overwhelming majority of these costs, \$2.26 million. The balance of \$137,426 was incurred by ODHS, with a minimal level of expenses incurred by county departments of human services.

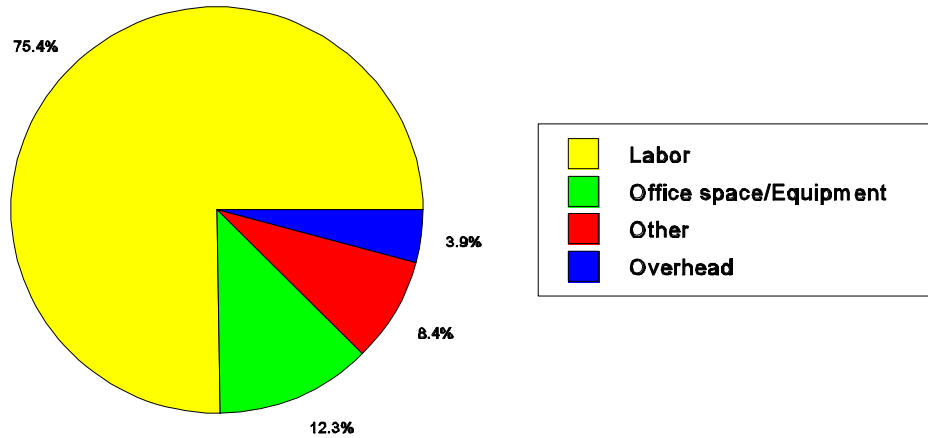
As shown in Exhibit 4-2, the design and development process was very labor-intensive, with labor and associated overhead costs making up the bulk of the costs. Labor costs were \$1.81 million, or 75 percent of the total design and development cost. Design and development-related labor totaled 22.4 person-years.

Exhibit 4-1

Total Design and Development Costs

	Vendor	ODHS	County	Total
Labor	\$1,706,456	\$100,727	\$2,754	\$1,809,937
Telecommunications	\$39,577	\$0	\$0	\$39,577
Travel/vehicle leases	\$21,921	\$2,166	\$0	\$24,087
Office space/equipment	\$294,386	\$0	\$0	\$294,386
Stationery and supplies	\$64,896	\$0	\$0	\$64,896
Miscellaneous	\$36,981	\$122	\$0	\$37,103
Computers	\$0	\$34,411	\$0	\$34,411
Overhead ^a	\$92,423	\$0	\$0	\$92,423
Total costs	\$2,256,640	\$137,426	\$2,754	\$2,396,820
Total person-years	21.5	0.9	0.04	22.4

a ODHS and CDHS overhead costs are included in the labor line-item.

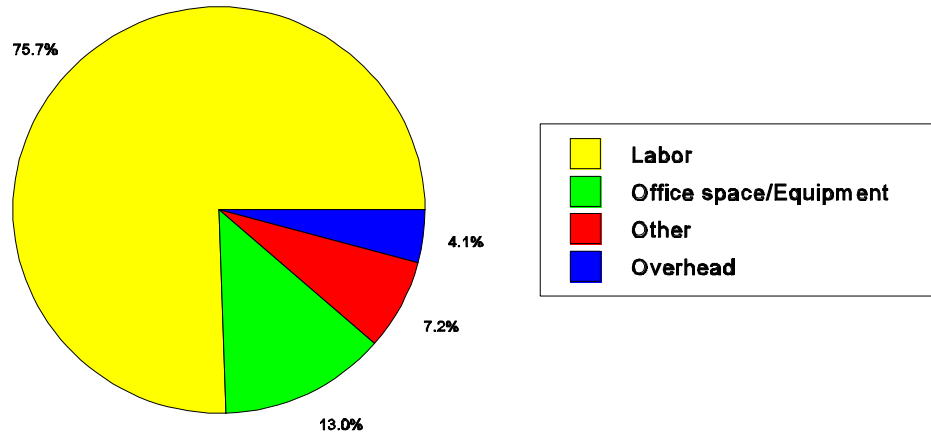
Exhibit 4-2**Total Design and Development Costs, by Cost Category**

4.4 Vendor Design and Development Costs

Citibank and its subcontractors incurred a total of \$2.26 million in resource costs for design and development, as shown in Exhibit 4-3. Of this, \$1.71 million was labor costs. The vendor team's resource costs are higher than its billed costs; Citibank billed ODHS a total of \$1.24 million for deliverables related to system design and development.

Exhibit 4-3**Vendor Design and Development Costs**

	Citibank	CENTECH	SVS	Total
Labor	\$155,773	\$1,173,972	\$376,710	\$1,706,456
Telecommunications	\$3,376	\$36,201	\$0	\$39,577
Travel/Vehicle leases	\$3,189	\$17,471	\$1,262	\$21,921
Office space/Equipment	\$59,264	\$235,122	\$0	\$294,386
Stationery and supplies	\$43,299	\$21,597	\$0	\$64,896
Miscellaneous	\$8,646	\$28,026	\$309	\$36,981
Overhead	\$39,540	\$7,489	\$45,394	\$92,423
Total costs	\$313,088	\$1,519,878	\$423,675	\$2,256,640
Total person-years	1.2	13.5	6.8	21.5

Exhibit 4-4**Vendor Design and Development Costs, by Cost Category**

Citibank

As prime contractor for the project, Citibank managed the overall contract, provided overall project management, and oversaw the work of CENTECH and SVS. Citibank expended \$313,088 in design and development costs. About half of this represents labor costs associated with the two Citibank staff assigned to the project, the project director, and the assistant project director.

Total design and development-related labor for Citibank was 1.2 person-years. Between July and November 1996, the Citibank project director spent 90 to 100 percent of his working time on system design and development activities, and 80 percent of his time from December 1996 through April 1997. The assistant project director spent 90 to 95 percent of her work time on design and development in November and December 1996, and 80 percent of her time from January through April 1997.

Citibank established an office in Columbus to house its EBT project staff. As a result, the main non-labor costs were office space and equipment, stationery and supplies, and overhead (see Exhibit 4-3).

Century Technologies, Inc.

CENTECH incurred \$1.52 million in design and development costs, including \$1.17 million in labor expenses. CENTECH's labor costs are associated with 18 staff people spending an average of 82 percent of their work time on design and development. The total design and development labor expenditure represents 13.5 person-years of effort. The primary non-labor costs were for office space and equipment, supplies, and telecommunications (see Exhibit 4-3). Telecommunications costs included establishing and equipping a telephone center in preparation for the implementation phase.

As described in Chapter 3, CENTECH was involved in many tasks during the design and development phase. In particular, CENTECH was responsible for the following activities: developing procedures for contacting retailers and executing agreements with them, developing procedures for equipping retailers with EBT equipment and training them on use of the equipment, and writing the Retailer Training Manual, the County Training Manual, and the Implementation Plan.

The largest portion of CENTECH's effort was devoted to developing a system for site surveys and establishing equipment installation and maintenance systems. These tasks required the development and documentation of all the technical and procedural steps to support the installation and maintenance of EBT equipment. In addition, the development of the training modules for retailers and counties accounted for a large portion of labor resources. Finally, the process of planning for implementation required job-stream analysis to determine what needed to be accomplished and how quickly.

CENTECH's design and development costs—representing two-thirds of the EBT vendor team's costs—are relatively high in part because CENTECH was not previously in the business of installing EBT equipment. Therefore, CENTECH incurred “start-up” costs that a firm with more experience and with the necessary infrastructure already in place would not have incurred.

Stored Value Systems

SVS was responsible for completing the technical work required to revise the off-line EBT system for statewide expansion. Key areas of responsibility included:

- drafting the Detailed System Design Document;
- enhancing the security of the system;
- refining card, terminal, and host system software; and
- acceptance test planning, execution, and reporting.

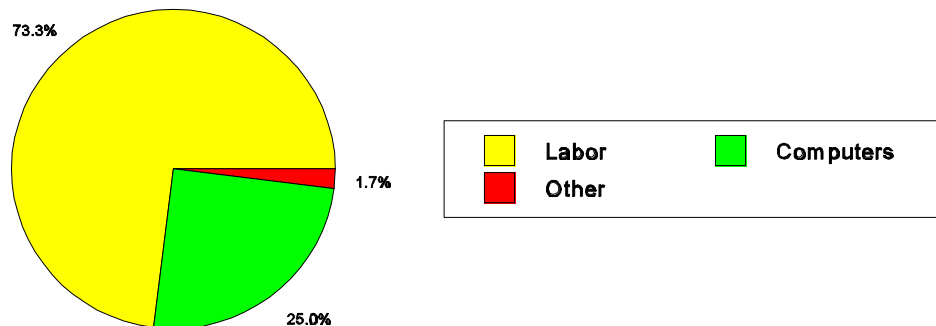
SVS incurred \$423,675 in design and development costs, almost all of which was labor costs. SVS' labor costs are associated with 17 staff people spending an average of 44 percent of their work time on design and development. The total labor expenditure on design and development was 6.8 person-years.

