Table of Contents

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Analysis and
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Evaluation of the Off-Line
Electronic Benefits Transfer
Demonstration

The Impacts of the Off-line EBT Demonstration on the Food Stamp Program

Volume I - Impacts on Administrative Costs

Table of Contents

The Impacts of the Off-line EBT Demonstration on the Food Stamp Program

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Table of Contents

THE IMPACTS OF THE OFF-LINE EBT DEMONSTRATION ON THE FOOD STAMP PROGRAM

The evaluation of the off-line electronic benefits transfer demonstration is presented in three volumes and an Executive Summary.

The Executive Summary presents a concise review of the evaluation and the major findings.

Volume I provides an analysis of the economic impact of off-line EBT on food stamp operations. It also looks at the financial impact of expanding the demonstration.

Volume II describes the costs and other impacts of the off-line EBT system on retailers, recipients, and financial institutions. This research includes both qualitative and quantitative impacts and provides a comparative assessment of off-line EBT versus the paper coupon system.

Volume III describes the off-line EBT system design, development and implementation process; system operations; and, lessons learned. The purpose of this volume is to provide guidance for other EBT development efforts.

TABLE OF CONTENTS

Page

Chapter 1: INTRODUCTION 1

Overview of the Off-line Demonstration 1
Evaluation Highlights - Volume I 2
Off-line System Design, Development and Implementation 10
Organization of Volume I 10

Chapter 2: SYSTEM FUNCTIONALITY 12

Introduction 12
Overview of FSP Functions 13
Authorizing Access to Benefits 17
Delivering Benefits 21
Crediting Retailers and Financial Institutions 25
Managing Retailer Participation 29
Reconciling and Monitoring the System 32
Comparison of Paper Coupon, Off-line EBT, and
On-line EBT Systems 39

Chapter 3: IMPACT OF THE OFF-LINE EBT SYSTEM ON
ADMINISTRATIVE COSTS 40

Introduction 40
Summary of the Impact of the Off-line EBT
Demonstration on Administrative Costs 48
The Components of Cost 53
Off-line EBT Operational Costs by Function 64
Design, Develop, and Implement the Off-line
EBT Demonstration 83

Table of Contents

TABLE OF CONTENTS
(continued)

Page

Chapter 4: IMPACT OF THE OFF-LINE EBT SYSTEM ON BENEFIT LOSS AND DIVERSION 93

Introduction 93
Benefits Authorized for the Wrong People or in the Wrong Amount 97
Redemption Credits (Credits for Redeeming Food Stamp Benefits) to the Wrong People or in the Wrong Amount 103
Benefits Lost During Production and Handling 112
Benefits Lost or Stolen from Recipients 116
Recipient Use of Benefits in an Unintended Manner 122
Conclusions 137

Chapter 5: THE FEASIBILITY OF CONTINUED OR EXPANDED EBT OPERATIONS 145

Is Off-line Technology a Technically Viable Alternative? 146
Can Other Benefit Programs be Added to the System? 149
Can Off-line EBT be Economically Feasible? 153
How Does Off-line EBT Fit Within the Construct of the Food Stamp Program EBT Regulations? 167
What are the Advantages and Disadvantages of Off-line EBT Compared to On-line EBT? 167
Can Off-line Technology Co-Exist With On-line Technology? 171
Is There a Role for Smart Cards in the Future of the Food Stamp Program? 172

Table of Contents

TABLE OF CONTENTS
(continued)

Page

APPENDICES

Appendix A Current EBT Projects and Initiatives A-1

Appendix B Comparison of Montgomery County Paper Coupon, Montgomery County Off-line EBT and On-line EBT Systems by FSP Function B-1

Appendix C Retailer Compliance Enforcement C-1

Appendix D Supplemental Exhibits to the Administrative Cost Analysis D-1

Appendix E Discussion of the Application of Various Provisions of the EBT Food Stamp Regulations to the Off-line System E-1

Appendix F Computation of the Card Amortization Period F-1

Appendix G Supplemental Exhibits to the Analysis of Economic Feasibility G-1

Appendix H List of Abbreviations H-1

Table of Contents

LIST OF EXHIBITS

		Page
Exhibit 1-1	Impact of the Off-line System on Administrative Costs	5
Exhibit 1-2	Impact of the Off-line System on Benefit Loss and Diversion	7
Exhibit 1-3	Evaluation of Off-line EBT - Economic Feasibility	9
Exhibit 1-4	Costs to Design, Develop and Implement the Off-line EBT System	10
Exhibit 3-1	Summary of Administrative Costs per Case Month of Alternate Food Stamp Delivery Systems	49
Exhibit 3-2	EBT Operating Costs per Case Month Cost Comparison by Function	51
Exhibit 3-3	Total Operational Cost per Case Month by Source	52
Exhibit 3-4	EBT Demonstration Contractor Operational Costs	53
Exhibit 3-5	Calculation of Card Amortization Period	58
Exhibit 3-6	Sensitivity of Cost per Case Month to the Card Amortization Period	59
Exhibit 3-7	Montgomery County Off-line EBT Operational Costs	60
Exhibit 3-8	State of Ohio EBT Operational Costs	61
Exhibit 3-9	FNS Regional Office Operational Costs	62
Exhibit 3-10	Summary of Operational Costs by Component	64
Exhibit 3-11	Cost Allocation by Function	66
Exhibit 3-12	Authorizing Access to Benefits	69
Exhibit 3-13	Delivering Benefits	72

Table of Contents

LIST OF EXHIBITS
(Continued)

		Page
Exhibit 3-14	EBT Terminal Costs and Density	75
Exhibit 3-15	Crediting Retailers and Financial Institutions	77
Exhibit 3-16	Reconciling and Monitoring System	79
Exhibit 3-17	Managing Retailer Participation	82
Exhibit 3-18	Summary of the Costs to Design, Develop and Implement the Off-line EBT System	84
Exhibit 3-19	Cost to Design the Off-line EBT System	86
Exhibit 3-20	Cost to Develop the Off-line EBT System	88
Exhibit 3-21	Cost to Implement the Off-line EBT System	90
Exhibit 4-1	Summary of Food Stamp Coupon and EBT Vulnerabilities Resulting in Benefits Authorized for the Wrong People or in the Wrong Amount	98
Exhibit 4-2	Summary of Food Stamp Coupon and EBT Vulnerabilities Resulting in Redemption Credits to the Wrong People or in the Wrong Amount	105
Exhibit 4-3	Summary of Food Stamp Coupon and EBT Vulnerabilities Resulting in Benefits Lost During Production and Handling	113
Exhibit 4-4	Summary of Food Stamp Coupon and EBT Vulnerabilities Resulting in Benefits Lost or Stolen from Recipients	118
Exhibit 4-5	Lost and Stolen Benefits	119
Exhibit 4-6	Overcharges and Refunds	120

Table of Contents

LIST OF EXHIBITS
(Continued)

		Page
Exhibit 4-7	Summary of Food Stamp Coupon and EBT Vulnerabilities Resulting in Recipient Use or Benefits in an Unintended Manner	124
Exhibit 4-8	Retailer Perceptions of Fraud in the Food Stamp System - Ease of Buying Non-eligible Items.	126
Exhibit 4-9	Recipient Perceptions Regarding Unintended Use of Food Stamp Benefits - Buying Ineligible Items	127
Exhibit 4-10	Retailer Perceptions of Fraud in the Food Stamp System - Ease of Trading Food Stamp Benefits for Cash.	128
Exhibit 4-11	Recipient Perceptions Regarding Unintended Use of Food Stamp Benefits - Trading Benefits for Cash	129
Exhibit 4-12	Cash Change by Store Type and Payment Mode	131
Exhibit 4-13	Summary of Benefit Loss and Diversion Rates	139
Exhibit 4-14	Summary of Program Loss Rates	140
Exhibit 4-15	Summary of Participant Loss Rates	143
Exhibit 4-16	Summary of Component Measures of Overall Benefit Loss and Diversion	144
Exhibit 5-1	Sensitivity of Card Amortization Period to Loss/Stolen Rate	155
Exhibit 5-2	Administrative Costs - Cost by Case Month by Month	157
Exhibit 5-3	Comparison of the Cost of Operations for the Demonstration Site and Prospective Scenarios	159

Table of Contents

LIST OF EXHIBITS
(Continued)

		Page
Exhibit D-1	EBT Demonstration Contractor Operational Costs	D-2
Exhibit D-2	EBT Demonstration Contractor Operational Costs - Authorizing Access to Benefits	D-3
Exhibit D-3	EBT Demonstration Contractor Operational Costs - Delivering Benefits	D-4
Exhibit D-4	EBT Demonstration Contractor Operational Costs - Crediting Retailers and Financial Institutions	D-5
Exhibit D-5	EBT Demonstration Contractor Operational Costs - Reconciling and Monitoring System	D-6
Exhibit D-6	EBT Demonstration Contractor Operational Costs - Managing Retailer Participation	D-7
Exhibit E-1	Inaccuracy Transaction Rate	E-4
Exhibit F-1	Survival Probabilities for Left Censored Spells and Non-left Censored Spells	F-2
Exhibit F-2	Number of Food Stamp Spells Under Different Gap Closings	F-3
Exhibit F-3	Determination of Spell Length from 1990 SIPP DataUsing One Month Gaps Closed	F-4
Exhibit F-4	Survival Rate of Spells	F-5
Exhibit G-1	Cost to Equip Retailer Lanes	G-3
Exhibit G-2	Demonstration Site Continued - Prospective Costs	G-4
Exhibit G-3	Expanded Montgomery County - Prospective Costs	G-5
Exhibit G-4	Expanded State-wide - Prospective Costs	G-6
Exhibit G-5	Expanded State-wide with AFDC - Prospective Costs	G-7

Table of Contents

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Table of Contents

Chapter 1

INTRODUCTION

The Food and Nutrition Service (FNS) of the United States Department of Agriculture (USDA) has funded a number of electronic benefits transfer (EBT) demonstration projects to test the feasibility of delivering food stamp benefits electronically. EBT is an electronic funds transfer (EFT) application that delivers government benefits to recipients by combining automated financial transaction processing with point-of-sale (POS) terminals and card-access devices.

Previously, the EBT demonstration systems tested by FNS for delivery of food stamp benefits used magnetic stripe card and on-line access technologies, which are the prevalent card and access technologies used throughout the commercial banking industry in the United States. Evaluations of the on-line demonstrations indicate that EBT is an effective and reliable benefit delivery method. Recipients prefer EBT to food coupons because it is more convenient and less costly to use. Retailers who issue and/or accept food stamps, find that EBT relieves them of the burden of having to store, count, and deposit food coupons. Financial institutions, which are increasingly moving from paper to electronics, also prefer EBT over coupons. With the technical and economic feasibility of on-line EBT for the Food Stamp Program established, analysis of EBT demonstrations is now turning to issues such as technological alternatives and policy and operational options.

OVERVIEW OF THE OFF-LINE DEMONSTRATION

While not prevalent in the United States, off-line technology, which uses intelligent "chip" or smart cards,[1] has successfully been used in Europe for a variety of consumer and commercial applications. Recognizing the potential of using off-line technology to deliver food stamp

[1] Intelligent chip cards, also known as smart cards or integrated circuit (IC) cards, contain a microchip that can perform limited logic routines. The database containing the recipient's primary record and account balance is stored in the chip. The data can be read at any location with a card reader/writer. The card balance is updated as transactions are written to the card. For example, when the recipient makes a food purchase, the amount of the purchase is subtracted from the card balance.

benefits, FNS awarded a contract to the National Processing Company (NPC), the State of Ohio, and Montgomery County to design, develop, implement, and operate an off-line EBT demonstration system to deliver Food Stamp Program (FSP) benefits electronically in September, 1990.

FNS also awarded a contract[1] to Phoenix Planning & Evaluation, Ltd. and its subcontractors, Market Facts, Inc. and The Orkand Corporation, to conduct an evaluation of the demonstration. The evaluation required the identification, collection, and analysis of data to address the following objectives:

- Describe the design, development, implementation, and operation of the off-line EBT system.
- Estimate the cost-effectiveness of the EBT off-line system.
- Estimate and compare the costs of the EBT off-line system to the preceding paper-based system and to on-line EBT systems.
- Describe and compare the impact of the off-line system on each of the groups participating in the system.
- Explore the feasibility of continuing or expanding the project.

EVALUATION HIGHLIGHTS - VOLUME I

Montgomery County is located in southwestern Ohio and includes the city of Dayton. The demonstration area is comprised of a six zip code area in Dayton which had approximately 11,000 food stamp households when the off-line system was implemented. The demonstration area includes 70 food retailers and is a compact shopping area with high household-to-store and household-to-lane ratios. Based on recipient shopping patterns, another 25 retailers in areas adjacent to the zip code area were added to the demonstration, for a total of 95 participating retailers. The demonstration was segmented into five phases over approximately 30 months.[1] System design began in September 1990. By December 1991, the system was completely built.

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[1] Contract No. 53-3198-0-013.

[1] A detailed description of project phases is provided in Volume III.

Table of Contents

NPC began converting recipients to EBT in March 1992. By June 1992, all recipients in the demonstration area were converted. After operations reached a steady state, an evaluation, which extended over the five month period from August 1992 through December 1992, was conducted. The system continues in operation today.

Off-line System Functionality

Both paper and electronic food stamp delivery systems must perform five basic steps or functions:

- authorizing access to benefits;
- delivering benefits;
- crediting retailers and financial institutions;
- managing retailer participation; and
- reconciling and monitoring the system.

The manner in which these functions are performed can differ. The most obvious differences are

the same visit in which the client is issued a CRIS-E ID card. EBT clients go to the PayEase office and receive a PayEase benefit card, receive training on how to use the EBT system, select a personal identification number (PIN), and select three authorized retailer locations at which they can post their PayEase food stamp benefits to the card.

Monthly benefits are automatically added to the card the first time the PayEase cardholder uses the card at any one of the three selected retailers. After that time, recipients can purchase eligible food items at any authorized retailer in the demonstration area. Purchase amounts are deducted from the card balance each time a purchase is made. Retailer and financial institution reimbursements are handled through Automated Clearing House (ACH) transfers, which are sent through a concentrator bank and ultimately funded by a FNS project letter of credit (LOC) maintained by the Midwest Regional Office (MWRO).

Impact of the Off-line System on Administrative Costs

The evaluation of the economic impact of the off-line EBT demonstration on administrative costs indicates that off-line technology is more expensive to operate than the paper coupon system it replaced in Montgomery County, Ohio. Exhibit 1-1 presents a summary of the economic impact of the off-line EBT demonstration system on administrative costs.

As shown in Exhibit 1-1, the average monthly administrative cost of $8.21 per case month during the evaluation period for the off-line EBT demonstration was significantly higher (by $5.32 per case month) than the comparable cost for the paper coupon system.

Table of Contents

Exhibit 1-1

IMPACT OF THE OFF-LINE SYSTEM ON ADMINISTRATIVE COSTS
(Cost per Case Month)

	Food Coupon	Off-line EBT	Difference
Authorizing access to benefits	$0.33	$2.05	$1.72
Delivering benefits	2.27	3.34	1.07
Crediting retailers and financial institutions	0.17	0.90	0.73
Reconciling and monitoring system	0.08	1.64	1.56
Managing retailer participation	0.04	0.28	0.24
Total Administrative Cost	**$2.89**	**$8.21**	**$5.32**

For the function authorizing access to benefits, EBT costs were higher than comparable costs for the coupon system primarily due to the need to establish the EBT benefit account ($1.37 per case month) on the host and to issue the smart card benefit access device ($0.38 per case month). Costs to establish the EBT benefit account include EBT vendor expenses for labor, data center usage, hardware and software maintenance and network communications. A photo ID card was issued under both the coupon and EBT systems at a cost of $0.11 per case month and, therefore, had no impact on cost.

For the function delivering benefits, costs associated with the coupon system include printing, distributing and issuing coupons, while for EBT, the comparable costs include deploying and maintaining terminals and processing transactions. The $1.07 difference in costs for the EBT versus the coupon system primarily reflect costs attributable to problem resolution. EBT costs for problem resolution were much higher ($1.04 per case month) than comparable coupon system costs ($0.18 per case month). The difference is because Montgomery County established a separate PayEase assistance control office (ACO) to handle client inquiries and serve as a control to the fiscal control office (FCO). In addition, NPC established a customer service toll free number which was staffed 24 hours per day.

For the function crediting retailers, Federal Reserve processing costs for coupons ($0.17) were substantially lower than the cost incurred under EBT ($0.90). In an off-line EBT environment, the retailer initiates settlement with the host. During settlement, all POS transactions that occurred at the retailer location during the day are uploaded to the host. After settling and balancing the host, a file to credit retailers is generated. Retailer credits are processed through the Automated Clearing House. The cost of crediting retailers in the off-line system includes the ACH expense of $0.04, plus processor equipment expense of $0.42 and labor of $0.44, for a total cost of $0.90 per case month. For the coupon system, the cost of $0.17 per case month reflects Federal Reserve coupon processing costs paid by FNS under a cost-reimbursement agreement.

EBT reconciliation was substantially higher ($1.64 per case month) than coupon reconciliation ($0.08 per case month). In the coupon system, the primary responsibility for reconciliation and monitoring lies with the Federal Reserve. However, FNS works closely with the Federal Reserve when problems arise. In the off-line EBT system, the EBT vendor (NPC) has the primary responsibility for reconciliation. NPC incurred costs for reconciling issuances and balancing system debits and credits, reconciling general ledger accounts, and for investigating differences between the reported card balance (uploaded to the host during settlement) and the host derived card balance. These reconciliation functions performed by NPC cost $1.17 per case per month. The Midwest Regional Office also incurred reconciliation costs of $0.05 per case month to manage the EBT project letter of credit, which is used to fund the off-line demonstration project. In addition, costs for EBT project management and oversight ($0.42 per case month) are also included in the reconciliation function and reflect a cost incurred by county, state, field office, regional office, and FNS headquarters staff.

Functionality for managing retailers is similar for both the EBT and coupon systems. There was very little difference in costs associated with authorizing and training retailers, monitoring retailer redemption activity, enforcing retailer compliance, or providing redemption oversight ($0.04 for both the coupon and EBT systems). However, under EBT, NPC provided 24-hour customer service to retailers at a cost of $0.24 per case month. There is no comparable function in the coupon system.

Table of Contents

Impact of the Off-line System on Benefit Loss and Diversion

While administrative costs were higher under EBT, costs associated with benefit loss and diversion were lower under EBT. As shown in Exhibit 1-2, the off-line EBT system resulted in a $2.98 per case month reduction in loss and diversion compared to the coupon system.

Exhibit 1-2

IMPACT OF THE OFF-LINE SYSTEM ON BENEFIT LOSS AND DIVERSION
(Cost per Case Month)

	Coupon	EBT	Difference
Total estimated loss and diversion	**$4.06**	**$1.08**	**($2.98)**

Under the off-line EBT system, the total percentage loss was reduced for two component measures: participant loss and benefit diversion. The reduction in participant loss results from the reduction in the amount of benefits that are lost by, or stolen from, recipients. The reduction in benefit diversion primarily results from the elimination of cash change in an EBT system.

The Feasibility of Continued or Expanded Operations

Although the administrative cost for operating the off-line EBT demonstration system during the evaluation period ($8.21 per case month) was substantially higher than the administrative cost of the coupon system ($2.89 per case month) or on-line EBT systems ($4.39 in Ramsey County and $3.07 in New Mexico), economies which have been implemented since the evaluation and further economies which could be achieved in an expanded, more mature environment, indicate that off-line EBT technology could compete economically with coupon and on-line EBT systems. Since the evaluation, there have been reductions in card replacement rates, the costs of cards and terminals, and some reductions in staffing. In addition, the installation of audio response units has reduced customer service costs. There are potential reductions in ACO and FCO staffing, as well as the economies that can be obtained by spreading costs over a larger

population base. These factors suggest that the prospective cost for a state-wide, off-line EBT system to deliver food stamp and cash assistance benefits, such as Aid to Families with Dependent Children (AFDC), could be in the range of $2.16 to $3.58 per case month. Exhibit 1-3 shows the comparative costs of each of the expansion scenarios.

Although costs are potentially favorable, there are other significant issues such as compatibility with the commercial POS infrastructure, as well as compatibility with other EBT systems that will need to be addressed. Commercial POS systems are based upon an on-line system architecture. In areas where POS has taken hold, there has been a considerable investment in on-line technology in retail food markets. An off-line EBT system cannot be integrated easily into a retailer's on-line POS system.

Regarding compatibility with other EBT systems, one goal of EBT is that it should not adversely impact recipients. Under the paper system, a recipient can transact coupons anywhere in the country. As EBT spreads throughout the country, recipients should be able to transact benefits across state lines. However, other states are electing to develop on-line EBT systems. As a result, Ohio recipients will not be able to use their EBT smart cards in neighboring states. To date, Wyoming is the only other state that is developing an off-line, smart card system.

Finally, some POS experts believe that the industry will eventually move toward off-line, smart card systems to improve security and for other applications such as "electronic purses". Indeed, smart cards are beginning to be used in this country, especially for these pre-paid applications. As the industry moves to off-line technology, the experience gained in Ohio and Wyoming will be invaluable for the Food Stamp Program.

Table of Contents

Exhibit 1-3

EVALUATION OF OFF-LINE EBT

Economic Feasibility

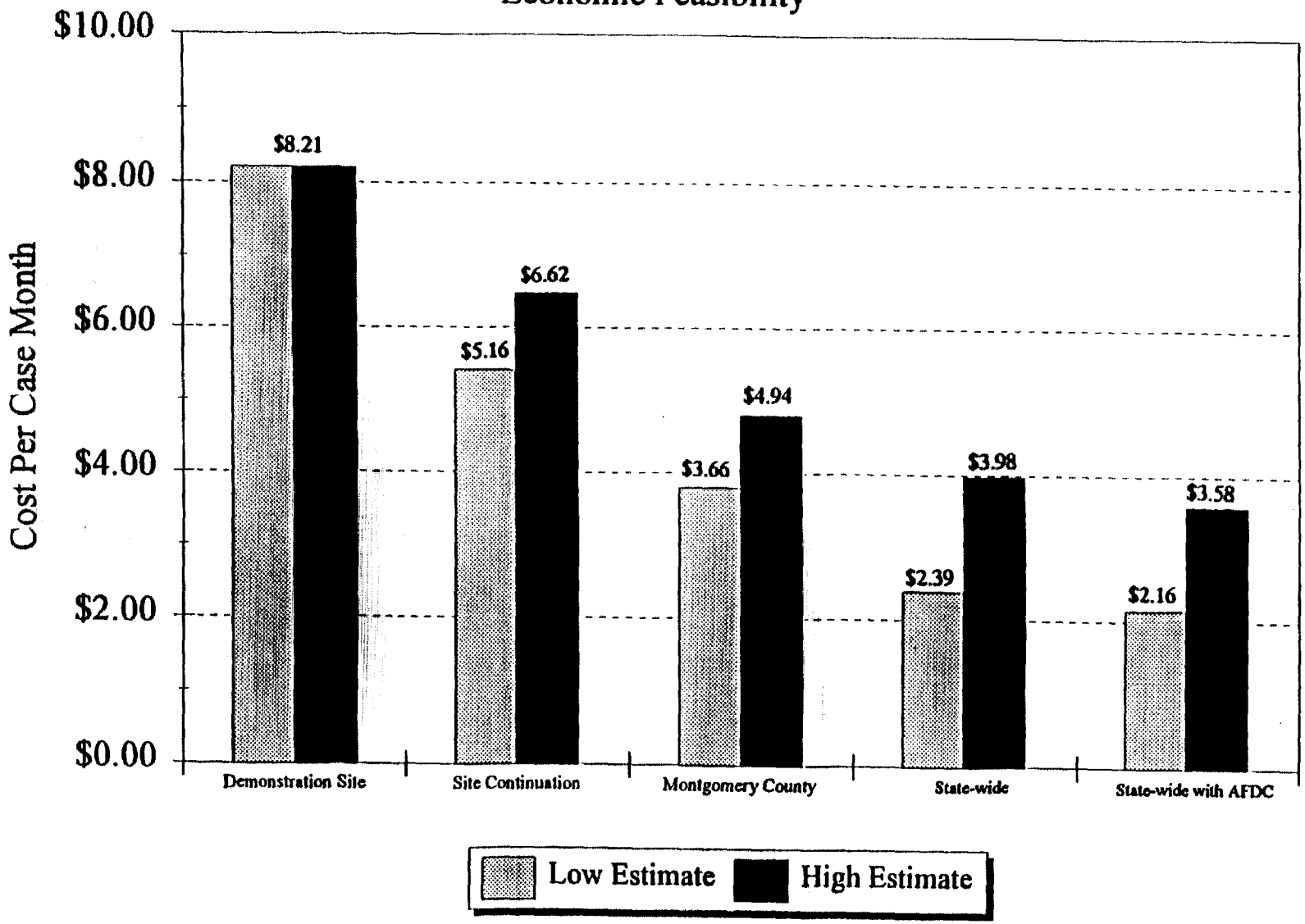

Table of Contents

OFF-LINE SYSTEM DESIGN, DEVELOPMENT AND IMPLEMENTATION

Design, development, and implementation costs for the off-line system totalled $3.4 million. In addition to NPC, Montgomery County, the State of Ohio, and FNS also incurred substantial expenses for system design, development, and implementation. Exhibit 1-4 below summarizes the costs by participant.

Exhibit 1-4

COSTS TO DESIGN, DEVELOP AND IMPLEMENT THE OFF-LINE EBT SYSTEM

Cost Component	Design	Develop	Implement	Total
Demonstration Contractor (NPC)	$439,691	$1,206,323	$863,855	$2,509,869
Montgomery County	31,432	83,489	171,765	286,686
State of Ohio	60,778	39,120	19,098	118,996
Food and Nutrition Service	311,654	149,710	53,283	514,647
Total	**$843,555**	**$1,478,642**	**$1,108,001**	**$3,430,198**

Design costs of $843,555 include costs incurred prior to contract award for FNS preparation of the request for proposal, contractor preparation of the proposal, and FNS evaluation of solicitation responses.

ORGANIZATION OF VOLUME I

In addition to this introductory chapter, Volume I is comprised of four other chapters. Chapter 2, System Functionality, focuses on the technical and functional aspects of the off-line EBT system. A discussion is provided to compare the capabilities and operational differences of on-line and off-line EBT. Last, a summary of the off-line system design and development process is included.

Table of Contents

Chapter 3, Impact of the Off-line EBT System on Administrative Costs, presents the impact on the cost of administering the EBT benefit delivery system in comparison to the food coupon system it replaced. A discussion of the cost components and influencing factors is provided, as well as an impact analysis of each of the primary administrative functions (e.g., authorizing access, delivery of benefits, retailer settlement and management, and reconciliation). A detailed cost discussion is also provided for each phase of the project including design, development, and implementation.

Chapter 4, Impact of the Off-line EBT System on Benefit Loss and Diversion, compares the vulnerabilities of the on-line EBT, off-line EBT and paper food coupon based systems.

Chapter 5, The Feasibility of Continued or Expanded Operations, examines the economic and technical feasibility of continued operations, expanded county-wide operations, expanded state-wide operations and operations under a combined AFDC and Food Stamp system.

Table of Contents

Chapter 2

SYSTEM FUNCTIONALITY

All systems that administer food stamp benefits must perform five basic functions:

- authorizing access to benefits;
- delivering benefits;
- crediting retailers and financial institutions;
- managing retailer participation; and
- reconciling and monitoring the system.

The manner in which these functions are performed, however, can be very different for an off-line EBT system compared to a paper system. The most obvious differences are in the form of the benefits and the process by which recipients obtain and use their benefits. The implementation of an off-line EBT system also causes significant changes in the procedures for crediting retailers and financial institutions. Further, an EBT system provides more points at which monitoring and reconciliation activities can be performed.

INTRODUCTION

This chapter describes how the paper-based food coupon system in Ohio and the PayEase off-line EBT system meet the five basic functions described above. The chapter begins with general descriptions of the current paper-based food stamp system and the PayEase system. The two systems are then examined and compared by FSP function. Detailed descriptions of EBT functions are provided only for those functions that are performed differently in the PayEase system than in the paper system.

A comparison among paper coupon, off-line EBT, and on-line EBT systems by function is provided in Appendix B.

Table of Contents

OVERVIEW OF FSP FUNCTIONS

In July 1992, Ohio completed the state-wide implementation of an integrated public assistance system. This system, called the Client Registry Information System - Enhanced (CRIS-E), resulted in significant procedural changes in administering the Food Stamp Program in Ohio.[1] Before the implementation of CRIS-E, food stamps were issued through an authorization-to-participate (ATP) system. ATP cards were mailed to recipients, who exchanged the ATP cards for food stamps at a county or contractor-operated issuance center. CRIS-E provides for on-line food stamp issuance and eliminates the need to produce and mail ATP cards to every recipient household each month. CRIS-E is also an integrated system; it determines eligibility and calculates benefits for all state and Federal public assistance programs. To support an integrated system, each county Department of Human Services office made the transition to a generic caseworker approach before CRIS-E was implemented. Under this approach, each worker is a generalist rather than a specialist in a particular program area such as food stamps, Aid to Families with Dependent Children (AFDC), and Medicaid.

Paper System

Montgomery County recipients who do not live in the demonstration area continue to receive paper food stamp benefits through the CRIS-E system. A client not currently receiving public assistance meets with an eligibility specialist (caseworker), who enters information directly into the CRIS-E system during an interview. The system determines the client's eligibility for food stamp benefits as well as other assistance. If the client is eligible for benefits, the system also determines the amount of monthly assistance he or she is entitled to receive, called a benefit allotment. Once the worker and client verify that all the information entered into the system is correct, the worker authorizes the case. A CRIS-E photo identification card (ID card) is issued to each eligible client. The client goes to an issuance center on or after a designated date each month and presents the ID card. Following a computer file check, the cashier provides the recipient with food stamps that can be used to purchase eligible food items at authorized food

[1] The demonstration area in Montgomery County was fully converted to the CRIS-E system during the fall of 1991, before the start of PayEase implementation and operations.

retailers. Retailers submit food stamps to their financial institutions (FIs). The FIs credit the retailer accounts and submit the food stamps to the Federal Reserve Bank (FRB). The FRB credits the FI's Federal Reserve account and debits FNS's Treasury General Account for the value of the food stamp redemptions.

Off-Line EBT System

The implementation of the off-line EBT system results in significant changes in some areas of FSP operations, but it has little impact in other areas. For example, the procedures that are used to determine eligibility and calculate the benefit amount do not change at all, but additional steps are required to authorize access to benefits with the EBT system (e.g., EBT training and EBT card issuance).

Overview of Off-Line EBT System

EBT recipients follow the same benefit application procedure at the Montgomery County Department of Human Services (MCDHS) as food coupon recipients. An applicant meets with an eligibility worker who conducts an interview and uses CRIS-E to authorize the recipient's food stamps and other benefits. The recipient goes to the photo ID area and receives a CRIS-E ID card. Some additional activities are required for recipients participating in the PayEase system; typically, these activities are performed during the same visit in which recipients are issued CRIS-E ID cards. EBT recipients must also go to the PayEase office and receive a PayEase card, receive EBT training, select a personal identification number (PIN), and select three retailer locations at which they can obtain their PayEase food stamp allotments each month.[1]

When PayEase cardholders use their cards at one of their three selected retailer locations after the date when benefits are issued, their monthly benefits are automatically added to the card. Recipients can purchase eligible food items at any participating retailer. Purchase amounts are

[1] Since the completion of EBT conversion in June 1992, the PayEase office at MCDHS has handled all EBT training and card issuance functions and has served as the contact point for recipient problems. A separate conversion site was established to perform these functions during EBT conversion.

deducted from the card balance each time a purchase is made. Retailer and financial institution reimbursements are handled through Automated Clearing House (ACH) transfers, which are sent through a concentrator bank and ultimately funded by a FNS letter of credit (LOC) maintained by the Midwest Regional Office (MWRO).

EBT Hardware

The off-line EBT system consists of a mainframe computer at NPC that functions as the EBT host, along with POS equipment and a smart card. In most stores, POS equipment includes a Tranz 340 terminal, CTU-140 card reader, and printer in each equipped checkout lane. In addition, this configuration requires that the store have a PC and a VeriFone 1200C local area network (LAN) controller.[1] Each recipient household is provided with a smart card. The cards currently being used are produced by MCTI, a subsidiary of Bull Computer. The cards are self programmable one chip microcomputer (SPOM) cards that contain 6K (kilo) bytes of read only memory (ROM) to store the operating system or mask for the card; 3K bytes of electronically erasable programmable read only memory (EEPROM) to store the primary account number (PAN), recipient PIN, current balance, all card transactions (including purchases, issuances, manual purchases, and forced credit and debit transactions), data encryption standard (DES) working keys, and check digit sums; and 128K bytes of random access memory (RAM) to interface with the card reader device.

Other equipment deployed at remote sites includes the fiscal control office (FCO) terminals and a POS system used for recipient training at MCDHS.[2] The FCO configuration consists of a PC that provides an on-line interface to CRIS-E and an off-line link to the EBT host. The FCO terminals are used to retrieve from CRIS-E information that is needed to

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[1] In March 1993, NPC began testing an alternative configuration in a few single-lane retailers. POS equipment for this test includes only an OTT2000 terminal, which integrates a cashier terminal and card reader into a single unit, and the same printer used in the multi-lane configuration.

[2] Until the end of January 1993, other terminals were deployed at MCDHS to provide the accounting control office (ACO) with on-line access to the EBT host. Procedures were changed during the latter part of 1992 and early 1993 to eliminate the need for ACO on-line access, and terminals were removed.

establish a recipient in the PayEase system and provide this data to the EBT host. The FCO terminals support several functions including PayEase card issuance, card diagnostics, manual account adjustments, and conversion of EBT benefits to paper coupons for recipients leaving the Dayton area temporarily or permanently.

The EBT host, located at NPC facilities, resides on a Tandem CLX model 800 with two 32 megabyte (MB) processors that provide redundant processing capabilities. The EBT host processor is dedicated to the EBT system and supports a variety of functions including: authorization and capture of credit (e.g., refunds) and debit (e.g., purchase) transactions at the POS; delivery of non-financial transactions to a central site for retention, distribution, and reporting; and facilitation of issuance delivery and PayEase card update. In addition, the EBT host's on-line customer service functions provide file maintenance and inquiry capabilities.

EBT Communications

Communication links exist between the EBT host and each of the following organizations: ODHS, MCDHS, the Cincinnati Field Office (FO), the concentrator bank, and each participating retailer. A CompuServe node is used to provide retailer communications with the EBT host. In the off-line system, retailers need to connect to the host only to perform settlement. In addition, retailers have 24-hour access to NPC customer service through a toll-free telephone number. This provides the means for reporting equipment or system problems, inquiring about settlement status, and obtaining other support.

Other communications with the host are provided through modem connections or dedicated lines. MCDHS communications (between the FCO terminal and the EBT host) are handled through an asynchronous 2400 BPS modem using a proprietary streaming protocol.[1] ODHS communications involve a dedicated circuit between ODHS and NPC that routes data through NPC's affiliate in Columbus, Bank Ohio, and uses an existing data line between NPC and Bank Ohio. Bank Ohio also processes the ACH file for the off-line EBT project, and the

[1] ACO terminals, which were removed in January 1993, used CompuServe to connect to the EBT host.

Table of Contents

same data line is used to receive the ACH file from NPC. The Cincinnati Field Office originally connected to the host through CompuServe, but this access method was changed during the operations period. The Field Office currently dials into the NPC system using a modem connection. This change was made to correct field office problems in uploading retailer

AUTHORIZING ACCESS TO BENEFITS

When benefits are authorized, a CRIS-E photo ID card is issued, and issuance files are created and maintained in both the paper food coupon and off-line EBT systems. In addition, the PayEase system requires additional steps to establish recipients in the EBT system and provide benefit issuance information to NPC.

Authorizing Access - Paper System

In the current paper-based food coupon system in Montgomery County, two functions are required to authorize access to benefits: a CRIS-E photo ID card must be issued, and an issuance file must be created and made available for on-line access at the issuance centers.

Issuing CRIS-E Identification Card

The CRIS-E photo ID card issuance process begins with a completed referral form. This form usually is completed by the intake caseworker when a new case is authorized or by an on-going caseworker when information is changed or a replacement ID card is required. The recipient takes the caseworker's referral to the photo ID area, which is located in the MCDHS fiscal office. If the ID card is a replacement card, the recipient goes to the cashier area. The cashier verifies the recipient's identity and determines whether a replacement fee is charged. Clients are charged $1.50 to replace a missing card, but a recipient who is having a card replaced

date, and expiration date onto the identification card. The photo ID clerk then takes the recipient's picture and laminates the ID card.

Creating and Maintaining Benefit Issuance Files

All information related to issuance records is maintained by ODHS in the CRIS-E system. The ODHS management information systems (MIS) group maintains the CRIS-E system and other systems that are operated from the state data center. In addition to sharing computing resources with other state agencies, ODHS also shares telecommunication resources. The shared Ohio Data Network (ODN) provides necessary connections between the mainframe computer on which CRIS-E resides and the county Department of Human Services offices and issuance centers that access the CRIS-E system. Issuance records are available for on-line access by the issuance centers. Each month, a batch process is used to create the regular monthly issuance file. This batch process is performed at monthly cutoff, which occurs approximately eight days before the end of the month. During this process, master eligibility files and issuance files are examined to verify continued eligibility and allotment amount, and for eligible households, the benefit information is written to the monthly issuance file. This file and daily supplemental issuance records can be accessed by the issuance centers through the ODN. CRIS-E usually is available on-line Monday through Friday, 7:00 a.m. to 7:00 p.m.; the system also is available for issuance center access in the morning of the first and second Saturday of each month.

Authorizing Access - PayEase System

Several of the steps necessary to authorize benefits under the paper food coupon system do not change under the PayEase system. The procedures required to determine recipient eligibility and issue a CRIS-E photo identification card do not change. Based on the recipient's zip code, the CRIS-E system determines whether the household receives EBT benefits or paper food coupons, and sets the issuance flag to "S" to indicate recipients who receive EBT benefits.

Procedures for notifying recipients about demonstration participation differed during initial conversion and after recipient conversion had been completed. During EBT conversion, letters were sent to recipients informing them about participation in the EBT demonstration and setting

a training appointment. Once the initial conversion had been completed, the caseworkers assumed responsibility for providing information to recipients concerning EBT participation.

Establishing Recipients in the EBT System

Some additional steps are required for recipients who participate in the EBT system. Since the completion of PayEase conversion in June 1992, training and activities necessary to establish a recipient's case in the PayEase system have been performed by the MCDHS FCO. All newly authorized EBT recipients are required to attend a PayEase training session before they receive their first EBT benefits. During training, recipients attend a classroom session, watch a video, and obtain "hands-on" experience by doing a practice exercise using PayEase equipment. One smart card, referred to as a PayEase card, is issued to each recipient household, and personal identification numbers (PINs) are selected by recipients. Recipients also select three retailer sites at which they can receive their benefits each month.

Card issuance involves the recipient and the FCO clerk. The FCO clerk, after identifying the recipient, accesses the recipient's records and enters the recipient's retailer issuance site choices into the PayEase FCO terminal. The recipient then enters his or her self-selected PIN (and verifies correct entry by entering it a second time). The card issuance process performs DES encryption and writes the encrypted PIN to the card's memory.

During the evaluation period, the final step in the card issuance process involved taking a picture of the individual responsible for the household's contact with MCDHS and adding that image to the card. This action represented the last step in card personalization.[1]

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[1] Beginning in February 1993, smart card issuance procedures changed due to card design changes. Cards are received from the manufacturer with the PAN, logo, graphics, and disclosures pre-printed on them. Prior to February, this pre-personalization of the cards was performed by NPC. In addition, recipient photographs are no longer taken and placed on the cards, which enables the project team to reuse lost cards that are returned after replacement cards have been issued. Procedures for retailer selection, PIN entry, and DES encryption do not change with the introduction of the new smart card issuance procedures.