4.5 Ohio Department of Human Services Design and Development Costs

ODHS directly incurred a total of \$137,426 in design and development costs, excluding costs billed to the agency by Citibank, as shown in Exhibit 4-5. These costs were incurred on the following design and development activities: review of and comment on the Detailed System Design Document, the Acceptance Test Plan, the Acceptance Test Report, the Implementation Plan, the Risk Analysis Report, and manuals and training materials; development of the Implementation Advanced Planning Document (IAPD); software development for CRIS-E; meeting with the Ohio Grocers' Association for recruitment of retailers; and conducting the acceptance test. The bulk of these costs, \$100,727, were direct labor costs associated with the three ODHS staff people working on the EBT project. The budget called for the three staff to spend an average of about 60 percent of their time on design and development activities during a six-month period, for a total labor commitment of 0.9 person-years. The balance of ODHS' direct costs were for computers, travel, and miscellaneous items.

Exhibit 4-5**ODHS Design and Development Costs**

	Total
Labor	\$100,727
Travel	\$2,166
Computers	\$34,411
Miscellaneous	\$122
Total	\$137,426

Exhibit 4-6**ODHS Design and Development Costs, by Cost Category**

4.6 County Design and Development Costs

Most counties did not incur costs during the design and development phase of the expansion of the off-line EBT system in Ohio. The six county departments of human services that participated on the County Advisory Board, however, incurred expenses related to the participation of county staff on the board. The members observed a demonstration of the pilot system in Montgomery County in July 1996 and met with ODHS and vendors to discuss the planned system design in August 1996. Each of these meetings

lasted approximately one-half day. The total county costs associated with activities of this committee are estimated at \$2,754.³ The total labor commitment was approximately 0.04 person-years.

4.7 Comparison of Design and Development Costs to the Pilot

As stated previously, this evaluation estimates the design and development costs for the statewide Direction CardK system to be \$2.40 million. This is roughly comparable to the \$2.1 million needed by the state, Montgomery County, and the EBT vendor for the design and development of the off-line EBT pilot in Montgomery County, although the two estimates are based on different types of cost data and cover different sets of activities.⁴

The costs to design and develop the pilot system represent the creation of the off-line system from the ground up, whereas, to a great degree, Ohio's statewide system was built upon the pilot system and the off-line EBT system in Wyoming. In this respect, we would expect the design and development costs of the statewide expansion to be lower than those for the pilot system. SVS' costs of \$423,675 for the design and development of the Direction CardK system were, in fact, only a fraction of the almost \$1.9 million (in 1997 dollars) incurred by NPC for the design and development of the pilot off-line EBT system. The statewide design and development costs, however, include the costs to put into place the systems, procedures, and infrastructure necessary for a multi-year roll-out involving all 88 counties in Ohio. The pilot system, on the other hand, involved the conversion of less than one full county from paper food stamps to off-line EBT.

The start-up costs for the Ohio statewide EBT system were quite a bit higher than the \$1.4 million in design and development costs estimated for the off-line PayWest EBT system in Wyoming.⁵ Although the Wyoming system also built directly on the Dayton pilot project, most design and development costs were related to adding the WIC program to the system. The WIC program is fundamentally different from the FSP or cash-based assistance programs, in that the benefits are issued as a prescription for specific foods. Like the Dayton pilot, the Wyoming system was originally implemented on a very small scale and did not require the extensive implementation planning effort required by statewide rollout in Ohio.

In a sense, the full set of state and vendor resources invested in the design and development of the Direction CardK system includes a portion of the \$2.1 million design and development cost for the

3 The estimate is based on six members with a typical salary of \$48,000 plus 53 percent fringe, each spending a total of twelve hours on committee-related activities. (The fringe rate includes pay for all types of leave as well as outlays in addition to salary.)

4 Glickman *et al.*, *The Impacts of the Off-line EBT Demonstration on the Food Stamp Program: Volume I – Impacts on Administrative Costs*, U.S. Department of Agriculture Food and Nutrition Service, April 1994. The original cost of \$2.3 million, incurred from 1990 to 1994, has been adjusted for inflation, and FNS' share (\$0.5 million in 1997 dollars) has been excluded for purposes of comparison. For the pilot project, all parties reported their actual costs, except for unbilled overtime spent by vendor personnel.

5 Elwood *et al.*, *Issues in Planning Off-line EBT for the WIC and Food Stamps Programs: Interim Evaluation of the Wyoming Smart card Demonstration*, Cambridge, MA: Abt Associates Inc., April 1996. The original cost of \$1.3 million has been adjusted for inflation.

Dayton pilot, plus a portion of the \$1.3 million in design and development costs for the Wyoming project, as well as the \$2.4 million spent by ODHS and the Citibank team. There has been, however, a great deal of repetition in documentation, testing, implementation and other activities that did not directly contribute to the current generation of off-line EBT technology. Thus, another state and vendor starting from scratch would probably spend more than \$2.4 million to achieve the same result, but certainly much less than the combined \$5.8 million cost of design and development for the three projects.

At present, the Direction CardK system serves only the FSP, so all of the design and development costs are attributed to the FSP. With some modification, however, the system has the capability to deliver cash assistance benefits and, with some further development, WIC benefits as well. As of the fall of 1998, ODHS was finalizing plans regarding whether and when to add these benefits to the EBT system. If the Direction CardK system is ultimately used to deliver other assistance as well as FSP benefits, a portion of the costs of joint system design and development will be attributable to the other assistance programs.

Chapter 5

System Implementation

5.1 Introduction

On January 1, 1997, the Citibank team converted those food stamp recipients using the PayEase system in Montgomery County to the Direction Card**K** system. To accomplish this conversion, the team installed new POS terminals in retailer locations and issued new EBT cards to recipients. These actions marked the start of the planned statewide expansion of the Direction Card**K** system, an expansion that is expected to take approximately two and one-half years to complete.

Due to the extended period over which the system will be implemented statewide, the evaluation of the off-line EBT project is splitting its examination of implementation activities into two phases—"early implementation" and "late implementation." The early implementation phase includes all expansion activities through March 1998, a period of 15 months. During this period, ten counties in the southwestern part of the state began converting recipients to the Direction Card**K** system. County administrators in all ten counties were contacted to determine their experiences with the conversion process. Evaluation staff also interviewed representatives of ODHS and the EBT vendors to gain as complete a picture of implementation activities as possible.

The key findings with regard to early implementation efforts include:

- Implementation efforts are generally going well. Some unexpected problems have arisen, but most have been minor.
- The parties involved in implementing off-line EBT have done a good job of communicating and cooperating with one another. ODHS and the Citibank team have actively sought feedback from counties, retailers, and recipients, and they have used this information to improve their implementation strategies. Counties have taken the initiative in reporting problems and in seeking assistance from ODHS and Citibank.
- County staff report that they prefer the EBT system to the paper coupon system. EBT has eliminated the liability associated with lost and stolen coupons and opened up new and more challenging employment opportunities. County staff also say that recipients seem pleased with the Direction Card**K** system. Finally, both county staff and a representative of the Ohio Grocers Association say that retailers appear to prefer the EBT system.
- In completing statewide conversion, ODHS and the Citibank team will face additional challenges. These will include addressing hardware and software problems that have been reported during early implementation, and dealing with the higher level of activity required to convert Cuyahoga County (Cleveland) to off-line EBT.

5.2 Sequencing of System Implementation

As noted, the Direction Card**K** system began operations on January 1, 1997, when approximately 7,700 food stamp recipients using the PayEase system were converted to the new system. After a planned “shakedown” period of operating the new system with this caseload, the first step in expanding the system was to convert the remaining 7,500 food stamp recipients in Montgomery County to EBT. Before this expansion could begin, the Citibank team first had to equip all FSP-authorized retailers in the county with EBT terminals and train retailer staff in how to use the equipment. Thus, in March 1997, CENTECH began equipping retailers in Montgomery County outside the area served by the PayEase pilot. In August, the Montgomery County Department of Human Services began converting food stamp recipients from food stamp coupon issuance to EBT issuance. These recipients began receiving benefits through the EBT system in September 1997. All food stamp recipients in Montgomery County were converted to EBT by January 1, 1998, five months after county expansion began.

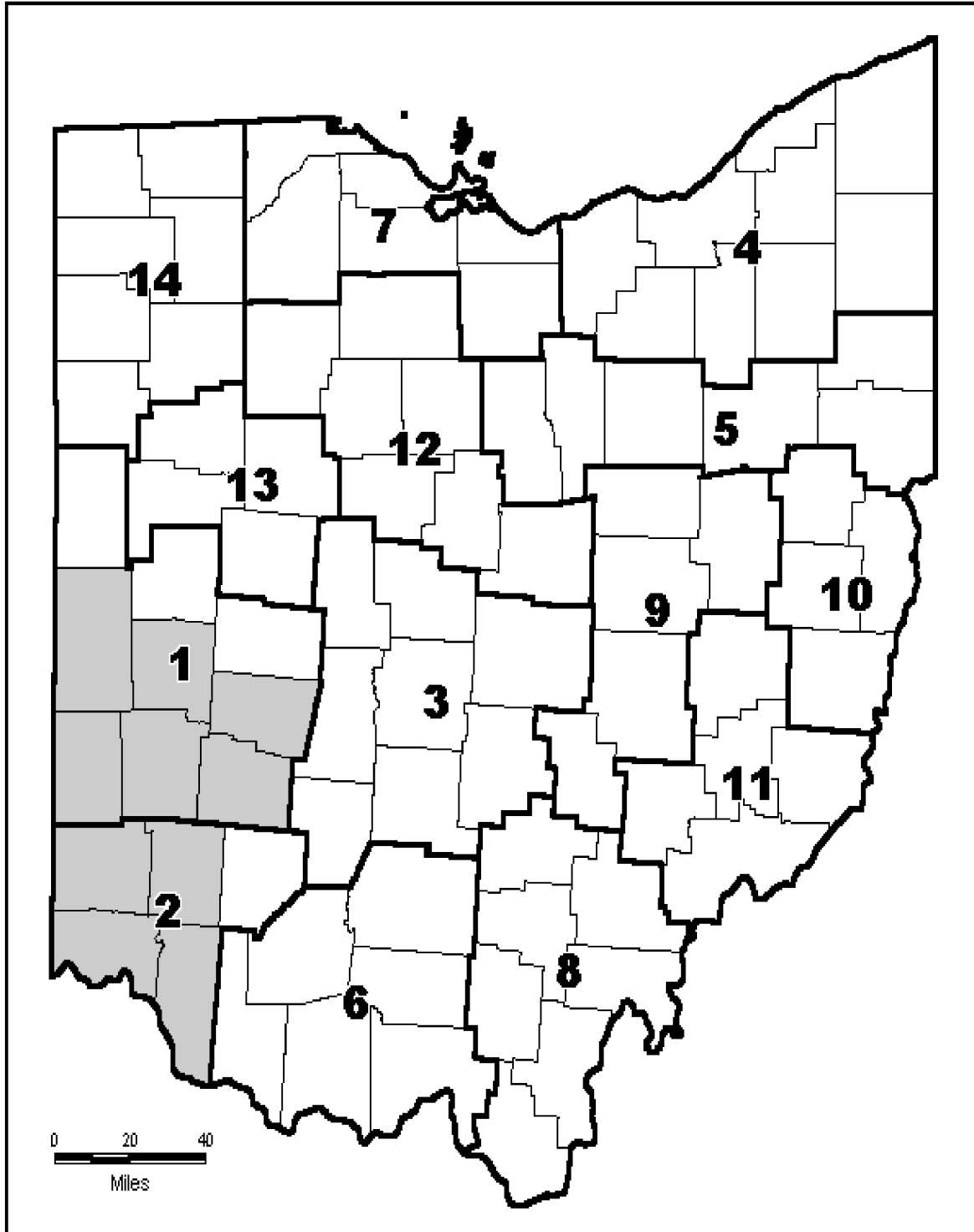
With no prior EBT experience, conversion activities in other counties are following a somewhat different pattern than in Montgomery County. Conversion begins with a group meeting with program-authorized retailers in a county, followed by signed agreements between Citibank and the retailers, site visits to the stores, and equipment installation and retailer training. In a parallel set of activities, CENTECH installs EBT equipment in the county offices and trains county staff in EBT-related functions. County staff then begin converting recipients to the Direction Card**K** by issuing them EBT cards and providing EBT training. Many counties are converting food stamp recipients to EBT when they come to the office for certification or recertification, although some counties have recipients come to the office specifically for EBT card issuance and training.

Plans call for food stamp recipients in Ohio to be converted to EBT as 14 groups of counties, or “clusters,” are sequentially equipped for the new system. Exhibit 5-1 shows the 14 clusters and the order in which they will be converted to EBT. The ten shaded counties in the lower left of the map are those included in this chapter’s description of the early implementation phase. Exhibit 5-2 lists all 14 counties in the first two clusters, with the ten shaded counties shown in italics. As shown in the exhibit, conversion activities started in six of the nine counties within the first cluster by October 1997. Conversion activities then began in the second cluster of counties. The ten counties interviewed for this report contain approximately 17 percent of the retailers and 18 percent of the food stamp recipients who will ultimately be converted to the Direction Card**K** system. They include both small, rural counties (e.g., Darke and Preble) and large, urban counties (e.g., Montgomery, which includes Dayton, and Hamilton, which includes Cincinnati, the state’s second largest city).

By May 1998, conversion activities had begun in all counties in the first two clusters. In June, the Franklin County Department of Human Services, which is in Columbus and is part of the third cluster of counties, began converting recipients. The following month, one office within Cuyahoga County, which includes Cleveland and is in the fourth cluster, began recipient conversion. Thus, the pace of system implementation has picked up in the second half of 1998. The state plans to have all food stamp recipients converted to the Direction Card**K** system by July 1999.

Exhibit 5-1

County Clusters to Be Converted to EBT



Note: Representatives from shaded counties were interviewed for this report.

Exhibit 5-2**Counties Converted to Off-line EBT^a**

County	FSP Caseload (July 98)	EBT Caseload^b (July 98)	Month Conversion Started^c	Duration of Conversion (months)
Cluster 1				
<i>Montgomery</i>	14,458	15,033	<i>Aug 97</i>	5
<i>Greene</i>	2,055	2,167	<i>Sept 97</i>	6
<i>Preble</i>	502	529	<i>Sept 97</i>	3
<i>Darke</i>	578	601	<i>Oct 97</i>	7
<i>Miami</i>	1,119	1,202	<i>Oct 97</i>	4
<i>Clark</i>	4,803	5,141	<i>Oct 97</i>	6
Shelby	578	612	Apr 98	3
Champaign	612	485	May 98	3
Mercer	431	308	May 98	5
Cluster 2				
<i>Butler</i>	5,067	5,497	<i>Nov 97</i>	7
<i>Hamilton</i>	22,888	18,404	<i>Dec 97</i>	10
<i>Warren</i>	1,122	1,206	<i>Jan 98</i>	5
<i>Clermont</i>	1,900	2,189	<i>Feb 98</i>	5
Clinton	629	712	May 98	2

a Counties interviewed for this report are shown in italics.

b EBT caseload figures have been compiled from vendor documents that report the number of EBT issuances each month. Because issuances include supplemental issuances as well as regular recurring issuances, the actual EBT caseload is somewhat less than indicated in the exhibit.

c First month in which EBT training and card issuance began.

5.3 Implementation Plan

Much of the planning required to implement the Direction Card^K system was in place before statewide expansion began. For instance, many of the planning documents prepared during the Dayton pilot were revised for statewide implementation. In addition, a detailed Implementation Plan was prepared during the design and development phase. The Implementation Plan outlined major tasks associated with statewide expansion of off-line EBT and specified the dates on which the tasks were to occur.

The Implementation Plan called for clusters of counties to be converted to EBT at about the same time. Most clusters include a major metropolitan area and several surrounding counties. (Thus, for instance, Dayton is the major metropolitan area in the first cluster, Cincinnati in the second cluster, Columbus in the third, and Cleveland in the fourth.) This clustering approach allowed the Citibank team to focus its conversion efforts in one or two geographic areas at a time. In determining when counties would be converted to off-line EBT, the Citibank team took two main factors into account. First, the team was interested in getting as many counties converted as quickly as possible. Second, the team wanted to gain experience in smaller counties before beginning conversion in the largest counties—Hamilton, which contains Cincinnati, and Cuyahoga, which contains Cleveland.

The Implementation Plan outlined the main tasks and time frames associated with implementing off-line EBT in each county. The retailer conversion activities identified in the Implementation Plan included the following:

- presenting off-line EBT at retailer meetings in each metropolitan area;
- mailing information packets to retailers;
- obtaining signed agreements from retailers;
- establishing retailer accounts on the EBT system;
- wiring stores;
- installing equipment; and
- training retailers.

The county office conversion activities identified in the Implementation Plan included:

- mailing letters to EBT coordinators in each county;
- completing site visits;
- setting up accounts for counties;
- installing equipment; and
- training county staff.

Although the Implementation Plan outlined the main tasks and time frames, it was necessary for the Citibank team to specify further its plans for working with each county and each retailer. For example, although the date that each county was to be trained and equipped was projected in the Implementation Plan, the actual dates were left to the discretion of the counties, within specified ranges. CENTECH took the lead on the time-consuming task of establishing dates to equip counties and train county staff. This task was especially time-consuming when county staff changed their minds about when they wanted to be equipped, where they wanted equipment placed, and when they wanted to be trained.

Additional planning took place early during the implementation phase. This planning included continual meetings with the Ohio Grocers Association (OGA), Kroger's (the largest food retail chain in the state of Ohio), community organizations, and selected counties. It also included revising several existing planning documents, and revising the tasks and timeframes associated with converting retailers and county offices.

During the early implementation phase, ODHS and the Citibank team continued to plan and meet with the OGA. Meetings between Citibank and the OGA were held as needed during early implementation.

On average, meetings were held once every four to six weeks. Sometimes, however, two or three months passed between meetings. There was only one main issue on which ODHS and the Citibank team disagreed strongly with the OGA. The OGA wanted ODHS and the Citibank team to equip 100 percent of grocers' lanes with off-line EBT equipment. ODHS and Citibank felt that this was not feasible. A compromise solution was reached prior to rollout. This compromise solution involved using a formula to determine how many lanes were to be equipped.¹

Although ODHS had been quite involved in the more general planning that took place during the design and development phase, ODHS was less involved in the detailed planning that took place during the early implementation phase. ODHS staff, however, assisted the Citibank team in preparing planning documents, attended planning meetings, and assisted the Citibank team with day-to-day problem-solving activities.

5.4 Retailer Conversion Activities

Within the Citibank team, CENTECH has responsibility for converting retailers to the Direction Card**K** system. As discussed in the next section, CENTECH also handles conversion of CDHS offices. Retailer conversion activities are usually scheduled prior to county conversion activities because of the time needed to equip all program-authorized retailers within a county. In small counties early in the implementation phase, however, retailers and county offices were sometimes prepared for conversion simultaneously.