Table of Contents

Providing Issuance Information to NPC and Issuance Sites

Issuance information is provided to the PayEase system from CRIS-E daily (auxiliary issuance files) and monthly. Recurring monthly issuance files are produced by ODHS as part of the end of month batch processing that creates the regular monthly paper food coupon issuance file.[1]

The following process is used to provide recipient information to the PayEase system:

- The CRIS-E system at ODHS directs EBT issuance records to a separate file (based on EBT issuance flags).
- ODHS, as part of its nightly batch job stream, transmits the file to the EBT host at NPC. The auxiliary file contains information for all new issuance records created that day.
- The MCDHS FCO, as part of its daily information exchange with NPC, uploads card issuance and recipient setup data to the EBT host. This occurs on business days only.
- The EBT host matches the NPC authorization numbers, which are derived from the recipient's CRIS-E number, from two sources: the file sent by ODHS and the data uploaded from the FCO.
- When a retailer performs settlement, a two-way data exchange occurs between the retailer and the EBT host. Transaction data is uploaded to the EBT host. Negative files, which contain the PANs of damaged, lost, stolen, or suspect cards and are used to prevent transactions with these cards until the negative flag has been removed, and "staged" transactions, such as benefit issuances, are downloaded to the retailer. (The benefit issuance records identify the first day on which the recipients can access benefits and are downloaded to a retailer only if the recipient chose that retailer as one of their three retailer issuance sites.)
- The EBT host also downloads benefit issuance records to MCDHS, so that recipients can add benefits to their cards at the county office as well as at selected

[1] Until December 1992, ODHS transmitted this file to NPC in the same manner in which it transmits the daily auxiliary file. Beginning with the December issuance file, which was provided at the end of November 1992, ODHS began providing the monthly recurring file on magnetic tape rather than through transmission. This change was made to avoid the recurrence of problems in differentiating auxiliary files from the recurring file and to provide a more cost-effective alternative for larger files by eliminating the telecommunications costs associated with transmitting the recurring file.

retailer sites. Recipients might elect to redeem their benefits at the county office if they have other business there. Benefit issuances also may be available sooner at the county office than at selected retailers because benefit issuances are not downloaded to retailers until the retailer initiates settlement.

DELIVERING BENEFITS

Procedures for benefit delivery are very different in the paper food coupon and off-line EBT systems. Major differences include the form of the benefits themselves, the process involved in getting benefits to the issuance point, and the procedures for issuing the benefits. This section describes the methods used in each system.

Delivering Benefits - Paper System

With the paper coupon system in Montgomery County, food stamp coupons are supplied to the issuance centers. Recipients must go to one of the issuance centers to pick up their benefit allotments.

Maintaining Supply of Food Coupons

There are three issuance centers and a coupon bulk storage site in Montgomery County, all run by private contractors selected through a competitive bidding process. The County's objective is to maintain a six month coupon inventory at each site. To maintain the supply of food coupons, the following process is used:

- To determine current coupon inventory, MCDHS's Fiscal Supervisor reviews the FNS 250 - *Food Coupon Accountability Report* prepared for each issuance site and the bulk storage site monthly.
- The supervisor orders coupons monthly (if necessary) by completing the FNS 260 - *Requisition for Coupon Books* form and submitting the form to ODHS.
- Upon receiving the FNS 260 report from the county, ODHS's Bureau of Payment Distribution reviews the report to ensure that it is complete and correct. ODHS then forwards the FNS 260 to the FNS MWRO.
- The FNS MWRO reviews the report and forwards it to FNS headquarters.

Table of Contents

- FNS headquarters processes the report and orders coupons from the printer, the American Bank Note Company.
- The printer ships coupons to the bulk storage site via armored truck.
- The bulk storage site delivers coupons to the issuance centers via armored truck.

Issuing Coupons to Recipients

MCDHS uses a staggered schedule to issue food stamp benefits with coupons issued over the first five working days of the month. CRIS-E case numbers determine the day on which each individual's benefits are available. Most recipients in Montgomery County obtain food coupons by presenting their photo ID cards to issuance center cashiers.[1] The cashiers type in the CRIS-E case number, which allows the system to retrieve case information and display an issuance screen. The screen indicates the total amount of the benefit allotment as well as the number of each denomination of food stamp books ($2, $7, $10, $40, $50, and $65) to issue. Cashiers print a paper copy of the issuance screen, give the recipient books containing the appropriate amount of food coupons, and have the recipient sign the issuance screen printout to acknowledge receipt of the benefits. The record is automatically updated to reflect that the recipient has picked up his or her food coupons. The signed forms are kept by the cashier to reconcile daily issuance, and the signatures can be used to verify that the correct person has picked up the food coupons. Once issued, food stamps do not expire, and recipients can use the food stamps to purchase eligible food items at any authorized retailer.

Delivering Benefits - PayEase System

The off-line EBT system does not require the recipient to visit an issuance center or conduct a separate system transaction to obtain food stamp benefits.

[1] Coupons are mailed directly to a small number of recipients in Montgomery County outside the EBT demonstration area.

Table of Contents

PayEase Benefit Issuance

The PayEase system also staggers benefit issuance over the first five days of each month. Each household's issuance date is determined by CRIS-E case number. PayEase issuance currently is staggered over the first five calendar days of the month rather than the first five working days, as is the case with paper food coupons.[1]

To obtain monthly benefits, recipients must go to MCDHS or one of the three selected retailer issuance sites, on or after the benefit start date. The issuance can be obtained automatically during a purchase transaction at the retailer, or the recipient can obtain the benefits without making a purchase by inserting the PayEase card into a card reader. Once the issuance has been added to the card, the recipient can use the food stamp benefits at any store that participates in the PayEase system.

Purchasing Food at Participating Retailers

The basic EBT purchase transaction begins when the recipient places the PayEase card in the CTU-140 card reader. The recipient enters his or her PIN on the card reader's keypad. The PIN validation is performed immediately on the card, and the in-store database is checked to determine if the card is listed on the hot card file or if there are any staged transactions to be posted to the card. The cashier rings the grocery order, and at the conclusion of the transaction, the cashier enters the EBT purchase amount into the cashier terminal. The card reader display provides the EBT total for the recipient to validate. The recipient validates a correct total by pressing the "#" key on the keypad. At this point, the amount of purchase is verified against the available balance on the card. If the balance is sufficient, the transaction is recorded on the retailer's system, and on the recipient's card, decrementing the available balance. An EBT receipt, as well as a register receipt, is provided to the recipient. The EBT receipt indicates the

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[1] Prior to January 1, 1993, PayEase issuance was staggered over the first five working days each month; however, this practice created some confusion over the exact date that benefits would be available each month. To eliminate this confusion, the PayEase project team changed the schedule for staggering issuances to base it on calendar days.

beginning card balance, the purchase amount, and the ending card balance.[2] Each recipient's smart card retains a transaction history comprised of the last 100 transactions and the retailer's system retains all POS transactions in memory until retailer settlement occurs. At settlement, the transaction data from the retailer is uploaded to the EBT host. The account balance for each recipient household is maintained on the host as well as on the smart card. Therefore, with the off-line system, at any given time there are two balances for every recipient: a card balance and a host-derived balance.

In addition to regular purchases, the PayEase system allows for a variety of other transactions at participating retailers. Some of these transactions include: purchase reversals, which void the last purchase; refunds; refund reversals, which void the last refund; manual purchases; manual refunds; and forced debit and credit transactions. Forced credit transactions allow retailers to correct purchase transactions -- if it is discovered that a recipient, who is not present, was inadvertently overcharged -- by adding the amount of the overcharge to the PayEase card the next time the card is used. For security purposes, some transactions, e.g., manual purchases, require the use of a manager card.

Manual Purchases. Retailers can perform manual transactions for recipients when the store is experiencing system or equipment problems. Manual purchases, which are performed at the retailer's discretion and risk (due to the possibility of an overdraft), differ from regular purchase transactions because the PayEase card is not used.[2] Instead, the store calls NPC customer service to request approval for the transaction; the retailer provides the recipient name, PAN, purchase amount, and store number to the customer service agent. Customer service enters the transaction information into the EBT host. The system checks the negative file, the available balance, and any outstanding manual transactions for the card. If these conditions indicate sufficient funds for the manual transaction, the 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 number was entered into the system correctly), and places the

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[1] The receipt also shows any automatically posted activity (such as issuances and staged debits for manual transactions not previously posted to the card).

[2] Few retailers process manual transactions. Manual purchases during the evaluation period were less than 0.15 percent of total transactions each month.

transaction in a pending file. The PayEase 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 is available, the information from the manual purchase receipt must be entered into the retailer's system. The entry of this information requires the use of a manager card. Retailers receive credit for manual transactions five days (host settlement cycles) after the EBT host has received the transaction from the POS. Crediting is delayed to ensure that the recipient's account balance is sufficient to cover the manual transaction after all outstanding regular purchases have been settled at the EBT host.

Forced Debit Transactions. The PayEase system accommodates the inclusion of certain special types of retailers, such as "meals on wheels" and certain food cooperatives, without providing a special mobile terminal. Participation of these retailers is accomplished using a "forced debit" transaction. In many respects, the forced debit transaction is very similar to a manual purchase; however, its use is limited to retailers without PayEase equipment. The retailer's actions and responsibilities in forced debit transaction processing are similar to those for manual purchases. The retailer assumes the overdraft risk, calls customer service for an authorization, and completes a manual transaction receipt. Because these retailers do not have EBT equipment, the retailers provide their receipts to MCDHS, and the transaction information is entered into the PayEase system at the FCO. Host processing for forced debit transactions is similar to manual transaction processing, except that retailers receive credit for the transaction after the EBT host receives an acknowledgement that the transaction has been written to the recipient's card. A forced debit transaction is written to the recipient's card the first time the recipient uses the card at any participating retailer after the EBT host receives the transaction, host settlement occurs, and the retailer at which the recipient is shopping settles with the EBT host.

CREDITING RETAILERS AND FINANCIAL INSTITUTIONS

The crediting process and the timing of various events change significantly with the implementation of an EBT system. The flow of paper coupons and associated credit from the

retailer to the store's FI to the FRB is replaced by the electronic flow of retailer credits from the store to NPC to the concentrator bank and through the ACH network to the retailer's FI.

Crediting Retailers and Financial Institutions - Paper System

In the paper food coupon system, retailers receive credit for paper food coupons from their financial institutions. The retailer submits food coupons accompanied by a redemption certificate (RC), to the FI where the retailer deposits cash and checks. The RC functions as a special deposit slip for food coupons. The FI verifies the retailer's deposit and credits the retailer's account for the verified amount. The time elapsed between the point at which the retailer makes the deposit (in person at a teller window or commercial window or through a night depository) and the point at which the store's account is credited varies depending on the procedures used by the retailer's FI.

Despite differences in banking procedures, there are some basic similarities in the procedures followed to obtain credit. The FI that receives food coupons from a retailer performs some level of deposit verification and credits the retailers' account. Next, the FI combines retailers' food coupon deposits while keeping the coupon denominations ($1, $5, and $10) separate. Coupons are then combined into straps containing 100 coupons each. The FI prepares a food coupon deposit document (FCDD), which details the contents of the FI's deposit to the Federal Reserve. After reconciling the sum of the food coupons to the sum of the RC totals and the FCDD amount, the FI deposits the food coupons, RCs, and the FCDD to the Federal Reserve. Many FIs do not count and strap the food coupons they receive and prepare the deposit for the Federal Reserve; instead, they use a correspondent bank and/or pay service fees to another FI for performing these functions. In addition, all of the FIs interviewed during the baseline data collection period indicated that they centralize food coupon processing at one or more locations, rather than having each branch submit separate food coupon deposits to the Federal Reserve. The Federal Reserve verifies the food coupon amount, credits the FI's account, and debits the FNS Treasury account. Analysis of redemption patterns during the baseline data collection period indicated that food stamp redemptions for all PayEase demonstration retailers examined occurred through one of six FIs; all six of these FIs redeemed food coupons through the Cincinnati Federal Reserve.

Table of Contents

Crediting Retailers and Financial Institutions - PayEase System

The PayEase system changes significantly the way in which retailers and FIs are credited for benefit redemptions. Retailers upload data to NPC, NPC sends retailer credits to the concentrator bank, which in turn creates an ACH file that is provided to the ACH network. The ACH provides credit to retailers' FIs, which subsequently credit retailer accounts.

Retailer Settlement

Under EBT, the process for reimbursing retailers for food stamp redemptions begins with the retailer's daily settlement with NPC. Each purchase, as well as other transactions (e.g., refund) performed at a PayEase POS terminal is recorded in memory. The retailer chooses a convenient time for performing the end of day (EOD) settlement transaction. Retailers can perform manual settlements, but many retailers use the auto-settlement option, in which daily settlement is initiated automatically at a specific time each day. Settlement requires the system to be in manager mode, which is the default option if auto-settlement is used. If the retailer settles manually, the manager card must be used to initiate the EOD settlement transaction. When retailers settle, the POS system dials into CompuServe, which 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 and issuance records 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 EOD settlement clears all transaction data from the retailer's system.

EBT Host Settlement and ACH File Creation

EBT host settlement is performed daily through a batch process that is initiated at 4:00 a.m.. Host settlement consolidates individual purchases and other transactions made at a

particular store into a net amount for each retailer and creates a file in ACH format that contains credits for individual retailers. NPC also produces a retailer credit extract, the FNS 460F - *Extract for FNS: Retailer Settlement Credits*. Once a week, these extract files are downloaded to tape and provided to the Minneapolis Computer Support Center (MCSC).

After creating the ACH format file, NPC transmits the file to the concentrator bank, Bank Ohio. Bank Ohio removes from this and other ACH files all debit and credit items destined for accounts at Bank Ohio and its affiliates for which it performs ACH processing (on-us accounts). The on-us account items are posted directly to customer accounts on the ACH settlement date without passing through the ACH network, thereby avoiding ACH processing charges. All remaining items are then sent to the local ACH. Processing for the local ACH is performed by the Cleveland FRB.

Reimbursement Request

After NPC has created the ACH file and calculated the total value of retailer credits, NPC accesses the Department of Health and Human Service's SmartLink/Payment Management System (PMS) through a modem connection to request reimbursement for the sum total of the retailers' credits in the file. The deadline to request SmartLink/PMS reimbursement through the ACH network is 5:00 p.m. each business day. Meeting this deadline ensures that the concentrator bank receives credit on the business day following the day that the request was made through SmartLink/PMS.

ACH Network Processing Activities

After overnight ACH processing, the concentrator bank's Federal Reserve account is debited and the Federal Reserve accounts of retailers' FIs are credited. Payment files detailing the individual accounts and payment amounts also are provided to each financial institution through the ACH network. At the same time, the concentrator bank's account is credited for the SmartLink reimbursement amount. This payment to the concentrator bank is funded by a draw from FNS's letter of credit (LOC) for this demonstration.

Table of Contents

Crediting Retailers' Bank Accounts

To complete the reimbursement process, the retailers' FIs credit the retailers' accounts. This process is performed either during the next business day or during batch processing that night. For example, if the concentrator bank sends the ACH file to the ACH network on Monday evening, the ACH processing is done overnight Monday, and the retailers' FIs can credit retailer accounts during business hours on Tuesday or after business hours Tuesday as part of the batch overnight processing cycle.

MANAGING RETAILER PARTICIPATION

The primary functions involved in managing retailer participation include authorizing retailers to participate in the FSP, monitoring the redemptions of participating retailers, updating retailer information in the system, and conducting investigative activities and imposing sanctions on retailers that are not in compliance with FSP regulations. These functions must be performed regardless of whether program benefits are delivered in the form of paper food coupons or through an EBT system.

Managing Retailer Participation - Paper System

Under the paper food coupon system in Montgomery County, FNS's Cincinnati Field Office has primary responsibility for managing retailer participation. Other FNS agencies also provide assistance in retailer management functions. These agencies include the MWRO, the Compliance Branch's Chicago Compliance Area Office, and the MCSC.

Authorizing Retailers to Participate

A retailer in Montgomery County who wants to participate in the FSP contacts the Cincinnati Field Office. The secretary in the field office handles this initial contact, completes an Application Request form, and mails the application package, which includes the FNS 252 - *Food Stamp Program Application for Stores*, to the retailer. After the retailer returns the completed application to the field office, the Officer-in-charge (OIC) reviews it to determine if

the application should be approved, disapproved, or returned to the retailer for additional information. At this time, the OIC also decides if a store visit is required to ensure that the store is legitimate and that the retailer understands the program and his role in the FSP. At the discretion of the OIC, a store can be authorized through a telephone call or a site visit. One of the FO's food program specialists (FPS) conducts the telephone interview or site visit. Following the store visit or call to the retailer, the FPS prepares an initial contact report.

The decision to authorize a retailer is sent to the retailer through certified mail. The Cincinnati Field Office secretary sends this approval/follow-up letter and other program materials to the store. The secretary completes the authorization process by entering retailer information into the system, uploading data to MCSC to update the master retailer database maintained by MCSC, and placing an initial Redemption Certificate order for the new retailer. If the field office decides to reject an application, a denial letter is sent to the store. The letter indicates the reason for denial and informs the retailer that the owner can appeal the decision through the FNS Administrative Review process. Only a small number of retailer applications are denied by the Cincinnati Field Office.

Retailer Monitoring Activities

In addition to authorizing retailers, the Cincinnati Field Office is responsible for routine monitoring and updating of system information for retailers in its area. The Cincinnati Field Office manages the participation of over 2,000 retailers in a 170 mile area that includes 35 counties. Annually, MCSC provides the Cincinnati Field Office with a report, *Firms with Redemptions Exceeding 90 percent of Food Sales*. This report is reviewed by a FPS at the field office. The Cincinnati Field Office conducts further examination of the stores listed on the report to determine whether the retailer's redemptions were excessive -- indicating potential FSP violations -- or if the apparent excessive redemptions that caused the store to be included on the report were due to inaccurate (low) reported food sales value in the system. Usually, this follow-up action is accomplished by calling the retailer. If the retailer indicates that store sales are significantly different from reported values, the field office sends a new application to the retailer so the retailer can provide updated information to FNS.

In addition, an average of two retailers per week call the Cincinnati Field Office to indicate that there has been some change in information. In this case as well, a retailer application is sent by the field office so that the retailer can provide updated information. The Cincinnati Field Office then updates the retailer information in its computer system and uploads the information to MCSC. In addition, the field office addresses retailer and FI problems related to the paper food coupon redemption process. The primary activity involves placing emergency RC replenishment orders when retailers contact the field office to indicate a shortage of RCs.

As indicated above, MCSC supports retailer monitoring by providing redemption reports to the Cincinnati Field Office. MCSC provides a series of monthly and annual reports to the Cincinnati Field Office. In addition, MCSC can provide ad-hoc reports in response to the specific needs of the Cincinnati Field Office and other organizations within FNS and the government.

Retailer Compliance Enforcement

Retailer compliance with FSP regulations is enforced through a multi-step process that involves the Cincinnati Field Office, the Compliance Branch, and possibly Administrative Review personnel, Judicial Review personnel, and/or the Office of Inspector General, depending on the nature of the violation and the direction that the investigation takes. There are many variations in the process of investigating possible FSP or legal violations by retailers. A description of this process is included in Appendix C.

Managing Retailer Participation - PayEase System

The existing management functions do not change with the EBT system. However, a few additional functions must be performed to support the EBT system. When a new retailer in the demonstration area is authorized for the FSP, the Cincinnati Field Office provides this information to NPC so that the retailer can be approached about participating in the EBT demonstration. The Cincinnati Field Office also is responsible for entering information about new retailers into the PayEase system and updating existing retailer information when relevant changes are reported. To provide information to NPC, the field office uses a PC with specialized software that connects to the EBT host. The field office also enters information concerning

retailer withdrawals or disqualifications from the FSP; the retailer is then deactivated in the PayEase system. Further, the Cincinnati Field Office is available to address any retailer questions and provide general information about the PayEase system.

Procedural changes required to perform investigations in the PayEase system are discussed in Appendix C.

RECONCILING AND MONITORING THE SYSTEM

There are several differences in reconciliation and monitoring between the paper food coupon system and the off-line EBT system. These differences focus on additional reconciliation points that are used with the EBT system.

Reconciliation and Monitoring - Paper System

For the paper system, reconciliation and monitoring activities examined include issuance activities and benefit redemption activities.

Benefit Issuance Reconciliation

MCDHS, ODHS, and FNS are all involved in issuance reconciliation and monitoring for the paper coupon system under CRIS-E. Three FNS reports usually are used in reconciliation: FNS 46 - *Issuance Reconciliation Report,* FNS 250 - *Food Coupon Accountability Report*, and FNS 259 - *Mail Issuance Report*. Food coupon issuance by mail is not used in Montgomery County except for a small number of cases in the rural part of the county outside the EBT demonstration area. Therefore, the procedures for mail issuance reconciliation will not be discussed in detail.

MCDHS prepares and submits the FNS 250 and FNS 46 reports to ODHS monthly. The FNS 250 report is used primarily to record coupon issuance and coupon inventory. Each issuance center prepares a FNS 250 report and submits it to the MCDHS Fiscal Office. The Fiscal Officer reviews the reports from each issuance center and prepares a consolidated FNS 250 for

Montgomery County. The FNS 46 reports issuance activity by category: CRIS-E direct access, ATP, and mail. It is used to report issuance losses and other problems as well as total monthly benefit issuance. To prepare the FNS 46 report, the MCDHS Fiscal Officer uses the information from the FNS 250, the FNS 259, documentation of coupon replacements, information on payment collections, and other data.

The reports are sent to ODHS Food Stamp and Temporary Emergency Food Assistance Program Section. A person in this group reviews the reports received from all the issuance sites and counties in Ohio. The ODHS food stamp section also enters relevant data into the state system. ODHS sends reports to the FNS MWRO by certified mail.

The reports are used at both the MWRO and FNS headquarters levels. After receiving the report, the clerical staff at the MWRO logs, stamps, copies, and files the reports. The data from the reports are entered into the FNS system. In addition, the MWRO identifies losses and other issuance errors, for which Ohio is billed. MWRO uses the reports submitted by the state as a tool to review state food stamp issuance systems.

Several other organizations within FNS also are involved in reconciling issuance activities. The Information Resources Management Division (IRMD) maintains the databases of FNS 46 and FNS 250 data. Issuance data also is used in policy making, by the Program Development Division, and in monitoring state issuance and Regional Office oversight by the Program Accountability Division (PAD).

Benefit Redemption Reconciliation

FNS reconciles food coupon redemption. This activity involves monitoring retailer and financial institution redemptions and reconciling credits to FIs and debits to the FNS accounts. This activity is coordinated by FNS headquarters and supported by MCSC. Since the national implementation of the Redemption Accountability Program (RAP) in 1991, the Federal Reserve has been responsible for ensuring that retailer redemption totals reconcile to FI totals and actual food coupon amounts. The Federal Reserve processing locations transmit retailer and financial institution redemption data to MCSC. From this data, MCSC produces a variety of management

reports. In addition, the Federal Reserve Banks (FRBs) submit debit vouchers, which indicate the daily debits to the FNS Treasury accounts, to MCSC. Debit voucher data is key-entered into the FNS system, and from this information, FNS prepares the SF-224 - *Statement of Transactions* report, which reconciles monthly debit voucher totals to Treasury data. MCSC also performs a reconciliation that compares debit voucher amounts to RC totals to FCDD totals for each FRB location. The results of this reconciliation are reported in the FRB 510 - *FRB Bank Monitoring Performance Comparison.*

Reconciliation and Monitoring - PayEase System

Reconciliation and monitoring activities for the off-line EBT system involve several activities that are performed by retailers, NPC, MCDHS, ODHS, and FNS. Retailers are responsible for reconciling daily EBT net purchases to their bank accounts -- to ensure that they have received full credit -- and contacting NPC to resolve discrepancies. However, the extent to which reconciliation and discrepancy resolution is done varies among retailers. The major system reconciliation and monitoring activities performed include: issuance reconciliation, EBT account reconciliation, obligation reconciliation, redemption reconciliation, and LOC draw reconciliation.

Benefit Issuance Reconciliation

Issuance reconciliation and monitoring functions at the county and state levels change slightly with the introduction of the PayEase system. MCDHS prepares a separate FNS 46 - *Issuance Reconciliation Report* for EBT issuances. This report, which details the dollar value of EBT issuances as reported through the CRIS-E system, is provided to ODHS. The EBT Project Director for ODHS reviews the information and adds the monthly EBT net purchase amount (the sum of ACH settlements for the month) -- provided by NPC -- to the "Comments" section of the FNS 46 report before forwarding the report to the MWRO. In addition, the ODHS EBT Project Director receives and reviews a daily report from the CRIS-E system that lists the issuance records that were provided to NPC. The director also receives and reviews a daily report that lists issuances redeemed, i.e., benefits added to PayEase cards, by recipients. These two reports enable ODHS to compare issuances authorized to issuances added to PayEase cards;

however, on a daily basis, issuances authorized are not required or expected to reconcile to issuances added to PayEase cards.

EBT Account Reconciliation

NPC has primary responsibility for EBT account reconciliation. Several levels of reconciliation are performed. As a part of the EBT system, NPC has developed an intricate general ledger system, and reports produced by this system are used to perform reconciliation activities. NPC performs the following types of account reconciliation activities: issuance, retailer settlement and crediting, daily transaction activity and host update, and comparison of card and host-derived balances.

NPC Issuance Reconciliation. NPC performs daily issuance reconciliation on a system-wide basis by comparing the following three sources: ledger account balances provided in the EBT 455 report; the host issuance master file (EBT 390A report); and the host PAN master file (EBT 440A report). Issuance records can assume several conditions in the EBT system, e.g., redeemed, suspended, and expired. General ledger accounts exist for each condition. The focus of the reconciliation effort is to ensure that the total issuance outstanding in the PayEase system equals the sum of all possible issuances. All discrepancies are investigated by NPC customer service.

NPC Redemption Reconciliation. In the PayEase system, the aggregate amount of the retailer end-of-day (EOD) settlements should reconcile to the sum of the ACH credits in the file sent to the concentrator bank from NPC and the debit to the FNS LOC. This is verified through the use of the general ledger system and various reports on a daily basis. The deposit amount shown on the retailer's EOD totals receipt is reconciled to the host-calculated net credit. The net credit amount does not include manual purchase transactions, because these must be held out of the ACH settlement for five settlement cycles. After the five settlement cycles elapse, manual credits are settled through a separate ACH credit rather than being included in that day's ACH credit for the retailer. Manual purchases, therefore, are shown separately on the retailer EOD receipt and are not included in the deposit total. The results of this reconciliation are provided to FNS through the EBT 460F - *Extract for FNS: Retailer Settlement Credits*. PayEase system

reconciliation entails verifying that the sum of the credit items in each of the following reports are the same:

- FNS 460A - *Daily Retailer ACH Settlement* (work file);
- FNS 460T - *Daily ACH File to Bank*;
- FNS 460S - *FNS Settlement Through SmartLink* (request amount); and
- EBT 460F - *Extract for FNS: Retailer Settlement Credits.*

System Update Reconciliation. The PayEase system performs reconciliation to ensure that daily activity uploaded from retailers and the FCO correctly updates the master files on the EBT host. Three system reports are used to compare update activity to the sum of all retailer and FCO settlement histories for the period:

- EBT 480A1 - *Daily Transaction Activity by PAN*;
- EBT 480X - *Daily Transaction Activity: Exceptions*; and
- EBT 460B1 - *Retailer/FCO Settlement History.*

During the reconciliation, the PayEase system generates a report, EBT 440A - *Reconciliation of Card Balances*, which determines net activity by calculating the difference between the prior day's PAN master total and the current day's PAN master total. This report also reconciles individual card balances.

Card Balance to Host-derived Balance Reconciliation. Card reconciliation is performed in the PayEase system because there are two balances: a card balance based on the transactions written to the card, and a host-derived balance based on transactions settled with the host. NPC reconciles the card balance to the host-derived balance for each household daily. The primary tools that are used to perform this reconciliation are the EBT440F - *Card Balances; Overages/Shortages* report, the EBT440F1 for card shortages only, and the EBT440F2 for card overages only. Differences are investigated only for cases in which the card balance exceeds the host balance (card overages), because these differences represent a potential liability with respect

to unauthorized value being added to the card. Each card overage prompts immediate investigation.

The vast majority of differences, however, are card shortages, in which the card balance is less than the host-derived balance. Card shortages usually result from operational or system problems that occur during the POS transaction -- for example, when the POS transaction writes to the recipient's card, but the transaction is not stored in the retailer's PC database. When card shortages occur, NPC uses the card balance as the available balance in the PayEase system. Card shortages are discovered when there are discrepancies between the retailer's EOD settlement total and the sum of the day's EBT transactions indicated on EBT receipts. NPC delegates to individual retailers the responsibility for reconciling EOD settlement totals to the sum of individual transactions. The potential impact of recipient card shortages on retailers is financial loss if retailers do not resolve discrepancies when the EOD settlement amount is less than the sum of their daily transactions.[1]

NPC helps retailers identify discrepancies by using messages on receipts and the cashier terminal to identify problem transactions. When the POS components do not send the expected confirmation messages to each other, the POS system prints "VOID" and "SUSPECT" messages on receipts and displays messages on the terminals. If transactions are missing from EOD totals, the missing transactions generally are the "VOID" and "SUSPECT" transactions. Retailers notify NPC of transactions that were not included in their EOD settlement and send copies of the receipts to NPC. After verifying the transaction by checking the recipient's card balance on the PayEase system, NPC then provides retailers credit for the transaction.

MWRO Reconciliation

The FNS MWRO has responsibilities in several areas related to PayEase reconciliation and monitoring. The major reconciliation responsibilities include EBT obligation reconciliation, EBT redemption reconciliation, and EBT LOC drawdown reconciliation. MWRO has additional responsibilities related to managing and funding the LOC.

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[1] Additional information and an estimate of the loss to retailers is provided in Chapter 4.

Funding Obligation Reconciliation. To reconcile funding obligations, the MWRO uses the FNS 46 and FNS 388 - *Benefit Issuance and Participation Estimates* reports provided by ODHS. MWRO compares the monthly issuance obligation amount reported on the FNS 388 to the actual issuance for the month provided on the FNS 46. The intent of this reconciliation is to ensure that the issuance obligation is consistent with actual issuance, and to provide a mechanism for making any adjustment to obligated funds based on actual issuance.

Redemption Reconciliation. The MWRO is also responsible for reconciling EBT redemptions using data provided by ODHS and MCSC. The EBT monthly purchases, provided in the "Comments" section of the FNS 46 report, are compared to retailer redemption data provided by MCSC in the FRB 095 - *Report of Transmitted Data.* This report lists the retailer authorization number and the redemption credit amount for each settlement by date and provides the daily redemption total for all settlement activity. MCSC's Data Control Unit (DCU) generates this report by processing the redemption data tape provided weekly by NPC. To ensure that retailer EBT redemptions are equal to recipient purchase transactions, MWRO compares aggregated data for the month, from the FRB 095 report, to the EBT monthly purchase amount, provided on the FNS 46 report.

LOC Reconciliation and Related LOC Activities. MWRO also performs reconciliation functions related to the LOC drawdown. This reconciliation effort entails comparing the daily EBT drawdowns reported through the Payment Management System and the Grant Award Document (GAD)/LOC system to the daily retailer redemption totals reported through MCSC's FRB 095 - *Report of Transmitted Data.* The purpose of this reconciliation is to verify that the draw from the FNS account for a transaction date matches the aggregate credit amount due to retailers for the same date.

In addition to performing reconciliation functions related to the LOC, the MWRO has other responsibilities related to the LOC used for reimbursement with the PayEase project. MWRO initially established the LOC, and it is responsible for performing year-end reconciliation. The MWRO also determines the level of FSP funds to obligate to the EBT LOC. MWRO projects quarterly benefit funding needs and submits these projections, using the projected funding

document (PFD), to FNS headquarters Budget Division. MWRO then allocates funds to the EBT LOC on a monthly basis.

COMPARISON OF PAPER COUPON, OFF-LINE EBT, AND ON-LINE EBT SYSTEMS

Appendix B details the similarities and differences between each type of system in performing the functions required to authorize access to benefits, deliver benefits, credit retailers and FIs, manage retailer participation, and reconcile and monitor benefit issuance and redemption. The columns for the paper food coupon system summarize the Montgomery County system under CRIS-E. The off-line EBT system that is described is the PayEase demonstration system. The column for the on-line EBT system is based on a generic model of an on-line EBT system rather than a specific operational system.[1]

[1] The sources of information used for the generic model are the following documents: Michelle Ciurea et al., The State-Initiated EBT Demonstrations: Their Design, Development, and Implementation, Cambridge, Massachusetts: Abt Associates Inc., June 1993, pp 13-27; and Charles R. King and John A. Kirlin, Guidelines for Preparation and Review of On-line EBT System Design Plans, Cambridge, Massachusetts: Abt Associates Inc., August 1992, pp 107-111.

Table of Contents

Chapter 3

IMPACT OF THE OFF-LINE EBT SYSTEM ON ADMINISTRATIVE COSTS

A primary objective of the evaluation of the off-line EBT demonstration was to estimate and compare the costs of the off-line smart card system to the paper coupon system it replaced and to on-line EBT alternatives. Of principal interest to all parties was whether off-line technology could deliver food stamp benefits more efficiently by minimizing telecommunications and other costs traditionally associated with on-line EBT systems.

INTRODUCTION

This chapter compares the administrative costs of the off-line system to the administrative costs of the state-initiated on-line systems in Ramsey County, Minnesota and Bernalillo County, New Mexico.[1] Administrative costs include all costs borne by the state, local, and federal governments in issuing and redeeming food stamp benefits. The reader is cautioned that comparing the administrative costs of the off-line system to the on-line systems provides a preliminary basis for decision-making; however, the costs incurred in each of the two on-line systems represent costs of more mature operating systems. The off-line system is, in many ways, experimental. In addition, the two on-line systems deliver multiple program benefits and are integrated with the existing commercial infrastructure, thus resulting in potentially greater cost economies.

The first section of the chapter discusses the research questions, research design, data sources, and the cost components. Next, a summary of the operational costs of the off-line EBT demonstration system is presented. Third, a detailed discussion of each of the component costs is presented, followed by a discussion of costs for each of the five primary EBT functions. The final section provides a summary of design, development, and implementation costs. Projections of costs in an extended or more mature environment are presented in Chapter 5 of this volume,

[1] Costs of the state systems are reported in John A. Kirlin, et al., The Impacts of the State-Initiated EBT Demonstrations on the Food Stamp Program, Cambridge, Massachusetts: Abt Associates Inc., June, 1993.

The Feasibility of Continued or Expanded EBT Operations.

Research Questions

Four key research questions are addressed in this chapter. These questions include:

- What are the overall administrative costs of operating the demonstration system compared to the paper coupon system it replaced?
- What are the operational costs for relevant program functions?
- How do the off-line administrative costs compare to the costs for on-line applications?
- What are the design, development, and implementation costs for the demonstration system?[1]

The off-line EBT demonstration provided the first opportunity to examine costs of a smart card based EBT alternative for the Food Stamp Program. A detailed discussion of costs incurred illustrates the relative efficiencies of the off-line alternative to both the coupon-based and on-line delivery systems. The evaluation of administrative costs includes estimation of costs incurred by the Montgomery County Department of Human Services (MCDHS), the Ohio Department of Human Services (ODHS), the Food and Nutrition Service Cincinnati Field Office and Midwest Regional Office (MWRO), and costs incurred by Food and Nutrition Service headquarters. Demonstration contractor costs, while reported separately, were paid by the Food and Nutrition Service under demonstration authority.

Cost incurred by the demonstration contractor, the National Processing Company (NPC),

excess of eight hours per day was not billed and NPC did not pay overtime or premium pay. The one exception was customer service personnel. These NPC staff members did receive overtime pay and all hours for customer service personnel were billed to FNS.[1]

Research Design

The evaluation is based on a pre/post approach for both the demonstration and comparison site. All costs were measured using a resource inventory approach, in which the unit of measurement was converted to a dollar value based upon resources used. For example, the time spent by county eligibility workers on issuance-related activities, as recorded through observation, was converted to dollars by multiplying the time units by labor expense including salary, overhead, and general and administrative costs. Other non-personnel costs such as equipment, leases, and telecommunications were computed based upon actual use in the issuance and redemption activities.

The EBT project team selected a comparison site (Franklin County) to provide a measure of resource costs absent the introduction of the EBT system. It was hoped that a comparison of the pre and post costs of the paper system would provide a basis to determine if factors other than the introduction of the EBT system caused changes in administrative costs in the demonstration site.

Data Collection

Data collection encompasses activities performed at the county offices, state offices, demonstration contractor, and the FNS offices. Formal data collection activities focused on the county (intake workers, issuance office time, and on-going caseworkers) and NPC activities. Each of these categories is discussed below.

[1] A complete discussion of resources used in the design, development, implementation, and operation of the off-line EBT system is provided in Volume III of this report.

Intake Worker Observations

CRIS-E is an automated system that determines recipient eligibility and calculates the monthly allotment for several public assistance programs including food stamps, Aid to Families with Dependent Children (AFDC), General Assistance, and Medicaid. Persons applying for assistance are interviewed by an intake caseworker. During the interview, the caseworker enters recipient household information into CRIS-E so that a determination of eligibility and calculation of the benefit amount for each program can be processed.

For the purposes of this evaluation, data collection in the intake office was limited to intake activities specifically related to food stamp issuance. In order to determine the time spent on Food Stamp Program issuance, intake interviews were observed in Montgomery County and in Franklin County, the control site. The purpose of the observations was to capture the amount of time spent on the food stamp issuance components of the intake interview, in order to derive cost estimates for these activities. Issuance-related activities in the two counties were similar, with the exception that Montgomery County workers captured voice password information in anticipation of converting to the EBT system.

Interviewees in the intake office consist of new clients and returning clients who are reapplying for benefits. The sampling plan called for 15 observations of new clients and 15 observations of returning clients in both Montgomery and Franklin Counties, for a total of 30 observations in each of the pre and post waves.

Issuance Office Time Allocation Study

A one-month time study was conducted to determine the amount of time spent on issuance-related functions by county personnel. This information was collected to determine the full cost of coupon issuance.

Issuance daily time allocation records (DTAR) were used to collect data in Montgomery and Franklin Counties. County personnel who supervise and oversee the issuance centers are not dedicated full-time to these functions in either county. Therefore, in order to estimate the amount

of time directly attributable to these functions, they were asked to complete the DTAR forms for a one-month period during both the pre and post waves. County officials provided supplemental information during in-person interviews with evaluation team members.

Although the two counties issue coupons in different ways,[1] an attempt was made to collect comparable data by tracking time for staff members in Franklin County who performed functions similar to Montgomery County's issuance supervisory and oversight personnel. The following individuals in Montgomery County completed logs as part of the data collection effort: the fiscal officer; the account clerk with responsibility related to end of day settlement; and cashiers with responsibility related to CRIS-E, data inquiries, signature verification, and other coupon issuance activities. Franklin County personnel included in the data collection effort were the issuance administrator; issuance site supervisors; and internal audit personnel who are responsible for cashier settlement, end of day settlement, reporting, and filing and retrieving signature verification forms.

DTAR data were also collected in the PayEase office, which was established in Montgomery County for the EBT program. The PayEase office includes two components: fiscal control office (FCO) and an assistance control office (ACO). The ACO provides the primary interface to Food Stamp Program clients that are on the EBT system. Clients are instructed to contact the ACO, rather than their caseworker, with any issuance or redemption questions. The PayEase ACO is responsible for processing requests for replacement cards, answering questions about benefit allotment amounts or transactions, verifying recipient status, assisting clients in changing issuance sites,[2] and administering requests for coupon conversions. The PayEase ACO has on-line access to CRIS-E and, during the demonstration period, the ACO also had on-line

[1] In Franklin County issuance centers are operated and supervised by county employees. In Montgomery County issuance centers are operated by contractors. However, the Montgomery County personnel supervise the issuance centers and have responsibilities similar to the supervisory staff in Franklin County.

[2] Clients select three authorized food retail stores as issuance sites at which they can pick up their benefits. Once the benefits have been "loaded" onto the card, the recipient can shop at any authorized retailer in the demonstration area.

access to PayEase.[1] Montgomery County has had an assistance control unit for over ten years. The state and county decided to create a separate PayEase ACO for the pilot to accommodate conversion because an off-site conversion site was used. The county indicated that except for the conversion period, the functions performed by the PayEase ACO would be performed by the regular assistance control unit or the caseworkers.

The FCO provides dual control over the issuance and management of cards. The FCO is responsible for training clients, issuing cards, selecting PINs, selecting issuance sites, and issuing replacement cards. During the demonstration period, the FCO performed the card personalization function, including placement of the recipient picture and name on the card. The state, county, and demonstration contractor determined that the photos were not being used for any concrete purpose, and personalization was discontinued in February, 1993. Further, removal of the photos and names reduced the costs of issuing cards, and allowed the cards to be recycled within the demonstration.

On-going Caseworker Event Logs

For the purposes of this evaluation, data collection regarding on-going caseworkers was limited to those activities that are specifically related to the Food Stamp Program. The information of interest included on-going caseworker interactions with clients involving CRIS-E ID cards, food stamp coupons, and other aspects of the coupon issuance process.

To calculate costs related to food coupon issuance and redemption, all on-going caseworkers and caseworker aides in Montgomery County were asked to complete an event log for 20 consecutive business days. A sample of caseworkers in Franklin and Clark Counties who deal with food stamp clients, completed similar logs in the baseline period. Franklin County workers also completed the logs in the post period. Supervisors of on-going caseworkers were asked to complete the logs on days when they had direct involvement with clients and/or performed any coupon issuance activity. The logs captured the number of minutes that each

[1] ACO on-line access to the PayEase system was eliminated in January, 1993 because it was judged to be cost-ineffective. ACO personnel process requests through PayEase customer service. A complete discussion of this decision is provided in Volume III of this report.

worker spent on issuance and redemption activities. To help the workers complete the logs, a list of "event codes" was provided that codified the issuance and redemption activities.

Demonstration Contractor Time Allocation Logs and Interview

Demonstration contractor cost data were gathered from three sources:

- demonstration contractor time allocation logs completed by all demonstration contractor personnel showing hours worked by task;
- interviews with demonstration contractor management personnel and key subcontract personnel; and
- demonstration contractor invoices to the Food and Nutrition Service.

Unique Cost Considerations in the Off-line EBT Demonstration

Estimating the operational costs of the off-line EBT demonstration posed some challenges that are unique to the off-line system. While on-line and off-line systems are functionally similar from the recipient's point of view, the actual processing of transactions is very different. The key difference is that in an on-line system, account balances are maintained in a host computer, and all transactions are authorized by the host. In an off-line system, the balance is held on the card, and all transactions are authorized at the card and terminal level. For example, in an on-line system, the "swiping" of the card through the terminal and pressing the "send" key on the retailer's terminal starts an on-line communication to the host computer. The host process verifies that funds are available and returns either an approval or denial message. All account balances are maintained at the host. In an off-line system, however, pressing the send key does not result in an outside communications link. Rather, the available balance is maintained in the card memory, and the transaction is recorded in an in-store computer. Once each day, a communications link is established between this computer and the host to upload the transaction data and to initiate the settlement process. As a result of this difference in processing the off-line system demands that reconciliations be performed between the host balances and the card balances for each account, that the retailer take a more active role in the settlement process, and

that the card replace some of the functionality traditionally performed by the host in an on-line system.

Another key difference between the on-line and off-line systems is the card media. On-line systems use magnetic stripe technology, which is relatively inexpensive. The primary cost of replacing lost and stolen cards in the on-line system is the administrative expense associated with this activity. The off-line system uses a smart card that is far more expensive. In addition to the administrative costs of issuing cards and replacing lost or stolen cards, the additional cost of the card itself must also be considered. Amortization of card costs is unique to the off-line system.[1]

Adjusting Baseline Costs

Normally, baseline information is used for projecting what the coupon system would have cost if the EBT system had not been implemented. Post-implementation data collection in Franklin County indicated that on-going caseworkers were spending twice the amount of time on issuance activities than they did during pre-implementation data collection. Upon investigation, it was learned that the substantial increase in issuance activity was due to client confusion resulting from a change in issuance sites. The state indicated that the problems were unique to Franklin County and, as a result, the information would not provide a sound basis for adjusting the baseline data. Review of the pre and post data on intake caseworker observations in Franklin County showed no appreciable difference in the amount of time spent on issuance activities. Workers spent 4.5 percent of their time on issuance activities post-implementation compared to 4.4 percent of their time during the pre-implementation period. As a result, no adjustments were made to the Montgomery County baseline intake data.

Regarding adjustments for salary increases, those workers covered by collective bargaining agreements received a nominal wage rate increase between the baseline and evaluation periods. Non-union workers did not receive a wage rate increase between the baseline and evaluation periods. Given the nominal change in wages, and to ensure comparability between the baseline

[1] A complete discussion of the average card life is provided in Appendix F.

and evaluation periods, no adjustment was made to the baseline. The wage rates established during the baseline were used for both periods.

Other data obtained during post-implementation did indicate a need to adjust the baseline. Specifically, the Montgomery County baseline data were adjusted for the following:

- Renegotiation of the Montgomery County coupon issuance contracts indicated an increase in transaction costs.
- A post-implementation review of the functions in the Cincinnati Field Office, which has responsibility for managing retailer participation in 35 counties in Ohio and Indiana, indicated an increase in these activities.
- The Food and Nutrition Service, Food Program Division, provided an update of costs related to coupon printing, coupon shipping, Federal Reserve coupon processing, and retailer/bank monitoring.

SUMMARY OF THE IMPACT OF THE OFF-LINE EBT DEMONSTRATION ON ADMINISTRATIVE COSTS

The estimated total administrative cost for the demonstration period of August through December, 1992 is $8.21 per case month compared to an adjusted coupon cost of $2.89 per case month. Exhibit 3-1 summarizes these costs relative to the costs of the state-initiated, on-line demonstrations.

As shown in Exhibit 3-1, the $8.21 cost per case month during the evaluation period for the off-line EBT demonstration was significantly higher than comparable costs for the paper coupon system and the on-line EBT demonstrations. The reader is cautioned that comparing the administrative costs of the off-line system to the paper and on-line systems provides a preliminary basis for decision-making; however, the costs incurred in each of the two on-line systems represent costs of more mature operating systems. The off-line system is, in many ways, experimental. In addition, the two on-line systems deliver multiple program benefits and are integrated with the existing commercial infrastructure, thus resulting in potentially greater economies of scale.

Table of Contents

Exhibit 3-1

SUMMARY OF ADMINISTRATIVE COSTS PER CASE MONTH
OF ALTERNATE FOOD STAMP DELIVERY SYSTEMS

Function	Montgomery County Food Coupon	Montgomery County EBT	New Mexico EBT	Ramsey County EBS	Average New Mexico and Ramsey County EBT
Authorizing access to benefits	$0.33	$2.05	$0.75	$0.58	$0.66
Delivering benefits	2.27	3.34	1.80	2.71	2.25
Crediting retailers and financial institutions	0.17	0.90	0.03	0.04	0.03
Reconciling and monthly system	0.08	1.64	0.33	0.87	0.60
Managing retailer participation	0.04	0.28	0.16	0.19	0.17
Total	**$2.89**	**$8.21**	**$3.07**	**$4.39**	**$3.73**

A discussion of the distribution of costs within each system provides an insight into how each type of system impacts costs. The difference in the distribution of costs between the off-line and the on-line systems, reflects the procedural and operational differences between the systems. The distribution of costs is highlighted in Exhibit 3-2. Note that in the off-line system, costs are more evenly distributed between all functions, except managing retailers than in either of the two on-line systems or the paper system. This distribution is a result of the functional differences between off- and on-line systems. For example, in the on-line system, crediting retailers is a passive activity. Settlement is initiated by the EBT processor at a pre-set cut-off time that does not require any additional communications from the retailer to the host. In the off-line system, redeeming benefits requires that the retailer establish a communications link to the host and upload the day's transaction activity. Therefore, the higher proportion of costs for crediting retailers in the off-line system (10.8 percent) versus the on-line systems (1.1 percent) is caused by the requirement for the retailer to communicate with the host to initiate settlement. On the other hand, delivering benefits in an on-line system requires that a communications link be established between the retailer terminal and the host to authorize each transaction. The same function in the off-line system is performed without an outside telecommunications link, thus

Table of Contents

resulting in a lower proportionate share of total costs (40.1 percent for off-line versus 60.5 percent for on-line).

Similarly, reconciliation in the off-line system reflects a greater proportion of expense than in an on-line system. This relatively greater expense associated with off-line systems is due to the requirement to perform reconciliation between the card balances, which are uploaded to the host along with the transaction data during retailer settlement, and the host derived card balance.

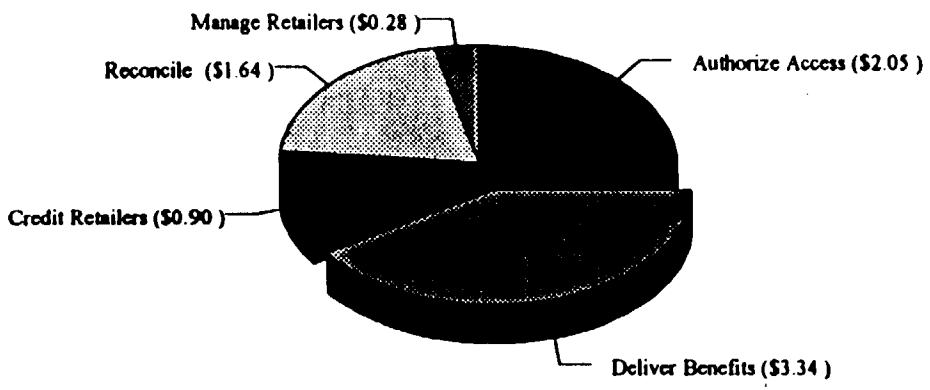
The total operational cost of $8.21 per case month includes administrative costs incurred by all parties as shown in Exhibit 3-3. As can be derived, 73.4 percent of the cost is incurred through demonstration contractor operations, which includes card and terminal costs as well as EBT system operations. Montgomery County costs represent a significant proportion of the total costs (18.8 percent) primarily because the county established a separate PayEase office, which included the FCO and ACO; each office required full time dedicated staff. State costs (4.8 percent) can be attributed to the operation of the CRIS-E interface and to management and reporting. The remainder of the cost was incurred by FNS regional, field, and headquarters operations for monitoring, management, and reconciliation activities.

Table of Contents

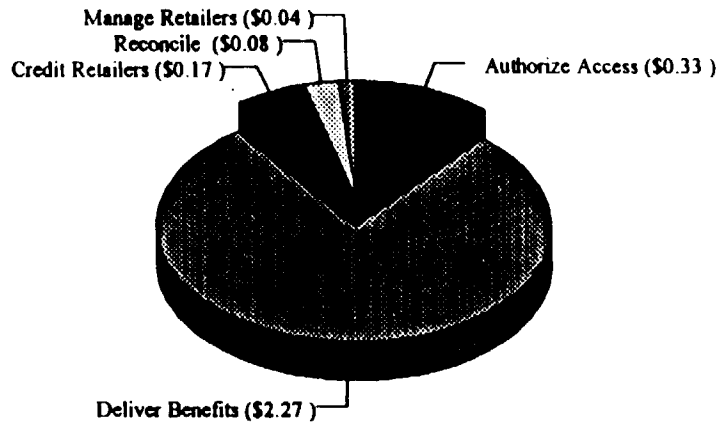
Exhibit 3-2
EBT Operating Costs Per Case Month

Cost Comparison by Function

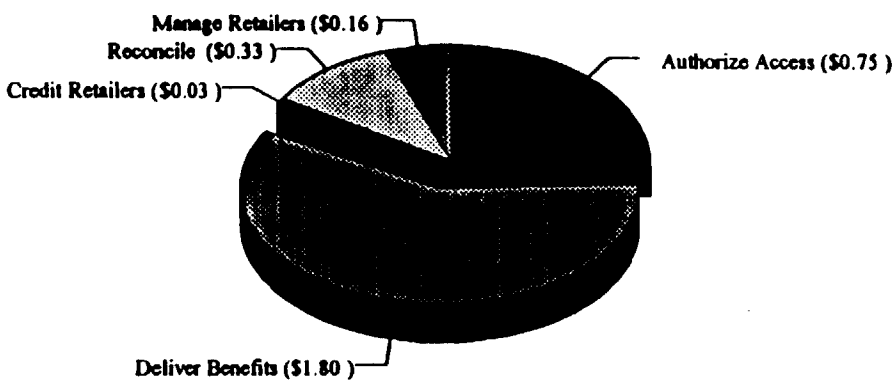
Off-line EBT



Paper Baseline



New Mexico



Ramsey County

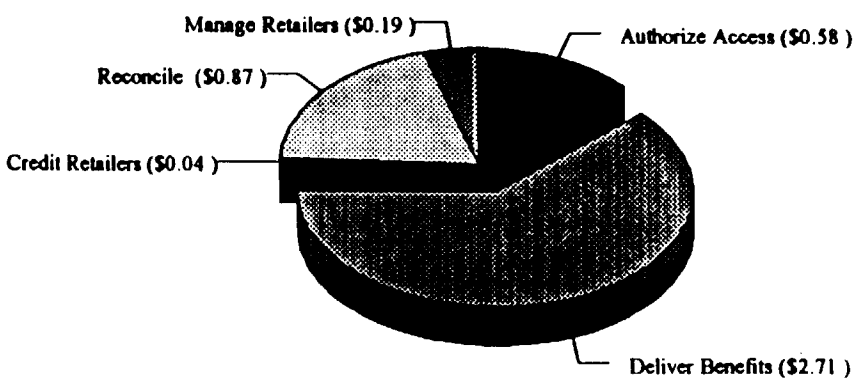
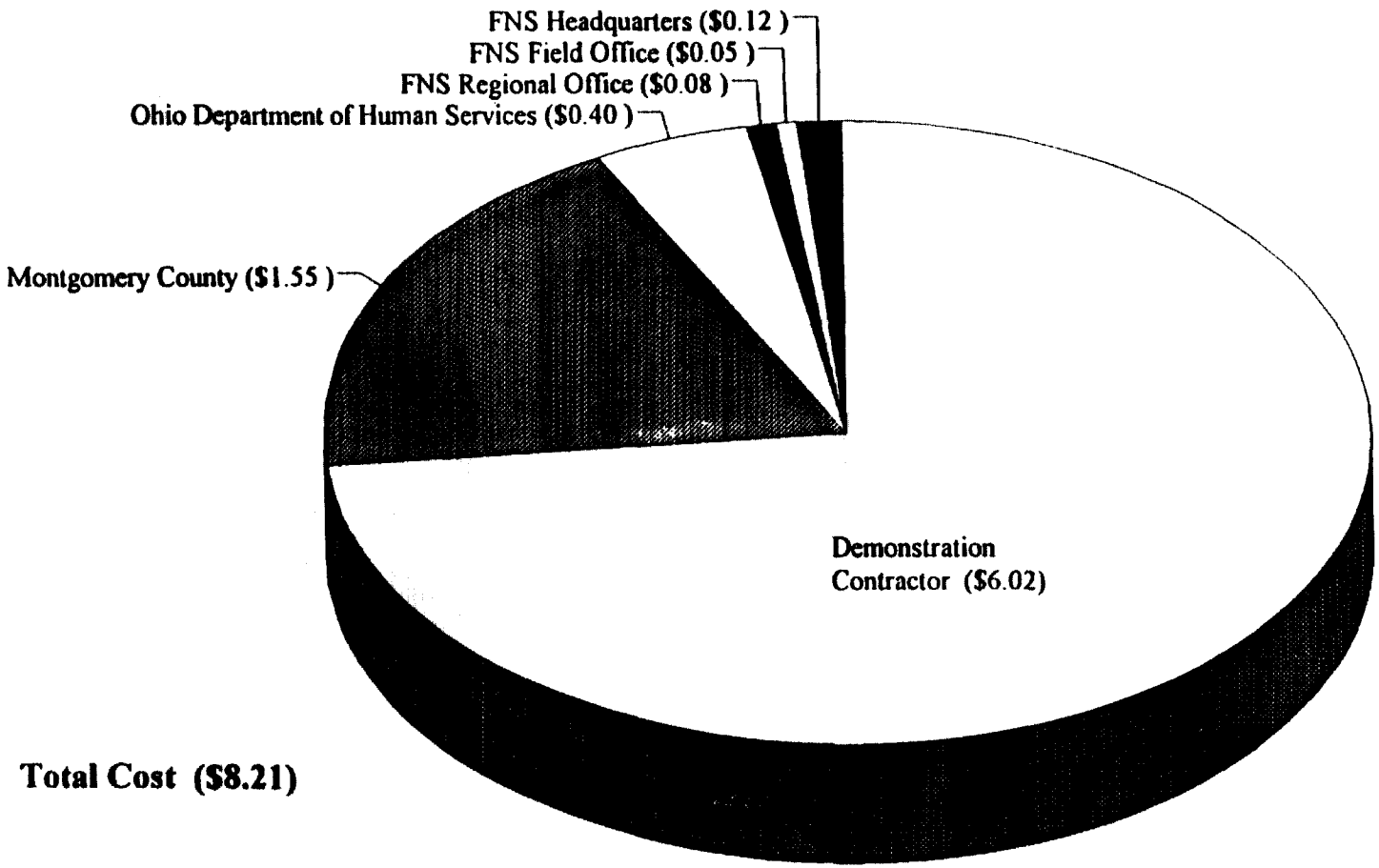


Table of Contents

Exhibit 3-3

Total Operational Costs Per Case Month by Source



Total Cost ($8.21)

Table of Contents

THE COMPONENTS OF COST

Costs are discussed as they pertain to the EBT demonstration contractor (NPC), Montgomery County, the State of Ohio, and the Food and Nutrition Service offices (regional, field, and headquarters).

Demonstration Contractor Costs

Total demonstration contractor operational costs are $6.02 per case month. Components of these costs are shown in Exhibit 3-4.

Exhibit 3-4

EBT DEMONSTRATION CONTRACTOR OPERATIONAL COSTS

Cost Category	Cost per Case Month	Percent
Direct labor and travel	$2.50	41.5%
Customer service	0.36	6.0
Subcontracts (training, terminal on-site maintenance)	0.25	4.2
Data center hardware/software	0.80	13.3
Terminals	0.71	11.8
Communications	0.48	8.0
Automated Clearing House (concentrator bank)	0.04	0.7
Card costs	0.88	14.6
Total	**$6.02**	**100.0%**

Table of Contents

Direct Labor and Travel

Labor and travel costs represent 41.5 percent of the total processor cost. Labor includes all time charged for operating the EBT system, based upon actual salary rates plus fringe, overhead, travel and related expenses, and general and administrative expense.[1] During the evaluation period, NPC labor reflects personnel costs associated with data center (host computer) hardware and software maintenance, system reconciliation and preparation of daily financial and management reports, card inventory management, and overall project management.

Customer Service

Customer service personnel staff the 800-number help desk to answer any client or retailer inquiries. Customer service personnel are responsible for recording lost or stolen cards, issuing authorizations for new cards, providing on-line assistance in reconciling client or retailer balances, and initiating retailer service calls. The $0.36 cost per case month reflects customer service labor. The customer service staff are paid hourly and staffing levels vary by time of day and time of month. Staffing levels are higher during the business day than at night, and peak staffing levels occur at the beginning of the month to coincide with benefit issuance. To manage the fluctuation in customer service staffing levels, NPC uses trained contract labor to staff peak periods.

Subcontracts

During the evaluation period, subcontractors on the EBT project included the Public Service Institute (PSI), which provided card issuance, client training services, and assistance as a liaison to community advocacy groups. ASTRA Systems provided terminal hardware and software installation and maintenance support. After the evaluation period (in March 1993), PSI and ASTRA roles were eliminated and these responsibilities were assumed by NPC.

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[1] The level of effort expended by each participant within each phase of the project is provided in Volume III of this report.

Table of Contents

Data Center, Terminals, Communications and Supplies

Data center, terminals, and communications costs represent 33.1 percent of the total EBT demonstration contractor cost. These costs include data center (host computer) depreciation and maintenance; host software maintenance contracts; depreciation of retailer terminals, PCs, controllers, and printers; maintenance of retailer terminals; telecommunications; and retailer support.[1]

Automated Clearing House (ACH) Costs

ACH costs are incurred by the concentrator bank (and charged to NPC) and include a daily charge of $9.80 plus $0.0161 per credit.

Card Cost

Two factors affect the price of smart cards. First is the level of technology used in the card. Smart cards range in capability from simple data storage devices, that are commonly used in decrementing value applications, such as pre-paid phone cards, to sophisticated processing and storage devices, such as the TB100 card that was used in the off-line demonstration. The second factor is volume. Card prices are directly affected by the volume of cards in production and by the volume purchased. The TB100 cards initially purchased for the off-line demonstration cost $9.50 per card. After the demonstration period, additional cards were purchased that used a new manufacturing method. These cards cost $10.50 per card. Another $0.09 was added to the cost of the cards for a plastic card carrier that was issued with each card.

The evaluation of the card cost included an assessment of whether the card be immediately expensed or capitalized and amortized and, if amortized, over what period.[2] Typically, durable items such as equipment are amortized over their expected life. Since the card is a fundamental

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[1] NPC equipment depreciation costs reflect a five-year life with the exception of PCs and network equipment, which are depreciated over a three-year life.

[2] See Appendix F, *Computation of the Card Amortization Period*, for an in-depth discussion of the card life.

Table of Contents

part of the EBT system, providing data storage as well as processing functions (many of which duplicate functions performed by the host computer in an on-line system), there is a reasonable basis to treat the card as a durable item. The second part of the question required a more complex analysis. It was estimated that the expected life of the card is 36 months, based on industry trends for other plastic cards. It is expected that the physical life of the smart card is constrained not by the chip but by the plastic card carrier. However, since a relatively small number of recipients remain on the Food Stamp Program beyond 12 months[1] and few, if any, participants could be expected to return the card when they leave the program,[2] the effective life of the card is constrained by the length of time recipients remain on the program (spell length). Spell length for new entrants as reported in the Survey of Income and Program Participation (SIPP) was combined with spell lengths for an existing (cross-sectional) caseload.[3]

Furthermore, cards need to be replaced because of losses and theft, and as a result of card failure due to damage or defect. Annually, approximately 37 percent of recipients received new cards as a result of their cards being lost or stolen. Two generations of cards were issued during the demonstration. The first generation experienced an annualized card failure rate of 30 percent due to manufacturing defects. The second generation card, produced with an improved manufacturing process, has a 14 percent failure rate. Because cards that failed due to manufacturing defects were replaced at no cost by the card manufacturer, consideration of these replacements reduced the average cost to $8.79 per card. Replacement of lost and stolen cards and damaged cards serves to further reduce the average card life. The lost/stolen rate was considered with the card failure rate to develop the card replacement rate used in the computation

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[1] Nancy R. Burstein, Dynamics of the Food Stamp Program as Reported in the Survey of Income and Program Participation, Cambridge, Massachusetts: Abt Associates Inc., January 1993.

[2] There was no provision in the demonstration for return and reissue of cards. However, a subsequent decision was made to eliminate the personalization of the cards to allow for reissue. To date, there has not been any experience with reissuing cards to a recipient population.

[3] Private communication entitled "Closing Gaps Between Food Stamp Spells and Its Impact on Estimated Duration on the Program", Alberto Martini and Roy Olsen, Mathematica Policy Research, Inc.

of average card life. The resulting data for calculation of the card life are presented in Exhibit 3-5.

The last column in Exhibit 3-5 represents average card life assuming no card failures or lost cards (i.e., no replacements). In the absence of replacements, and based solely on program participation rates, the card life would average 21.032 months. It is, therefore, apparent that lost and stolen cards and card failures have a significant impact on the expected card life of 9.929 months. Thus, the total cost per case month of the off-line EBT demonstration is very sensitive to the amortization period of the card particularly for the period of less than nine months. As shown in Exhibit 3-6, the cost per case month decreases as the expected life of the card increases.

Montgomery County Costs

The county is the primary organization responsible for client interface. The total county cost for issuance and redemption activities under the EBT system is $1.547 per case month, compared to a cost of $1.453 per case month under the food coupon system. As seen in Exhibit 3-7, Montgomery County costs increased by approximately six percent with EBT. The primary reason for the difference in coupon versus EBT costs is due to costs associated with the PayEase ACO and FCO ($1.123 per case month) and EBT project management oversight ($0.09 per case month) versus county issuance contract and issuance oversight costs ($1.13 per case month) under the coupon system. The introduction of the EBT system eliminated the need to maintain issuance centers devoted to over-the-counter issuance of food coupons. Operation of Montgomery County issuance centers is contracted to private organizations on a per-transaction basis. Under the EBT system, the county continues to issue photo identification cards at a cost of $0.114 (portion of ID card cost allocate to the FSP) per case month. One card is issued to all MCDHS clients for all programs in which they are enrolled. The amount of time spent on issuance and redemption activities by on-going and intake caseworkers did not change substantially with the introduction of the EBT system. The slight increase in cost reflected in the on-going caseworker time can be attributed to additional client inquiries that were referred to the FCO/ACO.

Table of Contents

Exhibit 3-5
Calculation of Card Amortization Period

Spell Length (Months)	Card Replacement Rate	Probability of Recipient Leaving FS Program	Calculated Card Life	Calculated Card Life Assuming No Replacements
1	0.000	0.000	0.000	0.000
2	0.056	0.039	0.086	0.091
3	0.056	0.040	0.128	0.142
4	0.056	0.027	0.104	0.121
5	0.056	0.067	0.389	0.476
6	0.056	0.027	0.164	0.210
7	0.056	0.033	0.195	0.261
8	0.056	0.021	0.131	0.183
9	0.056	0.024	0.187	0.271
10	0.054	0.017	0.134	0.200
11	0.053	0.017	0.129	0.197
12	0.051	0.021	0.186	0.292
13	0.047	0.016	0.158	0.248
14	0.046	0.022	0.187	0.299
15	0.045	0.009	0.094	0.153
16	0.044	0.011	0.141	0.235
17	0.044	0.010	0.088	0.150
18	0.043	0.010	0.113	0.197
19	0.043	0.004	0.023	0.041
20	0.042	0.009	0.100	0.180
21	0.042	0.004	0.041	0.076
22	0.042	0.012	0.172	0.323
23	0.042	0.009	0.122	0.235
24	0.042	0.007	0.053	0.104
25	0.041	0.011	0.133	0.266
26	0.041	0.005	0.064	0.130
27	0.041	0.005	0.065	0.135
28	0.041	0.005	0.066	0.140
29	0.041	0.005	0.067	0.145
30	0.041	0.005	0.068	0.150
31	0.041	0.005	0.069	0.155
32	0.041	0.005	0.070	0.160
33	0.041	0.005	0.071	0.165
34	0.041	0.005	0.072	0.170
35	0.041	0.005	0.073	0.175
36	0.041	0.486	5.982	14.558
Total		**1.000**	**9.929**	**21.032**

Table of Contents

Exhibit 3-6

Sensitivity of Cost Per Case Month to the Card Amortization Period

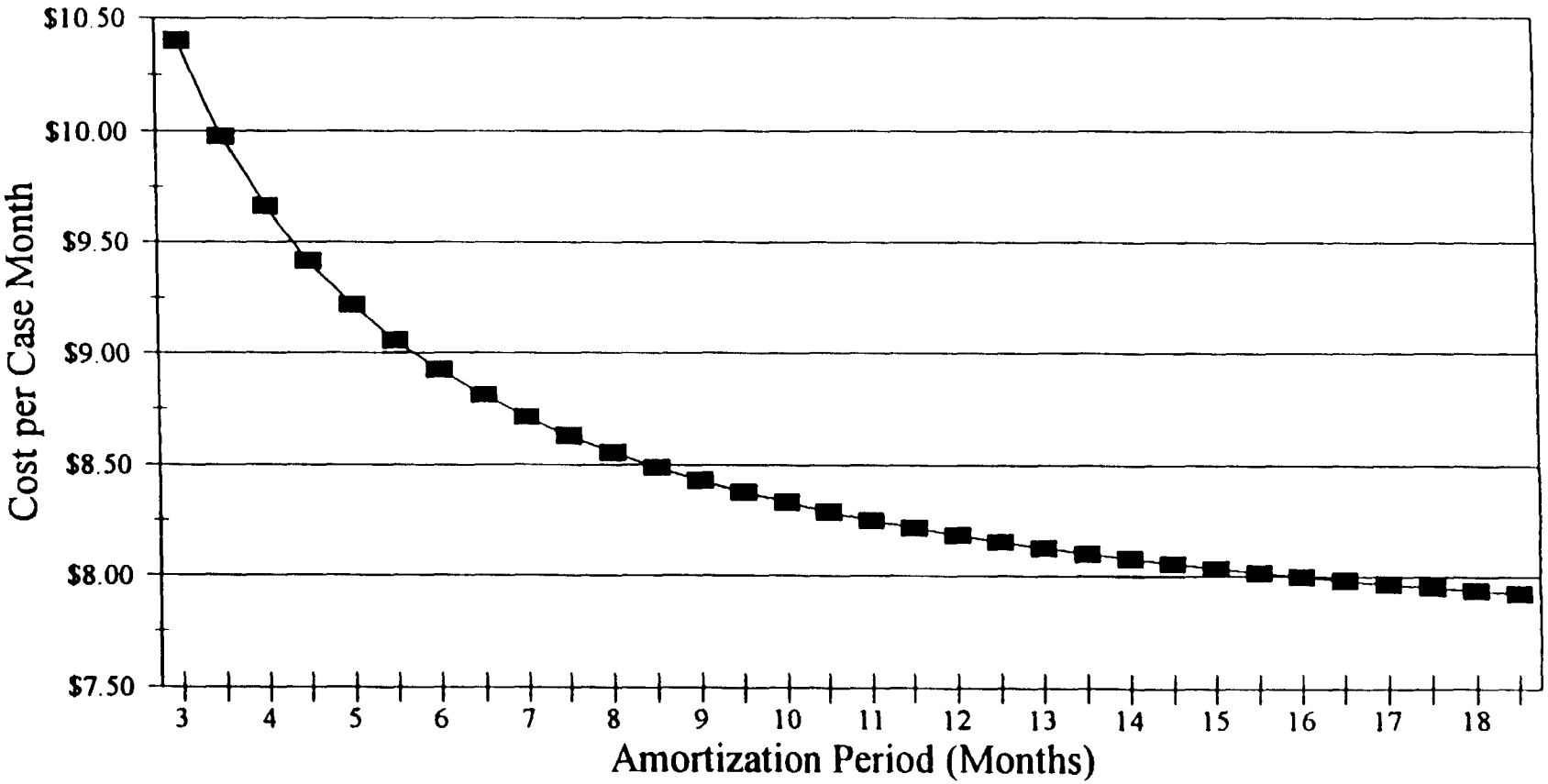

Table of Contents

Exhibit 3-7

MONTGOMERY COUNTY OFF-LINE EBT OPERATIONAL COSTS
(Cost per Case Month)

Cost Category	Food Coupon	Off-line EBT
Labor:		
Intake caseworkers	$0.035	$0.029
Photo ID card unit	0.114	0.114
Issuance center supervision	0.138	N/A
Manage coupon supply	0.002	N/A
Manage issuance agents	0.044	N/A
Pick up issuance paperwork	0.001	N/A
Issuance center monitoring and reconciliation	0.005	N/A
On-going caseworkers	0.178	0.193
MCDHS EBT project team	N/A	0.039
PayEase fiscal control office	N/A	0.355
PayEase assistance control office	N/A	0.768
Total	**0.517**	**1.498**
Equipment:		
Issuance center terminals	0.019	N/A
Issuance center communications	0.034	N/A
Total	**0.053**	**0.000**
Other:		
Issuance center contracts	0.883	N/A
Non-personnel EBT project costs [a]	N/A	0.049
Total	**0.883**	**0.049**
Grand Total	**$1.453**	**$1.547**

Note: [a] Includes travel, supplies, telephone, and consulting expenses related to the EBT project.

N/A = Not Applicable

State of Ohio Costs

Costs for the State of Ohio decreased substantially from $0.81 per case month for the paper system to $0.40 per case month for the off-line EBT system. This difference of $0.41 per case month is attributed to the elimination of activities associated with managing, supplying and reconciling the food coupon inventory, as shown in Exhibit 3-8.

Table of Contents

Exhibit 3-8

STATE OF OHIO OPERATIONAL COSTS
(Cost per Case Month)

Cost Category	Food Coupon	Off-Line EBT
Personnel	$0.014	$0.161[a]
Create and post issuance records	0.182	0.182
Issuance center equipment and site preparation	0.082	N/A
Communications	0.231	0.028
Issuance reporting	0.109	N/A
Coupon management	0.012	N/A
Coupon related postage	0.009	N/A
Coupon storage and transportation	0.118	N/A
Reconciliation	0.056	0.014
Non personnel EBT project costs	N/A	0.011
Total	**$0.813**	**$0.396**

Note: [a] Includes $0.042 in EBT project oversight and management.

N/A = Not Applicable

FNS Regional Office Costs

The FNS Midwest Regional Office (MWRO) is responsible for management of state issuance activities. This management includes reconciliation, retailer compliance, and guidance to states on Food Stamp Program policy-related issues. Responsibility for EBT demonstrations and operations has recently been delegated by FNS headquarters to the regional offices. Costs associated with issuance and redemption activities increased from $0.0002 per case month under the paper coupon system to $0.076 per case month under EBT. This cost reflects the increased level of effort required to reconcile and fund EBT settlement accounts (0.049), as well as costs

Table of Contents

for EBT project oversight and management ($0.027). The regional office is responsible for managing EBT project letters of credit (LOC), maintained within the SmartLink/Payment Management System (PMS)[1] that provides reimbursement to the concentrator bank.[2] The costs incurred by the regional office are provided in Exhibit 3-9.

Exhibit 3-9

FNS REGIONAL OFFICE OPERATIONAL COSTS
(Cost per Case Month)

Cost Component	Food Coupon	Off-line EBT
Reconciling and monitoring	$0.0002	$0.049
EBT project oversight and management	N/A	0.027
Total	**$0.0002**	**$0.076**

N/A = Not Applicable

FNS Field Office Costs

The FNS Cincinnati Field Office is responsible for authorizing and managing food retailers. The field office reviews and approves authorization applications and performs compliance reviews. The demonstration contractor provided software to the field office to allow direct entry and update of authorized retailer information. Field office costs under the paper system were $0.044 per case month. Costs under the EBT system increased slightly to $0.050 due to the requirement for the field office to enter authorized retailer information into both the

[1] SmartLink/Payment Management System (PMS) is an automated system operated by the U.S. Department of Health and Human Services (DHHS) to pay grantees of federal funds.

[2] For a complete description of the Food Stamp Program EBT funding, settlement and reconciliation process, see Margaret W. Melhem and Edith M. Smith, Development of Specification for EBT Settlement and Reconciliation Services: Options Report, Rockville, Maryland: Phoenix Planning & Evaluation, Ltd., forthcoming.

Minneapolis Computer Support Center (MCSC) retailer database and into the EBT system's PC interface.

FNS Headquarters Costs

Under the paper system, FNS headquarters contracts for the printing and distribution of all food coupons and reimburses the Federal Reserve for food coupon and redemption certificate processing. Headquarters is also responsible for monitoring retailers and banks, and for reconciling food coupon accounts. The total cost for these activities is $0.575 per case month. FNS headquarters took a more active role in the management of the off-line EBT demonstration than would be the case with a fully operational system. Headquarters costs for EBT project management are $0.115 per case month.

Summary of Operational Costs by Cost Component

A comparison of the operational costs of the off-line EBT system and the on-line EBT systems as reflected in the state-initiated demonstrations indicates that the primary source of additional costs is the demonstration contractor. This comparison is shown in Exhibit 3-10. While there are variations across sites in responsibilities for various functions, such as card issuance, training, and terminal deployment and maintenance, the analysis indicates that the costs of operating and maintaining the off-line system are significantly higher than those for on-line systems.

Table of Contents

Exhibit 3-10

SUMMARY OF OPERATIONAL COSTS BY COMPONENT
(Cost per Case Month)

Component	Montgomery County Food Coupon	Montgomery County Off-Line EBT	Ramsey County On-line EBS	New Mexico On-line EBT
EBT demonstration contractor	**N/A**	**$6.023**	**$1.988**	**$1.478**
Montgomery County	**$1.453**	**1.547**	**2.091**	**1.227**
State of Ohio	**0.813**	**0.396**	**0.031**	**0.116**
Food and Nutrition Service				
Field office	0.044	0.050	0.073	0.079
Regional office	<0.001	0.076	0.079	0.012
Headquarters	0.575	0.115	0.123	0.158
Total	**0.619**	**0.241**	**0.275**	**0.249**
GRAND TOTAL	**$2.885**	**$8.207**	**$4.385**	**$3.069**

OFF-LINE EBT OPERATIONAL COSTS BY FUNCTION

This section describes the costs for each of the five EBT functions and compares the cost incurred for the off-line system to costs incurred for the paper coupon and on-line systems. The five functional categories include:

- authorizing access to benefits;
- delivering benefits;
- crediting retailers and financial institutions;
- reconciling and monitoring the system; and
- managing retailer participation.

Table of Contents

Allocating Costs by Function

Costs were directly allocated to the function for which the costs were incurred. Vendor labor costs were allocated based upon time logs completed by each individual and the job functions to which each individual was assigned. Subcontractor costs were allocated based upon the functions performed by each organization. County, state, regional office, field office, and FNS headquarters labor costs were also allocated based on job function. All non-labor costs were allocated based upon the relationship of the costs to particular functions. Exhibit 3-11 shows the detail on cost allocations across the five EBT functions and by component. The following pages discuss the basis for the allocation of each cost component.

Throughout the following discussion, differences in functionality between off-line and on-line EBT systems are described to aid the reader in interpreting the causes for cost differences between the two types of systems. Greater detail on costs by function is provided in the tables in Appendix D.

EBT Vendor

Direct Labor. Direct labor was allocated based upon time logs completed by NPC and subcontractor personnel. These time logs indicated the task performed and the time required. Tasks were categorized by function.

Customer Service. Customer service was distributed equally across all functions except managing retailer participation. Recipient calls were predominantly requests for information regarding the availability of benefits (authorizing access), problems at the point of sale (delivering benefits) or problems reconciling card balances to receipts (reconciling accounts). Retailer calls were predominantly problems at the point of sale (delivering benefits) or problems reconciling ACH credits to daily settlements (reconciling accounts).

Table of Contents

Exhibit 3-11

COST ALLOCATION BY FUNCTION
(Cost per Case Month)

	Authorizing Access to Benefits	Delivering Benefits	Crediting Retailers and Financial Institutions	Reconciling and Monitoring System	Managing Retailer Participation	Total Cost
EBT Vendor						
Direct labor	$0.723	$0.275	$0.346	$0.917	$0.239	$2.500
Customer service	0.090	0.090	0.090	0.090	0.000	0.360
Subcontractors	0.144	0.107	0.000	0.000	0.000	0.251
Data center hardware/software	0.080	0.480	0.080	0.159	0.000	0.799
Terminals	0.000	0.707	0.000	0.000	0.000	0.707
Communications	0.113	0.031	0.339	0.000	0.000	0.483
ACH	0.000	0.000	0.043	0.000	0.000	0.043
Card cost	0.221	0.661	0.000	0.000	0.000	0.882
Total Vendor	**1.371**	**2.351**	**0.898**	**1.166**	**0.239**	**6.025**
Montgomery County						
Direct labor	0.384	0.961	0.000	0.039	0.000	1.384
Photo identification	0.114	0.000	0.000	0.000	0.000	0.114
Non-personnel	0.000	0.000	0.000	0.049	0.000	0.049
Total County	**0.498**	**0.961**	**0.000**	**0.088**	**0.000**	**1.547**
State of Ohio						
Direct labor	0.182	0.000	0.000	0.175	0.000	0.357
Communications	0.000	0.028	0.000	0.000	0.000	0.028
Non-personnel	0.000	0.000	0.000	0.011	0.000	0.011
Total State	**0.182**	**0.028**	**0.000**	**0.186**	**0.000**	**0.396**
Food and Nutrition Service						
Direct Labor	0.000	0.000	0.000	0.196	0.045	0.241
Total FNS	**0.000**	**0.000**	**0.000**	**0.196**	**0.045**	**0.241**
Total All Functions	**$2.051**	**$3.340**	**$0.898**	**$1.636**	**$0.284**	**$8.209**

Subcontracts. Public Service Institute (PSI) costs were allocated to authorizing access to benefits since their primary function was training clients. Astra Communications costs were allocated to delivering benefits since their primary function was terminal implementation and maintenance. Subcontractor labor was allocated based on the function performed.

Data Center Hardware and Software. These costs were allocated based upon input from the vendor as to the percentage of resources required to process input files from CRIS-E and post benefits to recipient accounts (authorizing access), process transactions (delivering benefits), prepare the credits to retailers (crediting retailers and financial institutions) and prepare accounting and management reports (reconciling accounts).

Terminals. Terminals are used primarily in the delivery of benefits, and costs were allocated accordingly.

Communications. Communication consists of the costs of receiving issuance information from CRIS-E (authorizing access to benefits), receipt and posting of transaction information (delivery of benefits), and receipt of settlement transactions from retailers (crediting retailers and financial institutions). The transfer of files from CRIS-E and the daily settlement transmissions from retailers comprise most of the data communications. Communications costs associated with customer service calls are primarily attributed to questions regarding availability of benefits, problems at the point of sale or problems with retailer credits.

Automated Clearing House. ACH costs are incurred in preparing and submitting the retailer credit information and are allocated solely to this function.

Card Cost. Card functions include loading the benefit amounts onto the card (analogous to posting benefits in an on-line system) and performing transactions at the point of sale. Costs were allocated 25 percent to authorizing access to benefits and 75 percent to delivering benefits.

Montgomery County

Direct Labor. Direct labor was allocated based upon time logs completed by county on-going caseworkers and ACO and FCO personnel. These time logs indicated the task performed and the time required. Intake workers were observed at their jobs and tasks related to issuance functions were timed. Both the logs and time estimates were summarized by task which were allocated to the appropriate function.