As part of its effort to prepare retailers for EBT, the Citibank team prepared an introduction package that included a letter and a brochure explaining the new Direction Card**K** system. The Citibank team also held a series of meetings to inform retailers about off-line EBT. During these meetings, Citibank staff and ODHS staff gave presentations about the new system and answered retailers' questions. One meeting was held in each cluster of counties. At these meetings retailers raised a number of concerns and questions. In cases where issues raised at retailer meetings were not fully resolved during the meeting, ODHS and the Citibank team worked with the OGA to resolve the issues successfully.

Once the initial meeting with county retailers had been completed, CENTECH sent an information packet with a retailer agreement form to all retailers. The agreement form represented the basic contract between the retailer and Citibank to provide EBT services. Retailers were asked to completely fill out the agreement, sign it, and return it to CENTECH. With a signed agreement in hand, the Citibank team would establish an account for the retailer on the EBT host and initiate efforts to equip and train the retailer.

This approach did not work particularly well, often because retailers either had trouble or were otherwise delayed in filling out the agreement. Responding to feedback from retailers, the Citibank team decided to

¹ For stores redeeming less than \$1,000 in FSP benefits each month, one free EBT terminal would be provided. Two lanes would be equipped for free if the store redeemed between \$1,000 and \$6,000 in FSP benefits each month. For stores redeeming more than \$6,000 in benefits per month, the percentage of lanes to be equipped would be either 50 percent or the percent required by EBT regulation, whichever was higher. In the majority of cases, 50 percent of grocers' lanes are being equipped. The ODHS estimates that this more liberal method of calculating the number of free terminals will require that approximately 1,800 more EBT terminals be deployed than originally projected.

take a new approach to securing signed retailer agreements. First, as before, CENTECH mailed out the information packets. This mailing was then followed with a telephone call, during which time CENTECH staff asked questions about the retailers' sites and provided retailers with additional information about off-line EBT. These conversations allowed CENTECH to collect information and address the concerns of reluctant retailers. At the end of the telephone calls, CENTECH had all the information it needed to complete the retailer agreements and send them out for signature. Once retailers began receiving follow-up phone calls and retailer agreements that were filled out in advance, retailers were much quicker to sign the contracts and send them back to Citibank.

Retailer installation was relatively straightforward once planning and preparation activities were completed. After retailers returned signed agreements, CENTECH authorized retailers to use the Direction CardK system. SVS then established an EBT account on the host system for each retailer, and CENTECH shipped equipment to retailers via UPS. Shortly after the equipment arrived at a particular store, a CENTECH installation crew would install the equipment. Finally, CENTECH set up a training appointment with each retailer. The trainers helped retailer staff learn how to use EBT equipment properly and provided a manual with operating instructions.

5.5 County Conversion Activities

It took more work to prepare counties in Ohio for off-line EBT than Citibank expected. In other states, Citibank was able to send EBT information packets to a central office, but because Ohio is a county-administered state, the Citibank team had to deal with each county individually. This required that CENTECH make many phone calls to the individual EBT coordinators in each county to plan the details of preparation for off-line EBT.

As part of its effort to prepare counties for conversion to off-line EBT, ODHS and Citibank developed and distributed an introduction packet that introduced counties to off-line EBT. This packet contained a letter and a short informational brochure. After sending letters, CENTECH staff contacted counties by phone. During these phone calls CENTECH asked a number of questions, and also answered some of the counties' questions about off-line EBT. During this phone call CENTECH staff also set a date for a site visit to each county.

The site visit involved a one-hour presentation, a video describing the Direction CardK system, and a demonstration of off-line EBT equipment. CENTECH staff also examined counties' physical facilities during site visits. This allowed CENTECH and the counties to jointly determine where off-line EBT equipment would be placed. In some cases, CENTECH staff discovered that little work was required to install off-line EBT equipment; in other cases, it was necessary to cut through floors to access the needed electrical and phone lines. CENTECH staff worked closely with county staff, and helped county staff think through when and where off-line EBT equipment should be placed. Factors such as traffic flow and space requirements were taken into account in determining the location of equipment.

After site visits, the Citibank team ordered the equipment needed to convert counties to off-line EBT. This equipment included computers, modems, and POS terminals. Counties were provided with stand-alone computers for off-line EBT. These computers allow the counties to communicate with both SVS' system host computer and ODHS' main processing computer through use of modems and terminal emulation adapter cards. A few counties were also provided with Customer Service Terminals (CSTs).

These terminals allowed counties to obtain authorization codes from SVS' main off-line EBT processing computer. The authorization codes were required for some EBT card issuance and replacement functions.

Although ODHS and the Citibank team provided substantial guidance and assistance, CDHS staff were also responsible for preparing for conversion to EBT. Each county prepared for off-line EBT in a different way. For example, making appropriate staffing changes was one of the more important activities associated with county preparation for off-line EBT. Guidance regarding staffing changes was provided by ODHS and the Citibank team in the form of suggested staff positions for off-line EBT. These staff suggestions were developed well before implementation and included the following positions:

- Fiscal Control Officer—responsible for card issuance and terminal-based transactions that update Direction Cards and the EBT computer.
- Assistance Control Officer—responsible for assisting clients in addressing issues by diagnosing problems presented by recipients, preparing appropriate approval forms, and contacting SVS when necessary.
- Card Inventory Manager—responsible for managing the card inventory.
- Trainer—responsible for training clients.
- Supervisor—responsible for overseeing the work of the Assistance Control Officer, Fiscal Control Officer, Card Inventory Manager, and Trainer.

The system design called for these positions to be staffed by different people. In other words, the Card Inventory Manager was not supposed to also serve as an Fiscal Control Officer or Assistance Control Officer. In practice, however, CDHS staffing patterns varied considerably. In small offices, individual staff members often filled multiple roles. For example, a single staff member might serve as Assistance Control Officer, Fiscal Control Officer, and part-time trainer. In small county offices there were not enough staff to separate roles according to the state's guidance. Also, in smaller counties it was important for each staff member to be capable of playing multiple roles. Otherwise, there might be no one available to cover for an absent staff member. In order to learn all the roles, staff performed multiple duties on a regular basis.

Prior to EBT implementation, counties used a variety of benefit issuance systems. As a result, CDHS offices varied considerably in their pre-EBT staffing patterns. Some counties had used mail issuance exclusively, and some used a vendor to mail benefits and thus did not have an in-house issuance staff. CDHS offices that lacked FSP issuance staff drew on staff from other departments to fill the staff positions required to implement off-line EBT. The staff from other departments required additional training, because they first had to learn about the FSP before learning about food stamp distribution under the Direction CardK system. Counties with a sufficient number of existing food stamp issuance staff had an easier transition to the EBT environment.

Installation of equipment in county offices typically occurred after the majority of retailers had already been installed. Although there were fewer county offices than retailers, installing equipment in each

county office took much more effort and time than installing an individual retailer. Some counties were especially difficult to equip because they had old facilities. For example, in some cases the conduits needed for computer cables and wires were inadequate, requiring CENTECH staff to install new conduits to support the wiring required for EBT equipment.

CENTECH installed equipment at a time chosen by the county. Training for counties typically involved a video, a presentation by a CENTECH staff member, and a question-and-answer session. The Director of Management of Information Systems (MIS) for ODHS attended the initial meetings between CENTECH and the counties. The director answered questions about the interface between the EBT and CRIS-E systems, helped counties make appropriate decisions regarding placement of equipment, and helped to ensure that the counties felt comfortable with the implementation process.

After CENTECH's training, CDHS staff conducted self-training using a training mode available on the EBT equipment. Counties also contacted CENTECH with follow-up questions after the initial training. Some counties contacted CENTECH once or twice following their initial training, whereas other counties contacted CENTECH dozens of times with various follow-up questions. CENTECH staff used this feedback to help focus training efforts in counties subsequently converted to EBT, although the training materials themselves were not revised.

CENTECH initially conducted training the day after equipment was installed, typically four to six weeks before recipient conversion. Starting in early 1998, however, CENTECH encouraged counties to schedule staff training closer to counties' recipient conversion start dates. CENTECH took this action based on feedback from the initial set of counties it trained. This initial set of counties indicated that the training they received was good, but that they had forgotten much of what they learned in training by the time they began recipient conversion.

Several unexpected issues arose during conversion to off-line EBT. One example was disagreement over the extent to which caseworkers were to be involved in off-line EBT. ODHS policy was that eligibility workers not be involved in conversion. In some instances, however, caseworkers provided clients with information regarding off-line EBT, or attempted to make EBT-related decisions such as when a client would be converted to the EBT system. These disagreements were generally resolved quickly, with caseworkers remaining uninvolved in off-line EBT.

Another issue that had to be addressed under off-line EBT was the issue of new computer system "profiles." Under the CRIS-E system, each staff member has a profile in the computer system. The profiles determine which staff can view and change various data files. Under the coupon issuance system, all issuance staff had the same profile. Under the EBT system, the various staff involved in the distribution of food stamps have distinct profiles consistent with their roles in the issuance process. For example, fiscal control officers, who are responsible for issuing cards, have different profiles, and access to different system features, than assistance control officers. Similarly, assistance control officers, who troubleshoot and adjust the status of cards, have different profiles than trainers. This separation of roles and access to system features protects the security of the system. After equipment was installed in a CDHS office, ODHS established new profiles for the CDHS staff. As discussed previously, smaller counties initially had difficulty making their staffing patterns fit with ODHS' system profiles. This issue was addressed quickly by changing the profiles to match each county's staffing patterns.