Photo Identification. A photo identification card is provided to all recipients of food stamp and AFDC benefits. During the demonstration, these cards continued to be issued. The costs were allocated to authorizing access to benefits.

Non-Personnel. Non-personnel or other direct cost such as equipment and supplies were allocated to the primary function of the local agency, authorizing access to benefits.

State of Ohio

Direct Labor. Direct labor was allocated based upon time logs and an analysis of the functions performed by each individual.

Communications. Communications costs were allocated to delivering benefits reflecting the cost to Montgomery County for use of the Ohio Data Network (ODN) for access to CRIS-E by county staff to assist with responding to recipient inquiries regarding their account balances and benefit allotments.

Non-Personnel. Non-personnel costs such as equipment and supplies were allocated to reconciling accounts. CRIS-E reports were used to help reconcile the EBT system activity.

Food and Nutrition Service

Direct Labor. Direct labor was allocated according to function. Headquarters and regional office personnel are primarily responsible for project management and reconciliation of

Table of Contents

the issuance data. Field office personnel are primarily responsible for authorizing new retailers and managing retailer participation.

Impact on Authorizing Access to Benefits

In either the food coupon or EBT system authorizing access to benefits includes the process of establishing a recipient account and providing an access vehicle to that account. The costs associated with authorizing access to benefits under the coupon and EBT systems are shown in Exhibit 3-12.

Exhibit 3-12

AUTHORIZING ACCESS TO BENEFITS
(Cost per Case Month)

Task	Montgomery County Food Coupon	Montgomery County Off-line EBT	Average On-line EBT [a]
Create/post benefit records	$0.182	$0.182	$0.210
Establish EBT benefit account	0.000	1.371	N/A
Issue benefit/ID cards	0.149	0.498	0.455
Total	**$0.331**	**$2.051**	**$0.664**

Note: [a] Reflects a non-weighted average of the cost per case month for the New Mexico and Ramsey County on-line systems.

N/A = Not Applicable

The primary tasks involved in authorizing access to benefits include:

- creating and posting the benefit records;

- establishing the EBT benefit account; and
- issuing benefit and photo ID cards.

Different methods are sometimes used to accomplish these tasks in paper and EBT systems. The differences are described in the following discussion.

Creating and Posting the Benefit Records

This task is the same in both the coupon and EBT systems. During the intake process, the benefit record is created in the state's client certification and eligibility determination system (CRIS-E). The intake caseworker keys the client information into CRIS-E, and the CRIS-E system determines eligibility, creates an account, and calculates the benefit record. Each month, CRIS-E creates and posts a new allotment record to the client's account. The cost of creating and posting the benefit record in the Montgomery County coupon and EBT systems is $0.182. The comparable costs in Ramsey County and New Mexico averaged $0.210.

Establishing the EBT Benefit Account

Under the coupon system, CRIS-E establishes eligibility and assigns each client a case number, which becomes the client's "account" number. This function is accomplished during the creation and posting of the benefit record. In the EBT system, CRIS-E is also used to establish eligibility and calculate the benefit amount. However, under EBT, this information must be passed to the EBT host where the EBT account is established. This information is provided via an on-line communications link that was developed for the EBT demonstration. The cost for establishing the EBT benefit account is $1.370 per case per month; this amount includes EBT vendor charges for labor, data center usage, hardware and software maintenance, and network communications. For the on-line systems, the cost associated with establishing the EBT benefit record is included in *creating and posting the benefit file.*

Table of Contents

Issuing Benefit and ID Cards

Under the EBT system, each client is issued two cards, compared to the single card that is issued to food coupon recipients. Recipients receive an EBT cards as well as a picture identification card that is issued to all county clients. This card is used in the paper system to establish identity at the issuance centers and at retailers when necessary. It is also used by other programs for check cashing and other identification needs. In Montgomery County, picture identification and EBT cards are issued in different offices. After establishing eligibility, the intake caseworker authorizes the issuance of the picture identification card and instructs clients to proceed to the identification card area to have their pictures taken and receive the card. The issuance of the photo ID did not change under EBT. The cost for authorizing and issuing the photo ID is $0.114 per case month.

Under EBT, the client then proceeds to the fiscal control office. The FCO worker dials into CRIS-E to establish the initial account and issue the EBT card. The system links the CRIS-E account number to the unique EBT card number. The client is given the EBT card to insert in a device linked to the card-issuance PC and is asked to select and input their personal identification number (PIN). The FCO also helps clients select three authorized food retail stores at which they can "pick up" their benefits. The FCO then provides training for the recipient. Issuance of the EBT card adds $0.355 per case month for a total cost of $0.498 per case month. New Mexico and Ramsey County both experienced somewhat lower costs for this function, averaging $0.455 per case month. The relatively high cost of the off-line system is partially a result of continuing to issue the photo identification card in addition to the EBT card, along with the time and photo imaging equipment required to personalize the EBT card.

The total cost of authorizing access to benefits in the off-line EBT system is $2.050 per case month. This cost compares to a cost of $0.331 per case month in the paper system and an average cost of $0.664 per case month for the two on-line demonstrations.

Table of Contents

Impact on Delivering Benefits

The paper system and the off-line EBT system are primarily benefit-delivery mechanisms, and benefit-delivery activities are most directly impacted by the conversion to EBT. The costs associated with these activities are shown in Exhibit 3-13.

Exhibit 3-13

DELIVERING BENEFITS
(Cost per Case Month)

Task	Montgomery County Food Coupon	Montgomery County Off-line EBT	Average On-line EBT[a]
Print/supply coupons	$0.524	$0.000	$0.000
Deploy/maintain terminals	0.000	1.164	0.734
Deliver coupons to recipients	1.564	0.000	0.000
Process transactions	0.000	1.135	1.223
Resolve problems	0.178	1.041	0.298
Total	**$2.266**	**$3.340**	**$2.254**

Note: [a] Reflects a non-weighted average of the cost per case month for the New Mexico and Ramsey County on-line systems.

Two major tasks are associated with the paper coupon system. These tasks include:

- supplying coupons, including printing, distribution, and inventory management; and
- delivering coupons to recipients, including operating local issuance centers and providing an on-line telecommunications link to CRIS-E from the issuance center.

In Ohio, the issuance process is managed at the county level. Each county is responsible for establishing and operating the issuance centers. Before the baseline data collection period, Montgomery County converted from a paper ATP (authorization-to-participate) issuance procedure to on-line CRIS-E issuance. Issuance centers in Montgomery County are contracted out based on a per-transaction fee. The issuance centers were provided with CRIS-E terminals and telecommunications lines to link them to the central computer. Upon conversion to EBT, issuance center fees and costs associated with amortization and maintenance of issuance center CRIS-E terminals were eliminated.

The off-line EBT system eliminates the use of food coupons and delivers benefits to recipients at the point of sale. In contrast to on-line systems, in which benefits are available in a central database that is accessed from the point of sale, benefits in the off-line system are actually "issued" to the card. The steps involved in this process include:

- deploying and maintaining the terminal network, including terminal depreciation, maintenance, store supplies and store preparation, and processor services to stage issuances for transmission to the selected retailers;
- processing transactions, which includes the amortized cost of the card and host computer services to update the host balance for each card; and
- resolving transaction problems by authorizing paper back up transactions, and providing balance and other information to recipients over the 800-customer service number.

Printing and Supplying Coupons

The Montgomery County Department of Human Services (MCDHS) oversees the contractors who operate the issuance centers where recipients pick up their monthly allotment of food coupons. MCDHS also has a role in monitoring the coupon supply, placing orders for coupons, and storing coupon inventories. The Ohio Department of Human Services (ODHS), Bureau of Payment Distribution reviews county coupon requisitions and sends them to the MWRO where they are recorded, processed, and forwarded to FNS headquarters. Headquarters orders coupons from the printer and manages the bulk printing contract. The coupons are sent to an ODHS bulk storage site. Coupons are sent from the bulk storage site to county issuance

offices by armored truck or U.S. registered mail. At the issuance centers, the coupons are sorted and stored in safes until they are distributed to recipients.

The total cost of printing and supplying coupons is $0.524 per case month, which includes $0.392[1] of federal costs to print and distribute coupons, and $0.132 of state and county costs to manage, store, and transport coupons.

Delivering Coupons to Recipients

Coupons are delivered to recipients at county issuance centers. Coupon delivery is staggered over the first five work days of the month. The centers operate at full staffing during these days. After the initial issuance period, the staffing is reduced, with additional support provided by supervisors from other centers that are open only the first five days of the month. The cost of delivering coupons to recipients is $1.564 per case month, which consists of $0.445 of state costs to oversee coupon inventory management and support the establishment of telecommunications between the issuance centers and CRIS-E, and $1.119 of county costs for issuance contracts and management, and terminals and CRIS-E communications.

Deploying and Maintaining the POS Terminal Network

The cost of deploying and maintaining the off-line POS terminal network is approximately $1.164 per case month, compared to the average cost of $0.734 for the on-line systems in Ramsey County ($1.41) and New Mexico ($0.06).[2] Contributing to the off-line system's relatively lower terminal deployment and maintenance cost compared to Ramsey County is its

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[1] In addition to the $0.392 per case month for printing and distributing food coupons, in 1992 the federal government also incurred an additional cost of $0.183 per case month for monitoring and Federal Reserve processing of coupons. These costs are shown in the reconciliation and crediting retailers functions. The total cost incurred during fiscal year 1992 for coupon printing, shipping, monitoring and Federal Reserve processing was $0.575 per case month.

[2] According to Abt Associates, New Mexico's EBT system used an existing infrastructure and existing terminals, resulting in much lower cost for deploying and maintaining terminals than in Ramsey County.

Table of Contents

higher recipient density per terminal (44 food stamp cases per terminal in Dayton versus 28 in Ramsey County). The monthly depreciation costs of Ramsey County and New Mexico EBT are lower than the Montgomery County costs of $28.75 per month, as indicated in Exhibit 3-14.

Exhibit 3-14

EBT TERMINAL COSTS AND DENSITY

	Montgomery County Off-line EBT	Ramsey County On-line EBS	New Mexico On-line EBT
Monthly depreciation cost per terminal	$28.75	$21.30	$19.30
Cases per terminal	44	28	36

Terminals in the off-line system cost approximately 35 percent more than terminals in Ramsey County and 44 percent more than terminals in New Mexico. This additional cost is due to the addition of the smart card readers and the requirement for a PC, which is used as a storage device and controller in every retailer site. The demonstration contractor has recently installed new terminals in four single-lane stores that have an integrated smart card reader and enhanced memory and processing capabilities. This new terminal will reduce the equipment cost in single-lane retailers by 45.7 percent. It should be noted that FNS and the state agreed during negotiations with retailers to equip all lanes at authorized retailers in the demonstration area. This resulted in equipage of approximately 22 percent more lanes than would be required under the equipage formula in the Food Stamp EBT regulations.[1,2]

[1] 7 CFR 274. 12(8)(4)(ii)

[2] The cost impacts of full lane equipage are discussed in Volume I, Chapter 5.

Processing Transactions

In the off-line EBT environment, the EBT card is an integral part of the transaction processing function. The EBT card interacts with the POS card reader/terminal to process and complete the transaction. Over 60 percent of the cost for processing transactions is the amortized cost of the card. As explained earlier in this chapter, the card amortization period is a function of the replacement rate for lost or stolen cards, the replacement rate for card failures, and the attrition rate of the recipient population. The average card life is estimated at 9.9 months, yielding a per case month cost of $0.882.

The remaining 40 percent of the cost for processing transactions is an allocated portion of the costs for the demonstration contractor's host computer and labor, which are used to update account balances based upon the information received from retailers. These costs contribute $0.253 per case month. The cost of processing transactions in the off-line EBT system is thus analogous to the costs of processing transactions in the on-line systems, which includes transaction fees, telecommunications, and third party payments. One attribute of the off-line system is that the cost per case month is not as sensitive to the number of transactions that are performed. The cost of processing transactions in the on-line systems is directly related to the volume of transactions.

Resolving Transaction Problems

The cost of resolving transaction problems in the off-line EBT demonstration ($1.041) is substantially higher than the cost in the on-line demonstrations ($0.298). The primary reason for this cost differential is that Montgomery County established a separate PayEase assistance control office to handle client inquiries and to serve as a dual control to the fiscal control office. In addition to the ACO, the demonstration contractor established a customer service 800-number, which was staffed 24 hours per day. Both the county and the contractor are currently reviewing their staffing plans to reduce the level of effort associated with this activity.

The total cost of delivering benefits in the off-line EBT system is $3.34 per case month compared to a cost of $2.27 in the coupon system. The comparable costs in the Ramsey County

Table of Contents

and New Mexico demonstrations averaged $2.25. As shown in Exhibit 3-13, the lower costs in the on-line system are primarily related to lower costs for resolving problems and deploying and maintaining terminals.

Impact on Crediting Retailers and Financial Institutions

Crediting retailers, also referred to as retailer settlement, is a straightforward process in both the paper and EBT systems. Costs for this function are shown in Exhibit 3-15.

Exhibit 3-15

CREDITING RETAILERS AND FINANCIAL INSTITUTIONS
(Cost per Case Month)

	Montgomery County		
Task	Food Coupon	Off-line EBT	Average On-line EBT [a]
Process coupon deposits	$0.167	$0.000	$0.000
Food retailer settlement	0.000	0.898	0.033
Function Total	**$0.167**	**$0.898**	**$0.033**

Note: [a] Reflects a non-weighted average of the cost per case month for the New Mexico and Ramsey County on-line systems.

In the paper system, the food coupons are deposited with the retailer's financial institution. The financial institution verifies the value of the deposit and deposits the coupons with the Federal Reserve. The costs of these activities are borne by the financial institution. The Federal Reserve verifies the value of the deposit and credits the financial institution account. Each Federal Reserve Bank prepares a daily debit voucher to withdraw funds from the U.S. Treasury for coupon deposits credited to financial institutions. The cost of the Federal Reserve processing is paid by FNS under a cost-reimbursement agreement. Total administrative costs to credit retailers under the paper food coupon system is $0.167 per case month.

In an EBT system, crediting retailers is usually accomplished via the ACH. Generally, the EBT processor provides a file of all retailer credits to a concentrator bank. In the on-line systems, the EBT processor generates the ACH credit file based upon all transactions previously posted through on-line communications from POS terminals. This process, called the retailer settlement, can be initiated by the retailer or automatically by the EBT processor. In the off-line system, settlement must be initiated by the retailer, and the settlement transaction is usually the only on-line transaction that occurs each day.[1] The retailer initiates the settlement transaction at a POS terminal. The terminal dials into the EBT host and uploads all transactions that occurred that day. The host then downloads a confirmation of the settlement batch along with any new issuances, and an updated negative file that includes card blocks for all lost and stolen cards. Thus, in the off-line environment, in addition to the ACH costs, the cost of settlement includes the telecommunications link to the retailer and host processing costs. The off-line cost of the ACH settlement ($0.04) is comparable to the total cost of crediting retailers in the on-line systems ($0.033). The full cost of crediting retailers in the off-line demonstration includes the ACH expense, plus processor equipment expense of $0.42 and labor of $0.44, for a total of $0.90 per case month.

Impact on Reconciling and Monitoring System

The total costs for reconciling and monitoring the system are shown in Exhibit 3-16.

In the paper system, the county, state, FNS regional office, and FNS headquarters all have a role in monitoring issuances and redemptions. The county reported costs of $0.005 per case month for monitoring and reconciling coupon issuances from its issuance centers. State costs for monitoring issuances were $0.056 per case month. The FNS Regional Office performs monitoring functions related to coupon accountability. The costs associated with these monitoring activities were $0.0002. FNS headquarters monitors redemptions by retailers and financial institutions. This office relies on the Federal Reserve to enforce compliance with coupon depositing requirements but works closely with the Federal Reserve when problems arise. FNS

[1] Retailers are required to settle once within each 24 hour host processing cycle. None of the retailers have elected to settle more than once per day.

Table of Contents

headquarters also reconciles debits from the FNS treasury accounts to credits paid to retailers and financial institutions. The reported cost for these activities was $0.016.

Exhibit 3-16

RECONCILING AND MONITORING SYSTEM
(Cost per Case Month)

Task	Montgomery County Food Coupon	Montgomery County Off-line EBT	Average On-line EBT [a]
Reconcile issuances/report losses	$0.019	$0.049	$0.021
Reconcile EBT system	0.000	1.166	0.172
Management and oversight	0.058	0.421	0.410
Total	**$0.077**	**$1.636**	**$0.603**

Note: [a] Reflects a non-weighted average of the cost per case month for the New Mexico and Ramsey County on-line systems.

EBT reconciliation includes reconciling issuances, reconciling the EBT system, and managing the project. Reconciliations are performed by various entities including: the regional office, the county, the state, and the EBT processor.

For all EBT systems, reconciliations are performed by the FNS regional offices. The regional office also obligates funds quarterly for the EBT letter of credit or LOC. The draws to the LOC are monitored to ensure that sufficient funds remain in the LOC to meet the needs during the quarter. The regional office has on-line inquiry capability into the SmartLink/PMS system. The cost of performing these activities is $0.076 per case month.

Table of Contents

The state performs some specific reconciliations. On a daily basis the EBT processor reports benefit issuance and redemption information to the state. This information is checked for reasonableness against the authorization file that the state provided to the processor, to ensure that allotments posted to recipient accounts balance to the authorizations. The state also verifies that redemptions are within expected ranges and do not exceed authorizations.

The EBT processor's responsibilities include:

- providing the county office with on-line access to the system, which maintains transaction volumes and recipient balances;
- performing all other reconciliations, including benefit account reconciliation during the host cycle processing and reconciliation of host balances to card balances;
- providing the FNS Minneapolis Computer Support Center (MCSC) with data concerning retailer redemptions on a daily basis (a copy is sent to the state);
- providing reports to the state on a monthly basis, or upon request; and
- sending reports on a daily basis to the state when benefits are issued or written to the recipient's card.

The cost for the EBT processor to perform these steps is $1.166 per case month.

Other reconciliation steps that occur in the EBT system include suspension of issuances received from CRIS-E for which no card has been issued, and reconciliation of dormant accounts and returned benefits. The EBT system automatically establishes an "account" for each recipient upon issuance of a card. If no card is issued, the account is not set up. Therefore, if an issuance is received by the processor for a client who has not yet picked up a card, the issuance will be suspended. Issuances that are suspended more than one month (with a short grace period) are returned to the state. These returned benefits should be de-obligated. Dormant accounts are accounts in which balances remain unused for more than 90 days. If the recipient attempts to use the card after this period, the terminal displays and prints a transaction denial message that asks the recipient to go to the ACO to resolve the problem. The ACO can reverse the dormant status to enable access to the available funds in the account.

Costs for project management and oversight in the off-line system ($0.421) are similar to those experienced in the on-line demonstrations ($0.410). However, the cost of reconciling the off-line EBT system is considerably higher ($1.166) compared to the cost of reconciling the on-line system ($0.172). The primary reasons for this difference are the additional reconciliation that is required between the host balances and the card balances, the reliance on the retailer to initiate settlement, and perhaps the inexperience with off-line systems that creates a desire to perform additional reconciliation steps that would not be performed in a mature system.[1]

Impact on Managing Retailer Participation

While the costs to manage retailer participation comprise the least significant portion of the total costs of operating the EBT system, the introduction of EBT shifts responsibility for retailer management from solely a federal responsibility to a shared responsibility among the federal government, the state, and the EBT processor. Costs for managing retailer participation are shown in Exhibit 3-17.

In the paper system, retailers apply to the FNS Field Office to be an authorized food retailer. The field office may visit or call the retailer for additional information. The field office enters the retailer information into the FNS retailer management systems maintained at MCSC. Retailer compliance monitoring consists of reviewing investigative reports, initiating undercover buying operations, and tracking redemptions. Compliance and administration of sanctions are performed by the field and regional offices, the Compliance and Administrative Review Branches of the Benefit Redemption Division, and MCSC. EBT does not change these roles, with the exception that the field office is also responsible for entering new retailer information into the EBT system in addition to MCSC. The field office can also de-authorize or suspend retailers using this system.

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[1] In fact, towards the end of the demonstration period NPC determined that the reconciliation would be performed only when a card balance exceeded the host-derived balance. See Chapter 4 of this volume and Chapter 3 of Volume III for additional discussions concerning card reconciliation.

Table of Contents

Exhibit 3-17

MANAGING RETAILER PARTICIPATION
(Cost per Case Month)

Task	Montgomery County Food Coupon	Montgomery County Off-line EBT	Average On-line EBT [a]
Authorize/train retailers	$0.019	$0.024	$0.070
Provide retailer customer service	0.000	0.240	0.000
Monitor redemption activity	0.001	0.001	0.023
Enforce compliance	0.019	0.019	0.073
Redemption oversight	0.005	0.001	0.009
Total	**$0.044**	**$0.284**	**$0.175**

Note: [a] Reflects a non-weighted average of the cost per case month for the New Mexico and Ramsey County on-line systems.

The state and EBT processor are responsible for executing an agreement with each retailer before EBT equipment is installed. This agreement stipulates the operating rules for the EBT system, including settlement arrangements, crediting of funds, terminal deployment and responsibilities, and liabilities. Liabilities pertain to imposing liability on the retailer for manual transactions that are accepted when the EBT system is not available. The EBT processor is responsible for managing retailer issues, including settlement adjustments, disputes with clients, and other questions related to the use of the EBT system.

The cost of managing retailers increases from $0.044 in the paper system to $0.284 in the EBT system. The cost of managing retailer participation in the on-line systems is $0.175. The difference in cost between the off-line and on-line is due to differences in the treatment of the retailer customer service function. In the off-line EBT system, a portion of the customer service

function is attributed to managing retailer participation. In the on-line EBT system, no processor costs are shown for providing retailer customer service.[1]

DESIGN, DEVELOP, AND IMPLEMENT THE OFF-LINE EBT DEMONSTRATION

The design, development, and implementation of the off-line EBT system was a pioneering effort, similar to the design, development, and implementation of the Reading EBT system in 1984. While the designers of the off-line EBT system were able to draw on the insights provided by seven years of EBT development and substantial experience with commercial POS systems, this was the first system to use smart card technology. As such, important functional issues had to be resolved, such as how to issue benefits to cards in a reliable, convenient, and cost-effective manner, as well as complex technical issues such as how to interface the POS device to the smart card reader. These issues were overcome to provide a functionally stable environment. Because of the technical achievements accomplished in this development effort, future off-line efforts may realize economies. Design, development, and implementation costs for the off-line system were $3.4 million compared to costs for New Mexico and Ramsey County of $1.6 million and $2.1 million, respectively. Design and development of the off-line system cost approximately $1.7 million, compared to $919,000 and $1.4 million in New Mexico and Ramsey County, respectively. Exhibit 3-18 below summarizes the costs to design, develop, and implement the off-line EBT system.

[1] According to Abt Associates Inc., in New Mexico, the costs for providing customer service were included in the transaction processing fee; in Ramsey County, the costs were included in POS maintenance.

Table of Contents

Exhibit 3-18

SUMMARY OF THE COSTS TO DESIGN, DEVELOP AND IMPLEMENT THE OFF-LINE EBT SYSTEM

Cost Component	Design[a]	Develop	Implement	Total
Demonstration contractor (NPC)	$439,691	$1,206,323	$863,855	$2,509,869
Montgomery County	31,432	83,489	171,765	286,686
State of Ohio	60,778	39,120	19,098	118,996
Food and Nutrition Service	311,654	149,710	53,283	514,647
Total	**$843,555**	**$1,478,642**	**$1,108,001**	**$3,430,198**

Note: [a] Design costs shown in this exhibit include pre-award phase of design effort including preparation of the request for proposals, preparation of the proposal, and evaluation of the proposal by FNS.

Design Costs

The design period consisted of two phases, the pre-award phase and the post-award phase. During the pre-award phase, FNS developed the request for proposals, evaluated the responses, and awarded the contract. The state and county worked with NPC to develop its proposal and to respond to technical and cost questions. The system design phase (post-award) commenced with the project kick-off meeting on September 29, 1990. During the design phase, NPC developed the draft and final design documents in conjunction with the state and county. FNS expended resources to review the design, attend project meetings, and provide technical assistance. The costs of these activities are summarized in Exhibit 3-19.

Table of Contents

Development Costs

During the development phase, NPC engaged in software development, system testing, and implementation planning. NPC project staff also conducted project status meetings. FNS, the state, and Montgomery County expended resources for project management and oversight, to attend design review and project status meetings, and to participate in system functional and acceptance testing. FNS also expended resources for technical assistance.

Development of the EBT system included:

- software development for the EBT host system, the retailer POS systems, the CRIS-E interface, and the Field Office retailer management subsystem;
- an initial purchase of smart cards for development purposes;
- travel to attend design review meetings;
- labor and technical assistance for the functional demonstration, acceptance test, and regression test;
- retailer terminals and the host hardware required for development;
- subcontractor costs, materials, and equipment for electrical engineering services (terminal engineering) to develop the interface between the POS terminals and the smart card readers; and
- set-up of a conversion site for initial issuance of cards and recipient training.

Table of Contents

Exhibit 3-19

COST TO DESIGN THE OFF-LINE EBT SYSTEM

	Pre-Award Phase	Post-Award Phase	Total Design
National Processing Company			
Labor	$120,591	$216,520	$337,111
Travel	16,300	16,948	33,248
Subcontractor	0	30,839	30,839
Equipment	0	6,950	6,950
Miscellaneous	0	31,543	31,543
Total	**136,891**	**302,800**	**439,691**
State of Ohio			
Personnel	9,505	48,456	57,961
Miscellaneous	0	2,817	2,817
Total	**9,505**	**51,273**	**60,778**
Montgomery County			
Personnel	7,410	14,578	21,988
Consultant	0	7,750	7,750
Miscellaneous	0	1,694	1,694
Total	**7,410**	**24,022**	**31,432**
Food and Nutrition Service			
Headquarters	215,584	37,767	253,351
Regional office	0	2,611	2,611
Field office	0	2,028	2,028
Technical assistance	0	53,664	53,664
Total	**215,584**	**96,070**	**311,654**
GRAND TOTAL	**$369,390**	**$474,165**	**$843,555**

The system development effort began in March, 1991. The system coding effort began in March and included coding for the following functional areas: CRIS-E enhancement, the command set code, the retailer authorization system, the EBT host screens, customer service, the ACO, and the FCO. The final functional demonstration plan was completed and the functional

Table of Contents

demonstration was conducted in August, 1991. An acceptance test plan was developed and the test was conducted during November, 1991. Implementation phase planning also began during the development phase. Costs for these activities are provided in Exhibit 3-20.

Implementation Costs

During the implementation phase, NPC conducted project status meetings, deployed retailer and administrative terminals, conducted regression and quality assurance testing, completed arrangements to provide customer service, set the recipient EBT accounts, issued recipient cards and PINs and trained retailers and recipients. FNS, the state and Montgomery County participated in the testing activities, attended project status meetings, and provided project oversight and management. FNS also expended resources to provide technical assistance. The implementation phase began in December, 1991. Implementation of the EBT system took the project from the development phase to a point where recipient benefits could be delivered. This

process, spanning eight months, included:

- performing site preparation activities (installing cables and modifying checkout counter space) at each of the authorized retailer locations;
- installing terminals and software at each retailer;

Table of Contents

Exhibit 3-20

COST TO DEVELOP THE OFF-LINE EBT SYSTEM

National Processing Company	
Labor	$466,235
Subcontract labor	453,190
Travel	22,448
Smart cards	1,790
Retailer terminals	7,200
Host hardware	43,717
Terminal engineering	131,778
Communications	13,562
Miscellaneous	66,311
Total	**1,206,323**
Montgomery County	
Labor	30,469
Travel and other	22,553
Building (conversion site)	30,467
Total	**83,489**
State of Ohio	
Labor	36,314
Travel and other	2,805
Total	**39,120**
Food and Nutrition Service	
Headquarters labor	67,329
Headquarters travel and other	3,193
Regional office labor	5,231
Regional office travel and other	2,127
Field office total	4,135
Technical assistance	67,694
Total	**149,710**
GRAND TOTAL	**$1,478,642**

During January, 1992, NPC conducted regression and quality assurance testing. Retailer equipment was installed in February, 1992. NPC arranged to provide 24-hour customer service support to recipients and retailers. Throughout the implementation period, NPC staff continued

to make system changes to improve functionality and correct identified problems. Training was conducted for Montgomery County workers, and the county began to make physical improvements at the temporary site that was leased for recipient conversion and training activities. Recipient conversion began in February. The total cost of implementation activities was $1,108,001, as shown in Exhibit 3-21.

Table of Contents

Exhibit 3-21

COST TO IMPLEMENT THE OFF-LINE EBT SYSTEM

National Processing Company	
Labor	$442,893
Subcontract labor	268,251
Travel	19,101
Retailer terminals	32,365
Host hardware	42,044
Terminal engineering	1,203
Communications	17,526
Store preparation	21,258
Miscellaneous	19,214
Total	**863,855**
Montgomery County	
Labor	33,899
Travel and other	37,205
Building (conversion site)	100,661
Total	**171,765**
State of Ohio	
Labor	17,408
Travel and other	1,690
Total	**19,098**
Food and Nutrition Service	
Headquarters labor	16,488
Headquarters travel and other	2,307
Regional office labor	9,780
Regional office travel and other	0
Field office total	1,661
Technical assistance	23,047
Total	**53,283**
GRAND TOTAL	**$1,108,001**

Total Resource Costs

The preceding analysis of administrative costs was based on billed costs from the vendor. Of interest to states and other organizations considering off-line technology is the total value of resources expended in the design, development, and implementation of the system. These total costs are referred to as resource costs because they represent the economic value of all labor and non-labor resources expended in the effort.

The primary factor differentiating billed and resource costs for the off-line demonstration relates to uncompensated overtime. Costs associated with uncompensated overtime were computed based on daily time sheet records that detailed total hours worked by each member of the NPC project team. Hours worked beyond the standard day (i.e., hours not billed to FNS) were valued at the employee's billed wage rate to compute the value for uncompensated overtime. Other than the value of uncompensated overtime, cost incurred by NPC were billed to FNS.

The agreement between the off-line EBT demonstration vendor and the government was under a cost plus fixed fee (CPFF) type contract. In a CPFF contract, the vendor calculates labor costs based upon a pre-determined total number of hours per individual per year. (For example, if an employee earns $25,000 per year and is expected to work 2,000 hours, then their hourly unloaded labor rate is $25,000/2,000 or $12.50 per hour. Overhead and general and administrative expenses are then added to this rate.) The charges under the off-line EBT demonstration contract were based on a 40-hour work week. If the vendor had billed overtime hours, the actual difference in cost to the government cannot be known with certainty. It is possible that the hourly rate for each individual would have been reduced in proportion to the total number of hours billed. (In the example above, if the same individual worked 2,500 hours, the unloaded labor rate would be $10.00 per hour.)

The $3.4 million in design, development and implementation reported in Exhibit 3-18 excludes the value associated with uncompensated overtime by NPC personnel. Using billed wage rates, the total resource cost to design, develop and implement the off-line EBT system is $3.6 million, reflecting $0.2 million or 3.3 man years in uncompensated overtime. For the reasons mentioned above, the estimated monetary value for uncompensated overtime reflects an

upper limit to what might have been billed under other circumstances. The off-line EBT demonstration system was a pioneering effort. There was no model to build from. All firmware and software coding and terminal engineering had to be done from scratch. The magnitude of the effort, combined with the ambitious project schedule, resulted in a need for the project team to put in overtime hours. With the Montgomery County off-line system to serve as a model, future off-line development efforts might not require similar levels of effort.

There may also be unbilled operational resource costs. During the evaluation period, the NPC PayEase project team continued to log uncompensated overtime hours. During the five month period ending December 31, 1992, 0.65 man years in uncompensated overtime valued at $37,745 were logged by NPC personnel. This amounts to $0.69 per case month.

Again, this amount is an upper limit since much of the overtime effort was developmental rather than operational. As noted in Chapter 3 of Volume III, the PayEase project team continued to make system modifications during the evaluation period. Of particular note, during the evaluation period, NPC began to develop an alternative POS configuration for single lane stores and several modifications were made to the EBT host to improve performance and enhance functionality. While it is difficult to determine exactly what portion of the uncompensated overtime was due to the pioneering nature of this effort, it is safe to say that a proven technology have required fewer modifications during an operational period, and, therefore, should have resulted in a lower level of uncompensated overtime. The same caveats regarding the procedures used to monetize overtime hours also applies.

Table of Contents

Chapter 4

IMPACT OF THE OFF-LINE EBT SYSTEM ON BENEFIT LOSS AND DIVERSION

The paper food coupon process has been criticized as being susceptible to fraud and abuse. Data from the on-line EBT demonstrations indicates that, overall, EBT provides the means to reduce benefit loss and diversion as compared to a paper coupon system. However, both on-line and off-line systems may introduce new vulnerabilities such as system "hacking" and other electronic tampering.

To compensate for these new vulnerabilities, the EBT system must include controls to accomplish the following objectives:

- detect and correct unauthorized or unexplained transactions;
- detect and prevent erroneous processing;
- ensure that complete and timely data are captured; and
- provide for appropriate segregation of functional responsibilities.

INTRODUCTION

This chapter analyzes the impact that the PayEase system in Ohio had in reducing food stamp loss and diversion as compared to the paper coupon system. Comparisons to on-line systems are made, using data derived from the report The Impacts of the State-Initiated EBT Demonstrations on the Food Stamp Program.[1]

For consistency with prior research initiatives, total benefit loss and diversion is measured as the sum of three components:

[1] John A. Kirlin et al., The Impacts of the State-Initiated EBT Demonstrations on the Food Stamp Program, Cambridge, Massachusetts: Abt Associates Inc., June 1993

- **Program loss**. This includes errors or fraudulent activities that increase the cost to the Food Stamp Program. Examples of program loss include replacement of food stamp benefits that are reported by recipients as lost or stolen from the mail, and duplicate issuances to recipients that cannot be recovered because the recipient has left the program.

- **Participant loss**. This includes activities that increase the cost of participation to food stamp recipients, retailers, financial institutions, and outside contractors.[1] These losses do not increase the cost to the Food Stamp Program. A recipient's loss of food stamp coupons after receipt in the mail constitutes a participant loss because these coupons are not replaced by the Food Stamp Program.

- **Benefit diversions**. These are benefits that are diverted from their intended purpose, i.e., the purchase of eligible food items. Benefit diversions do not directly increase program costs. The often-cited examples of benefit diversion in the Food Stamp Program include the selling of food stamps (trafficking), the purchase of ineligible items (both food and non-food), and the use of cash change from food stamp transactions to purchase ineligible items (both food and non-food).

Research Approach

The estimation of benefit losses and diversions and the discussion of program vulnerabilities is presented in the context of five broad categories, to enable a comparison across the three types of issuance systems. These categories are:

- benefits authorized for the wrong people or in the wrong amount;
- redemption credits (credit for redeeming food stamp benefits) to the wrong people or in the wrong amount;
- benefits lost during production and handling;
- benefits lost or stolen from recipients; and
- recipient use of benefits in an unintended manner (benefit diversion).

Each category is discussed in a separate section of this chapter. The program vulnerabilities of each of the three types of issuance systems will be presented first, followed by an analysis of the costs associated with that category of benefit loss and diversion.

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[1] Outside contractors include issuance site operators and the system processor and are considered a participant for the purposes of this analysis.

The general research design is a pre/post comparison of benefit loss and diversion under the coupon and off-line systems. When reliable coupon loss data was not readily available for Montgomery County, we used statewide or national data to provide an accurate estimate of coupon loss.

We also obtained estimates from individuals familiar with specific areas of benefit loss and diversion in the paper and off-line systems. These individuals included representatives from the EBT processor, the Office of the Inspector General of the USDA, FNS Chicago Compliance Area Office, FNS Cincinnati Field Office, the Secret Service, the State of Ohio, and Montgomery County, Ohio (the PayEase site). To facilitate the comparison to the on-line systems, we asked a representative from a smart card manufacturer and independent experts familiar with on- and off-line systems to provide specific commentary on the differences between the two systems. We interviewed stakeholders such as participating retailers, recipients, and financial institutions to supplement the development of estimates used in the analysis. These interviews are discussed in Volume II, Chapter 2 (retailers), Chapter 3 (recipients), and Chapter 4 (financial institutions) of this report.

For many functional areas, on- and off-line systems are remarkably similar in their approach to providing the functionality required in an EBT system and hence, they exhibit many of the same vulnerabilities and exposure. Therefore, for purposes of this analysis, the starting points for estimating benefit loss and diversion for the off-line system were derived from the estimates established for on-line systems.[1] Adjustments to these estimates were considered when:

- the design of the off-line system introduced a change that affected an area of vulnerability, e.g., the use of a smart card in an off-line system versus the use of a magnetic stripe card in an on-line system;
- available data showed a different loss estimate; and

[1] The estimates for on-line systems are derived from Kirlin et al. A detailed discussion of the factors and assumptions used to determine the estimates can be found in that document and are not repeated here unless it was believed necessary to enhance the understanding of the development of estimates used for the off-line system.

- estimates from industry experts for off-line systems and smart card technology differed from the estimates provided for the on-line systems.

For consistency with prior evaluation reports, this analysis presents estimates of benefit loss and diversion in terms of the **percentage of total benefits issued** by each issuance system and in **dollars per case month**. Because the analysis relies on both expert judgments and reported data, the resulting estimates should be viewed with caution. It is believed that this methodology is more useful for showing the relative importance of each vulnerability and the expected direction of an EBT effect than for estimating the absolute magnitude of benefit loss and diversion. Also, projection of any estimate to future periods is subject to risk, because: existing control procedures may become inadequate due to changing conditions; new controls could be implemented; and the degree of compliance with the control procedures may deteriorate.

Highlights

The off-line EBT system appears to reduce benefit loss and diversion below that experienced under the CRIS-E coupon system. The total benefit loss and diversion was reduced from 2.12 percent of benefits issued under the CRIS-E coupon system to 0.57 percent of benefits issued under the off-line EBT system. These percentages translate into a cost per case month of $4.06 for the CRIS-E coupon system and $1.08 for the off-line EBT system. The total benefit loss and diversion was estimated at 0.60 percent and 0.61 percent of benefits issued for the New Mexico and Ramsey County on-line EBT systems, respectively.

Under the off-line EBT system, the total percentage of loss was reduced for two of the component measures: participant loss and benefit diversions. A major part of the reduction in participant losses results from the reduction in the amount of benefits that are lost by, or are stolen from, recipients. This reduction would have been larger had it not been for a slight increase in losses experienced by retailers that resulted from the introduction of overdraws on manual transactions.

Benefit diversions were also much lower under the off-line EBT system, resulting primarily from the elimination of cash change for use by recipients. The reductions in participant

loss and benefit diversion were consistent with the results from the on-line EBT systems in New Mexico and Ramsey County.

The total percentage of program loss went up slightly with the introduction of the off-line EBT system, rather than down as it had with the on-line EBT systems in New Mexico and Ramsey County. Those on-line systems eliminated program losses resulting from food stamp benefits being lost in the mail, which comprised the major portion of program loss in the coupon systems. This vulnerability was almost non-existent in the CRIS-E coupon issuance system. This significant fact illustrates the point that the impact that any EBT system has on benefit loss is dependent, in part, on the efficiency of the coupon system that it replaces.

The remainder of this chapter presents these results in more detail for each of the five categories of vulnerability. The final section of the chapter provides a summary of the combined results.

BENEFITS AUTHORIZED FOR THE WRONG PEOPLE OR IN THE WRONG AMOUNT

In the paper coupon system, benefit authorizations are controlled through the State CRIS-E system. CRIS-E is an on-line system that determines the amount of benefits to be paid each month. A caseworker then verifies and authorizes the issuance of those benefits. Recipients travel to a CRIS-E issuance site, present identification, and are issued food stamp coupons. In the off-line EBT system, CRIS-E provides the electronic issuance information to the EBT host. The information is transmitted electronically to the three retailers chosen by the recipient for "pick-up." The benefits are automatically transferred to the recipient's card during the first transaction at any of the three retailers.

Exhibit 4-1 summarizes coupon and EBT losses for benefits authorized for the wrong people in the wrong amount. It should be noted that, for this analysis, incorrect authorizations that occur typically as a result of the certification process are not included in the loss estimates because these losses would be unaffected by the type of issuance system used.