5.6 Recipient Conversion Activities

After CENTECH installed EBT equipment in retailers' and counties' facilities, counties began the time-consuming process of converting recipients to the Direction Card^K system. County staff scheduled appointments, trained recipients to use the new system, completed the processing required to initiate recipient accounts on the EBT system, and confronted numerous small problems. Exhibit 5-3 shows the pattern of recipient conversion in the ten counties examined in this report. The shaded cells show the months in which existing FSP cases were converted to the Direction Card^K system.

Exhibit 5-4 shows the total number of active EBT cases statewide each month, including counties not shown in Exhibit 5-3. The large jump in new cases beginning in March 1998 coincides with the conversion of recipients in Hamilton County, where roughly 3,000 to 5,000 recipients were converted to EBT each month.

Exhibit 5-3

Number of Active EBT Cases, by Month and County

Month	Cluster 1						Cluster 2			
	Mont-gomery	Greene	Preble	Darke	Miami	Clark	Butler	Hamilton	Warren	Clermont
Aug 97	7,460									
Sept 97	8,337									
Oct 97	10,696	151	41	4	4	6				
Nov 97	13,405	422	198	122	216	33			1	
Dec 97	14,954	1,350	559	186	551	738	24	1	0	
Jan 98	15,631	1,746	552	221	1,066	1,569	725	164	0	
Feb 98	15,216	2,071	542	289	1,189	3,082	1,990	402	16	
Mar 98	15,471	2,310	570	366	1,272	4,562	3,227	3,327	352	26
Apr 98	15,163	2,288	545	452	1,235	5,331	3,526	7,131	809	364
May 98	15,180	2,275	526	597	1,179	5,230	4,417	10,757	1,041	692
June 98	15,355	2,252	538	624	1,229	5,249	5,517	13,648	1,259	1,126
July 98	15,033	2,167	529	601	1,202	5,141	5,497	18,404	1,206	2,189

Shaded months indicate when existing caseload was being converted to the Direction Card^K system. In the few situations in which only a limited number of cases in a county were receiving benefits via EBT, these households had transferred into the county after receiving their card and training elsewhere.

EBT caseload figures have been compiled from vendor documents that report the number of EBT issuances each month. Because issuances include supplemental issuances as well as regular recurring issuances, the actual EBT caseload is somewhat less than indicated in the exhibit.

Exhibit 5-4**Number of Active EBT Cases Statewide**

Month	EBT Caseload ^a	Increase from Prior Month	Percent of FSP Caseload Converted
Aug 97	7,460		2.1%
Sept 97	8,337	877	2.3
Oct 97	10,902	2,565	3.1
Nov 97	14,397	3,495	4.2
Dec 97	18,363	3,966	5.3
Jan 98	21,675	3,312	6.4
Feb 98	24,798	3,123	7.4
Mar 98	31,483	6,685	9.4
Apr 98	36,847	5,364	11.4
May 98	41,947	5,100	13.0
June 98	48,355	6,408	15.0
July 98	57,404	9,049	18.2

a EBT caseload figures have been compiled from vendor documents that report the number of EBT issuances each month. Because issuances include supplemental issuances as well as regular recurring issuances, the actual EBT caseload is somewhat less than indicated in the exhibit.

One of the most significant problems counties faced in converting recipients to the new system was absenteeism. Most counties reported that only one-quarter to one-half of recipients showed up for their initial appointments to be converted to EBT. Some counties sought to address this issue by switching all recipients to the Direction Card^K system on the day they were scheduled for conversion, forcing recipients to come into the county office for training in order to access their benefits. Other counties were more patient, allowing recipients to remain on the paper system until the end of the conversion period. Then, near the end of conversion, recipients were informed that they would have to convert to off-line EBT in order to continue receiving FSP benefits.

In a few cases, recipients refused to convert to the new system. Most often, these recipients received only a small amount of food stamp benefits and had difficulty commuting to the county office for their conversion appointment. In these cases, recipients' benefits were discontinued.

Recipient training involved a standard 10-minute video provided by ODHS and the Citibank Team, a 5- to 15-minute presentation by county office staff, a question-and-answer session, and some form of practice to ensure that recipients understood how to use their smart cards. The presentations given by county staff generally repeated important information given in the video and explained selected steps in

greater detail. For example, most counties used part of the presentation to review instructions for selecting the three stores at which recipients could collect their benefits each month. Counties also generally encouraged recipients to ask questions about the new system and scheduled a considerable amount of time for such questions.

Most counties established a procedure to verify that recipients understood how to use the Direction Card^K properly. Typically, after the video, presentation, and questions, but before recipients received their actual cards, recipients used a practice card to complete a transaction. If the recipient did not successfully complete the transaction, CDHS staff would provide additional assistance.

After recipients completed the training session, they met with FCO staff, who verified demographic information and obtained the names of three stores that the recipients planned to use most frequently. The FCO staff then entered these three stores into the computer system and reminded the recipients that they would be able to collect their benefits only at these three stores or the CDHS office. Finally, the EBT cards were issued to recipients. The recipients were able to leave the office with the cards, but the benefits were not available until 24 to 48 hours later.

Predictably, as recipients began to use their EBT cards, they encountered a variety of difficulties. Recipients were instructed to seek help in resolving card-related problems by contacting the SVS customer service center or their local CDHS office. Recipients were given a toll-free telephone number they could use to reach SVS customer service to report problems 24 hours a day. They were also encouraged to contact the ACO staff at their county office with questions. Both customer service and the ACO staff helped recipients to determine the nature of the problem and identify appropriate solutions.

The most common problems that occurred during the early post-conversion period were:

- lost, stolen, or damaged cards;
- forgotten PINs; and
- problems with the issuance amount.

Lost, stolen, or damaged cards were the most prevalent problems, requiring county offices to replace cards for 3 to 4 percent of the caseload each month. Forgotten PINs were less common. Most of the problems relating to the amount of benefits loaded on the card resulted from a mistake or a misunderstanding about the amount of benefits authorized. In Montgomery County, only about one case a month involved a discrepancy between the amount authorized and the amount issued to the Direction Card.

It was sometimes possible for ACO staff to resolve recipients' problems quickly and easily. In other cases, they needed to contact SVS customer service for assistance or approval. For instance, when cards are lost, stolen, or damaged, ACO staff are required to report the incident to SVS. If the recipient contacted SVS, SVS staff would try to address the problem, but would refer the recipient to the county office if additional information about the client was required to resolve the problem.

5.7 Implementation Problems

In general, early implementation activities have proceeded smoothly. Equipment installation has been difficult in some stores and CDHS offices (usually those located in older buildings), but this is to be expected. Furthermore, with experience, the Citibank team has improved its ability to efficiently schedule the various implementation tasks at retail stores and county offices. As described below, there have also been some software and hardware problems.

Software Problems

Early in 1998, a programming problem affecting when benefits are available to recipients was identified. Although the problem affected a relatively small number of recipients, it caused significant hardship for them and created additional work for county staff. The problem, which was corrected by September 1998, stemmed from the system's assignment of sequential numbers to issuances. To prevent the downloading and subsequent collection of an unauthorized issuance to a recipient's selected issuance sites, the system assigns a sequential host reference counter (HRC) to each issuance or value-adding transaction (e.g., a store refund). These issuances and value-adding transactions must be collected by the recipient in sequential order.

Generally, regular issuance benefit files are transferred from the state's CRIS-E system to the EBT system seven days before the first of the month. Each issuance was given a sequential counter immediately prior to the software fix, and benefits had to be collected at issuance points before the end of the month. This led to two types of problems:

Case 1

In Case 1, John Doe's normal March benefit issuance was given a sequential counter number of 12. Because John did not collect these benefits during March, they became unavailable and he was not able to collect them at a later date. John was then issued his April food stamp benefits, which were given a sequential counter number of 13. Because John did not collect the benefits numbered 12, he was unable to collect number 13 without a manual intervention from the EBT service provider.

Case 2

In certain cases, a client may be issued supplemental benefits for the current month, but after the next month's file transfer has been made. The supplemental issuance is batched overnight for immediate availability and is given the next sequential counter. This creates a problem if the supplemental benefits are issued at the end of the month, after the regular benefit files have been transferred to the EBT service provider. In Case 2, John Doe's regular benefit file for March was transferred to the EBT service provider on February 20 and given a counter number of 12. On February 22, John was deemed eligible for supplemental benefits, intended to be available during February. The supplemental file was batched overnight to the EBT service provider and given a counter number of 13.

Because benefits cannot be collected out of sequential order, in this case February's supplemental benefits could not be collected until the March benefits were collected; hence, John Doe had to wait until his next month's issuance date, and had to collect the next month's benefits, before he could collect benefits intended to supplement the current month's food stamp issuance. As in the previous case, until

programming changes were implemented, a manual intervention had to be performed in order to by-pass the sequential numbering system.

In August 1998, SVS implemented a software change to eliminate the “HRC” problem. Instead of assigning the HRC when issuances are received from CRIS-E, the Direction CardK system now assigns HRCs just prior to downloading the issuance amount to the recipient’s designated collection points. This change bypasses the second problem described above, that of supplemental issuances, but not the first. If recipients fail to collect their benefits one month, they still need to go to the county office to gain access to benefits issued for the following month.

Hardware Problems

Eight of the ten counties studied reported little or no trouble with the hardware provided by the Citibank team. The other two counties, however, reported that their off-line EBT computer terminals frequently did not work properly. One of these counties, for example, reported that its EBT system crashed at least half a dozen times between January and April 1998. Each time the system crashed, it caused the county significant problems. County office staff would have to turn away recipients who had come in for training and initial card issuance. This was especially burdensome for elderly recipients and recipients who had taken time off from work to attend their appointments.

In response to the hardware problems that these counties reported, CENTECH provided advice regarding proper use of the EBT equipment and replaced the equipment, as necessary. As of April 1998, one of the counties was on its second set of equipment, and another county was on its third set of equipment. Neither of these counties was confident that the replacement equipment would continue to work properly. Staff at the two CDHS offices experiencing hardware problems blamed the trouble on the poor quality of the equipment. The Citibank team was concerned that the counties were not using the equipment properly, but remains committed to working with all counties to ensure a smooth transition to EBT.

The Citibank team reports that the tasks associated with implementing off-line EBT in the 78 counties not covered in this chapter should not be substantially more challenging than the tasks undertaken in converting the ten counties studied. The process will remain the same, with CENTECH working with retailers and county offices on a county-by-county basis. Although a significantly greater volume of recipients will be converted each month during the summer and fall of 1998, compared to the number converted so far, most of the effort will be handled by CHDS staff in the counties being converted. Indeed, the remaining counties may pose fewer challenges because ODHS and Citibank have successfully identified and addressed many issues that arose during the conversion of the first ten counties.

Chapter 6

Current System Operations

6.1 Introduction

This chapter examines the Ohio Direction CardK program during June 1998, when the system was in the second year of a three-year statewide rollout. It is presented as a “snapshot” of then-current conditions, a look at what may be expected during future statewide implementation activities, and a basis for later comparison to the fully implemented system.

The Direction CardK system began its statewide rollout in January 1997. Between that date and the end of June 1998, approximately \$76,045,000 in food stamp benefits were issued electronically in nearly 537,000 transactions, averaging \$142 per issuance transaction. By June 1998, about 15 percent of the state’s FSP caseload had been converted to EBT. Most of the 48,355 food stamp cases on EBT were distributed among the 19 counties shown in Exhibit 6-1.

Exhibit 6-1

EBT Food Stamp Cases, by County

County	EBT Cases	County	EBT Cases
Butler	5,517	Licking	205
Champaign	180	Madison	26
Clark	5,249	Mercer	161
Clermont	1,126	Miami	1,229
Clinton	60	Montgomery	15,355
Darke	624	Pickaway	214
Delaware	20	Preble	538
Fairfield	106	Shelby	581
Greene	2,252	Warren	1,259
Hamilton	13,648	Other	5

The five cases marked “other” were located in four counties where retailer conversion activities were nearly complete, but recipient conversion had not started. According to state officials, these five clients had recently moved from counties already converted to EBT

The following sections examine levels of system activity for benefit issuance and collection, purchases, retailer settlement, card issuance, and help desk assistance. The information provided in each section is based on reports the system generates each month. The evaluation has discovered that some information provided by the reports is inaccurate, or at least inconsistent from one report to another. Neither ODHS nor the counties seem to be using these particular reports for system monitoring, so there appears to be no danger that the inconsistencies are causing problems for system operations and oversight. Nevertheless, problems with the reports do make it more difficult for the evaluation to assess system operations.

6.2 Benefit Issuance and Collection Activities

In June 1998, benefits totaling \$6,881,143 were issued in 55,016 transactions, averaging \$125.07 of food stamp benefits per issuance transaction.¹ The regular monthly issuance of food stamp benefits is staggered over the first five to fifteen days of the month, depending on county choice. In certain circumstances, and at any time during the month, supplemental benefits may be issued in separate issuance transactions.

Once benefits are issued, it is the client's responsibility to collect benefits by having them loaded onto the card. Benefits may be collected at a CDHS office or at one of three retailer sites selected in advance by the recipient. As displayed in Exhibit 6-2, benefit collection activity is heaviest when benefits are first issued, although recipients continue to collect their benefits throughout the month.² Note that the average issuance amount decreases as the collection period lengthens, suggesting that recipients with larger food stamp issuances collect their benefits closer to the issuance date than those with fewer benefits. This experience is consistent with collection patterns in previous months.

Most recipients collect their FSP benefits at one of the three stores they select when they receive their Direction Card³. As shown in Exhibit 6-3, however, 7.8 percent of all benefit collection transactions in June 1998 occurred at CDHS offices, and these transactions represented about 8.4 percent of all benefits collected.³ The exhibit shows substantial county-by-county variation in the percent of benefits collected at the county office (from 3.6 percent to 58.3 percent). The cause of this variation is not yet clear, although it may be affected in part by the extent to which a county has completely converted to EBT. (That is, newly converted cases may be more likely to collect their first month's benefits at the county office.) System reports will be examined again after rollout is complete to see whether this variation persists.

1 Per system report, "Issuance Redeemed: Monthly Summary." Average issuance amounts have declined by nearly \$30 per month since January 1997. System reports do not show the distribution of issuance amounts, so only the average issuance amount can be calculated.

2 Exhibit 6-2 provides data for May 1998 because the system report for June contains no information on benefit collections beyond two days after issuance.

3 These percentage figures exclude benefits collected in Montgomery County, for which data are unavailable.

6.3 Benefit Use

Purchase transactions are computed by adding automated and manual purchase transactions and subtracting purchase reversal transactions.⁴ There were 283,213 purchase transactions statewide during June 1998, with a total value of \$6.3 million. The average purchase transaction value during June was \$22.34, and each case averaged 5.9 purchase transactions per month.⁵ The value of the average purchase transaction has not changed significantly from April 1997 through June 1998, as indicated by Exhibit 6-4.

Exhibit 6-2

Benefit Issuance and Collection – May 1998^a

Collection Period	Number of Transactions	Total Value of Benefits	Percentage of Issued Benefits Collected	Average Benefit Amount
Total issued this period	48,403	\$5,998,991	n.a.	\$123.94
Collected on issuance date	17,003	2,844,085	47.4%	167.27
Collected within 1-2 days	11,364	1,539,642	25.7	135.48
Collected within 3-5 days	7,010	732,172	12.2	104.45
Collected within 6-10 days	4,206	337,974	5.6	80.36
Collected within 11-20 days	2,644	148,077	2.5	56.00
Collected within 21-30 days	648	21,806	0.4	33.65
Issued this period, not collected	5,818	382,158	6.4	65.69
Issued prior period(s), not collected	3,263	0 ^b	n.a.	n.a.
Issued prior period(s), collected	2,052	237,473	n.a.	20.52
Expired this period (returned to state)	2,654	146,587	n.a.	55.23

a The numbers contained in this table are from the system report, "Issuance Redeemed: Monthly Summary." It should be noted that the report does not balance—the difference between benefits issued and collected (adjusted for prior period activity) does not equal benefits issued but not collected.

b This is the figure included in the system report, but either it or the corresponding number of issuances must be incorrect inasmuch as it leads to a calculated average benefit amount of zero.

n.a. = not applicable

4 Purchase reversals are performed due to reasons such as the correction of cashier errors on the original automated purchase transaction.

5 System reports do not show the distribution of purchase amounts, so only the average purchase amount can be computed. The same is true for number of purchase transactions during the month.