Table of Contents

Exhibit 4-1

SUMMARY OF FOOD STAMP COUPON AND EBT VULNERABILITIES RESULTING IN BENEFITS AUTHORIZED FOR THE WRONG PEOPLE OR IN THE WRONG AMOUNT[a]
(In Percent of Benefits Issued)

	Montgomery County	New Mexico	Ramsey County
Coupon Vulnerability			
Coupons are lost or stolen in mail	0.00	0.77	0.75
Duplicate issuance sent	<0.01	0.01	0.00
Total	**<0.01**	**0.78**	**0.75**
EBT Vulnerability			
State or county agency employee posts benefits to fictitious case or inflates benefits to existing case	0.00	0.00	0.00
System processor employee posts benefits to fictitious case or inflates benefits to existing case	0.00	0.00	0.00
Recipient overdraws account in a backup transaction or other error leading to retailer loss			
· Loss reimbursed by state or county	0.00	0.00	0.01
· Unreimbursed loss	0.02	0.03	0.09
Software error incorrectly credits client account	0.00	0.00	0.00
Double posting of issuance file	0.00	0.00	0.00
Total	**0.02**	**0.03**	**0.10**

Note: [a] Excludes amounts recovered or recouped from retailers or recipients.

Table of Contents

Food Stamp Benefits Authorized For The Wrong People or in the Wrong Amount

Under the CRIS-E system, the potential vulnerabilities include the duplicate issuance of a monthly benefit by CRIS-E and the distribution by contractor personnel at the issuance site of an amount greater than calculated by CRIS-E. Duplicate issuances by CRIS-E add to program costs and are considered **program losses**. Errors made by contractor personnel at the issuance site do not add to program costs and are therefore considered **participant losses**, because the contractor is liable for these errors.

Estimated Coupon Losses

Due to the manner in which coupons are distributed,[1] coupon losses from duplicate issuances under CRIS-E were almost non-existent. During the baseline period from October, 1991 through February, 1992, in only one instance was a duplicate issuance made under CRIS-E. This loss is a **program loss** and represents approximately 0.002 percent of benefits issued under CRIS-E during the baseline period.[2]

EBT Benefits Authorized for the Wrong Person or in the Wrong Amount

As with on-line systems, incorrect benefit posting in the off-line system can be the result of human error that is not detected by system controls (for example, double posting of an issuance file) or by system problems (for example, software errors). EBT systems should have adequate controls to prevent incorrect posting to recipient accounts and to detect situations that

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[1] Chapter 2 provides a description of the procedures used to distribute coupons in Montgomery County.

[2] During the baseline period there were no reported losses involving the distribution of food coupons in an amount different from the amount calculated by CRIS-E. However, in one instance after the start of the EBT operations period, issuance site personnel did issue benefits to the wrong person. (This information was obtained from Form FNS-46 for the portion of Montgomery County that was not included in the off-line demonstration.) This occurrence is presented to illustrate the potential for benefit loss in the coupon system. The amount of the issuance was $203, representing less than .001 percent of all benefits issued under CRIS-E through the occurrence of the event. This loss illustrates a **participant loss** because the liability rests with the issuance site contractor.

circumvent the prevention techniques. For example, access controls, such as terminal and application password protection, prevent unauthorized people from manipulating account balances; and reconciliation processes such as system reconciliations (CRIS-E to EBT host) and card balance reconciliations, provide the detection capability. In addition, recipient knowledge and review of their balances provides another detection control for conditions that result in their accounts being understated. Conversely, it would not be prudent to rely on this control to detect conditions that result in recipient balances being overstated.

Several potential vulnerabilities could lead to incorrect posting of benefits. They include:

- State or county agency employee posts benefits to a fictitious case or inflates benefits to an existing case;
- system processor employee posts benefits to a fictitious case or inflates benefits to an existing case;
- recipient overdraws account in a backup transaction or other error leads to a retailer loss;
- software error incorrectly credits client account; and
- issuance file is double-posted.

Estimated EBT Losses

There should be no significant differences between on-line and off-line systems in the functionality and controls related to the first two vulnerabilities, i.e., state, county, or EBT processor employees posting benefits to a fictitious case or inflating benefits to an existing case. Estimates for the on-line system for these vulnerabilities rounded to zero percent. There were no reported attempts to compromise the off-line system in this manner. Therefore, considering the design similarities and demonstration experience, a zero loss estimate will be used for these vulnerabilities.

For each of the other vulnerabilities, a separate discussion is provided below that presents design differences between the on-line and off-line systems and/or experiences during the demonstration period. As for the on-line systems, the only vulnerability to be assigned a loss

estimate was overdrawn manual (backup) transactions. This vulnerability is the most likely to result in creation of excessive benefits to recipients and losses to retailers.

Recipient overdraws account in a backup transaction or other error leads to retailer loss. The decision to process manual transactions is at the sole discretion of the retailer. The state, county and EBT processor do not provide guarantees for manual transactions. To assist the retailer, the EBT processor requires that all manual transactions receive authorization from PayEase customer service. The customer service agent checks the card balance on the host, checks to see if the card appears on the negative file, and so on. These steps are similar to those that would be made in an on-line system. The one significant difference between the two systems is that in an on-line system, the customer service agent should have access to the most recent account balance, because all transactions should be posted on a real-time basis. In an off-line system, the customer service agent has access only to the balances that result from the prior day's settlement activity. Transactions that occur on the same day as the manual transaction have not been posted to the recipient's account on the host computer. Also, if some retailers did not settle during the previous day, their transaction data would not be available, further compounding the potential exposure to an overdraft.[1]

Demonstration data indicate that during the period from October through December, 1992, a total of 222 manual transactions was made; 18 resulted in overdraft conditions that led to a retailer loss. The gross amount due to retailers as a result of these overdrafts represents a loss estimate of 0.02 percent of benefits issued.[2]

Although the on-line systems provide more current account balance information, the loss estimates used for their vulnerability analysis were higher than the estimate for the off-line system. One explanation for this is that the on-line system estimates were developed using

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[1] It should be noted that the off-line system has a control feature that is referred to as "settlement lock," which forces retailers to perform a settlement within a designated period of time or their systems will not perform regular transaction processing. This feature can be turned on by the EBT processor for retailers that do not settle regularly.

[2] A recoupment process is available to retailers. The loss estimate of 0.02 percent does not take into account amounts recouped from recipients.

Table of Contents

retailers' perceptions of permanent losses arising from EBT sales, which could have included other sources of losses. The estimate for off-line losses was developed using available system-generated data.

Software error incorrectly credits client account. The use of a smart card to carry the benefit balance requires a method to load the remaining balance from a lost or stolen card onto a replacement card. This process is known as a "transfer of value transaction." In April, 1992 a host programming error resulted in too high a value being transferred onto the replacement cards for 18 recipients. At the time, the host-derived balance was being transferred onto the replacement card even though it was higher than the last reported balance (maintained on the host) for the card that was being replaced.[1] When this situation occurs, it is then possible for subsequent transactions to total more than the host-derived balance. However, the host will not allow the balance it carries to go below zero. Instead, a non-sufficient funds (NSF) condition results and the transaction that brings the host-derived balance below zero is rejected to the

Table of Contents

Double posting of issuance file. During the demonstration period, a unique combination of events resulted in duplicate issuances for 115 recipients. On November 4, 1992, ODHS sent the daily auxiliary file too late to process in the normal host cycle. To meet the requirement to process issuances for new certifications, the EBT processor ran a special ad-hoc job to process only those issuances. This process had been performed several times in the past to accommodate a file that was received late. However, on this occasion, the EBT processor inadvertently processed the wrong file, pulling in the previous monthly file instead of the daily auxiliary file. Normally, controls built into the system prevent the duplicate processing of the same CRIS-E issuance. However, one condition involving replacement cards, which was not contemplated, allowed the issuance to be posted to these recipients. After this event, the control procedure was modified and ad-hoc processing of auxiliary files was discontinued.

Of the 115 recipients who received the duplicate issuance, 101 issuances were retrieved before the benefits were posted to the recipient's card. The remaining 14 recipients had a total of $3,219 in duplicate issuances posted to their cards, of which $1,267 was recovered during November, 1992. The remaining $1,953 is being repaid by the recipients under a negotiated schedule. If all recipients remain on the FSP, the EBT processor will recover almost all of the duplicate issuance. The initial and remaining balances indicated above represent 0.15 percent and 0.014 percent of the benefits issued in November, 1992, respectively, and 0.018 percent and 0.0018 percent of benefits issued during the demonstration period, respectively. However, given the changes implemented in the control procedures and the lack of any evidence of a similar occurrence(s) subsequently, for the purposes of this analysis a loss estimate of zero is used for this vulnerability.

REDEMPTION CREDITS (CREDITS FOR REDEEMING FOOD STAMP BENEFITS) TO THE WRONG PEOPLE OR IN THE WRONG AMOUNT

The redemption processes for retailers and banks are significantly different with EBT than under the paper coupon system it replaced.[1]

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[1] Volume II, Chapter 4, Impact of the Off-line EBT System on Financial Institutions, provides a detailed account of the redemption process for the paper and EBT system environments in the demonstration area.

Table of Contents

The discussion in this section focuses on whether a food retailer or bank receives credit for the wrong amount for a food stamp deposit. Exhibit 4-2 summarizes coupon and EBT bases for redemption credits to the wrong people or in the wrong amount.

Food Stamp Coupon Redemption Credits to the Wrong People or in the Wrong Amount

The potential vulnerabilities in the paper coupon system include deliberate and inadvertent overstated or understated redemption certificates or deposit certificates by the retailer or the bank. Any resulting losses incurred by retailers or banks are considered **participant losses**.

This analysis does not include non-authorized stores that illegally accept and redeem coupons.[1] This decision is based on two factors. First, to the extent that recipients purchased eligible food items, no true program loss results.[2] Second, once discovered to be a non-authorized retailer, monetary sanctions, if any, against these non-authorized stores should not be considered participant losses because the retailers were intentionally circumventing the established process.

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[1] According to the Cincinnati Field Office, there were no reported incidents of a non-authorized retailer that was fraudulently redeeming food stamp coupons. There were instances, however, where the ownership of a store changed and the new owner used redemption certificates with the previous store authorization number.

[2] The extent that these retailers aided in various benefit diversion schemes would be captured in the estimates of losses for recipient use of benefits in an unintended manner which are provided later in this section.

Table of Contents

Exhibit 4-2

SUMMARY OF FOOD STAMP COUPON AND EBT VULNERABILITIES RESULTING IN REDEMPTION CREDITS TO THE WRONG PEOPLE OR IN THE WRONG AMOUNT
(In Percent of Benefits Issued)

	Montgomery County	New Mexico	Ramsey County
Coupon Vulnerability			
Non-authorized store accepts and redeems coupons	0.00	0.00	0.00
Redemption certificate or deposit document over or understated by retailer or bank	0.02	<0.01	0.01
Total	**0.02**	**<0.01**	**0.01**
EBT Vulnerability			
Fictitious store accounts are created by system processor employee and credited	<0.01	<0.01	<0.01
Funds transfer through ACH process is altered to change retailer credits	<0.01	<0.01	<0.01
Store clerk learns client PIN and card number and manually enters information into terminal without client consent	<0.01	<0.01	<0.01
Store submits voucher for bogus sale	<0.01	<0.01	<0.01
Store accounts are altered by system processor or store employee	<0.01	<0.01	<0.01
Software error over- or under-credits retailer account	<0.02	<0.01	<0.01
Non-EBT terminal configured to transmit EBT-transactions to system	0.00	<0.01	<0.01
Total	**0.04**	**0.04**	**0.04**

Table of Contents

Estimated Coupon Losses

Two types of discrepancies can occur: a discrepancy between the retailer's deposit amount and the bank's credit to the retailer, and a discrepancy between the bank's deposit amount and the Federal Reserve Bank's credit to the bank. Interviews with representatives at the retailers' local banks and the Federal Reserve Bank confirmed that the Federal Reserve Bank does not incur any loss. Unresolved discrepancies between the Federal Reserve Bank and the local bank are debited or credited to the account of the local bank. Likewise, unresolved discrepancies between the local bank and the retailer are debited or credited to the account of the retailer.

The primary sources of data for estimating permanent losses that result from the coupon redemption process were interviews with the local banks and the Federal Reserve Bank, and the surveys of participating food retailers regarding their accounting error costs.

Representatives from the local banks estimated that their permanent losses totaled $0.01 per $1,000 of food stamp coupon deposits. This amount translates into a loss rate of 0.001 percent of benefits issued. These losses are considered **participant** (bank) **losses**.

The estimation of permanent losses for participating retailers is subject to additional consideration due to conflicting estimates provided by the local banks and retailers. Respondents from the local banks estimated that retailers' losses totaled $0.09 per $1,000 of food stamp coupon deposits. Retailers, however, reported losses of $0.23 per $1,000 of food stamp coupons redeemed.[1] To temper the possible response bias exhibited by local banks and retailers when providing estimates of retailer losses, we averaged the resulting estimates of perceived losses, which then translated into a loss rate of approximately 0.016 percent of benefits issued. These losses are considered **participant** (retailer) **losses**.

The combined **participant loss** for retailers and banks totals approximately 0.02 percent of benefits issued.

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[1] Retailer losses are discussed in Volume II, Chapter 2, Impact of the Off-line EBT System on Retailers.

Table of Contents

EBT Redemptions to the Wrong People or in the Wrong Amount

The introduction of EBT and its automated redemption process opens new avenues for inadvertent and intentional discrepancies. The potential vulnerabilities include:

- fictitious store accounts are created and credited by an employee of the EBT processor;
- funds transfer through the ACH process is altered to change retailer credits;
- store clerk learns client PIN and card number and manually enters information in the terminal without client consent;
- store submits voucher for a manual transaction that never occurred;
- software error over- or under-credits retailer account;
- store accounts are altered by EBT processor or store employees; and
- non-EBT terminal is configured to transmit EBT transactions to the system.

A number of prevention and detection controls that are designed into automated systems minimize the risk presented by the vulnerabilities above. They include various controls to minimize access to data files and processing functions as well as reconciliations of balances in files that have logical relationships. Reconciliations of data are performed at the transition points of its flow from one destination to another. Finally, it is strongly believed that the majority of recipients are aware of their account balance and activity and would report any differences they find that are not in their favor.

Estimated EBT Losses

For the on-line system, estimates for each of the vulnerabilities listed were less than 0.01 percent of benefits issued and in the aggregate totaled less than 0.04 percent. Regarding the first two vulnerabilities listed, there are no significant differences in the design of either the on- and off-line systems or their controls that warrant discussion. Therefore, the estimates for the on-line system appear reasonable for use in estimating the benefit loss in the off-line system. These losses are considered **program losses**. However, differences in the design of off-line and on-line

systems as well as experience from the demonstration warrant a discussion of the remaining vulnerabilities.

Store clerk learns PIN and card number and manually enters information into terminal without client consent. In the off-line system, a recipient card or a manager card is required for a transaction. One of the first steps performed by the card reader and the store personal computer (PC) is to verify certain information on the smart card's chip. Transactions, including PIN entry, cannot be entered until this verification process has been completed successfully. The verification process also controls the types of transactions that can be entered. Therefore, without a store manager card, store clerks cannot enter account information manually.

If store employees have access to a manager card and the PIN (which they often do), they could enter a manual transaction. The system includes a number of features to prevent and detect this situation. For example, the store employee must call customer service to receive an authorization number. Also, recipients monitor their own benefit balances.[1]

To date, there have been no reported incidents of fraudulent manual transactions being entered by store employees. However, some incidents may have gone unreported because recipients did not notice the transactions. The estimates for loss used for the two on-line systems were different. The amount of loss for New Mexico and Ramsey County was determined to be 0.001 percent and 0.00075 percent of benefits issued, respectively. These estimates do not reflect significant exposure to this vulnerability. The Ramsey County percentage (0.00075) is used as the baseline for the off-line estimate because of the similarity of the controls and experience -- for example, Ramsey County requires the use of a supervisor code and also reported no evidence of fraudulent manual transactions.[2] The off-line system offers an additional control: a receipt for

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[1] The receipt for a subsequent transaction displays the manual transaction for recipient review. A complete description of procedures for initiating a manual purchase is provided in Chapter 2 of this volume.

[2] Because these vulnerabilities fraudulently increase the amount of retailer redemptions, they have been captured as part of the loss estimates discussed in "EBT Redemptions to the Wrong People or in the Wrong Amount." This maintains consistency in reporting to the vulnerability analysis of the on-line systems. Therefore, these vulnerabilities are not also included as part of the loss estimates for "Benefits Lost or Stolen from Recipients." However, these losses

a subsequent transaction also lists the manual transaction. This feature is not currently being used with on-line systems. Because the manual transaction is printed on the receipt, there is a greater likelihood that the transaction would be noticed by the recipient.[1] Therefore, the estimate of loss for this vulnerability for the off-line system is 0.00056 percent of benefits issued, or about 75 percent of the Ramsey County estimate.

Store submits voucher for a manual transaction that never occurred. This vulnerability is similar to the one previously described, except that it assumes that the store owner/manager is aware of this type of activity. There have been no reported incidents of this type of activity in the demonstration area. However, there may have been unreported incidents because recipients did not notice the transactions. For the on-line systems, the loss estimate was based on the assumption that there was a once-a-month occurrence of this vulnerability for approximately $100 per fraudulent transaction. This amount represented less than 0.01 percent of benefits issued for the on-line systems. Once again, the additional control measure of having the manual transaction printed on the receipt increases the likelihood that the recipient will notice the transaction. The loss estimate used for the off-line system is 0.00075 percent of benefits issued.[2]

Store accounts are altered by EBT processor or store employees. This vulnerability is slightly different from the on-line system vulnerability. In the off-line system, a PC is located in the store to collect transaction data, which is forwarded to the host computer once a day for settlement. This feature makes the off-line system more vulnerable to store accounts being

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are considered **participant losses** (to recipients) because they went unnoticed by the recipients.

The analysis here pertains only to manual transactions involving a manager card. Fraudulent activities involving the unauthorized use of a recipient card are discussed in "Benefits Lost or Stolen from Recipient."

[1] Recipients have the capability to print the last 10 transactions written to their cards to help them track their account activity and balance. The cards are designed to hold the last 100 transactions written to them. These transactions can be accessed if the recipient brings the card into MCDHS. Interviews with recipients indicate that one of the perceived benefits of EBT is greater control and knowledge of unexpended funds, as compared to coupons, through the use of receipts and printing of transactions histories.

[2] See previous three notes.

altered by store employees. In an on-line system, a PC at the store location is not needed, because transactions are posted to the host computer as they occur.

The loss estimate for this vulnerability in the on-line systems was less than 0.01 percent. This estimate is reasonable for use in the off-line system also, even with the added exposure introduced by having the PC in the store. This additional exposure is reduced by controls, including the lack of a keyboard at the PC, secured locations in some situations, and security protection in the operating system. The perpetrator would also need to know the file and transaction structures in order to keep the system in balance. Finally, any changes to the transaction information on the PC (or on the host computer by EBT processor personnel) would result in the host system calculating a card balance that was lower than the balance stored on the card. All such conditions appear on a report that is investigated by customer service personnel.

Software error that over- or under-credits retailer account. In an off-line system, operational or systematic disruptions that occur during a transaction can create circumstances where the transaction may not be posted correctly to either the card or the PC. For example, if a card was removed prematurely during a purchase transaction, the card balance may have been updated but the transaction may not have been written to the PC. When a transaction is written to either one but not both, a report is generated by the host computer. When a card's balance is higher than the host-derived balance, customer service investigates to determine the reason for the discrepancy. When a card's balance is less than the host-derived balance, no investigation is performed. These situations usually mean that the retailer's end of day settlement total is less than the sum of the day's EBT transactions indicated on the EBT receipts. The potential impact on the retailer is a financial loss if the retailer does not resolve the difference. Therefore, responsibility for performing the reconciliation rests with the retailer. Experience has shown, however, that many retailers do not reconcile these settlements or, if they do, many use thresholds to determine whether to perform an investigation of a difference. As a result, over the life of the demonstration, there has been an accumulation of what are believed to be retailer redemptions that the retailers have not yet requested.

Based on system-generated data, the estimate of the permanent loss to retailers from this vulnerability represents 0.035 percent of benefits issued during the demonstration period. This

percentage is expected to decrease with each month's activity because the majority of the accumulation occurred early in the demonstration. When it became apparent that there was a greater-than-expected lack of awareness of the settlement differences on the part of the retailers, additional functionality was added to the system that informs the retailers when there have been problems at the POS device that could cause an out-of-balance situation. Warning messages now print on a receipt whenever the POS system senses that a problem has occurred. In addition, retailers were taught how to correct problems as they occur and reconcile the system to their register totals. As a result, the accumulation of settlement difference has been reduced significantly and has leveled. Based on the added functionality and control procedures provided to the retailers, it is believed that an estimate of 0.017 percent of benefits issued, or approximately twice the loss estimate used for on-line systems, would appropriately reflect the vulnerability.[1] This loss represents a **participant loss**.

Non-EBT Terminal Configured to Transmit EBT-transactions to System. Losses sustained because of this vulnerability would represent a **program loss**. Many of the same controls used in an on-line system are also present in the off-line system -- for example, access to terminal identification numbers, access to and passwords for administrative terminals to establish the terminal on the host, knowledge of file and transaction structures, etc. One additional control in the off-line system is that a valid recipient card is required to conduct transactions, and a valid manager card is required to initiate settlement to obtain funds. These cards contain special security information that makes the cards difficult to duplicate. For this analysis, a zero-loss estimate is used.

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[1] Included in this estimate are situations when a transaction was completed but was not written to either the card or the PC. These conditions, if undetected by the retailer, result in a retailer settlement shortage and benefits not being deducted on the recipient's card, thereby providing the recipient with additional benefits equal to the value of the undetected transaction. (Retailers should detect these situations when registers are reconciled and the end-of-day register totals do not equal total payments in the form of cash, credit, debit, EBT, etc.) These situations are included in the loss estimate here because they represent a retailer **participant loss**. They have not been included in discussion of "Benefits Authorized for the Wrong People or in the Wrong Amount."

Table of Contents

BENEFITS LOST DURING PRODUCTION AND HANDLING

Paper food coupons are produced under controlled conditions by a security document printer under contract to FNS. The printer ships the coupons directly to a contractor-operated coupon bulk storage site in Montgomery County; coupons are then shipped to one of three contractor-operated CRIS-E issuance sites for delivery to recipients. Coupons torn from coupon books (except $1 denomination, which are used for change) are not supposed to be accepted by retailers. Retailers and financial institutions stamp coupons with cancellation. Once the coupons are redeemed at the Federal Reserve Bank, they are destroyed.

There is a production and handling process associated with EBT smart cards. They are produced by the smart card manufacturer and shipped to the EBT processor for transfer to the county fiscal control office for issuance to recipients. In addition, there is also concern about the vulnerabilities associated with the transfer of authorizations from the state agency to the EBT processor.

Exhibit 4-3 summarizes coupon and EBT losses for benefits lost during production and handling.

Food Stamp Coupons Lost During Production And Handling

During the production and handling cycle, there are four categories of potential vulnerability for food stamp coupons. They are:

- coupons are stolen during production, shipment, or storage; losses incurred here are considered a **program loss**;
- canceled coupons are taken from the redemption process and are reused; losses incurred here are considered a **program loss**;
- coupons are counterfeited; losses incurred here are considered a **participant loss** because counterfeit coupons are charged back to retailers; and
- recipients are given too many coupons; losses incurred here would ordinarily be considered a **program loss**; however, losses attributable to errors made by the issuance site operators would be considered a **participant loss**.

Table of Contents

Exhibit 4-3

SUMMARY OF FOOD STAMP COUPON AND EBT VULNERABILITIES RESULTING IN BENEFITS LOST DURING PRODUCTION AND HANDLING
(In Percent of Benefits Issued)

	Montgomery County	New Mexico	Ramsey County
Coupon Vulnerability			
Coupons are stolen during production, shipment, or storage	<0.01	<0.01	<0.01
Cancelled coupons are taken from redemption process and re-used	<0.01	<0.01	0.01
Coupons are counterfeited	<0.01	<0.01	<0.01
Recipient is given too many coupons	0.01	0.01	<0.01
Total	**0.03**	**0.02**	**0.02**
EBT Vulnerability			
Authorization file is tampered with or intercepted and replaced during physical transfer to:			
· County office	N/A	N/A	0.00
· System processor	0.00	N/A	N/A
Authorization file is tampered with or intercepted and replaced during electronic transmission to system processor	<0.01	<0.01	<0.01
Counterfeit card used to access fictitious benefits on the card	0.00	N/A	N/A
Total	**<0.01**	**<0.01**	**<0.01**

N/A = Not Applicable

Table of Contents

Estimated Coupon Losses

Estimates of coupons lost, stolen, or counterfeited during production and handling (the first three categories listed above) are based on interview data that corroborated the estimates provided for the New Mexico and Ramsey County food coupon systems, as reported in The Impacts of the State-Initiated EBT Demonstrations on the Food Stamp Program.[1] In that report, the estimate for each area was determined to be less than 0.01 percent of food stamp issuance based on national estimates of losses for each category over several years. There were no data from extant sources for the demonstration area for any of these categories of potential vulnerability. Therefore, for this analysis, the estimates provided in the cited report were used.

The final category of potential vulnerability involves providing recipients with too many coupons. Under the paper system in the demonstration area, there was only one reported incidence of a shortage in coupons; the shortage approximated $1,500 and was attributed to cashier error.[2] This results in a loss estimate of 0.01 percent of benefits issued and is considered a **participant loss**.

EBT Benefits Lost During Production and Handling

In an off-line EBT environment, two categories of vulnerability should be considered for EBT production losses, one of which is unique to the off-line environment. In both on-and off-line EBT systems, losses could result when the authorization file is tampered with or intercepted and replaced during either electronic transfer or physical transfer to the EBT processor. In the Dayton demonstration, this transfer occurs both ways. The daily auxiliary file is transmitted over a dedicated communications circuit between the ODHS and EBT processor using password protection and a structured file layout for header, file, and trailer records. The monthly recurring file is now transferred physically on a magnetic tape.

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[1] Kirlin, op. cit., p. 104

[2] These losses were reported as "Lost During Production and Handling" rather than as "Benefits Authorized for the Wrong Person or in the Wrong Amount," because there was no assurance that the cashier error resulted in excess benefits to recipients.

Table of Contents

In addition, for both on-line and off-line systems, there is also concern regarding the potential for counterfeiting cards. Card counterfeiting in an on-line system requires a recipient account on the EBT host in order to access funds. In an off-line system, balances are carried on the card and there is no need for an immediate communication with the EBT host. The additional vulnerability to the off-line system, which is not present in the on-line system, is the creation of fictitious balances on cards that would place value in the hands of the perpetrators.[1]

Estimated EBT Losses

Table of Contents

BENEFITS LOST OR STOLEN FROM RECIPIENTS

The Food Stamp Program is not liable for the loss or theft of benefits from recipients, whether the benefits are issued as coupons or on EBT cards. Benefits, once issued, are controlled by the recipient, and any loss is to the recipient, not the program. Therefore, these losses are considered **participant losses**.

Recipients are responsible for the security of food coupons just as they would be responsible for cash. Food coupons are not replaced if they are lost or stolen. The off-line EBT system provides for the replacement of lost or stolen cards and benefits remaining on the card. Forty-eight hours after the recipient notifies the county that the card was lost or stolen, a new card may be issued and benefits remaining are replaced. The value of remaining benefits is determined by comparing the last reported card balance to the host-derived balance. The lower balance is transferred to the new card.

In the baseline and post-implementation surveys, recipients were asked about their experiences with lost or stolen food stamp benefits. If they reported having their coupons or EBT card stolen or lost, they were asked how many times that had occurred, the dollar amount of the benefits, and -- if the loss was an EBT card -- whether other persons had used benefits without authorization.

Recipients readily perceived the difference in security of benefits between coupons and EBT, as shown by survey results.[1] Recipients who had used both coupons and EBT perceived the EBT card to be less vulnerable to loss or theft. Seventy-two percent of respondents "agreed" or "agreed strongly" that coupons are stolen more often than cards. Sixty-one percent "disagreed" or "disagreed strongly" that cards are lost more often than coupons. While the latter result is inconsistent with the high loss rate of cards that was actually reported, it is consistent with the greater security from loss of the benefits on the card.

[1] See Volume II, Chapter 3, Exhibit 3-26.

Table of Contents

Participant losses can also result when retailers overcharge recipients for their purchases or discount the value of the food stamp benefit. The baseline and post-implementation surveys asked recipients if they were overcharged for purchases and whether they received any refunds when the overcharge was brought to the attention of the cashier. Food Stamp Program regulations prohibit overcharging and discounting, and the Compliance Branch of the Food Stamp Program investigates suspected retailers.

Food Stamp Benefits Lost or Stolen from Recipients

Coupons are like cash in that they contain no means of identifying them to a particular recipient. They can be redeemed by the bearer for eligible food items at authorized retailers. If a recipient loses coupons or has them stolen, they are not replaced by the program. The burden of the loss is on the recipient. Exhibit 4-4 summarizes coupon and EBT losses for benefits lost or stolen from recipients.

Estimated Coupon Losses

Estimates of lost and stolen benefits are shown in Exhibit 4-5, which shows the losses experienced by recipients under coupons and EBT in Montgomery County. Under coupons in Montgomery County, four percent of recipients reported having coupons stolen, and four percent reported having lost coupons. Among those who had benefits stolen, the mean number of occurrences in the last six months was 1.3, and the average amount stolen was $120.70. Those who had lost benefits did so an average of 1.4 times, and the mean amount lost was $100.50. Across all recipients, the amount of benefits lost or stolen, on average, was $1.98 per case month, or a little more than one percent of benefits issued.

Table of Contents

Exhibit 4-4

SUMMARY OF FOOD STAMP COUPON AND EBT VULNERABILITIES RESULTING IN BENEFITS LOST OR STOLEN FROM RECIPIENTS
(In Percent of Benefits Issued)[a]

	Montgomery County	New Mexico	Ramsey County
Coupon Vulnerability			
Recipient loses coupons or has them stolen	1.04	0.30	1.20
Grocer overcharges recipient or discounts coupon value	0.25[b]	0.20	0.10
Total	**1.29**	**0.50**	**1.30**
EBT Vulnerability			
Unauthorized use of recipient EBT card	0.03	<0.01	<0.01
Counterfeit EBT card used to access recipient account	0.00	0.00	0.00
Discounting or overcharging by retailer	0.11[b]	0.15	0.09
Tampering with recipient account by retailer, state, county or EBT processor personnel	0.00	0.00	0.00
Software error in debiting recipient account	<0.01	<0.01	0.00
Recipient never picks up card, state or local worker takes card, selects PIN and accesses benefits or dormant account	<0.01	<0.01	<0.01
Total	**0.14**	**0.16**	**0.10**

Notes: [a] Excludes amounts recovered by recipients in one form of payment or another.

[b] Exhibit 4-6 provides an analysis of amounts included in these figures that were recovered by recipients in one form of payment or another (from retailer) for Montgomery County. Similar information for on-line studies was not reported.

Table of Contents

Exhibit 4-5

LOST AND STOLEN BENEFITS

In Last 6 Months	Montgomery County Coupon	Montgomery County EBT
Had coupons or cards stolen (percent)	4%	3%
Number of times (mean)	1.3	1.1
Total incidence	0.052	0.033
Mean amount stolen	$120.70	$49.80
Total value stolen	$6.28	$1.64
Lost coupons or cards (percent)	4%	9%
Number of times (mean)	1.4	1.2
Total incidence	0.056	0.108
Mean amount lost	$100.50	$73.20
Total value lost	$5.63	$7.91
Sum stolen and lost	$11.90	$9.55
Not restored by program (percent)	100%	3%
Adjusted value lost	$11.90	$0.29
Per Case Month		
Adjusted value lost and stolen	$1.98	$0.05
Mean issuance	$190	$190
Lost and stolen as percent of issuance	1.04%	0.03%

Source: Pre-implementation and post-implementation recipient survey data.

Estimates for the amounts that grocers overcharged recipients are shown in Exhibit 4-6. Recipients reported that overcharges amounted to 0.25 percent of benefits issued($0.477 per case month), of which all but 0.08 percent of benefits issued ($0.16 per case month) was refunded in one form of payment or another.

Table of Contents

Exhibit 4-6

OVERCHARGES AND REFUNDS

In Last 6 Months	Montgomery County Coupon	Montgomery County EBT
Been overcharged (percent of cases)	14%	10%
Number of times (mean)	3.4	2.2
Total incidence	0.476	0.22
Mean amount overcharged	$6.70	$5.50
Total value overcharged	$2.86	$1.21
Refunded in cash (percent)	23%	21%
Refunded in store credit or scrip (percent)	14%	19%
Refunded in food stamps	29	28
No refunds	33	29
Per Case Month		
Mean amount overcharged	$.477	$0.20
Refunded in cash	$.11	$.04
Refunded in store credit	$.065	$.04
Refunded in food stamps	$.14	$.06
Cash/credit refunds as percent of issuance	0.09%	0.04%
Amount lost	$0.16	$0.06
Amount lost as a percent of benefits	0.08%	0.03%

Source: Pre-implementation and post-implementation recipient survey data.

EBT Benefits Lost or Stolen from Recipients

Several potential vulnerabilities introduced by EBT can result in benefits being lost or stolen. They include:

- Unauthorized use of recipient EBT card;
- Counterfeit EBT card used to access recipient account;
- Discounting or overcharging by retailer;

- Tampering with recipient account by retailer, state, county or EBT processor personnel;
- Software error in debiting recipient account; and
- Recipient never picks up card, state or county personnel takes card, selects PIN and accesses benefits or dormant account.

Estimated EBT Losses

There should be no significant differences between on-line and off-line systems in the controls related to the last three vulnerabilities listed above. The off-line system provides an additional control in that any tampering or software errors would result in an out-of-balance condition between host-derived balances and card balances, and successful efforts to camouflage the tampering (which was previously given a low estimate of exposure in terms of benefits issued) would result in a discrepancy between host totals of transactions and settlement totals.

Unauthorized use of recipient EBT card. EBT benefits are protected by the recipient's PIN. If the card is lost or stolen, the benefits remaining on the card cannot be used without the PIN. As long as the recipient does not share the PIN or write it on the card, the benefits are not vulnerable. The program does restore unused benefits on lost or stolen EBT cards.[1]

Exhibit 4-5 shows that under EBT, benefits were reported stolen less frequently, and the average benefit amount on the card at the time it was stolen was substantially less than the value of coupons that were stolen. More than twice as many recipients had lost EBT cards (nine percent) as had lost coupons (four percent), but the amount of benefits lost was lower under EBT. The most significant advantage of EBT for recipients, however, was that in all but three percent

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[1] Recipients are supposed to report lost and stolen cards to customer service so that they can be "turned off" to prevent unauthorized use. However, a card is not effectively "turned off" in an off-line system until the updated negative file is downloaded to participating retailers during their settlement immediately following the report to customer service. Recipients are responsible for the benefits that may disappear from the card during this time period.

A balance is restored to the card 48 hours after the card is reported lost or stolen by the recipient. The balance used is the lower of the host-derived balance or the last reported card balance on the host at the time of restoral.

of the cases of lost or stolen EBT cards, their unspent benefit balances were restored by the program. After restoration, the value of benefits lost by recipients under EBT averaged $0.05 per case month, or 0.03 percent of benefits issued.

Discounting or overcharging by retailer. Exhibit 4-6 shows estimates for the amounts that grocers overcharged recipients. Recipients reported that overcharges amounted to 0.105 percent of benefits issued ($0.20 per case month), of which all but 0.03 percent of benefits issued ($0.06 per case month) was refunded in one form of payment or another.

Counterfeit EBT card used to access recipient account. The counterfeiting of smart cards has been previously discussed and was estimated to involve a zero-loss rate. The same rate applies here for benefits stolen from recipients through the use of a counterfeit card. In an on-line system, benefit balances reside on a host computer. A stolen magnetic stripe card could be read and copied into counterfeit cards and used -- assuming the PIN was known -- to diminish a recipient's account. The ease with which magnetic stripe cards can be counterfeited has been recently demonstrated on the national level through the perpetration of various ATM frauds. These incidents have added some credibility to the widespread belief that magnetic stripe cards are easily counterfeited. However, in the Food Stamp Program, one of the deterrents to this activity is the relatively small balances that are available and restricted to eligible food purchases at POS-equipped stores.

RECIPIENT USE OF BENEFITS IN AN UNINTENDED MANNER

Paper food stamp coupons are issued to provide a medium of exchange that is both convenient and constrained. Coupons are convenient in that they may exchanged, like cash, at the point-of-sale. They are constrained in that they may be exchanged only for eligible food items at authorized food retailers.

Some recipients use food stamp benefits in unintended ways. They may buy ineligible items with food stamps, or they may sell benefits for cash through transactions known as trafficking. Ineligible items may be paid for directly with food stamp benefits, or they may be purchased with cash obtained as change from legitimate transactions.

When recipients use food stamp benefits in unintended ways, there is no additional cost to the program. However, to the extent that benefits are diverted to uses other than the purchase of food, the goals of the Food Stamp Program are compromised, and the effectiveness of the program in helping households achieve adequate diets is reduced. For that reason, the Compliance Branch of the Food Stamp Program and the USDA Inspector General monitor and investigate stores to maintain high levels of compliance with program regulations. Specifically, monitoring visits are intended to assure that stores sell only eligible food items in exchange for coupons. Investigations are conducted in cases of suspected violations to gather evidence that is used to disqualify offending stores. Trafficking -- the buying and selling of food stamp coupons for cash -- is a more serious violation that bears criminal penalties.

Exhibit 4-7 summarizes the coupon and EBT vulnerabilities resulting in recipient use of benefits in an unintended manner.

Food Stamps Used in an Unintended Manner

Food stamp benefits are intended to help eligible recipients meet the nutritional needs of their families. Any other use of benefits, such as the purchase of ineligible items from grocers (liquor, tobacco, etc.), the purchase of non-food items, or the exchange of food stamps for cash, detracts from the achievements of the program's goals. Food stamp trafficking refers to the exchange of food stamps for cash. Trafficking may occur at a grocer location or on a "wholesale" basis, in which a broker buys food stamps from multiple recipients and then sells them to a grocer who redeems them for credit.

Table of Contents

Exhibit 4-7

SUMMARY OF FOOD STAMP COUPON AND EBT VULNERABILITIES RESULTING IN RECIPIENT USE OF BENEFITS IN AN UNINTENDED MANNER (In Percent of Benefits Issued)

	Montgomery County	New Mexico	Ramsey County
Coupon Vulnerability			
Recipients purchase ineligible items	0.17	0.17	0.17
Recipients sell coupons for cash	0.39	0.39	0.39
Recipients use cash change from food stamp purchase for non-food items	0.23	0.54	0.54
Recipients use cash/scrip refunds of overcharges from food stamp purchase for non-food items	0.02[a]	N/A	N/A
Total	**0.79**	**1.10**	**1.10**
EBT Vulnerability			
Recipients purchase ineligible items	0.16	0.16	0.16
Recipients sell benefits for cash	0.20	0.20	0.20
Recipients sell EBT-purchased food items for cash	0.01	--[b]	--[b]
Recipients use cash change from food stamp purchase for non-food items	0.00	0.01	0.01
Recipients use cash/scrip refund of overcharges from food stamp purchase for non-food items	0.01[a]	N/A	N/A
Total	**0.37**	**0.37**	**0.37**

Notes: [a] Amount is provided for informational purposes only and was not included in the total in order to maintain comparability to measurements used in on-line studies.

[b] On-line studies included an estimate of 0.01 percent of benefits issued as part of estimate for "Recipients use cash change from food stamp purchase for non-food items".

N/A = Not Available

Table of Contents

Estimated Coupon Diversion

Purchase of Non-eligible Items with Food Stamp Benefits. Retailers in the pre-implementation and post-implementation waves were asked about their perceptions of fraud in the food stamp system, including the difficulty of purchasing non-eligible items with both coupons and EBT benefits. Under the coupon system, retailer perceptions of the ease of buying non-eligible items were not consistent: on average one-quarter (25 percent) thought that it was "very easy," one-fifth thought it was "somewhat easy" (20 percent) and "somewhat hard" (18 percent), while approximately one-third thought it was "very hard" (38 percent). In contrast, over half (57 percent) of the retailers in the post-implementation thought that it was "very hard" to use EBT to buy non-eligible items and only 11 percent thought that it was "very easy." Exhibit 4-8 summarizes retailer perceptions.

Recipients also were asked how easy they thought it was for someone to use food stamp benefits to buy ineligible items such as tobacco or alcohol. Their responses are summarized in Exhibit 4-9. Under coupons, 55 percent of recipients perceived it to be "very hard", and 17 percent said it was "somewhat hard" to buy ineligible items. Seventeen percent thought it was either "somewhat easy" or "very easy".

Based on interviews with Food Stamp Program Compliance Branch staff conducted in conjunction with the Reading EBT evaluation in 1984, Kirlin *et al.*[1] have estimated that purchases of ineligible items with coupons amounts to 0.17 percent of benefits issued. There is no other basis for quantitative estimates of the amount of benefits diverted through purchase of ineligible items. This estimate was also used in the evaluation of the New Mexico and Ramsey County on-line systems. We present it here and in the summary in Exhibit 4-7 as the estimate of **benefit diversion** for Montgomery County for recipients who purchase ineligible items.

[1] Kirlin, op. cit., pp. 111 - 112

Table of Contents

Exhibit 4-8

RETAILER PERCEPTIONS OF FRAUD IN THE FOOD STAMP SYSTEM

EASE OF BUYING NON-ELIGIBLE ITEMS

	All Stores %	Super Markets %	Grocery Stores %	Convenience Stores %	Other Stores %
Very hard					
Coupon	38	40	25	39	45
EBT	57	71	40	76	15
Somewhat hard					
Coupon	18	27	25	11	9
EBT	17	16	20	12	23
Somewhat easy					
Coupon	20	13	33	11	27
EBT	15	6	25	4	38
Very easy					
Coupon	25	20	17	39	18
EBT	11	6	15	8	23
(BASE)					
Coupon	(56)	(15)	(12)	(18)	(11)
EBT	(89)	(31)	(20)	(25)	(13)

Source: Retailer pre-implementation/post-implementation surveys: How easy do you think it is for food stamp recipients to use the food stamp coupons/EBT benefits to buy items other than eligible items -- such as tobacco, alcohol, or other ineligible products? Do you think it is...

BASE = Number of retailers responding. See Chapter 2 of Volume II for a description of the research design used.

Table of Contents

Exhibit 4-9

RECIPIENT PERCEPTIONS REGARDING
UNINTENDED USE OF FOOD STAMP BENEFITS

BUYING INELIGIBLE ITEMS

	Montgomery County	
	Coupon	Off-line EBT
	%	%
Ease of Buying Ineligible Items		
Very hard	55	64
Somewhat hard	17	14
Somewhat easy	8	4
Very easy	9	5
Don't know	11	12
(BASE)	(810)	(814)

Source: Recipient pre-implementation/post-implementation surveys: How easy do you think it would be for a food stamp recipient to use food stamp coupons/EBT benefits to buy items other than eligible food items -- items such as tobacco, alcohol, or other non-eligible products. Do you think it would be ....

BASE = Number of recipients responding. See Chapter 3 of Volume II for a description of the research design used.

Selling Benefits for Cash. Retailers in the pre-implementation and post-implementation waves were asked about their perceptions of fraud in the food stamp system. Exhibit 4-10 displays the perceptions of retailers regarding trafficking of food coupons and EBT benefits. In the pre-implementation wave, almost half (49 percent) of all retailers reported that it was "very easy" for recipients to trade food stamp coupons for cash, while only 14 percent of retailers thought it was "very hard" for recipients to trade coupons for cash.

Recipients in Montgomery County also perceived it to be easy to trade coupon benefits for cash: 41 percent said it was "very easy" and another 18 percent said it was "somewhat easy." Only about one-fourth of recipients said it was "very hard" (14 percent) or "somewhat hard" (10

Table of Contents

Exhibit 4-10

RETAILER PERCEPTIONS OF FRAUD IN THE FOOD STAMP SYSTEM

EASE OF TRADING FOOD STAMP BENEFITS FOR CASH

	All Stores %	Super Markets %	Grocery Stores %	Convenience Stores %	Other Stores %
Very Hard					
Coupon	14	--	20	24	17
EBT	36	30	32	48	36
Somewhat Hard					
Coupon	16	19	20	12	17
EBT	27	30	21	32	21
Somewhat Easy					
Coupon	20	13	10	29	33
EBT	9	7	21	8	0
Very Easy					
Coupon	49	69	50	35	33
EBT	27	33	26	12	43
Amount of Cash Received					
Coupon - mean	$.52	$.44	$.56	$.61	$.54
- s.d.	.18	.15	.23	.11	.19
EBT - mean	$.73	$.65	$.77	$.74	$.81
- s.d.	.26	.27	.24	.25	.24
(BASE)					
Coupon	(49)	(16)	(10)	(17)	(6)
EBT	(88)	(30)	(19)	(25)	(14)

Source: Retailer pre-implementation/post-implementation surveys: What about trading food stamp coupons/EBT benefits for cash. If a food stamp recipient wanted to do this, do you think it would be ...

And if someone traded food stamp coupons/EBT benefits for cash, how much do you think they could get for each dollar of food stamp coupons?

BASE = Number of retailers responding. See Chapter 2 of Volume II for a description of the research design.

percent). Exhibit 4-11 displays recipient perceptions of the ease with which benefits could be exchanged for cash.

Table of Contents

Exhibit 4-11

RECIPIENT PERCEPTIONS REGARDING UNINTENDED USE OF FOOD STAMP BENEFITS

TRADING BENEFITS FOR CASH

	Montgomery County	
	Coupon %	Off-Line EBT %
Ease of Trading Benefits for Cash		
Very hard	14	37
Somewhat hard	10	17
Somewhat easy	18	15
Very easy	41	18
Don't know	16	13
(BASE)	(810)	(814)
Amount of Cash Received per Dollar of Benefit -mean	$.57	$.50
- s.d.	.219	.190

Source: Recipient pre-implementation/post-implementation surveys: What about trading food stamp coupons/EBT benefits for cash. If a food stamp recipient wanted to do this, do you think it would be ...

BASE = Number of recipients responding. See Chapter 3 of Volume II for a description of the research design.

As detailed in Exhibit 3-26 presented in Volume II, Chapter 3, recipients who had used both coupons and EBT perceived it was harder to sell benefits for cash with EBT than with coupons. About two-thirds agreed or strongly agreed with that statement, while only 20 percent disagreed strongly or disagreed.

Kirlin *et al.* estimated that 0.39 percent of food stamp benefits are sold for cash. This estimate was also used in the evaluation of the New Mexico and Ramsey County on-line systems. Again, we present it here and in the summary in Exhibit 4-7 as the estimate of **benefit diversion** for Montgomery County for recipients who sell coupons for cash.

Table of Contents

Cash Change from Coupon Purchases. When making food stamp purchases, recipients receive cash change for amounts up to $0.99. For change of one dollar or greater, whole dollar amounts are paid in one-dollar coupons, and cash change is paid for the partial dollar balance. The cash received as change is unconstrained and represents a source of diversion of benefits to non-food expenditures. The amount of diversion per case month depends on the amount of change returned on a typical transaction, the number of transactions per month, and the marginal propensities of recipients to purchase food out of food stamp benefits and out of cash income.

Estimates of the amount of cash change per transaction were derived from check-out counter observations. Observers recorded the amount of cash and food stamp payments for each of 9,418 transactions observed in the first week of November and December of 1991 and 1992 in a representative sample of stores in the demonstration area. Cash change was defined to be the complement of the cents portion of the payment ($1.00 minus cents portion). It represents the amount of change in cents that would have been returned to a customer who tendered payment of the next higher whole dollar.

Exhibit 4-12 shows cash change by payment mode and type of store. The weighted average cash change for all transactions paid wholly or partly by food stamp coupons was 52.02 cents. That amount was comparable to the cash change returned for all other modes of payment and was less than the cash change for transactions paid by cash. The data do not support the popular notion that recipients extract excess cash change from their benefits by engaging in multiple small transactions or by adjusting purchases to have small cents balances.[1] Cash change from food stamp coupons and EBT payments were very similar and were both lower than the mean cash-back from cash transactions.

[1] Since the observations were concentrated in the first week of each issuance month, they may not represent results from transactions that occur during other periods of the month.

Table of Contents

Exhibit 4-12

CASH CHANGE BY STORE TYPE AND PAYMENT MODE
(Cents Back Per Transaction)

	Store Type							
	Supermarket		Grocery		Convenience		All Types	
	Average Change	No. Trans.	Average Change	No. Trans.	Average Change	No. Trans.	Average Change	No. Trans.
Food stamps only	49.80	301	51.07	485	57.43	197	51.96	983

Recipients interviewed in Montgomery County reported using their food stamp coupons an average of 3.8 times per month.[1] The amount of cash change received on average out of a month's food stamp coupons was the product of average cash change per food stamp transaction and the mean number of transactions, or $1.98. That represents slightly over one percent of the average monthly allotment of $190.

The benefit diversion attributable to cash change must be calculated from estimates of the marginal propensities to consume (MPC) food out of food stamp benefits and out of cash income. Cash change produces an effective reduction in food stamp benefits, which are constrained, and an equivalent increase in unconstrained cash income. Spending for food will be affected by cash change to the extent that recipients are more disposed to spend a marginal dollar of food stamp coupons on food than they are to spend a marginal dollar of cash on food.

The Food and Nutrition Service recently published estimates of the MPCs for coupons and ordinary income from two evaluations of Food Stamp Cash-Out Demonstrations.[2] Averaging their findings from the Alabama and San Diego evaluations produces estimates of the MPC for coupons of .292 and for ordinary income of .068. The interpretation of these numbers is that recipients are estimated to spend 29 cents of an additional dollar of food stamp coupons on food, while they would spend about seven cents of an additional dollar of cash income for food.

Benefit diversion resulting from cash change as a percent of allotment (benefits issued) was estimated as follows:

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[1] Recipients reported they used EBT benefits 4.9 times per month. It is therefore possible that recipients underestimated the number of coupon transactions per month.

[2] Thomas Fraker et al., The Evaluation of the Alabama Food Stamp Cash-Out Demonstration, Princeton, New Jersey: Mathematica Policy Research, Inc., April 1992, p. F11. and James C. Ohls et al., The Effects of Cash-Out on Food Use by Food Stamp Program Participants in San Diego, Princeton, New Jersey: Mathematica Policy Research, Inc., September 1992, p. F10.

Consistent with earlier evaluations, the survey of recipients in the current evaluation found that recipients who had used both coupons and EBT perceived it is harder to sell benefits for cash with EBT than with coupons. About two-thirds agreed or strongly agreed with that statement, while only 20 percent disagreed strongly or disagreed. See Exhibit 3-26 in Volume II, Chapter 3.

When asked how easily someone could trade EBT benefits for cash, one-third of recipients said it would be "very easy" (18 percent) or "somewhat easy" (15 percent). See Exhibit 4-11. Many more recipients, however, thought it would be "very hard" (37 percent) or "somewhat hard" (17 percent). The 54 percent who said it would be "very or somewhat hard" substantially exceeds the 24 percent who told interviewers that trading coupons for cash would be "very or somewhat hard."

Retailers were asked how hard it would be for a food stamp recipient to trade EBT benefits for cash. Nearly two-thirds of all retailers (63 percent) perceived that it would be "very hard" or "somewhat hard", while only 36 percent thought it would be "somewhat or very easy" (see Exhibit 4-10). Managers of convenience stores were especially likely to perceive it to be "very or somewhat hard" to trade EBT benefits for cash (80 percent). These responses contrast with perceptions of all retailers that it was "very or somewhat easy" to trade coupons for cash (69 percent).

Based on these subjective findings, it appears that the selling of benefits for cash under EBT is much more difficult than under coupons, although still possible. There is no sound basis for making quantitative estimates of the percentage of benefits sold for cash under EBT. Once again, since there is little, if any, effect that the type of EBT system, on- or off-line, would have on this type of diversion, we present here and in Exhibit 4-7 the estimate for benefit diversion used for on-line systems of 0.20 percent of benefits issued.

Selling EBT Purchased Food Items for Cash. Two anecdotes related to interviewers by Dayton retailers reveal that some recipients are finding ways to convert EBT benefits into cash. One retailer reported that his weekly meat order had increased 400 percent since the implementation of EBT. Food stamp customers had purchased large quantities of meat with their

EBT cards and resold it at a discount on the street. A second anecdote involved a woman who purchased large quantities of soft drinks with her EBT benefits. She later resold the drinks in disco clubs for cash.

The transactions that the retailers described complied with program regulations. However, the practice of buying food and reselling it is inconsistent with the intention that food stamp benefits be used to purchase food for consumption at home. For the most part, it is believed that this type of diversion is uncommon. Once again, there is no sound basis for making quantitative estimates for this type of diversion and since there is little, if any, effect that the type of EBT system, on- or off-line, would have on this type of diversion, we present here and in Exhibit 4-7 the estimate of benefit diversion used for on-line systems of 0.01 percent of benefits issued.[1]

Cash Change Diversion. All EBT transactions are intended to be made for the exact amount of purchase of eligible food items. Cash change should not be issued.

Refunds and Credits for Overcharges. In Montgomery County, 10 percent of recipients reported having been overcharged when making purchases with EBT; the mean number of times they had been overcharged was 2.2. The average amount of those overcharges was $5.50. The off-line EBT system has the capability to "refund" any overcharge directly to the card. However, a substantial proportion of overcharges were reported to have been resolved in cash (21 percent) or scrip (19 percent). The analysis in Exhibit 4-6 shows that the amount overcharged averaged $0.202 per case month under EBT, of which $0.08 (0.04 percent of benefits issued) was refunded in cash or scrip.

Benefit diversion resulting from refunds of overcharges is estimated the same way as for cash change, by multiplying by the difference in MPCs:

[1] The evaluation of the on-line systems includes discussion of this type of diversion under the subheading "Cash Change Diversion."

Table of Contents

Percent Diverted $= (MPC_{coupons} - MPC_{cash}) * \text{refund} * 100 / \text{Allotment}$

$= (.292 - .068) * \$0.08 * 100 / \$190$

$= 0.01$ percent (rounded)

Summary of Benefits Used in an Unintended Manner

Exhibit 4-7 summarizes the estimated percentages of benefits that are diverted to unintended uses in various ways. For coupons, the estimated total diversion is 0.79 percent of issued benefits. For EBT, diversion is estimated to total 0.37 percent of benefits issued, or less than half the diversion under coupons. The substantial reduction attributable to EBT derives from EBT impacts that reduce each of the constituent vulnerabilities. The quantitative estimates presented in this summary are derived from a mix of quantitative data, subjective estimates, and informed guesses. The summary numbers should be interpreted as indicators of the direction of effects or order-of-magnitude estimates, at best.

CONCLUSIONS

This chapter compared estimates of benefit loss and diversion under the CRIS-E paper coupon system and the off-line EBT system in Montgomery County, Ohio. The estimates for the off-line EBT system were based upon those for the on-line systems in Ramsey County and New Mexico, adjusted for effects of system design, demonstration experience, and additional information provided by industry experts. The following sections provide additional analysis of loss estimates.

Total Benefit Loss and Diversion

Exhibit 4-13 shows a summary of the estimated rates for total benefit loss and diversion. Benefit loss and diversion in the coupon system and the off-line EBT system total 2.12 percent and 0.57 percent of benefits issued, respectively. These estimates translate into a cost per case month of $4.06 for the coupon system and $1.08 for the off-line EBT system. The total benefit loss and diversion rate for Montgomery County (0.57 percent of benefits issued) was approximately the same as that for New Mexico (0.60 percent) and Ramsey County (0.61

percent). The estimate of loss for each EBT system as a proportion of the total benefit loss of the coupon systems that they replaced, was also comparable across all three systems. The estimated EBT loss and diversion rates for Montgomery County, New Mexico, and Ramsey County were approximately 27 percent, 19 percent and 25 percent of their coupon systems' benefit loss and diversion rates, respectively.

In Montgomery County, the reduction in the rate estimates for a few vulnerabilities accounted for the majority of the difference in loss and diversion rates between EBT and coupon systems. The largest reduction was the value associated with lost and stolen coupons. This accounted for 1.04 percent of benefits issued in the coupon system (see Exhibit 4-4) and represents approximately 49 percent of the total benefit loss and diversion estimate. In the EBT system, the rate estimate for stolen benefits (unauthorized use of recipient EBT card) totaled approximately 0.03 percent (see Exhibit 4-4). The vulnerabilities comprising benefit diversion account for the next largest difference between the coupon and EBT systems. The rate estimate for the coupon system of 0.79 percent represents approximately 37 percent of the estimate for total benefit loss and diversion. The estimated rate of 0.37 percent represents the largest component (approximately 65 percent) of the total benefit loss and diversion for the EBT system.

Table of Contents

Exhibit 4-13

SUMMARY OF BENEFIT LOSS AND DIVERSION RATES[a]

	Montgomery County Coupon	Montgomery County EBT	New Mexico EBT	Ramsey County EBS
Benefits authorized for the wrong people or in the wrong amount	<0.01%	0.02%	0.03%	0.10%
Redemption credits to the wrong people or in the wrong amount	0.02%	0.04%	0.04%	0.04%
Benefits lost during production and handling	0.03%	<0.01%	<0.01%	<0.01%
Benefits lost or stolen from recipients	1.29%	0.14%	0.16%	0.10%
Recipient use of benefits in an unintended manner	0.79%	0.37%	0.37%	0.37%
Total percentage of benefits issued[a]	2.12%	0.57%	0.60%	0.61%
Total cost	$35,839[b]	$9,529[b]	$22,853[c]	$18,187[c]
Cost per case month	$4.06[b]	$1.08[b]	$1.09[c]	$1.01[c]

Notes:
[a] Excludes amount recovered or recouped from retailers or recipients.
[b] Based on average monthly Food Stamp Program participation and issuance statistics available for the entire operations period (2/92 - 4/93).
[c] Based on March 1992 Food Stamp Program participation and issuance statistics.

There were slight increases for two categories of vulnerabilities resulting from the implementation of the off-line EBT system, due mainly to the fact that there was a low loss rate in the coupon system as a result of the implementation of the CRIS-E system.

Table of Contents

Program Loss

A summary of program loss rates is provided in Exhibit 4-14. Program loss rates for the coupon system and the off-line EBT system total approximately 0.01 percent and 0.03 percent of benefits issued, respectively. These estimated rates translate into a cost per case month of $0.03 for the coupon system and $0.05 for the EBT system.

Exhibit 4-14

SUMMARY OF PROGRAM LOSS RATES

	Montgomery County Coupon	Montgomery County EBT	New Mexico EBT	Ramsey County EBS
Benefits authorized for the wrong people or in the wrong amount	<0.01%	0.00%	0.00%	<0.01%
Redemption credits to the wrong people or in the wrong amount	0.00%	0.02%	0.04%	0.04%
Benefits lost during production and handling	0.01%	<0.01%	<0.01%	<0.01%
Benefits lost or stolen from recipients	0.00%	<0.01%	<0.01%	<0.01%

A comparison of the program loss rates for the Montgomery County, New Mexico, and Ramsey County EBT systems shows that there is little difference in the rate estimates for each category of vulnerability. In all three sites, the program loss rate increased in the "Redemption Credits to the Wrong Account or in the Wrong Amount" category. This resulted primarily because EBT introduces four new potential vulnerabilities for which any losses incurred would be considered program losses. For Montgomery County, three of these four vulnerabilities had small loss estimates assigned to them (less than 0.01 percent of benefits issued). When aggregated, the losses total approximately 0.02 percent.

Participant Loss

A summary of the participant loss rates is provided in Exhibit 4-15. Participant loss rates for the coupon system and the off-line EBT system total approximately 1.32 percent and 0.17 percent of benefits issued, respectively. These estimated rates translate into a cost per case month of $2.53 for the coupon system and $0.32 for the EBT system. The reduction in these amounts supports the argument that the implementation of an EBT system reduces the amount of benefit loss that participants would ordinarily sustain.

The largest reduction came from the elimination of coupons that could be lost or stolen. This vulnerability accounted for 1.04 percent of coupon benefits issued (see Exhibit 4-4); for EBT the estimate for stolen benefits (unauthorized use of recipient EBT card) was only 0.03 percent of benefits issued (see Exhibit 4-4). Ramsey County and New Mexico had similar results: the largest reduction in participant losses were generated by eliminating the potential of lost or stolen coupons.

The second largest reduction resulted from a reduction in the rate estimated for the amount of retailer overcharging. In the coupon system, the estimated rate was 0.25 percent of benefits issued. The estimated rate for the EBT system was 0.11 percent. It should be noted that these estimated rates were not net of recoupment from retailers.

For retailers, however, participant losses increased slightly due to the introduction of overdraws on manual transactions. This result is consistent with the experience in Ramsey County and New Mexico. The increase was more dramatic in Ramsey County, where unreimbursed overdraws by recipients on manual transactions amounted to 0.09 percent of benefits issued, compared to 0.03 percent in New Mexico and 0.02 in Montgomery County. It should be noted that these estimated rates were not net of recoupment from recipients.

Benefit Diversions

The off-line EBT system reduced benefit diversions from 0.79 percent of benefits issued under the coupon system to 0.37 percent of benefits issued under the off-line EBT system. The

primary reason for the decrease was the elimination of cash change to purchase non-food items. Also contributing to the decrease were order-of-magnitude reductions in purchasing ineligible items and selling of benefits for cash. The reductions are attributed to recipient perception that it is more difficult to "traffick" benefits maintained on the smart card, and to increased investigative capabilities offered by the card.

Comparison of Program Loss, Participant Loss, and Diversion

Exhibit 4-16 displays a summary of the component measures that comprise overall benefit loss and diversion. The rates follow a consistent pattern for the three EBT systems in that the largest category of loss is benefit diversions, followed by participant loss, and followed by program loss. The off-line EBT system, compared to the coupon system, reduces the rates for two components: participant loss and benefit diversions. There is a slight increase in the rate for the program loss component due mainly to the fact that there was a very low loss rate for this component under the coupon system as a result of the implementation of the CRIS-E system and that there were a few new vulnerabilities introduced by EBT.

Table of Contents

Exhibit 4-15

SUMMARY OF PARTICIPANT LOSS RATES[a]

	Montgomery County Coupon	Montgomery County EBT	New Mexico EBT	Ramsey County EBS
Benefits authorized for the wrong people or in the wrong amount	0.00%	0.02%	0.03%	0.09%
Redemption credits to the wrong people or in the wrong amount	0.02%	0.02%	<0.01%	<0.01%
Benefits lost during production and handling	0.01%	0.00%	0.00%	0.00%
Benefits lost or stolen from recipients	1.29%	0.14%	0.15%	0.10%
Recipient use of benefits in an unintended manner	N/A	N/A	N/A	N/A
Total percentage of benefits issued[a]	1.32%	0.17%	0.19%	0.19%
Total cost	$22,279[b]	$2,855[b]	$7,237[c]	$5,665[c]
Cost per case month	$2.53[b]	$0.32[b]	$0.35[c]	$0.32[c]

Notes:

[a] Excludes amount recovered or recouped from retailers or recipients.

[b] Based on average monthly Food Stamp Program participation and issuance statistics available for the entire operations period (2/92 - 4/93).

[c] Based on March 1992 Food Stamp Program participation and issuance statistics.

N/A = Not Applicable

Table of Contents

Exhibit 4-16

SUMMARY OF COMPONENT MEASURES OF OVERALL BENEFIT LOSS AND DIVERSION[a]

	Montgomery County Coupon	Montgomery County EBT	New Mexico EBT	Ramsey County EBS
Program loss	0.01%	0.03%	0.04%	0.05%
Participant loss	1.32%	0.17%	0.19%	0.19%
Benefit diversions	0.79%	0.37%	0.37%	0.37%
Total percentage of benefits issued[a]	2.12%	0.57%	0.60%	0.61%
Total cost	$35,839[b]	$9,529[b]	$22,853[c]	$18,187[c]
Cost per case month	$4.06[b]	$1.08[b]	$1.09[c]	$1.01[c]

Notes:

[a] Excludes amount recovered or recouped from retailers or recipients.

[b] Based on average monthly Food Stamp Program participation and issuance statistics available for the entire operations period (2/92 - 4/93).

[c] Based on March 1992 Food Stamp Program participation and issuance statistics.

Table of Contents

Chapter 5

THE FEASIBILITY OF CONTINUED OR EXPANDED EBT OPERATIONS

The evaluation of the off-line demonstration indicates that it is a technically sound means of delivering benefits. Retailers, recipients, and financial institutions all note significant efficiencies and show a strong preference for EBT over the paper system. Program administrators indicate that the new system provides better accountability and a more secure and effective method of delivering benefits. These findings are not much different than the findings from previous evaluations of on-line demonstrations. However, this evaluation indicates that off-line EBT is more costly than either paper or on-line benefit delivery. While FNS has made a commitment to pursue EBT, as evidenced by the announcement of the Secretary of the Department of Agriculture to pursue nationwide EBT, the question is, then, should FNS support off-line technology as well as the on-line alternative?

The following issues need to be considered in determining the potential for expanding or continuing the off-line demonstration:

- Is off-line technology a technically viable alternative?
- Can other benefit programs, such as the Special Supplemental Food Program for Women, Infants, and Children (WIC) and Aid to Families with Dependent Children (AFDC), be added to the system?
- Can off-line EBT be economically feasible?
- How does off-line EBT fit within the Food Stamp Program regulations?[1]
- What are the advantages and disadvantages of off-line EBT compared to on-line EBT?
- Can off-line EBT co-exist with on-line EBT?

[1] A discussion of the application of the existing regulations to an off-line system is presented in Appendix E.

Taken together, the answers to these questions address the key issue of whether there is a role for smart cards in the future of the Food Stamp Program.

This chapter discusses each of these questions. In many cases, the data collected during the demonstration provide a substantive basis for conclusions. In other cases, such as issues surrounding the future of smart cards in the U.S. commercial banking system, the opinions of industry experts were sought. Where appropriate, sensitivity analyses are presented to illustrate the range of potential outcomes.

IS OFF-LINE TECHNOLOGY A TECHNICALLY VIABLE ALTERNATIVE?

The demonstration system showed that off-line technology is technically viable. The measure of technical viability is the system performance in each of the five functions of a food stamp EBT system. These five functions, thoroughly discussed earlier in this document, include:

Authorizing Access to Benefits

The tasks involved in authorizing access to benefits are similar in the on- and off-line systems. Both systems require an interface to the state eligibility system in order to receive household and allotment data. Both systems require the issuance of a benefit access device, and both systems require that recipients be trained to use the system. Measurable differences between the two systems include the addition of voice passwords to the eligibility worker screen (although this feature, used to verify the identity of recipients calling customer service, could apply to on-line systems as well) and the selection of three locations at which the recipient wishes to "pick up" benefits.

Delivering Benefits

Delivery of benefits was accomplished effectively in the off-line system. Recipients had little trouble understanding that their benefit allotment would be available on the scheduled date at any of the three retailers they selected. Anecdotal data suggest that, on occasion, recipients thought they had selected the location of the supermarket they usually shopped at when they had

selected another market in the same chain at a different address. These problems were corrected over the telephone with customer service. Transactions at the point of sale were equally effective. At the beginning of the demonstration, excessive response times resulted in negative feedback from both retailers and recipients. However, software and hardware modifications improved response time to a more acceptable level.

An advantage of the off-line system is that it does not rely on a central host computer to authorize transactions, nor does it rely on on-line telecommunications for each transaction. Therefore, unlike on-line systems, there is no system-wide downtime in an off-line system. Failure can be caused by a specific terminal, store controller, or recipient card, but the failure is limited to that terminal, store controller or card.

One other major difference between the off-line system and its on-line counterparts is the reliability of the benefit access device (the card) and its impact on benefit delivery. The cards that were originally issued during the demonstration had a failure rate of over 30 percent, of which slightly more than 50 percent were the result of manufacturers' defects. Card failures decrease the average life of all cards, with implications for cost and service. The second generation of cards were more durable, based upon card failure rates reported in March through August, 1993. However, even these new cards had a reported failure rate of over 14 percent per year. If off-line technology is to become a feasible alternative to on-line systems, reliability of the benefit access device must be improved.

Crediting Retailers and Financial Institutions

With the exception of some early hardware problems, retailers received timely and accurate credit through the off-line system. Retailers were able to perform settlement transactions and reconcile deposits on a routine basis. The off-line system is unique in that it places primary responsibility on the retailer for settlement. In an on-line system, the host computer accumulates transactions as they are authorized and calculates an end-of-day settlement total for each retailer. In the off-line system, the transaction authorizations remain at the store level until the retailer initiates settlement. Therefore, the off-line settlement process is somewhat of a hybrid between the paper food coupon deposit process, in which the retailer must count, bundle, and deposit

coupons, and the on-line system, in which the cumulative total of transactions is automatically captured and a deposit is electronically made to the retailer's account. In the off-line system, the retailer does not receive credit until the settlement transaction is received at the host. Retailer accounts are credited through the Automated Clearing House (ACH).

The retailer settlement transaction is a two-part transmission. First, transactions are uploaded to the host computer. Second, a negative file, also known as a "hot card" file, and any staged transactions are downloaded to the retailer's in-store POS system. Each time a card is presented, the system verifies that the card is not on the negative file. If it is, the card is "locked" to prevent further transactions. Therefore, it is critical that the store's negative file is updated regularly to prevent recipient loss of benefits. To ensure that the negative file is updated regularly, NPC has the option of locking retailer terminals if a settlement transaction is not performed within a specified time frame.

Reconciling and Monitoring the System

The off-line system reconciliation is more complex than an on-line system due primarily to the maintenance of dual balances for each recipient and the reliance on retailers to initiate settlement. The demonstration system was reconciled successfully on a daily basis. However, it should be noted that NPC discontinued the practice of researching every out-of-balance card situation early in the demonstration and elected to research only those cases in which the card balance was *greater* than the host balance. Reported card balances (an ending card balance is reported with each transaction) frequently reflect balances *lower* than the host-derived balance (card balance calculated by the host) for several reasons, including:

- Differences in the clock setting of the host and the retailer terminal. Although the host downloads the correct time with each settlement transaction, clock times can become out of synch due to power outages. Each recipient transaction is stored in the retailer terminal awaiting end of day settlement. The transaction includes the time of the transaction as well as the card ending balance. If the clock is out of synch, the ending balance for that transaction could be posted in the incorrect order to the host file.

- Interruption of the transaction at the POS that results in the transaction being posted to the card but not to the retailer file. In this case, the retailer cash register

would be out of balance with the settlement transaction amount and the retailer should notify NPC of the discrepancy. In addition, this situation results in an alert message being printed on the POS receipt to notify the retailer of the potential problem. In the off-line system, it is incumbent upon the retailer to reconcile each day's EBT settlement to their register totals.

- Retailer failure to settle. The accuracy of the host-derived card balance is dependent on all retailers settling at least once during each host cycle. The host-derived card balance for cards used at a retailer who does not settle will be out of synch with the card balance reported as a result of subsequent presentations of the card at other retail locations that do settle.

This process is analogous to commercial credit and debit card systems in which it is the responsibility of retailers to balance their daily transaction activity to the credits they receive at their bank. Because this procedure is a common commercial practice, retailer accounting was not adversely affected.

Managing Retailer Participation

Retailers generally reported that the off-line EBT system reduced their total cost to participate in the Food Stamp Program, and that they preferred the EBT system. NPC implemented one feature to facilitate FNS Field Office retailer management which is not necessarily tied to the difference in technology. The feature is a PC-based system that allows the field office to directly update the retailer database for newly authorized retailers as well as de-authorizations or suspensions. Most on-line EBT systems have used a paper transfer of information from the field office to the processor to serve this purpose.

The off-line system was successful in identifying potential instances of trafficking through an analysis of retailer redemption data. This information was provided to the FNS, Food Stamp Program, Compliance Branch for further investigation. These investigations are pending and appear to have positively identified non-compliant retailers.

CAN OTHER BENEFIT PROGRAMS BE ADDED TO THE SYSTEM?

There is no technical reason why the off-line EBT system could not be expanded to support multiple programs. However, as in an on-line system, there are administrative, cost, and

recipient-access issues that would need to be addressed. The functionality available within the smart card may be able to enhance program administration in a multi-program environment. For example, the smart card could be used to store demographic, income, and eligibility data as a portable data record. When a recipient applies for benefits under multiple programs, each program could "read" the database to improve the efficiency and accuracy of the interview process. Recipients who move could conceivably use the card to transfer benefit information. The off-line demonstration in Montgomery County did not explore these enhanced functions. Rather, it served to prove that off-line technology could effectively manage the minimum requirements of an EBT system in the Food Stamp Program.

Many of the concepts discussed in this section will be tested with the implementation of the combined food stamp and WIC EBT demonstration in Wyoming. WIC EBT presents some unique challenges if the EBT system is to verify and capture individual food item data. WIC administrators view EBT as a tool to enhance program administration by ensuring that WIC participants purchase items on the food prescription at the same price charged to other customers. The implication of this requirement is that the retailer point of sale system, as used in the Montgomery County demonstration, would have to be linked to the store inventory and pricing system. At each lane, the system would have to scan the universal product code (UPC) on the item, verify that the item is on the food prescription for that participant, pull the price of the item from the retailer database, and accumulate the transaction total for subsequent settlement. As demonstrated in the limited Wyoming WIC EBT experiment, the requirements are technically feasible. A recent feasibility study indicated that both on- and off-line technology can meet the needs of a combined FSP and WIC EBT system.[1] However, only the smart card solution has been tested. The on-line solution has yet to be tested and evaluated. Using the smart card to carry the food prescription data limits the need for extensive telecommunications and potentially reduces the complexity of the prescription validation process at the point of sale.

As discussed later in this chapter, one consideration in deciding whether to implement an on-line or off-line EBT system for the Food Stamp Program is the penetration of commercial

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[1] Gary L. Glickman and Edith M. Smith, Feasibility Study of a Combined EBT System for the Food Stamp Program and the Special Supplemental Food Program for Women, Infants, and Children (WIC), Rockville, Maryland: Phoenix Planning & Evaluation, Ltd., May, 1993.

debit card services in retail food stores in the target area. In most parts of the United States, debit card POS is still in its infancy. Only a limited number of concentrated geographic areas have experienced substantive penetration. However, the rate of POS deployment in the grocery industry is accelerating, and most retailers are only considering the on-line alternative. While there are indications that smart card systems may become more prevalent in the future, the market is generally reluctant to adopt the new technology.[1]

The same lack of substantive deployment appropriate to off-line EBT has been observed for automated teller machines (ATMs), which are critical for integrating cash benefits. Most urban and many rural areas have adequate ATM deployment.[2] The large number of installed ATMs may pose an implementation issue for Ohio if it elects to expand the off-line pilot geographically and to integrate cash benefits. Providing access to cash benefits could be accomplished by:

- Retrofitting existing ATMs to accept the smart card. The cost of retrofitting an ATM has been estimated at $3,500.[3] This includes the cost of a processor board to collect transactions and initiate settlement.

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[1] See Gary L. Glickman et al., Special Topic Report on Hybrid EBT Systems, Rockville, Maryland: Phoenix Planning & Evaluation, Ltd., forthcoming.

[2] ATMs may not be as prevalent in inner-city urban areas or low income rural areas and therefore, the Administration for Children and Families (ACF) has expressed concerns regarding access to benefits for AFDC participants. Alternative solutions could include additional deployment of ATMs and/or additional POS deployment to provide cash back at food and non-food retailers.

[3] Retrofitting ATMs is more cost-effective than retrofitting existing POS terminals. The typical life expectancy of an ATM is 10 to 12 years. New ATMs range in cost from $15,000 to $45,000 depending upon the manufacturer and features. Investing $3,500 in an ATM to provide dual card capability can be cost-justified. In addition, the incremental cost of a new ATM with dual card capability is estimated at $2,000 to $3,500. New POS terminals range in price from $200 to $1,000. Devices that can read both smart cards and magnetic stripe cards are available for approximately $400. It is difficult to make a business case to spend $100 or more to retrofit an existing POS device when the cost of a new device is not substantially higher. The exception to this argument is retailers that have recently installed newer and more powerful multi-functional POS terminals which have programming capability. The cost of these terminals tends toward the higher end of the range; they have sufficient memory and functionality to accommodate a smart card reader.

- Deploying new ATMs with dual card capability. ATMs capable of reading both magnetic stripe and smart cards have been deployed in France and other European countries. Several ATM manufacturers are beginning to develop and market these devices in the United States.

- Limiting access to cash benefits to POS devices in food and non-food retailers equipped with terminals capable of reading magnetic stripe and smart cards.

- Issuing benefit cards that contain both a magnetic stripe (for cash benefits) and a integrated circuit (IC) chip for food stamp and/or WIC benefits. This is essentially a hybrid system that would share POS terminals but would require separate authorization and settlement systems. Additionally, the cost of the IC chip portion of the card could still be attributed to the Food Stamp Program, resulting in limited costs savings to either program.

Off-line access to ATMs may serve to reduce the interchange and communications fees associated with on-line ATM transactions. Most ATMs are linked to the card database via one or more commercial networks. Each network charges a fee to transfer the authorization and transaction information. In addition, the ATM "owner" charges fees for the device and the funds that are distributed. Use of an off-line access alternative that does not require on-line authorization or transaction processing could result in reduced fees if typical ATM network interchange fees did not apply. However, networks and ATM transaction acquirers may be reluctant to institute different fee schedules for these types of transactions. Network fees include the costs to maintain ATM equipment, anticipated float on funds, as well as local and inter-regional communications costs. Only the on-line component of the communications cost would be avoided in an off-line environment. The State of Ohio must address each of these issues as it plans for state-wide rollout of the off-line system.

A final issue to be considered when combining cash and food stamp benefits in an off-line EBT system is the potential limitation on the number of cards that can be issued to a family or household. In an on-line system, there is no technical reason why multiple cards cannot be issued to individuals within a household or family unit. Each time a card is presented at either an ATM or POS terminal, an on-line inquiry is performed against a central database to verify the availability of funds. In an off-line system, the program balance(s) are held on the card. If multiple cards were issued, each card would carry the "account", and issuing multiple cards would require that a portion of the available funds be allocated to each card. If the full balance of the

"account," rather than a partial balance, were placed on both cards, then total cash withdrawals could exceed the total benefit allotment if both cards were used to withdraw the maximum amount. Therefore, in an off-line system, it is probably impractical to issue more than one card to a household or family. Other studies have indicated that this problem could be alleviated through use of a hybrid system combining elements of on-line and off-line technology.[1]

CAN OFF-LINE EBT BE ECONOMICALLY FEASIBLE?

Chapter 3, *Impact of the Off-line EBT System on Administrative Costs,* presents a detailed assessment of the costs of the demonstration system. This section of the report addresses the prospective cost of the off-line EBT system under various continuation and expansion scenarios. Numerous variations in design and implementation strategies would affect the costs of an expanded system. The purpose of this discussion is not to cover every contingency but to provide an informed assessment of potential costs under a limited number of scenarios.

Sensitivities Affecting Prospective Costs

The prospective cost of any EBT system is affected by the level of effort required by each of the stakeholders and by the cost of equipment. There are, however, several variables of uncertain outcome that radically impact an off-line system, but do not have the same effect on on-line systems.

The Average Life of the Card

The average life of the card is a function of the length of time recipients remain on the program and the rate at which cards are replaced due to card failure, damage, losses, and thefts.[2]

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[1] For a full description of industry considerations, see Gary L. Glickman, et al., Special Topic Report on Hybrid EBT Systems, op. cit.

[2] See Appendix F for computation of average card life.

The Cost of the Card

The cards used during the demonstration cost $9.50 each. The second generation of cards issued in the post-demonstration period cost $10.50 each. Ultimately, NPC negotiated a contract modification with MicroCard Technologies to obtain cards for the existing demonstration area at $5.00 per card, including embossing, printing, and programming. The card cost is expected to drop further as the technology matures and as increasing volumes of cards are purchased. To illustrate the impact of card cost on total operational expense, consider a card that costs $9.50 and lasts 10 months. The cost per case month of the card is $0.95 ($9.50/10 months = $0.95 per month on a straight-line basis). At a card cost of $5.00, the per month cost drops to $0.50, a savings of $0.45. Similarly, if the $9.50 card is amortized over 6 months instead of 10 months, the cost per month would increase from $0.95 to $1.58. The prospective cost models presented in this section presume a card cost of $4.89 (including the card sleeve), which is the projected cost of the card in an expanded environment.

Lost and Stolen Cards

The sensitivity of the card amortization period to the lost/stolen card rate is illustrated in Exhibit 5-1. Note that a zero loss rate will result in a maximum amortization period of slightly more than 14 months, and that a loss rate of 50 percent reduces the amortization period to approximately 8.5 months.