Exhibit 6-3

Issuance Collection Activities at County and Retailer Locations – June 1998

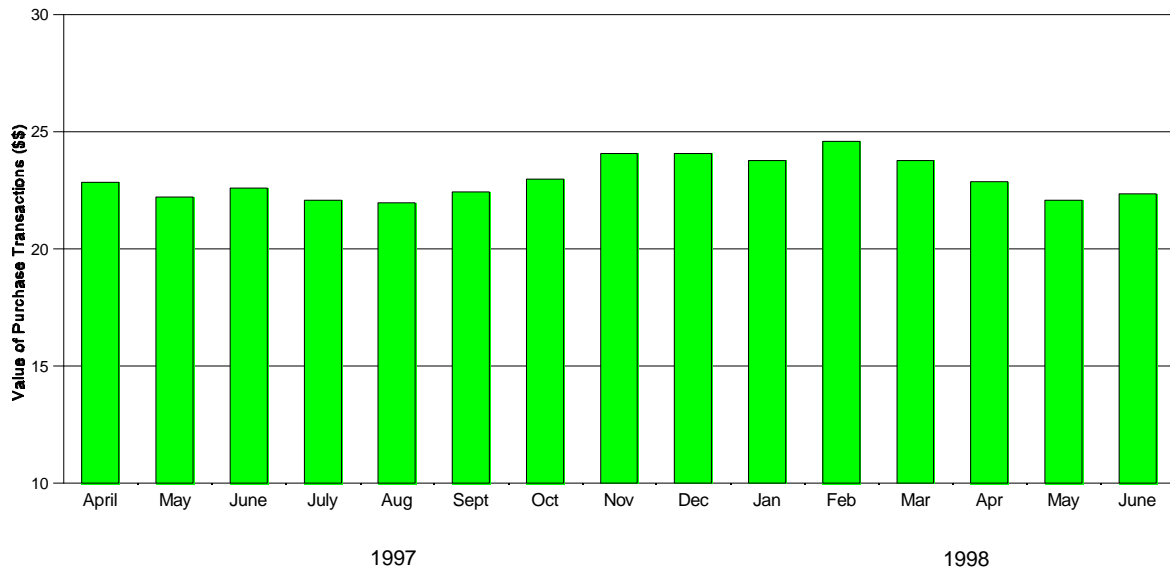
Total Collection Transactions				Collection Transactions at County Offices			
County	Number	Value	Average Value	Number	Percent of Total	Value	Average Value
Butler	5,298	\$671,223	\$126.69	434	8.2%	\$53,467	\$123.20
Champaign	160	14,067	87.92	53	33.1	5,584	105.36
Clark	5,292	726,189	137.22	361	6.8	51,321	142.16
Clermont	1,046	184,170	176.07	128	12.2	23,406	182.86
Clinton	30	5,563	185.43	11	36.7	1,576	143.27
Darke	675	83,190	123.24	175	25.9	24,538	140.22
Fairfield	82	9,976	121.66	14	17.1	2,057	146.93
Greene	2,362	310,459	131.44	196	8.3	27,818	141.93
Hamilton	13,735	1,572,650	114.50	487	3.5	56,212	115.43
Licking	182	31,800	174.73	69	37.9	11,923	172.80
Mercer	158	20,685	130.92	84	53.2	12,055	143.51
Miami	1,338	149,030	111.38	146	10.9	15,682	107.41
Montgomery (part of pilot)	14,024	2,002,239	142.77	n.a.	n.a.	n.a.	n.a.
Pickaway	213	26,162	122.83	42	19.7	4,464	106.29
Preble	543	68,256	125.70	125	23.0	17,783	142.26
Shelby	557	68,756	123.44	105	18.9	13,345	127.10
Warren	1,520	174,824	115.02	164	10.8	22,760	138.78
Total	47,215	\$6,119,239	\$129.60	2,594	7.8%	\$343,991	\$132.61

a Excludes Montgomery County due to unavailability of data.

n.a. = not available

Exhibit 6-4

Average Value of Purchase Transactions, April 1997 – June 1998



6.4 Settlement

Retailers must settle with the EBT host system in order to receive funds for purchases transacted with the Direction CardK. According to the operating manual provided to retailers during training, each retailer must settle at least once each day (presuming they processed EBT transactions that day). If they do not settle on time, their EBT terminals will lock and prevent further EBT transactions until settlement occurs.

At the end of June 1998, 3,153 retailers were enrolled in the Direction CardK system.⁶ These retailers performed 32,356 settlement transactions during June, for an average of 10.3 settlement transactions per retailer. With so few settlement transactions, it appears that many retailers on the system are experiencing infrequent Direction CardK business. This, however, may be an artifact of the process of system implementation. With many stores being equipped for EBT **before** food stamp recipients in the county receive their EBT cards, there may have been many days when these stores did not process any EBT transactions.

Retailer settlements during June 1998 totaled \$5.8 million;⁷ this amount yields average settlement values of \$177.72 per settlement transaction and \$1,823.73 per retailer for the month. As shown in Exhibit 6-5,

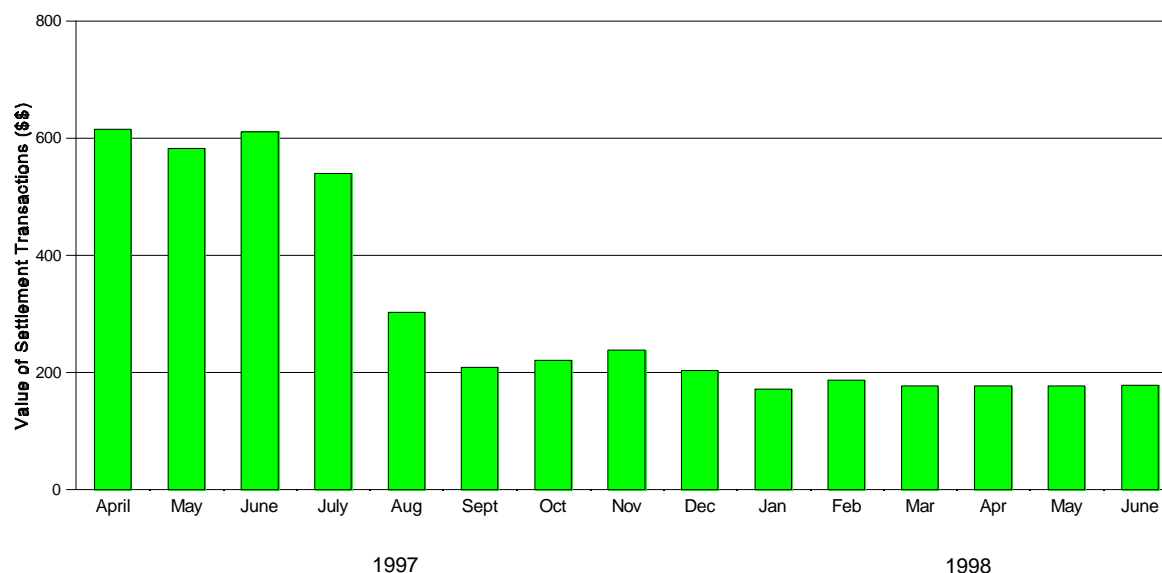
6 This number was obtained from system report, "Authorized Retailers: Activated." Prior to January 1998, this report and two others ("Authorized Retailers: Deactivated" and "Authorized Retailers: Alphabetical") provided inconsistent information regarding the number of active retailers. Although the three reports now provide similar statewide totals for active retailers, they continue to provide inconsistent data at the county level.

7 Per system report, "Retailer Settlement Transactions."

the average value of settlement transactions has fallen substantially since the statewide rollout began. This is probably due to a combination of two or three factors. First, as noted earlier, average EBT business on a per-retailer basis has fallen due to the lag between retailer signup and recipient conversion. Second, with the addition of more rural counties like Preble and Darke, the characteristics of participating stores are probably changing, with more small stores being added to the system. Third, stores may be settling more often as they gain experience with the system.⁸

Exhibit 6-5

Average Value of Retailer Settlement Transactions, April 1997 – June 1998



6.5 Card Deployment

Ohio Direction Cards^K are issued either when new households are determined eligible for food stamp benefits or when existing cases not currently in the Direction Card^K program are converted to the EBT system. Additionally, new cards are issued as replacements for existing cards found to be defective or reported as lost or stolen.

July 1997 was the first month in which the Direction Card^K was issued in a significant quantity. By the end of June 1998, 71,872 Direction Cards^K had been issued. Of these, 1,457 cards have failed due to card failure, and 20 cards have failed due to user abuse, a total of 2.06 percent of all Direction Cards^K issued. By comparison, 17 percent of the 29,486 PayEase cards issued by the pilot program had failed as

⁸ The state's manager for the Direction Card^K system has noted that he frequently gets calls from retailers saying the system is not working. Frequently, upon investigation, it turns out that the retailer has forgotten to initiate a settlement transaction. If settlement is not performed at least once a day, the store's EBT terminals will lock up until a settlement transaction is initiated by the store manager.

of July 1997.⁹ Although the percentage of Direction CardK failures is significantly less than the failures reported with the previous PayEase Card, it must be noted that at the time of the June 1998 report, Direction CardsK issued to recipients had been in use for 12 months or less. A better comparison of card reliability will be available as the Direction CardsK age.

County offices issued 11,969 new Direction CardsK during June 1998. The reasons for new card issuances are identified in Exhibit 6-6.

Exhibit 6-6

Card Deployment – June 1998

Reason for Card Issuance	Number of Cards Issued	Percent of Cards Issued/Replaced
Total number of cards issued	11,969	100.0%
New card setups	10,159	84.9
Card replacements	1,810	15.1
Card replacements: ^a		
Card chip failure	274	16.5%
Out of balance: not correctable	3	0.2
Lost and stolen	1,377	83.3

a The number of cards replaced does not equal the number of cards reported damaged, lost, or stolen. This information has been derived from the system report "EBT Smart Card Analysis." The report is in the process of being corrected by the EBT service provider.

6.6 Customer Service

SVS maintains a specialized EBT Customer Service Center for the Direction CardK system at its telephone center in El Paso, Texas. Customer service is available 24 hours a day, seven days a week. Toll free numbers connecting to the support center are provided to Direction CardK recipients, retailers, and county staff.

When food stamp recipients call Customer Service, they are connected to an automatic response unit (ARU). If they are calling from a rotary phone, the call is switched to one of the customer service representatives at the center. Callers with touch-tone phone service are given three menu options: obtain card balance or other benefit information; report a card as lost, stolen, or damaged; or connect to a customer service representative. In addition to balance inquiries and reports of lost, stolen or damaged

⁹ Of the 29,486 PayEase cards issued since March 1992, 3,973 (13.54 percent) failed due to chip failures and another 1,170 (3.47 percent) failed due to uncorrectable problems, including physical damage due to user abuse.