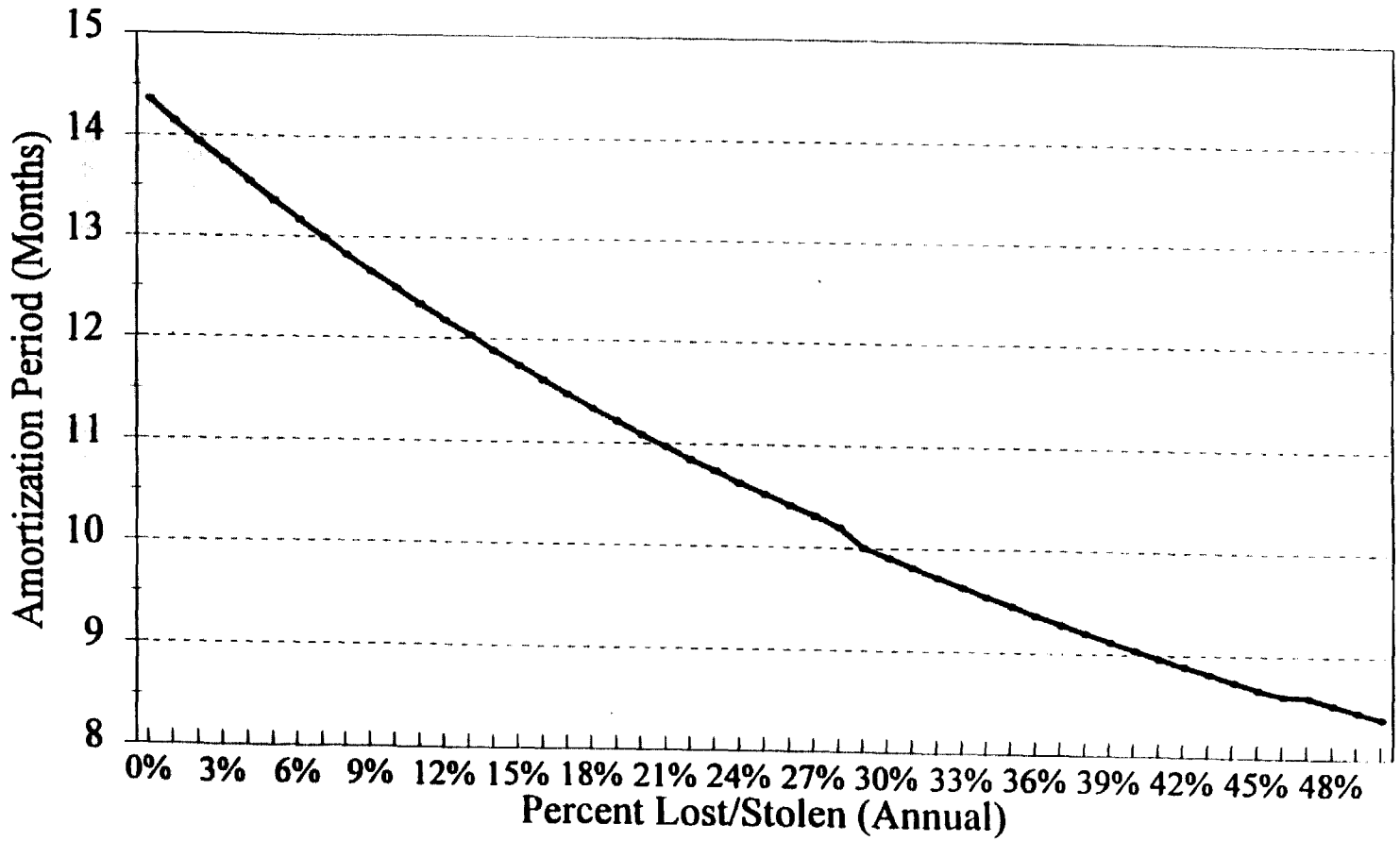
Actual card replacements due to loss and theft during the demonstration were approximately 37 percent on an annual basis, which is consistent with other EBT demonstrations.[1] This loss rate results in a card amortization period of approximately 9.5 months. In April, 1993, Montgomery County instituted a 10-day waiting period between the time a recipient reports a lost or stolen card and the time that benefits are posted to the new card for all recipients who have reported two or more lost or stolen cards.

[1] The card replacement rate in Maryland is reported to be as high as 6 percent per month. However, this rate includes replacements for failed as well as lost and stolen cards.

Table of Contents

Exhibit 5-1

SENSITIVITY OF CARD AMORTIZATION PERIOD TO LOST/STOLEN RATE



Note: Assumes 14% card failure/damage rate

The purpose of the waiting period is to provide an incentive to take better care of the card. The county reported that the incidence of lost and stolen card reports dropped by 20 percent (to approximately 30 percent) on an annual basis. The 10-day waiting period was approved by FNS on an experimental basis, and therefore it is uncertain if it would be continued in an expanded environment.

Card Failure

Card failures during the demonstration averaged slightly over 30 percent per year. A second generation of cards was obtained in early 1993, and these cards are issued to all new recipients and as replacements. Recent experience indicates that the failure rate for these cards is approximately 14 percent. This rate is used in the prospective models because there is little current evidence from the demonstration to support a lower rate estimate. There is, however, evidence from applications using smart cards in Europe, in which failure rates of 1.8 percent have been reported. NPC is currently investigating the cause of the higher failure rate and will be testing a card from another manufacturer later this year. A drop in the failure rate to 1.8 percent would result in a commensurate increase in the card life from 9.3 months to 10.9 months. This increased card life would lower total costs by approximately $0.08 per case month.

The Costs of Continuation or Expansion

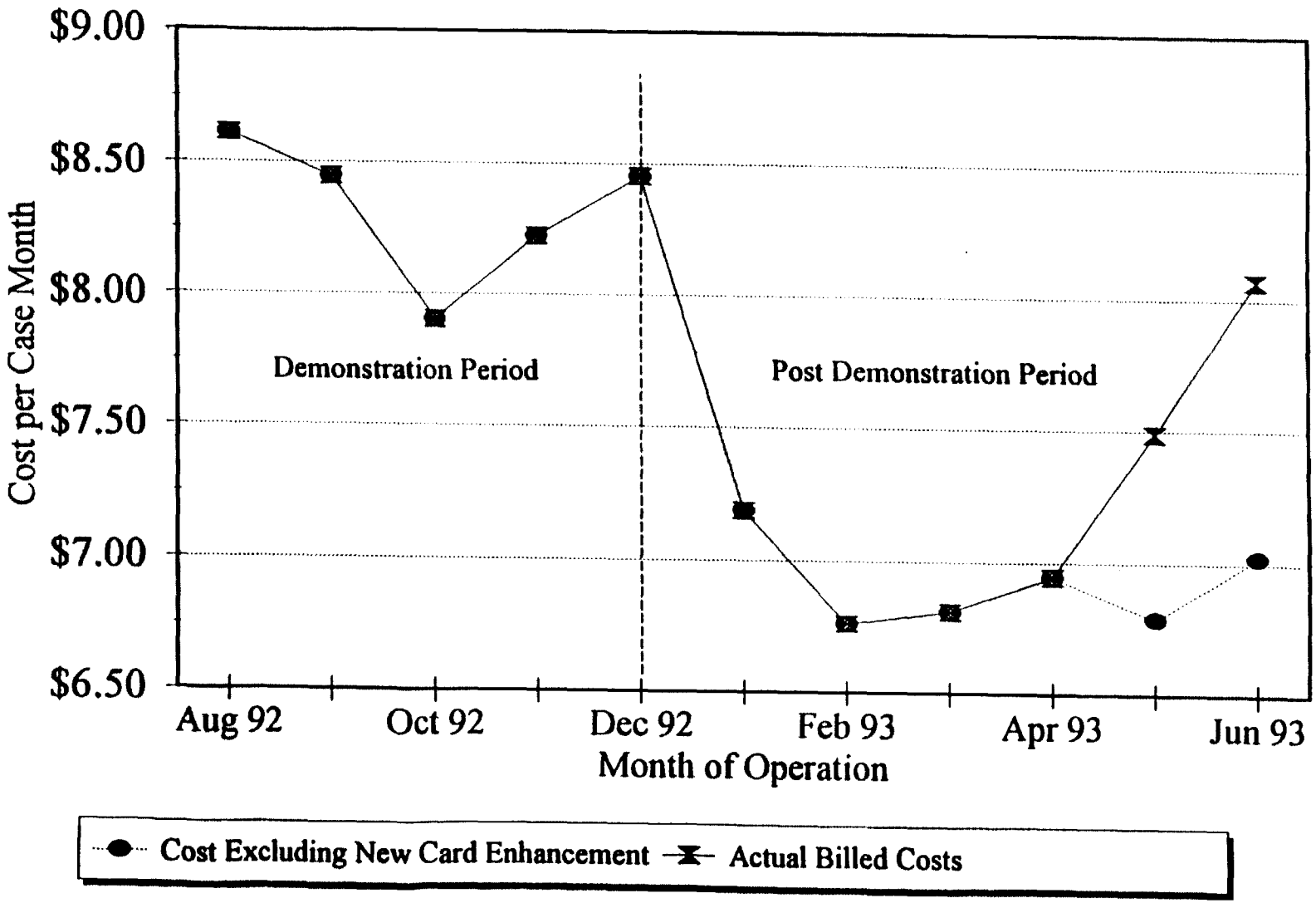
The projections of cost under the continuation or expansion scenarios are based upon an extensive analysis of the capacities of the current system, discussions with industry experts regarding the future directions and expected costs of smart cards and smart card-related equipment, and an examination of recent cost data from the demonstration site. These latter data were collected after the conclusion of the post-data collection period and serve to provide evidence of operational efficiencies that could be gained in continued operations. While the changes in operations that were implemented after the evaluation period do not appear to impact either recipient or retailer acceptance, no attempt was made to substantively address these questions. Exhibit 5-2 illustrates the monthly costs of operations both during and after the evaluation data collection period. The major changes that NPC and the county instituted during this latter period were: removal of the on-line access capability from the county to the host

Table of Contents

Exhibit 5-2

ADMINISTRATIVE COSTS

Cost per Case Month by Month



computer for customer information; a shift of subcontract responsibilities for terminal maintenance to NPC; and a reduction in NPC labor reflecting fewer system modifications and "fixes." The increase in costs that occurred in May and June, 1993 were a result of system development and testing in preparation for issuance of a third generation of card, manufactured by Schlumberger. The dotted line indicates the per case month cost that would have been incurred without this development effort.

Exhibit 5-3 presents a comparison of the cost of operations for the demonstration site and the following four prospective scenarios:

- Continued operations in the demonstration area. The estimated cost of continued operations ranges from $5.16 to $6.62 per case month.

- Expansion of the demonstration system to the remaining zip codes of Montgomery County. This expansion would increase the number of households served by 127 percent, to approximately 25,000. The number of authorized retailers would increase from 93 (26 of which are border stores that were equipped during the demonstration) to 267, excluding border stores. The estimated cost of expansion to all of Montgomery County is estimated to range from $3.66 to $4.94 per case month.

- Expansion of the demonstration system state-wide. The total number of households increases to over 532,000 and the total number of retailers increases to 7,508. Expansion state-wide results in decreased estimated costs per case month ranging from $2.39 to $3.98.

- Expansion of the state-wide system to integrate food stamp and AFDC payments. Integration of AFDC into the state-wide system reduces the range of administrative cost estimates for the Food Stamp Program to $2.16 to $3.58 per case month.

The analysis illustrates the dramatic savings that can be achieved through operational efficiencies, cost reductions and economies of scale.

Table of Contents

Exhibit 5-3
COMPARISON OF THE COST OF OPERATIONS FOR THE DEMONSTRATION SITE AND PROSPECTIVE SCENARIOS
(Cost per Case Month)

	Demonstration Site[a]	Demonstration Site Continued		Expanded Montgomery County		Expanded State-wide		Expanded State-wide with AFDC	
		Low	High	Low	High	Low	High	Low	High
EBT Vendor									
Direct labor	$2.75	$1.66	$1.66	$0.73	$0.73	$0.31	$0.31	$0.31	$0.31
Customer service	0.36	0.14	0.23	0.09	0.18	0.09	0.18	0.09	0.18
Data center hardware/software	0.80	0.72	0.72	0.32	0.32	0.12	0.12	0.12	0.12
ARU	N/A	0.05	0.05	0.03	0.05	0.01	0.01	0.01	0.01
Terminals	0.71	0.38	0.38	0.45	0.65	0.43	0.50	0.36	0.40
Communications	0.48	0.24	0.30	0.24	0.30	0.29	0.36	0.29	0.36
ACH	0.04	0.03	0.03	0.02	0.02	0.01	0.01	0.01	0.01
Card cost	0.88	0.43	0.57	0.43	0.57	0.43	0.60	0.27	0.37
Total Vendor	**6.02**	**3.65**	**3.94**	**2.31**	**2.82**	**1.69**	**2.09**	**1.46**	**1.76**
Local Office									
Local agency labor and equipment	1.43	0.98	1.36	0.98	1.16	0.57	0.98	0.57	0.98
Photo identification	0.11	0.11	0.11	0.11	0.11	0.00	0.11	0.00	0.11
Total County	**1.54**	**1.09**	**1.47**	**1.09**	**1.27**	**0.57**	**1.09**	**0.57**	**1.09**
State of Ohio - Total	**0.40**	**0.21**	**0.40**	**0.17**	**0.31**	**0.09**	**0.09**	**0.09**	**0.09**
Food and Nutrition Service									
Headquarters	0.12	0.11	0.11	0.05	0.05	<0.01	<0.01	<0.01	<0.01
Regional office	0.08	0.08	0.08	0.03	0.03	0.03	0.03	0.03	0.03
Field office	0.05	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Total FNS	**0.25**	**0.21**	**0.21**	**0.09**	**0.09**	**0.04**	**0.04**	**0.04**	**0.04**
Subtotal	**$8.21**	**$5.16**	**6.63**	**3.66**	**4.49**	**2.39**	**3.31**	**2.16**	**2.98**
Contingency	N/A	N/A	0.60	N/A	0.45	N/A	0.67	N/A	0.60
GRAND TOTAL	**$8.21**	**$5.16**	**$6.62**	**$3.66**	**$4.94**	**$2.39**	**$3.98**	**$2.16**	**$3.58**

Note: [a] Represents actual cost per case month for the demonstration period. See Chapter 3 for a detailed discussion.
N/A = Not applicable

What is most striking about this analysis is that it demonstrates that the operational costs of off-line technology could compare favorably to on-line technology. The presentation of operational costs does not include amortization of design, development, and implementation costs, which is consistent with data presented in the evaluation of the State-initiated on-line demonstrations.[1] According to the Food Stamp Program EBT regulations issued April 1, 1992, these costs are to be amortized over a seven-year period.[2] Assuming state-wide rollout, the per case month cost of this amortization would be approximately $0.12, which includes $0.07 for design, development, and system implementation, plus an additional $0.05 for retailer preparation, installation, and training.

Derivation of Prospective Costs

The prospective costs are provided in range estimates based upon the uncertainty surrounding the achievement of operational efficiencies with increases in scale. The "low" range represents a best case example of the possible costs under each scenario if all efficiencies were achieved. The "high" estimate represents the worst case if only minimal efficiencies were achieved. The high estimate also includes an allowance for unforeseen costs expressed as a percentage of the total cost. This allowance is referred to as a confidence contingency. A contingency of 10 percent of total cost was used for the demonstration site and county-wide expansion. The contingency was increased to 20 percent for state-wide expansion scenarios, reflecting the increase in risk associated with state-wide expansion.

Neither the high nor the low estimates are intended to define upper or lower bounds for potential costs. Rather, they define the probable bounds based upon the assumptions described in Appendix G and below for each major component of cost.

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[1] John A. Kirlin, et al., The Impacts of the State-Initiated EBT Demonstrations on the Food Stamp Program, Cambridge, Massachusetts: Abt Associates Inc., June 1993.

[2] "Food Stamp Program: Standards for Approval and Operation of Food Stamp Electronic Benefit Transfer Systems." Federal Register 57, no. 63, 1 April 1992.

Table of Contents

demonstration would need to be increased by a factor of 24 but that a more cost effective approach would be to upgrade the hardware coincident with the increase in capacity. This upgrade would provide a 290 percent gain in efficiency.

Audio Response Unit. An ARU provides an automated interface between a voice line and the computer host. Instead of having incoming calls answered by customer service personnel, the ARU asks for touch-tone input of account and other information and provides audio response based upon the selected options. This is an effective methodology to provide account balances or manual authorizations. The cost of the ARU is included as an equipment expense, amortized over five years. Additional ARU equipment is added to accommodate state-wide rollout. The cost of the ARU includes installation by the system vendor.

As discussed in relation to customer service, each of the projections anticipates that some portion of recipient and retailer calls would be handled by the ARU resulting in a reduction in customer service labor.

Terminals. The currently installed retailer base configuration consists of one personal computer (PC) per location that acts as a file server and storage device, and one communications controller that links the PC to the in-lane configuration. Each lane is equipped with three separate devices: a POS terminal similar to the type used in many on-line systems, a smart card reader (I/O device) that contains the PIN pad used by recipients, and a printer for receipts and in-lane store reports. The cost of this configuration is approximately $1,150 for the fileserver plus $775 per lane for the POS equipment. A new single-lane configuration to replace the PC, controller, POS device, and I/O device is available at approximately $1,100. This terminal is currently being tested in several locations in the demonstration area. NPC reported that the terminal operates effectively and that, in an expanded environment, it would deploy this configuration to all single-lane retailers. NPC also indicated that the terminal offers increased functionality and reduced response time because it eliminates the need for an in-store local area network. A new multi-lane configuration is also available that reduces the base cost to approximately $850, plus $700 per lane for an integrated POS, I/O device, and a printer.

Deployment of terminals is based upon the minimum formula presented in the food stamp EBT regulations issued April 1, 1992 in each of the low estimates. The high estimates are based upon equipping all lanes in all authorized retailers. The number of lanes to be equipped and the computation of terminal costs is provided in Exhibit G-1 in Appendix G.

Communications. Communications costs include customer service toll-free line charges, file transfer line charges between CRIS-E and the EBT host, and the cost of data communications to and from retailers. It is assumed that these charges will increase in proportion to the number of recipients and retailers that are using the system. All communications estimates are based upon the costs achieved in the April through June 1993 time period as billed by NPC. These costs are substantially lower ($0.30 versus $0.48 per case month) than the costs reflected in the demonstration site evaluation due to the elimination of all on-line access to the EBT host by ACO staff in the period following the completion of data collection. The low estimates presented in the demonstration site continuation and in the expansion to all of Montgomery County anticipate a 20 percent reduction in the number of customer service calls as recipients gain experience with the system. The increase in telecommunications expense in the state-wide expansion is due to the regionalization of the "hot card" databases. In a state-wide scenario, it would not be cost-effective to download the entire state file of lost, stolen or otherwise invalid card numbers to every authorized retailer. A more likely approach would be to segment the hot card database by geographic region based upon average shopping patterns. If a recipient from one region shopped at a retailer in another region, the terminal would initiate an on-line communication to verify that the card had not been placed on the hot card list. This regionalization should have little or no effect on the downloading of other information during settlement.

Automated Clearing House (ACH). The ACH is used to provide credit to retailers for each settlement transaction. ACH costs are comprised of a fee per credit plus a fixed set-up fee per day. These costs are charged by the concentrator bank to the EBT vendor. Estimated ACH costs are based upon the data supplied during the demonstration and have been adjusted to reflect the increased number of retailers and recipients using the system.

Card Cost. The cost of smart cards represents one of the major components of cost in an off-line system. During the April through June 1993 time period, NPC negotiated a new price

of $5.00 per card with MicroCard Technologies, the supplier of the cards for the demonstration. Industry experts indicated that this cost would decrease slightly to $4.80 in the near future with increased volume. In addition, NPC supplied each recipient with a card sleeve at a cost of $0.09. This card cost ($4.89) was used as the base to estimate the per case month card cost. The calculation of the cost per case month is based upon the card amortization model described in Appendix F. The low estimates assume a reduced card failure rate of 1.8 percent, which is consistent with the failure rates experienced in European smart card systems, and a reduced lost or stolen replacement rate of 25 percent per year. The high estimates assume a card failure rate of 14 percent (based upon a new generation of cards issued in the post-April 1993 time period) and a loss or stolen replacement rate of 42 percent.

Local Office

Direct Labor and Equipment. The reduction in the cost of direct labor is based upon information provided by Montgomery County that they could reduce the staffing of the assistance control office (ACO) and fiscal control office (FCO) by approximately one full-time equivalent (FTE) through attrition and that the county will cross train ACO and FCO workers to gain additional efficiencies. The per case month cost of on-going and intake caseworkers is assumed to remain constant at $0.22 per case month. The low estimate for the continuation of the demonstration site anticipates a one-third reduction in labor costs which would result from a one FTE reduction. The high estimate assumes a reduction of 0.5 FTE. The low estimate in the expansion to all of Montgomery County assumes a proportional increase in staff from the low estimate in the continuation of the demonstration site, resulting in no change in the cost per case month. The high estimate for the Montgomery County expansion assumes that five FTEs will be required for FCO and ACO operations. The low estimate for the state-wide expansion reflects minimum county staffing of one FTE per county (based upon preliminary analysis of the Maryland on-line EBT state-wide rollout), as well as elimination of labor and other costs for issuing the photo identification card.[1]

[1] The photo identification card is not required for EBT. However, Montgomery County continues to issue the photo identification card citing its importance as an indicator of CRIS-E eligibility identifications. A case can be made for eliminating the card for state-wide expansion or for allocating the cost to CRIS-E rather than the EBT system.

Table of Contents

The high estimate for the state-wide expansion assumes the same level of efficiency achieved in the county-wide low estimate.

State of Ohio

Direct Labor and Other Costs. Estimates of the costs attributed to the State of Ohio in continuation of the demonstration range from $0.21 to $0.40. The high estimate represents continuation of the level of effort expended during the demonstration. The low estimate assumes a reduction in the level of effort associated with project management activities. The county-wide estimates are based upon these same assumptions pro-rated for the 127 percent increase in the number of participating recipients. The state-wide estimate is based upon relatively fixed costs for labor and equipment spread over a much larger recipient population base.

FNS Headquarters, Regional Office and Field Office

Direct Labor and Other Costs. The estimates for each of these cost categories assume a reduction in the level of effort expended for project management. Costs decrease in the county-wide and state-wide estimates as a result of fixed costs spread over larger numbers of cases.

Total administrative costs remain constant, resulting in significant decreases in cost per case month.

The Impact of the Integration of Food Stamp and AFDC Benefits in the State-wide Model

This section discusses the effect on the state-wide expansion scenario of integrating AFDC cash benefits into the off-line system. No attempt is made to quantify the costs or benefits of the off-line system to the AFDC program. Nor is any consideration given to the technical or political feasibility of this action. Rather, the analysis serves as an example of the potential cost reductions to the Food Stamp Program of implementing an integrated multi-program off-line system.

Adding AFDC to the state-wide model has two primary impacts on the Food Stamp Program costs:

- It reduces the cost per case month of the card to the Food Stamp Program based upon the proportion of recipients that participate in both programs. It is assumed that the cost of the card would be shared equally between the two programs; and

- It reduces the cost per case month of retailer terminals based upon a pro-rated share of use as determined by a percentage of transactions. This share is based upon three AFDC cash-back transactions per month at POS terminals and 10 food stamp transactions per month.

This model does not include the costs of additional development at the host and deployment of additional terminals to accommodate access concerns, because we assume these costs should be borne by the additional program. A broad assumption that is generally valid is that the additional hardware capacity required by the host to accommodate both programs would be spread over a larger population and that, therefore, the cost to the Food Stamp Program for host resources would remain unchanged. The model also does not consider the likely reduction in costs to the Food Stamp Program resulting from shared recipient and retailer training, card issuance and replacement, and retailer telecommunications for settlement transactions. These savings are likely to be small and their exclusion presents a more conservative estimate of the potential savings to the Food Stamp Program.

The allocation of terminal usage to AFDC is estimated at $0.075 per case month. This savings is calculated based upon the proportion of cash to food stamp transactions. The sharing of card costs across the combined population would reduce the card cost to the Food Stamp Program by $0.163 per case month in the low estimates and approximately $0.100 in the high estimates. This reduction assumes that a single card would be issued to the overlapping population (40 percent) and that the addition of AFDC benefits to the card would not change the rates for loss, theft, or damage.

The net impact of adding AFDC to the state-wide model is to reduce the range of total food stamp cost to $2.16 to $3.58 per case month.

Table of Contents

HOW DOES OFF-LINE EBT FIT WITHIN THE CONSTRUCTS OF THE FOOD STAMP PROGRAM EBT REGULATIONS?

On April 1, 1992, FNS issued a final rule for approval and operation of Food Stamp EBT as an operational issuance system. The rule specifically states that the provisions of the rule "apply to all *on-line* [emphasis added] Electronic Benefit Transfer systems for the Food Stamp Program..." The off-line EBT demonstration was commissioned as a demonstration of an alternative technology and neither the rule nor the enabling legislation[1] provides for implementation of an off-line system as an operational alternative. However, FNS has stated that this demonstration would provide the basis for decision-making regarding expansion of this demonstration and implementation of other off-line projects. If approved as an operational alternative, there is a possibility that some regulations may be slightly altered to accommodate the technical needs of off-line technology.

The rule amends 7 CFR Parts 272, 274, 276, 277 and 278. While each amendment impacts food stamp issuance procedures, § 274.12(e) through § 274.12(l) deal primarily with technical standards for EBT systems and are, therefore, the focus of this discussion. In most respects, the off-line system conforms to the requirements stated in the rule. However, several provisions of the rule are not met by the off-line system. For example, the regulations require that an immediate hold be placed on accounts if a card is reported lost or stolen. The design of the off-line system does not allow for immediate holds. A full discussion of off-line technologies and provisions of the food stamp regulations is provided in Appendix E.

WHAT ARE THE ADVANTAGES AND DISADVANTAGES OF OFF-LINE EBT COMPARED TO ON-LINE EBT?

Two questions should be asked when considering the feasibility of off-line technology. First, does it offer an improvement over the paper system? Second, does it offer an improvement over on-line systems? The data from this evaluation supports an affirmative answer to the first question in the same way that data from the previous on-line demonstrations showed that EBT, in general, offers substantial improvements. However, while there is much anecdotal data, there

[1] Section 1729 of the Mickey Leland Memorial Domestic Hunger Relief Act of 1990.

is little comparative data to support a judgment of the relative merits of on-line versus off-line technology. Both technologies offer certain advantages and both present drawbacks.

The primary expected advantages of the off-line system compared to the on-line system include increased security, improved system availability, and flexible reporting.[1] The primary advantages of the on-line system include simpler reconciliation, greater compatibility with existing commercial POS infrastructures, and proven technology. Each of these advantages is described below.

Security

In some important respects, smart cards are considered to be more secure than magnetic stripe cards. For example, there is a growing concern within the banking industry about counterfeiting of magnetic stripe bank cards, including both debit and credit cards. Smart cards cannot yet be similarly counterfeited, as discussed in Chapter 4 of this volume of this report. Also, an off-line transaction cannot be completed without the presence of the original card. Under some on-line systems a clerk can complete a transaction by keying in the card number and PIN at a terminal.

On the other hand, there are some security vulnerabilities peculiar to off-line systems. The off-line system cannot immediately "turn off" cards that are reported lost or stolen, and the system will allow transactions to be performed with the card if the PIN is known until the updated negative file is downloaded to participating retailers. See Chapter 4 of this volume of this report for a complete discussion of the costs and impacts of the off-line EBT demonstration on benefit loss and diversion.

[1] Although the demonstration did not provide substantive data to support the claim of improved security and reliability, experts indicated that these benefits could be expected in an expanded environment.

System Availability

On-line systems are susceptible to system-wide outages or slowdowns caused by a disruption of telecommunications or computer failure at the host processor site. Slowdowns can appear as failures at the point of sale. Most on-line processors use fault-tolerant computer equipment to counter the risk of host failure and multiple avenues for telecommunications to minimize the risk of telecommunications failure. However, these failures do, on occasion, occur. The off-line system is less susceptible to a system-wide outage, and a short-term failure of the telecommunications or host processing equipment would result only in delayed settlement. A long-term failure (over 12 or more hours) could disrupt POS processing because it would prevent downloading of issuance and negative files. The off-line system is susceptible to local computer failure including card failure, terminal failure, and failure of the in-store controller. Failure of the controller would prevent the entire store from processing transactions, although all other stores would remain unaffected.

Flexible Reporting

The on-line systems allow recipients to request special reports such as transaction histories. These reports are requested through a customer service facility and may be mailed to the requestor. With the off-line system, the recipient can request a transaction history at the terminal. The terminal "reads" the card and immediately prints a history of the last 10 transactions. The recipient can perform a balance inquiry or a transaction history at any POS terminal by inserting the card, entering his or her PIN, and following the correct transaction sequence, without the need for an on-line communication.

Reconciliation

In the off-line system, two balances are maintained for each recipient. One is the balance on the card, the other is the host balance. One of the major controls within the system is the daily comparison of the host balance and the card balance to ensure that all transactions have been settled. This comparison, though, adds an additional level of reconciliation that is not required with on-line systems. In an off-line system, the host and card balance can be out of

synch if all retailers have not settled. When the card balance is higher than the host-derived balance, NPC investigates. When the card balance is lower than the host-derived balance, no investigation is performed. Similarly, the off-line system "stages" issuances to retailers for posting to the card. Until the issuance has been posted to the card, the host-derived balance differs from the card balance. The balance maintained on the host for each recipient reflects all posted transactions as well as those that have not yet been posted. The on-line systems add new allotments to the current recipient balance upon receipt from the state.

Compatibility with Commercial Infrastructures

Commercial POS systems are based upon on-line system architecture. The results of the New Mexico evaluation indicate that there may be substantial economies to the Food Stamp Program to piggyback on the existing infrastructure. Thus, in those areas in which there is a prevailing on-line infrastructure installed in retail food markets, a strong argument could be made to piggyback. On the other hand, the banking industry is investigating off-line technology and some experts believe that off-line technology will be adopted as a standard to counter security concerns in electronic verification applications. The banking industry is also looking at smart cards for electronic purse applications. In geographic areas where there is no existing commercial infrastructure, the differences become less distinct. Implementation of an off-line system, though, should consider the installation of terminals that have dual capability -- the ability to read both magnetic stripe and smart cards. This capability could serve two purposes: first, to allow cross-border shopping if one area is using on-line technology and another is using off-line technology (although the recipients with smart cards will not be able to use their cards outside the area); and second, to allow the terminals to be used for commercial transactions as well.

Proven Technology

The smart cards used in this demonstration experienced a higher than expected failure rate of over 30 percent. A second generation of cards is now being issued, but even these cards are experiencing failure rates in excess of 14 percent. As stated earlier in this report, the economic feasibility of the off-line system may well hinge on the ability of card manufacturers to improve the reliability of the cards and, at the same time, reduce the cost of the cards. Magnetic stripe

technology has long been proven to provide a cheap, reliable access mechanism for electronic funds transfer systems.

CAN OFF-LINE TECHNOLOGY CO-EXIST WITH ON-LINE TECHNOLOGY?

Off-line technology, while used primarily in pilot applications in the United States, has been implemented in widespread applications in many parts of Europe and the Far East. Other countries, including Russia, are investigating the implementation of off-line ATMs and POS technology to avoid the costs of installing a nationwide telecommunications infrastructure to support consumer EFT transactions. Most commercially available POS devices with integrated smart card readers can also read magnetic stripe cards. Most also have the capability to initiate and process an on-line transaction. And, since magnetic stripe encoding and on-line transaction processing follow certain standard protocols, the electronic exchange of on-line transactions between terminals, third parties, and processors is not difficult. The same ease of exchange cannot be claimed for off-line transactions. Currently, there is no one standard for the processing of an off-line transaction. The procedures and systems used in the off-line demonstration are likely to be substantially different from the procedures used by a commercial application. Furthermore, cards produced by different manufacturers may utilize different operating systems, as was the case for personal computers a few years ago. The implication of these differences is that each terminal must be capable of reading and processing different cards based upon the manufacturer. While this capability can be software-driven, it will increase the cost and complexity of off-line systems. This lack of compatibility among smart card systems will present one impediment to short-term widespread implementation.

A second impediment is the inability of an on-line terminal to read and process an off-line transaction. Thus, while a recipient from out-of-state can theoretically transact an on-line purchase at an off-line location, a recipient from the off-line environment cannot do the same in an on-line setting. One alternative would be to process a manual transaction. However, this procedure raises significant risk and settlement questions that would probably prevent its acceptance.

Table of Contents

A full discussion of the potential for a "hybrid" environment is discussed in Special Topic Report on Hybrid EBT Systems.[1]

IS THERE A ROLE FOR SMART CARDS IN THE FUTURE OF THE FOOD STAMP PROGRAM?

Off-line EBT faces many challenges in becoming a viable operational alternative to the paper system. Foremost among these challenges is the issue of cost. The demonstration data resulted in a cost of $8.21 per case month, compared to the baseline cost of $2.89. NPC demonstrated that these costs could be substantially reduced through implementation of operational efficiencies, and the feasibility analysis indicates that further reductions are possible. If these savings can be achieved, the off-line system offers many of the same advantages as the on-line system.

A second important challenge is improvement of the technical reliability of smart cards. The card failure rates encountered during the demonstration would be unacceptably high in an expanded environment. A large percentage of the failed cards were replaced under warranty by the manufacturer. However, the procedural delays at the point of sale, the inconvenience to the recipient and retailers and the administrative costs associated with card replacements raise significant questions regarding the near term technical feasibility of off-line systems.

A third challenge is effective management of the hot card database in an expanded environment. In the limited area of Montgomery County, it was feasible to download the entire hot card file to each authorized retailer. This file is used to verify that a card presented of a POS terminal has not been reported lost or stolen. The size of this database is likely to grow in proportion to the number of recipients participating in the system. At some point, the database will be too large to be maintained in local terminal memory and too expensive in terms of communications to download to every retailer. One possible solution is "regionalization" of the database based upon anticipated or observed shopping patterns. If a recipient from one region shopped at a store in another region, the terminal could initiate an on-line transaction to authorize

[1] Gary L. Glickman, et al., Special Topic Report on Hybrid EBT Systems, op. cit.

Table of Contents

the sale. This methodology, which could result in increased communications expense, is yet to be tested.

Other new issues raised with the implementation of off-line technology have policy implications. One such issue is the compatibility of EBT systems across state lines. As discussed above, implementation of an off-line system would not necessarily preclude out-of-state recipients from shopping within the project area, but it would confine the in-state population to retailers who are equipped with smart card terminals. Another issue is compatibility with the commercial POS infrastructure. To operate efficiently, off-line technology requires that all transactions be routed directly to the host processor for settlement. Widespread implementation of this technology could inhibit competition for commercial POS services unless the terminals were configured to allow access by alternative processors. Implementation would also effectively preclude the participation of local or regional networks in the EBT system.

Applications of the Federal Reserve Regulation E to EBT presents some unique concerns for off-line systems. First, smart cards cannot be locked immediately. Therefore, there will be a short period of time between the report of a lost or stolen card and the time that the card is blocked from further transactions. Under the demonstration, the State's policy was that any transactions that occurred during this time interval were the responsibility of the recipient and that these benefits would not be replaced. If Regulation E were strictly interpreted, the liability for these transactions could fall upon the state. Regulation E also specifies strict time periods for investigation and resolution of claims. As a result of the off-line nature of the system, current information is not always available, and investigation of a claim could be delayed while the processor awaits retailer settlements. These delays could potentially impose a further burden on state or processor resources to meet the time frames within the regulation. FNS has not adopted an official position on how off-line claims should be handled.

Assuming these issues can be resolved, off-line technology can offer a viable alternative to paper issuance systems for the Food Stamp Program. However, for several reasons, on-line EBT systems based upon the commercial debit card infrastructure appear to currently offer a more effective solution. These reasons include:

- the need to establish technical standards for an off-line EBT system;
- the strong tendency of the food retailer industry to support and implement on-line debit systems;
- the apparent cost-efficiencies of "piggybacking" on commercial systems as evidenced by the New Mexico on-line EBT demonstration;
- the ability to use the existing ATMs and commercial POS networks in an on-line environment; and
- the high rate of card failures and high cost of card replacements as shown in the off-line EBT demonstration.

Notwithstanding the above, the movement toward off-line (smart card) based systems by the States of Wyoming and Ohio, the Western Governors' Association and some segments of the banking industry may force resolution of many of these issues. In addition, many industry experts believe that smart card technology will eventually replace magnetic stripe technology as the predominant access media for POS and ATM systems. Recent experiments conducted by the MAC network and other announcements regarding smart card applications, such as electronic purse applications, by MasterCard, VISA and the MOST network lend support to this prediction. Furthermore, if piggybacking results in an elevation of administrative costs as third party processors and commercial POS networks charge transaction fees that must be borne by the government, off-line systems that avoid on-line communications for each transaction may prove a more cost-effective solution.

Table of Contents

Appendix A

Current EBT Projects and Initiatives

Table of Contents

Appendix A

CURRENT EBT PROJECTS AND INITIATIVES

Interest in EBT is expanding at an accelerating rate. With the passage of the Mickey Leland Memorial Domestic Hunger Relief Act of 1990, which made on-line EBT an operational alternative to the paper food coupon system, there has been heightened interest and activity on the part of the federal government, states, and local agencies. A summary of the current operating EBT projects and initiatives is presented below.

Reading, Pennsylvania

The first EBT project was initiated by FNS to provide food stamp benefits in Reading, Pennsylvania. Although Pennsylvania originally contracted with a system processor, the state assumed control of the system in 1986 and remains the only state-operated EBT project. The system continues to support food stamp benefits only, although the state is considering the addition of Aid to Families with Dependent Children (AFDC), Special Supplemental Food Program for Women, Infants, and Children (WIC), and Medical Assistance benefits.

The Reading project is an on-line system that uses non-standard soft magnetic stripe card and POS terminals. The state maintains the recipient account data and authorizes EBT transactions via a dial-up line between the food retailer and the state database. Settlement services are performed by the state's concentrator bank.

There is no limit to the number of transactions a recipient may make each month, and there are no transaction fees.

Ramsey County, Minnesota

Implemented in July, 1987, the Ramsey County EBT project issues food stamp, AFDC, General Assistance, State Supplemental Program - Supplemental Security Income, and Refugee Assistance (RA) benefits. In addition, the county is exploring an expansion to the EBT system

to include Child Support Enforcement (CSE) payments and the determination of Medicaid eligibility.

The Ramsey County project is an on-line EBT system that uses an International Standards Organization (ISO)-standard magnetic stripe card. Recipient cash and non-cash benefits are maintained in separate account balances by the EBT host, TransFirst. Cash benefits may be accessed through automated teller machines (ATMs) and point-of-sale (POS) terminals, while non-cash (food stamp) benefits can be accessed only through POS terminals. ATM transactions are processed over the commercial banking network to Norwest Bank, where they are identified as EBT transactions and are transmitted via a dedicated line to TransFirst. POS transactions are routed directly to TransFirst through dial-up lines.

There is no limit or charge for POS transactions, although recipients are limited to four free ATM transactions per month. The recipient is charged $1.00 for each additional transaction. Participation in the Food Stamp Program is mandatory, while participation in the AFDC program is voluntary.

Linn County, Iowa

In July, 1989, Iowa implemented the first EBT project that piggy-backed on the commercial ATM network. Iowa provides AFDC benefits and is in the process of adding Child Support Enforcement and Food Stamp Program benefits. Recipients use a magnetic stripe card to access benefits. Both ATM and POS transactions are cleared though the Iowa Transfer Switch (ITS) and the Shazam network. The state generates the authorization file and transmits it to ITS. ITS maintains the recipient account files and authorizes transactions.

Participation in the Iowa EBT project is voluntary. This is the only EBT project in which personal identification numbers (PINs) are assigned randomly rather than selected by the recipient.

Table of Contents

Maryland

The Maryland EBT project has been operating since August, 1989 to deliver food stamp, AFDC, General Assistance, and Child Support Enforcement benefits. Maryland completed expansion in the spring of 1993 to become the first state-wide EBT program. The program serves approximately 200,000 recipients.

The Maryland EBT project uses a two-track ISO-standard magnetic stripe card to provide access to benefits via ATMs and POS terminals. Recipient cash benefits are pooled into a cash account, while non-cash benefits are maintained separately. Cash benefits can be accessed through ATMs and POS terminals. Food stamp benefits can be accessed only through POS terminals. The EBT processor, Deluxe Data Systems, has an agreement with a commercial financial network for routing and settlement of ATM cash transactions. POS transactions are routed over the POS network to Deluxe for authorization.

The Maryland EBT project is mandatory. Multiple benefit cards are issued to each household, and there is no limit on the number of transactions per household.

Bernalillo County, New Mexico

The New Mexico project has been operating since August, 1990. The State of New Mexico was the first state to contract with a financial institution, the First National Bank in Albuquerque (FNBIA), to hold and process EBT transactions. New Mexico currently delivers food stamp and AFDC benefits through POS terminals. The state is considering adding SSI benefits to the program. New Mexico estimates that 83 percent of SSI recipients in Bernalillo County already have an EBT card for food stamps.

New Mexico uses a two-track magnetic stripe card to access benefits. Transactions are routed over a dedicated line to the FNBIA. FNBIA acts as both a transaction processor and a concentrator bank for the New Mexico EBT project. Participation in the program is mandatory. One benefit card is issued to each household. There are no limits on the number of transactions a recipient may make.

Table of Contents

Montgomery County, Ohio

The State of Ohio uses an off-line EBT system to deliver food stamp benefits to a segment of the food stamp population in Montgomery County, Ohio. The system began operations in March, 1992, and the state has issued an RFP for state-wide implementation of EBT for food stamps.