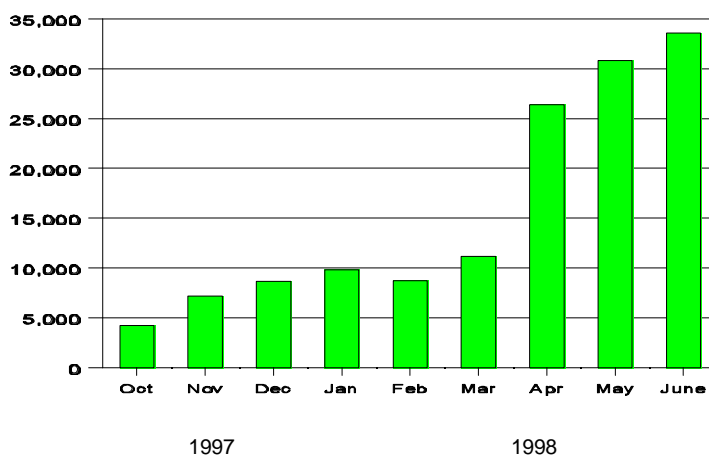
cards, food stamp recipients can use Customer Service to change benefit collection sites, request transaction statements, or request emergency food bank services.

The ARU menu for retailers focuses on authorizations for manual transactions and requests for information about the last settlement processed by the system. By connecting to a customer service representative, retailers can also report equipment problems, order EBT supplies,¹⁰ and request documentation of prior EBT transactions. Country staff can call Customer Service to request assistance with any of the Direction CardK functions for which they are responsible.

As would be expected, Customer Service has received an increasing number of calls each month as the Direction CardK system has been expanding. Exhibits 6-7 and 6-8 show the increase in recipient and retailer calls, respectively, between October 1997 and June 1998. This increase in calls was leading to reduced service levels prior to April 1998. In response, SVS began adding temporary customer service representatives during the first few days of the month in January 1998. These additional representatives helped alleviate the long queue times encountered during the regular monthly issuance cycle, the busiest time of each month for calls for assistance.

Exhibit 6-7

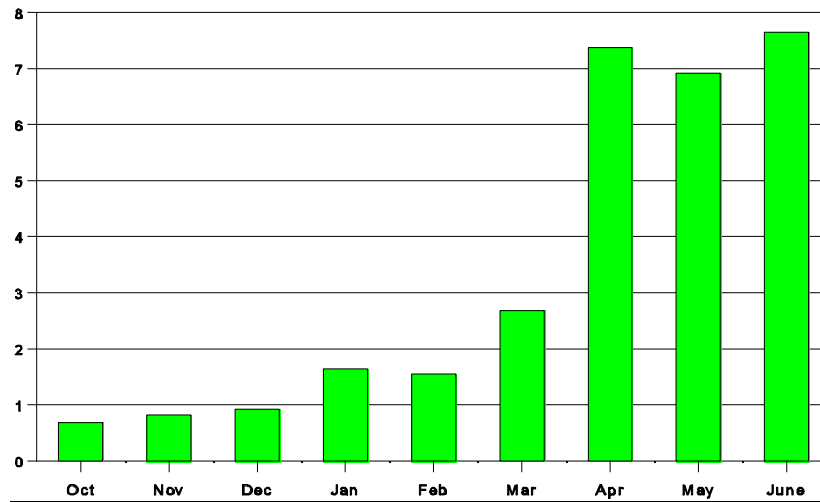
Number of Recipient Calls Received, October 1997 – June 1998



SVS also upgraded its ARU in April 1998, with marked results. For instance, prior to April average recipient queue times waiting for a representative varied from 7 to 48 seconds. In addition, about 8.0 percent of recipients were hanging up before the call was answered. After the upgrade, average queue times dropped to between 1 and 20 seconds, and only 1.8 percent of recipients hung up before reaching

¹⁰ The SVS customer service representatives forward any reports of equipment problems or supply needs to CENTECH for response.

the ARU or a customer service representative. On the retailer side, 4.8 percent of retailer calls to customer service prior to April 1998 were abandoned. Thereafter, the percentage of abandoned calls from retailers dropped to 1.5 percent.

Exhibit 6-8**Number of Retailer Calls Received, October 1997 – June 1998**

These service improvements are especially notable because they occurred when the number of incoming calls increased dramatically. Although the large increase in calls in April 1998 coincides with system rollout in Hamilton County (Cincinnati), this rollout cannot explain the full increase in calls because usage increased on a per-recipient and per-retailer basis.¹¹ It seems likely that improvements in customer service encouraged greater use of the service.

In addition to these early problems in reaching customer service representatives, county staff have complained about high turnover and lack of detailed system knowledge among the customer service representatives. To address these concerns, SVS has created and trained a dedicated group of representatives to respond solely to retailer and county requests for assistance, which tend to be more complicated than recipient calls for assistance.

Customer service tracks the reasons calls are made by recipients; Exhibit 6-9 lists the reasons calls were made in June 1998. Balance inquiries represent, by far, the most common reason for calls to customer

11 Prior to April 1998, the number of monthly calls from recipients varied between 35 and 50 percent of the number of active EBT cases each month. Since then, the number of calls has varied between 70 and 80 percent of active EBT cases each month. Similarly, the number of monthly calls received per retailer jumped in April 1998, from an average of 0.9 in the previous six months to 2.53 in the following three months.

service, a situation found in on-line EBT systems as well. Officials believe that most of the calls are made by recipients checking to see whether their monthly benefits are yet available for use.

Exhibit 6-9**Recipient Calls – June 1998^a**

Major Reasons for Recipient Calls	Number of Calls
Balance inquiry	14,760
Report lost card	543
Change issuance site	481
Report damaged card	193
Card unlock	141
Report stolen card	117
Transaction inquiry	20
Verify issuance sites	12
Coupon conversion	11

a Data derived from system report, "Operator Call Analysis."

6.7 Conclusion

Although discrepancies exist in the monthly reports generated by the Direction CardK system, the system itself appears to be operating fairly smoothly 18 months into its statewide implementation. A problem with the sequencing of issuance transactions has been addressed, and the system is currently handling all the transaction processing requirements for over 48,000 food stamp households. In June 1998, \$6.8 million in FSP benefits were issued, with \$6.3 million being redeemed that same month in approximately 3,200 food retail outlets.

The implementation process also appears to be proceeding without major difficulties. Some counties have reported problems with their EBT terminals and equipment, and most of the counties interviewed for this report said that many recipients fail to show up for their originally scheduled EBT training. Nevertheless, recipient conversion to EBT is proceeding as the Citibank team moves from county to county, equipping and training retailers and county office staff on EBT procedures. Current plans call for all retailers and counties to be equipped for EBT by approximately July 1999. If this schedule is met, then nearly all the food stamp recipients in the state should be converted to EBT by the end of 1999.

Appendix A

Glossary

ACO	Assistance Control Office, unit within county DHS office responsible for EBT training and helping recipients with card balance problems.
Booz•Allen	Booz•Allen & Hamilton, a contractor providing support to FNS for the technical evaluation of the Direction CardK system.
card block	A card block effectively disables a lost or stolen Direction CardK, preventing its use in any EBT transactions.
card reader	The smart card reader is contained in the EBT terminal. The card reader reads information from and writes transactions to the customer's benefit card.
CDHS	County Department of Human Services, which administers the food stamp and EBT programs.
CENTECH	Century Technologies, Inc., subcontractor responsible for equipping and servicing retailers and county offices.
Citibank EBT Services	Business unit of Citibank, N.A., which itself is a wholly-owned subsidiary of Citicorp.
COPA	Category of Public Assistance. A COPA designator is associated with each EBT transaction.
CRIS-E	Client Registration Information System-Enhanced, the computer system used by the Ohio Department of Human Services to determine client eligibility for the FSP and monthly allotment amounts.
CSI	Citicorp Services, Inc., the prime contractor for the EBT program for the State of Ohio. CSI is a New York-based wholly owned subsidiary of Citicorp.
DHS	Department of Human Services
Direction CardK	Registered service mark, which denotes the State of Ohio's EBT smart card system.
EBT	Electronic Benefits Transfer
FCO	Fiscal Control Office, unit within county DHS office that handles EBT functions related to card issuance, card replacement, PIN change, unlocking EBT cards, issuance site selection for FSP benefits, and coupon conversion.

FNS	Food and Nutrition Service, agency within U.S. Department of Agriculture that administers the Food Stamp Program.
FSP	Food Stamp Program
kbps	Kilobytes per second, a measure of the speed by which data are transmitted over a communications system.
MAC	Message Authentication Code, security code added to communications message. The value of the code is based on information contained in the message.
NPC	National City Processing Corporation, parent company of Stored Value Systems (SVS) and prime contractor for the Montgomery County EBT pilot.
ODHS	Ohio Department of Human Services
PAN	Primary Account Number, unique number assigned to the Direction Card K .
PayEase	Name of the pilot, off-line EBT system implemented in Dayton, Ohio.
PayFlex	Name of smart card, manufactured by Schlumberger, Inc., used in Direction Card K system.
PIN	Personal Identification Number
POS	Point of Sale.
REDE	Retailer EBT Data Exchange, a computer system that enables FNS to communicate the authorization status of retailers to EBT vendors.
staged issuance	Term used to describe the process of sending benefits to the EBT point of sale terminal at an issuance site.
SVS	Stored Value Systems, a subsidiary of National City Processing Corporation and a subcontractor to Citicorp Services, Inc. SVS processes EBT transactions and provides customer service for the State of Ohio's Direction Card K system.