Houston and Dallas, Texas

The Financial Management Service of the Treasury Department contracted with Citibank to initiate the first EBT system for direct federal programs. The federal demonstration project is currently underway in Houston and Dallas, Texas. It delivers Social Security, SSI, Veteran's Compensation and Pension, Civil Service Retirement and Disability, and Railroad Retirement Board benefits through ATM and POS terminals.

The project is an on-line system that uses the PULSE network to Citibank. A separate demand deposit accounting (DDA) structure exists at Citibank to accommodate the project. The EBT DDA can accommodate up to 10 benefit programs. Citibank holds the funds in its account until the recipient accesses the benefits. Funding is sent to Citibank through the ACH. Currently, there are about 8,700 cases on this voluntary EBT benefit access system. Houston and Dallas are the only demonstration sites to provide full Regulation E liability protection to recipients.

Texas

The State of Texas recently awarded a contract to deliver food stamp benefits and AFDC benefits. The system will be piloted in Chamber and Harris counties.

New Jersey

The New Jersey Department of Human Services, Division of Family Development awarded a contract for an on-line EBT system to Deluxe Data Systems in March, 1993. Deluxe

built the New Jersey system on the same platform it uses to deliver EBT benefits in Maryland. The New Jersey EBT system delivers FSP, AFDC, CSE rebates, and RA benefits. Food stamp benefits are provided through POS terminals located in authorized food retail locations. Cash benefits are provided through retailer POS terminals or ATMs. ATM transactions are switched to Deluxe over the commercial banking networks. The pilot is being conducted in Camden County, with expansions to Essex and Hudson counties to follow. A decision to expand beyond the three counties is dependent upon the evaluation of the pilot.

Wyoming

The State of Wyoming recently awarded a contract to National Processing Company to develop an off-line authorization, smart card demonstration in Natrona County to deliver food stamp and WIC benefits. This is a follow-up demonstration to the Natrona County, Wyoming EBT Project, which provided WIC benefits via smart card technology. Approximately 800 recipient households participated in the earlier demonstration along with four retailers. The new demonstration includes a wider participant area and retail base and will be the first demonstration to test many of the enhanced functional features available through smart card technology.

South Carolina

In October 1993, South Carolina awarded a contract to Citibank for the development of an on-line EBT system to deliver FSP benefits. The system will be piloted in Darlington County for a minimum of three months before a decision is made about state-wide expansion.

OTHER EBT INITIATIVES

Many states are investigating EBT feasibility or are at various stages of EBT system development. Some of the ongoing efforts are described below.

Table of Contents

Tri-State Initiative

Maine, New Hampshire, and Vermont are currently conducting a study to determine the feasibility of developing a tri-state EBT system.

Other EBT Initiatives

Missouri, Illinois, Michigan, North and South Dakota, Kansas, and Oklahoma have received approved planning APDs. Florida and Georgia have submitted planning APDs to ACF and FNS. Many other states are preparing planning APDs or investigating the feasibility of EBT. In addition, Federal Agencies, under the auspices of the EBT Interagency Steering Committee, have committed to the development of a joint federal/state EBT prototype system. The prototype is being developed as a means to evaluate many of the organizational and economic challenges that are presented by multiple-program EBT systems.

Table of Contents

Appendix B

Comparison of Montgomery County Paper Coupon, Montgomery County Off-line EBT, and On-line EBT Systems by FSP Function

Table of Contents

Appendix B

COMPARISON OF MONTGOMERY COUNTY PAPER COUPON, MONTGOMERY COUNTY OFF-LINE EBT, AND ON-LINE EBT SYSTEMS BY FSP FUNCTION

Characteristic	Montgomery County Paper System	Montgomery County Off-Line EBT System	On-line EBT Systems
Authorizing Access to Benefits			
ID Card	MCDHS issues public assistance (CRIS-E) ID card to each recipient household.	MCDHS issues public assistance (CRIS-E) ID card to each recipient household.	Policy varies by system; systems that use food stamp-only ID cards may not issue to EBT participants.
Allotment File	ODHS creates allotment file for coupon issuance and makes it available to issuance centers on-line.	ODHS creates allotment files for EBT and provides files to NPC.	State agency creates allotment files and provides files to EBT processor.
EBT Training	Not applicable.	PayEase training is provided to recipients. PayEase card (smart card) is issued. Retailer issuance sites and PIN are selected by recipient. PIN is encrypted on card.	EBT training is provided to recipients. EBT card is issued and PIN is selected by, or assigned to, recipient and encrypted on card.
Delivering Benefits			
Food Coupons	MCDHS monitors coupon supply at issuance centers and orders coupons; orders are reviewed by ODHS and FNS; and coupons are ordered, printed, and delivered.	Not applicable.	Not applicable.
Benefit Issuance	Recipient benefits are made available on a given day each month; recipient goes to issuance center to pick up food coupons on or after that day.	Recipient benefit allotments are made available on a given day each month. Benefit allotment is added to PayEase card the first time the card is used at one of the three pre-selected retailer issuance locations (or MCDHS) on or after the date that benefits are made available.	Recipient benefit allotments are made available on a given day each month at the EBT host. Recipient accesses benefit allotment by using the EBT card at any participating EBT retailer on or after the date that benefits are made available.

Table of Contents

Characteristic	Montgomery County Paper System	Montgomery County Off-Line EBT System	On-line EBT Systems
Benefit Use	Recipient uses food coupons at any FSP authorized store in the nation.	Recipient uses PayEase card only at participating EBT retailers. POS system checks card balance to determine if the recipient account contains sufficient funds for the purchase. If the balance is sufficient, debits the card balance for the purchase amount.	Recipient uses magnetic stripe card only at participating EBT retailers. POS system sends a purchase authorization request to the EBT host which checks the recipient's account balance, and if the balance is sufficient, debits the host maintained balance for the purchase amount.
Conversion to Paper Coupons	Not applicable.	Permitted under some circumstances to accommodate the needs of recipients who leave the EBT area.	Permitted under some circumstances to accommodate the needs of recipients who leave the EBT area.
Manual Transaction	Not applicable.	Transactions can be performed when system or equipment problems prevent regular transactions. The retailer assumes full liability for manual transactions and sets the dollar limit. Retailer must call customer service to receive authorization and must enter the transaction when the system becomes functional. No paperwork is forwarded but must be maintained by the retailer. Transaction is posted to host-maintained balance upon retailer settlement. The transaction is automatically posted to the recipient's card during a subsequent transaction.	Transactions can be performed when system, communications, or equipment problems prevent regular transactions. Liability (state or EBT processor) and dollar amount limit vary among EBT systems. Retailer must call help desk to receive authorization and must forward paperwork. The transaction is posted immediately to the recipient's balance maintained on the host computer by help desk personnel.
Delivery Merchants	FSP authorized delivery merchants accept paper food coupons like other retailers.	Mobile terminals are not used, but delivery merchants (such as some food cooperatives or "Meals on Wheels") are provided with a means to participate through the use of the forced debit transaction.	Delivery merchants can participate by performing manual transactions. Procedures vary. Cellular POS technology is being tested to allow on-line transactions.

Table of Contents

Characteristic	Montgomery County Paper System	Montgomery County Off-Line EBT System	On-line EBT Systems
Manual Transaction Settlement	Not applicable.	Settlement (retailer credit) for manual purchases and forced debit transactions does not occur until five settlement cycles have elapsed.	Manual transactions are usually settled the same day that they occur, but can be reversed if retailers do not submit paperwork within the allotted time.
Crediting Retailers and Financial Institutions			
Retailer Crediting Process	Retailers count food coupons and deposit coupons and RCs to their FIs; retailers receive credit for food coupon redemptions before FI is reimbursed.	Retailer performs daily settlement to upload transactions to NPC; NPC accumulates retailer transactions during host settlement and sends ACH file to concentrator bank. Credits for retailers with accounts at the concentrator bank or its affiliates are stripped from the file before it is sent to the ACH network. Retailer's bank account is credited after FI receives credit through ACH network (one business day after host settlement cutoff).	Each transaction is sent to processor as it occurs; at system cutoff, processor accumulates retailer transactions, creates an ACH file, and sends file to concentrator bank. Retailer's accounts are credited after bank receives credit through ACH network (usually within one or two business days). Credits for retailers with accounts at the processor or concentrator bank are stripped from the file before it is sent to the ACH network and retailer accounts are credited.
Retailers' FIs' Role	Retailers' FIs process and reconcile coupon deposits and submit food coupons, RCs, and FCDDs to the Federal Reserve Bank.	Retailers' FIs receive an ACH credit in their FRB account; FIs use ACH software to receive and process the file from ACH network.	Retailers' FIs receive an ACH credit in their FRB account; FIs use ACH software to receive and process the file from the ACH network.
Payment Reimbursement Request	Not applicable.	NPC requests reimbursement for daily retailer redemptions through SmartLink/PMS.	Concentrator bank or EBT processor requests reimbursement for retailer redemptions through SmartLink/PMS.

Table of Contents

Characteristic	Montgomery County Paper System	Montgomery County Off-Line EBT System	On-line EBT Systems
FI Crediting/FNS Debiting Process	FRB credits FI accounts and debits FNS account.	During overnight processing, ACH network credits concentrator bank account for amount of reimbursement request through SmartLink/PMS which draws funds from project letter of credit (LOC); simultaneously, the ACH network debits the concentrator bank's FRB account and credits retailers' FIs' FRB accounts (one credit per FI).	ACH network credits concentrator bank account for amount of SmartLink reimbursement request. SmartLink draws funds from the project LOC. ACH network also credits retailers' FIs' FRB accounts and debits concentrator's FRB account. The timing of these transactions varies by project.
Managing Retailer Participation			
Retailer Authorization	Cincinnati field office (FO) authorizes retailers to participate in the FSP.	Cincinnati FO authorizes retailers and informs NPC about new retailers in project area.	Local FNS FO authorizes retailers and provides information about new retailers to the EBT processor.
Retailer Monitoring and EBT Updating	Cincinnati FO takes the lead role in monitoring retailer activities.	Cincinnati FO monitors retailer activities and adds retailers and updates information in the PayEase system.	Local FNS FO monitors retailer activities and FO or EBT processor updates retailer information in the EBT system.
Validating Retailers	RCs that contain the retailer's FNS authorization number must be submitted with food coupon deposits to the retailer's FI to ensure that only authorized retailers redeem food coupons.	NPC and its subcontractors deploy and maintain EBT equipment and provide retailer training; system controls (retailer and terminal control files) ensure that all retailer settlements sent to the EBT host are initiated by valid retailers.	EBT processor or subcontractors deploy and maintain equipment, processor or state agency trains retailers, and system controls (retailer and terminal control files) ensure that all transactions sent to the EBT host are initiated by valid retailers.
Retailer Investigations	Retailer investigations are conducted; the involvement of and coordination among several groups including the FO, compliance area office (CAO), Midwest regional office (MWRO) is required. Undercover CAO agents use food coupons in their investigations.	Additional coordination is required for investigations involving EBT because undercover investigators need to be established as EBT recipients.	Additional coordination is required for investigations involving EBT because undercover investigators need to be established as EBT recipients.

Table of Contents

Table of Contents

Appendix C

Retailer Compliance Enforcement

Table of Contents

Appendix C

RETAILER COMPLIANCE ENFORCEMENT

Paper Food Coupon System

In many situations, complaints are made directly to the Cincinnati Field Office. The food program specialist (FPS) completes a form for each complaint and examines the retailer's file for a history of complaints and redemption data to determine if the complaint warrants further attention. Field office staff also may visit the store to assess the situation. If the FPS believes that redemptions are excessive or believes that other irregularities are evident, the FPS initiates an official investigation by completing the FNS 280 - *Request for Investigations* (RFI) form.

The case is then referred to the Chicago Compliance Area Office (CAO). The CAO employs undercover investigators who visit the stores in an attempt to gather evidence that the retailer has violated FSP regulations. Usually, investigators make at least three visits, attempting to conduct transactions such as selling food coupons to retailers for cash (trafficking) or buying ineligible items with food coupons. The results of the compliance investigation are forwarded to the Midwest Regional Office, where a determination is made regarding how to proceed with the case. If the case involves serious criminal conduct, particularly the suspected involvement of the retailer in a food stamp trafficking ring, the case is forwarded to the office of the inspector general (OIG) and a criminal case is initiated. Otherwise, the process described below for implementing FSP sanctions is conducted.

The compliance investigation results are also forwarded to the Cincinnati Field Office. The field office takes several actions to process the case after the compliance visits have been completed. First, a warning letter is prepared and sent to the retailer. The FPS then reviews the investigation report thoroughly, and if charges are to be made against the retailer, the Cincinnati Field Office prepares and sends the retailer a charge letter. Retailers are given the option to respond to the charge letter. If the retailer responds, the response is evaluated. The field office takes actions to determine penalties and sends determination letters to retailers. At this point, the retailer can request an administrative review if there is disagreement with the proposed sanction. If the retailer requests an administrative review, the field office prepares a case file that is

forwarded to the administrative review officer. (Administrative review is a separate organizational unit within FNS). After the administrative review has been completed, the Cincinnati Field Office sends the retailer an effective date later which describes the administrative review team's decision and the effective date for whatever sanctions are to be implemented. The retailer has the option to appeal at this point as well. If the retailer appeals, the Cincinnati Field Office prepares the case folders for the U.S. Attorney's office. If there is a judicial hearing, the FPS involved in the case or the officer in charge (OIC) meets with the U.S. Attorney's representatives and may testify at the hearing. The results of the judicial hearing are not subject to further appeal.

At the first point where the retailer does not appeal the findings, the Cincinnati Field Office acts to proceed with sanctions. Retailer sanctions can include temporary or permanent disqualification from participation in the FSP and/or payment of fines, referred to as civil money penalties (CMPs). In addition, the Cincinnati Field Office performs other activities related to the sanction activity. For example, when a retailer is disqualified, the field office notifies the retailer's financial institution.

PayEase System

The retailer investigative functions performed by the Chicago CAO also are changed somewhat in the EBT environment. In order for investigators to document EBT program violations, they must be established as EBT recipients and provided with a PayEase card that contains benefits. The provision of EBT benefits to an undercover investigator requires more coordination among PayEase project team members than is required for a typical paper food coupon investigation.

Table of Contents

Appendix D

Supplemental Exhibits to the Administrative Cost Analysis

Table of Contents

Appendix D

SUPPLEMENTAL EXHIBITS TO THE ADMINISTRATIVE COST ANALYSIS

The following exhibits provide additional detail on the derivation of administrative costs presented in Chapter 3. Calculation of direct and indirect costs parallelled the methodology employed in the state-initiated EBT demonstrations to facilitate the comparison of the data. The exhibits are organized as follows:

- Exhibit D-1 summarizes the EBT demonstration contractor operational costs from August through December, 1992;
- Exhibit D-2 provides NPC costs to operate the EBT system during August through December, 1992 for the function "Authorizing Access to Benefits";
- Exhibit D-3 provides NPC costs to operate the EBT system during August through December, 1992 for the function "Delivering Benefits";
- Exhibit D-4 provides NPC costs to operate the EBT system during August through December, 1992 for the function "Crediting Retailers and Financial Institutions";
- Exhibit D-5 provides NPC costs to operate the EBT system during August through December, 1992 for the function "Reconciling Accounts"; and
- Exhibit D-6 provides NPC costs to operate the EBT system during August through December, 1992 for the function "Managing Retailer Participation".

Table of Contents

Exhibit D-1

EBT Demonstration Contractor Operational Costs
August through December, 1992

Cost Category	Cumulative Cost	Average Monthly Cost	Cost per Case Month*
Direct labor and travel			
Labor	$133,296	$26,659	$2.44
Travel	3,373	675	0.06
Total	**136,669**	**27,334**	**2.50**
Customer service	**19,605**	**3,921**	**0.36**
Subcontractors			
PSI	7,852	1,570	0.14
Astra Communications	5,834	1,167	0.11
Total	**13,686**	**2,737**	**0.25**
Data center hardware/software			
Hardware usage	23,065	4,613	0.42
Hardware maintenance	4,465	893	0.08
Software maintenance	16,226	3,245	0.30
Total	**43,756**	**8,751**	**0.80**
Terminals			
Equipment usage	36,065	7,213	0.66
Installation/servicing	2,601	520	0.05
Total	**38,666**	**7,733**	**0.71**
Communications	**26,416**	**5,283**	**0.48**
ACH expenses	**2,364**	**473**	**0.04**
Card costs	**48,248**	**9,650**	**0.88**
Grand Total	**$329,410**	**$65,882**	**$6.02**

Note: * Based on average monthly FSP caseload of 10,938 during the evaluation period.

Table of Contents

Exhibit D-2

EBT Demonstration Contractor Operational Costs
Authorizing Access to Benefits
August through December, 1992

Cost Category	Cumulative Cost	Average Monthly Cost	Cost per Case Month[a]
Direct labor and travel			
Labor	$38,589	$7,718	$0.71
Travel	976	195	0.02
Total	**39,565**	**7,913**	**0.73**
Customer service	**4,901**	**980**	**0.09**
Subcontractors			
PSI	7,852	1,570	0.14
Astra Communications	0	0	0.00
Total	**7,852**	**1,570**	**0.14**
Data center hardware/software			
Hardware usage	2,307	461	0.04
Hardware maintenance	447	89	0.01
Software maintenance	1,623	325	0.03
Total	**4,377**	**875**	**0.08**
Terminals			
Equipment usage	0	0	0.00
Installation/servicing	0	0	0.00
Total	**0**	**0**	**0.00**
Communications	**6,180**	**1,236**	**0.11**
ACH expenses	**0**	**0**	**0.00**
Card costs	**12,062**	**2,412**	**0.22**
Grand Total	**$74,937**	**$14,987**	**$1.37**

Note: [a] Based on average monthly FSP caseload of 10,938 during the evaluation period.

Table of Contents

Exhibit D-3

EBT Demonstration Contractor Operational Costs
Delivering Benefits
August through December, 1992

Cost Category	Cumulative Cost	Average Monthly Cost	Cost per Case Month[a]
Direct labor and travel			
Labor	$14,663	$2,933	$0.26
Travel	371	74	0.01
Total	**15,034**	**3,007**	**0.27**
Customer service	**4,901**	**980**	**0.09**
Subcontractors			
PSI	0	0	0.00
Astra Communications	5,834	1,167	0.11
Total	**5,834**	**1,167**	**0.11**
Data center hardware/software			
Hardware usage	13,839	2,768	0.25
Hardware maintenance	2,679	536	0.05
Software maintenance	9,736	1,947	0.18
Total	**26,254**	**5,251**	**0.48**
Terminals			
Equipment usage	36,065	7,213	0.66
Installation/servicing	2,601	520	0.05
Total	**38,666**	**7,733**	**0.71**
Communications	**1,697**	**339**	**0.03**
ACH expenses	**0**	**0**	**0.00**
Card costs	**36,186**	**7,237**	**0.66**
Grand Total	**$128,572**	**$25,714**	**$2.35**

Note: [a] Based on average monthly FSP caseload of 10,938 during the evaluation period.

Table of Contents

Exhibit D-4

EBT Demonstration Contractor Operational Costs
Crediting Retailers and Financial Institutions
August through December, 1992

Cost Category	Cumulative Cost	Average Monthly Cost	Cost per Case Month[a]
Direct labor and travel			
Labor	$18,408	$3,682	$0.34
Travel	466	93	0.01
Total	**18,874**	**3,775**	**0.35**
Customer service	**4,901**	**980**	**0.09**
Subcontractors			
PSI	0	0	0.00
Astra Communications	0	0	0.00
Total	**0**	**0**	**0.00**
Data center hardware/software			
Hardware usage	2,306	461	0.04
Hardware maintenance	447	89	0.01
Software maintenance	1,623	325	0.03
Total	**4,376**	**875**	**0.08**
Terminals			
Equipment usage	0	0	0.00
Installation/servicing	0	0	0.00
Total	**0**	**0**	**0.00**
Communications	**18,540**	**3,708**	**0.34**
ACH expenses	**2,364**	**473**	**0.04**
Card costs	**0**	**0**	**0.00**
Grand Total	**$49,055**	**$9,811**	**$0.90**

Note: [a] Based on average monthly FSP caseload of 10,938 during the evaluation period.

Table of Contents

Exhibit D-5

EBT Demonstration Contractor Operational Costs
Reconciling and Monitoring System
August through December, 1992

Cost Category	Cumulative Cost	Average Monthly Cost	Cost per Case Month[a]
Direct labor and travel			
Labor	$48,866	$9,773	$0.90
Travel	1,237	247	0.02
Total	**50,103**	**10,020**	**0.92**
Customer service	**4,901**	**980**	**0.09**
Subcontractors			
PSI	0	0	0.00
Astra Communications	0	0	0.00
Total	**0**	**0**	**0.00**
Data center hardware/software			
Hardware usage	4,613	923	0.08
Hardware maintenance	893	179	0.02
Software maintenance	3,245	649	0.06
Total	**8,751**	**1,751**	**0.16**
Terminals			
Equipment usage	0	0	0.00
Installation/servicing	0	0	0.00
Total	**0**	**0**	**0.00**
Communications	**0**	**0**	**0.00**
ACH expenses	**0**	**0**	**0.00**
Card costs	**0**	**0**	**0.00**
Grand Total	**$63,755**	**$12,751**	**$1.17**

Note: [a] Based on average monthly FSP caseload of 10,938 during the evaluation period.

Table of Contents

Exhibit D-6

EBT Demonstration Contractor Operational Costs
Managing Retailer Participation
August through December, 1992

Cost Category	Cumulative Cost	Average Monthly Cost	Cost per Case Month[a]
Direct labor and travel			
Labor	$12,756	$2,551	$0.23
Travel	323	65	0.01
Total	**13,079**	**2,616**	**0.24**
Customer service	**0**	**0**	**0.00**
Subcontractors			
PSI	0	0	0.00
Astra Communications	0	0	0.00
Total	**0**	**0**	**0.00**
Data center hardware/software			
Hardware usage	0	0	0.00
Hardware maintenance	0	0	0.00
Software maintenance	0	0	0.00
Total	**0**	**0**	**0.00**
Terminals			
Equipment usage	0	0	0.00
Installation/servicing	0	0	0.00
Total	**0**	**0**	**0.00**
Communications	**0**	**0**	**0.00**
ACH expenses	**0**	**0**	**0.00**
Card costs	**0**	**0**	**0.00**
Grand Total	**$13,079**	**$2,616**	**$0.24**

Note: [a] Based on average monthly FSP caseload of 10,938 during the evaluation period.

Table of Contents

Appendix E

Discussion of the Application of Various Provisions of the EBT Food Stamp Regulations to the Off-line System

Table of Contents

Appendix E

DISCUSSION OF THE APPLICATION OF VARIOUS PROVISIONS OF THE EBT FOOD STAMP REGULATIONS TO THE OFF-LINE SYSTEM

Card Replacement

§ 274.12(f)(5)(ii) states that cards shall be replaced within two business days following notice by the household (though the state may request a waiver). Cards can, and often are, replaced within two days of notification that the card has been lost or stolen. However, a 48-hour waiting period is imposed before any remaining benefits are posted to the card. This is to allow time for all retailers to settle to ensure that the host balance reflects all transactions and that no transaction occurred after the time the card was reported lost and stolen and the time that a card block message could be transmitted.

Immediate Holds

Similarly, § 274.12(f)(5)(iv) requires that an immediate hold be placed on accounts at the time notice is received from a household regarding the need for card or PIN replacement. It also stipulates that once a household reports that its EBT card has been lost or stolen, the state agency shall assume liability for benefits subsequently drawn from the account and replace any lost or stolen benefits to the household. The design of the off-line system does not permit an *immediate* hold to be placed on the account. Rather, the report of lost or stolen cards initiates a process that downloads a card block message to all retailers at the time of retailer settlement. Therefore, there is a 24-hour and perhaps up to 48-hour period during which the card could be used if the card and PIN are presented at a retailer that has not yet settled. The state and the processor have indicated that the recipient is liable for losses during this 48-hour period.

Performance and Technical Standards

§ 274.12(h) provides requirements for performance and technical standards and advises that the EBT system comply with American National Standards Institute (ANSI) and/or

International Organization for Standardization (ISO) where applicable. Generally, ANSI and ISO standards for point-of-sale applications pertain solely to on-line processing of transactions. While there are ISO standards for the structure of chip cards, these standards pertain primarily to the technical features of the card rather than to the processing of transactions. In the preamble, the rule states that "the Department expects the State agencies to pay close attention to efforts by the banking industry, the regional networks and food retailers to control their communications through a series of formalized standards, and have their EBT systems designed to meet currently prevailing standards ..." Generally, the industry is developing standards for on-line transaction processing and, although many segments of the banking industry are beginning to place increased emphasis on chip card technology, broad-scale implementation is not expected to occur for several years.

Response Times

§ 274.12(h)(1) provides system processing speeds specifically as they relate to leased line and dial-up systems. The authorization and processing of an off-line EBT transaction is performed within the retailer store environment and, therefore, the reference to leased or dial-up lines is irrelevant. Processing speeds are defined as the increment of time between the pressing of the "send" button and the receipt and display of the authorization or denial message. The maximum time stated is 20 seconds. The off-line system meets this requirement within this narrow definition. However, the off-line system introduces two additional transaction time increments that do not fall within the purview of the current rule. These times include the response time from when the recipient inserts the card and enters the PIN to the time the system queries the in-store controller to determine if there are any outstanding issuances or other staged transactions, or if the card is on the "negative file".[1] The second increment is the retailer settlement transaction. In the off-line system, the retailer initiates settlement a minimum of once each day. During this transaction, the retailers' transactions are uploaded to the host and the negative file and any new staged transactions are downloaded to the retailer. While some on-line EBT systems allow for retailers to initiate settlement, there is no analogous transaction and no

[1] The negative file contains the list of cards that have been reported as lost or stolen. If an attempt is made to use a card that is on this file, the system returns a message to the terminal that "locks" the card and prevents any additional transactions.

EBT response time standard. Future rule making should address unique off-line transactions if it is to be considered an operational alternative.

Inaccurate Transactions

§ 274.12(h)(2)(ii) states that the "central computer shall permit no more than two inaccurate EBT transactions for every 10,000 EBT transactions processed. The transactions to be included in measuring system accuracy shall include all types of food stamp transactions permitted at POS terminals and processed through the host computer, manual transactions entered into the system, credits to household accounts, and funds transfers to retailer accounts." It is unclear if this standard is meant to include reconciled differences, failure of a retailer to settle a transaction such as not submitting a paper voucher for which a manual authorization was received, or solely those errors that result in incorrect balances being posted to a retailer, financial institution, or recipient account. Exhibit E-1 illustrates the performance of the off-line system according to a strict reading of this section of the rule.

Minimum Transaction Set

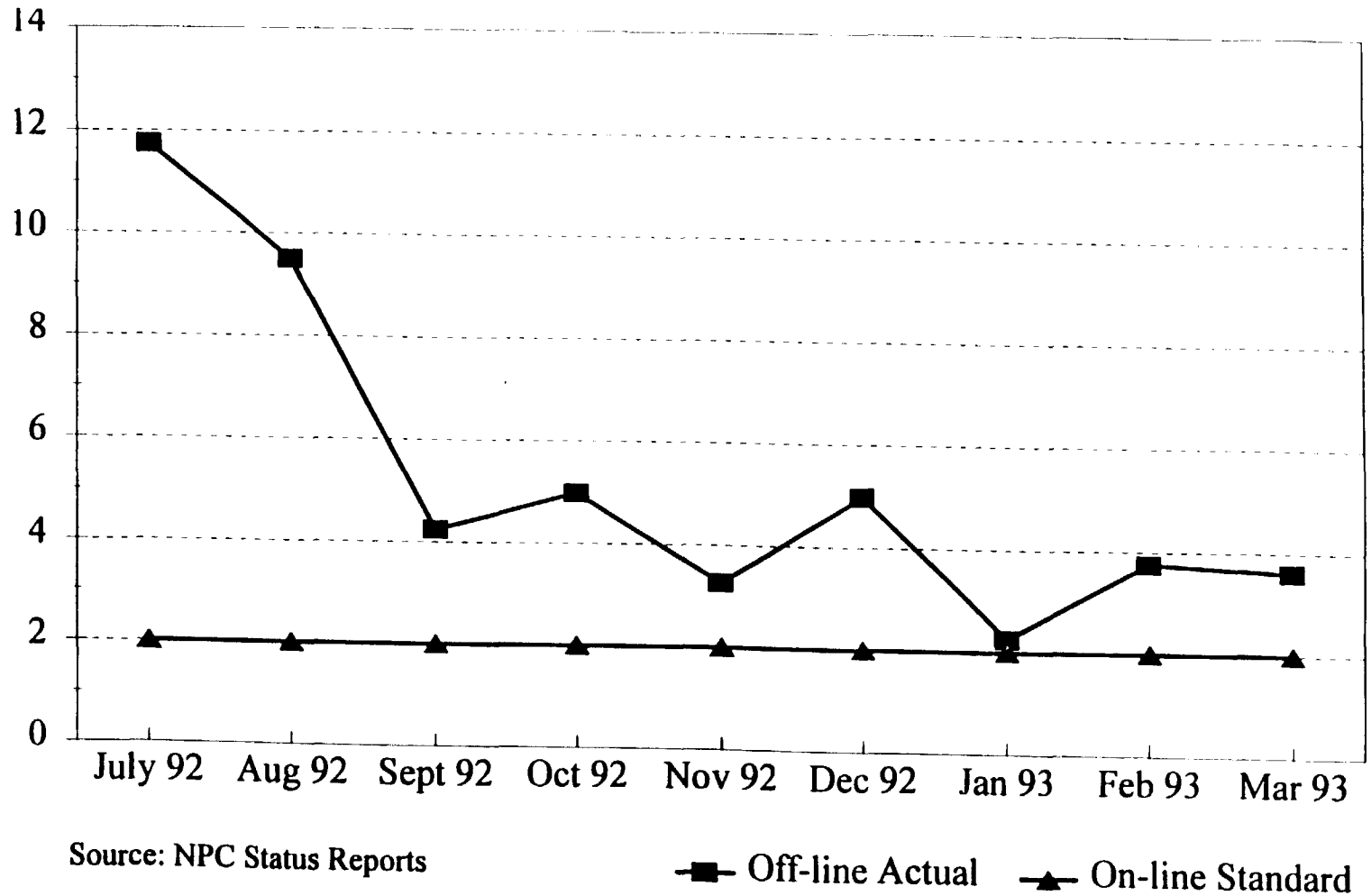
§ 274.12(h)(9) provides a list of the minimum transaction set that the EBT system should provide. The list includes a "key entered transaction" presumably to allow entry of a card number if the magnetic stripe is not readable. If the chip card cannot be read, there is no provision to allow for key entry of the card number. Furthermore, if the card cannot be read, the account balance that is maintained on the card would not be available. The off-line system provides for manual back-up in these circumstances.

As stated earlier, the off-line system generally meets the requirements stated in the rule. However, the rule and the underlying legislation would need to be revised if off-line EBT is permitted as an operational alternative rather than allowed solely under demonstration authority.

Table of Contents

Exhibit E-1

INACCURATE TRANSACTION RATE
(Per 10,000 Transactions)



Source: NPC Status Reports

Table of Contents

Appendix F

Computation of the Card Amortization Period

Table of Contents

Appendix F

COMPUTATION OF THE CARD AMORTIZATION PERIOD

The card amortization period is based upon the typical Food Stamp Program *spell* lengths. Spells represent the length of time a household participates in the program. For example, a household on the program for one month would be considered a one month spell. Spell data was provided by the Food and Nutrition Service (FNS) based upon an analysis of the 1990 survey of income and program participation (SIPP) panel, first seven waves.[1] The card amortization period also considers the rate at which cards are replaced due to losses, theft and card failure.

SPELL LENGTH

Exhibit F-1 shows the survival probabilities for left censored spells and non-left censored spells for households with continuous participation (no gap closed), households with a one month gap between participation periods, and households with a four month gap between participation periods. The left censored spells represent households who were participating in the Food Stamp Program prior to the beginning of the SIPP data collection (January 1990) and are therefore characteristic of "long term participants". The non-left censored spells represent households that entered the program during the data collection period and are therefore characteristic of "new entrants". At any given time, there will be a proportion of new entrants as well as long term participants participating in the program. The analysis of the spell length is based on the one-month gap closed data because recipients who leave the program for a single month would likely retain their card and would not need to be issued a new one.

The most accurate reflection of an average spell length must consider both new entrants and the long-term participant groups. As shown in Exhibit F-2, the 1990 SIPP panel contains 1,595 or 64.1 percent left censored first spells and 897 or 35.9 percent non-

[1] From a presentation on "Closing Gaps Between Food Stamp Spells and its Impact on Estimated Duration on the Program" given by Alberto Martini and Roy Olsen, Mathematica Policy Research, Inc.

Table of Contents

Exhibit F-1

SURVIVAL PROBABILITIES FOR LEFT CENSORED SPELLS AND NON-LEFT CENSORED SPELLS

	Left Censored Spell (Residual duration of spells in progress on January 1990)			Non-left censored spells (Duration of spells started after January 1990)		
Gaps closed	none	1-month	4-month	none	1-month	4-month
Months on the Program						
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.000
2	0.9649	0.9699	0.9768	0.9245	0.9463	0.9565
3	0.9306	0.9401	0.9565	0.8605	0.8894	0.9095
4	0.9048	0.9175	0.9372	0.8220	0.8540	0.8776
5	0.8722	0.8882	0.9111	0.6929	0.7218	0.7593
6	0.8536	0.8709	0.8972	0.6507	0.6769	0.7250
7	0.8255	0.8441	0.8758	0.6001	0.6336	0.6926
8	0.8071	0.8251	0.8608	0.5732	0.6086	0.6715
9	0.7883	0.8091	0.8483	0.5386	0.5712	0.6453
10	0.7742	0.7963	0.8370	0.5128	0.5468	0.6230
11	0.7549	0.7798	0.8242	0.4980	0.5280	0.6038
12	0.7375	0.7640	0.8106	0.4721	0.4991	0.5729
13	0.7229	0.7515	0.8018	0.4473	0.4764	0.5505
14	0.7133	0.7426	0.7930	0.4392	0.4614	0.5285
15	0.7014	0.7299	0.7818	0.4321	0.4552	0.5180
16	0.6908	0.7224	0.7743	0.4215	0.4436	0.5049
17	0.6809	0.7155	0.7697	0.3994	0.4247	0.4836
18	0.6693	0.7031	0.7612	0.3952	0.4178	0.4811
19	0.6606	0.6945	0.7557	0.3862	0.4054	0.4757
20	0.6551	0.6881	0.7470	0.3862	0.4054	0.4727
21	0.6463	0.6793	0.7399	0.3778	0.3961	0.4594
22	0.6406	0.6761	0.7358	0.3698	0.3919	0.4551
23	0.6308	0.6687	0.7252	0.3522	0.3730	0.4110
24	0.6250	0.6621	0.7178	0.3468	0.3610	0.4297
25	0.6158	0.6505	0.7054	0.3468	0.3610	0.4297
75th percentile	11	13	19			
Median				11	12	16

Source: 1990 SIPP panel, first seven waves.
Unit of observation: food stamp units, not persons covered by food stamps.

Table of Contents

Exhibit F-2

NUMBER OF FOOD STAMP SPELLS UNDER DIFFERENT GAP CLOSINGS

Gaps closed:	none	1-month	4-month
Initial Recipients			
1. Number of first spells (left censored)	1,595	1,595	1,595
2. Number of second spells	231	177	94
3. Number of third spells	29	12	1
4. Number of fourth spells	4	0	0
Initial Non-recipients			
5. Number of first spells	908	897	873
6. Number of second spells	101	67	19
7. Number of third spells	10	2	1
8. Number of fourth spells	1	0	0
Total Number of non-left censored spells (sum of 2 through 8)	1,284	1,155	988
Percent recidivism (second+third+fourth spells/first spells)	15.0%	10.3%	4.7%

Source: 1990 SIPP panel, first seven waves.
Unit of observation: food stamp units, not persons covered by food stamps.

left censored (initial non-recipients) first spells who have a one month gap. Since these numbers are representative of food stamp households, the relative ratios are applied to the respective survival rates shown in Exhibit F-3 to derive a composite survival rate that is representative of the total population.

The 1990 SIPP data provides survival rates for one through 25 months only. Based upon industry experience with plastic cards, we estimate that the maximum life of a chip card is 36 months and that while some cards may last longer, it is more conservative to assume that all cards will be replaced after this time. Therefore, it was necessary to estimate the survival rates for each of the spells for months 26 through 36. These estimates were derived through a simple trend analysis as illustrated in Exhibit F-4. At month 36, the survival rate goes to zero (0) indicating that all outstanding cards would be retired.

Table of Contents

Exhibit F-3

DETERMINATION OF SPELL LENGTH FROM 1990 SIPP DATA USING ONE MONTH GAPS CLOSED

Months	Existing Caseload	New Entrants	Composite	Cumulative Departure Rate (Composite)	Monthly Departure Rate (Composite)	Cumulative Departure Rate (Existing)	Monthly Departure Rate (Existing)	Cumulative Departure Rate (New Entrants)	Monthly Departure Rate (New Entrants)
1	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
2	0.946	0.970	0.961	0.039	0.039	0.054	0.054	0.030	0.030
3	0.889	0.940	0.922	0.078	0.040	0.111	0.057	0.060	0.030
4	0.854	0.918	0.895	0.105	0.027	0.146	0.035	0.082	0.022
5	0.722	0.888	0.828	0.172	0.067	0.278	0.132	0.112	0.030
6	0.677	0.871	0.801	0.199	0.027	0.323	0.045	0.129	0.017
7	0.634	0.844	0.768	0.232	0.033	0.366	0.043	0.156	0.027
8	0.609	0.825	0.747	0.253	0.021	0.391	0.025	0.175	0.019
9	0.571	0.809	0.723	0.277	0.024	0.429	0.038	0.191	0.016
10	0.547	0.796	0.706	0.294	0.017	0.453	0.024	0.204	0.013
11	0.528	0.780	0.689	0.311	0.017	0.472	0.019	0.220	0.016
12	0.499	0.764	0.669	0.331	0.021	0.501	0.029	0.236	0.016
13	0.476	0.752	0.653	0.347	0.016	0.524	0.023	0.248	0.012
14	0.455	0.730	0.631	0.369	0.022	0.545	0.021	0.270	0.022
15	0.444	0.722	0.622	0.378	0.009	0.556	0.012	0.278	0.007
16	0.425	0.716	0.611	0.389	0.011	0.575	0.019	0.285	0.007
17	0.418	0.703	0.600	0.400	0.010	0.582	0.007	0.297	0.012
18	0.405	0.695	0.590	0.410	0.010	0.595	0.012	0.306	0.009
19	0.405	0.688	0.586	0.414	0.004	0.595	0.000	0.312	0.006
20	0.396	0.679	0.577	0.423	0.009	0.604	0.009	0.321	0.009
21	0.392	0.676	0.574	0.426	0.004	0.608	0.004	0.324	0.003
22	0.373	0.669	0.562	0.438	0.012	0.627	0.019	0.331	0.007
23	0.361	0.662	0.554	0.446	0.009	0.639	0.012	0.338	0.007
24	0.361	0.651	0.546	0.454	0.007	0.639	0.000	0.350	0.012
25	0.350	0.640	0.536	0.464	0.011	0.650	0.011	0.360	0.010
*26	0.345	0.635	0.531	0.469	0.005	0.655	0.005	0.365	0.005
27	0.340	0.630	0.526	0.474	0.005	0.660	0.005	0.370	0.005
28	0.335	0.625	0.521	0.479	0.005	0.665	0.005	0.375	0.005
29	0.330	0.620	0.516	0.484	0.005	0.670	0.005	0.380	0.005
30	0.325	0.615	0.511	0.489	0.005	0.675	0.005	0.385	0.005
31	0.320	0.610	0.506	0.494	0.005	0.680	0.005	0.390	0.005
32	0.315	0.605	0.501	0.499	0.005	0.685	0.005	0.395	0.005
33	0.310	0.600	0.496	0.504	0.005	0.690	0.005	0.400	0.005
34	0.305	0.595	0.491	0.509	0.005	0.695	0.005	0.405	0.005
35	0.300	0.590	0.486	0.514	0.005	0.700	0.005	0.410	0.005
**36	0.000	0.000	0.000	1.000	0.486	1.000	0.300	1.000	0.590
Total					1.000		1.000		1.000

Number of existing cases	1595	64.00%
Number of new entrants	897	36.00%
Total	2492	1

* Months 26 through 35 predicted on trend line
** Month 36 assumes new card will be issued

Table of Contents

Exhibit F-4

SURVIVAL RATE OF SPELLS
(one month gap closed)

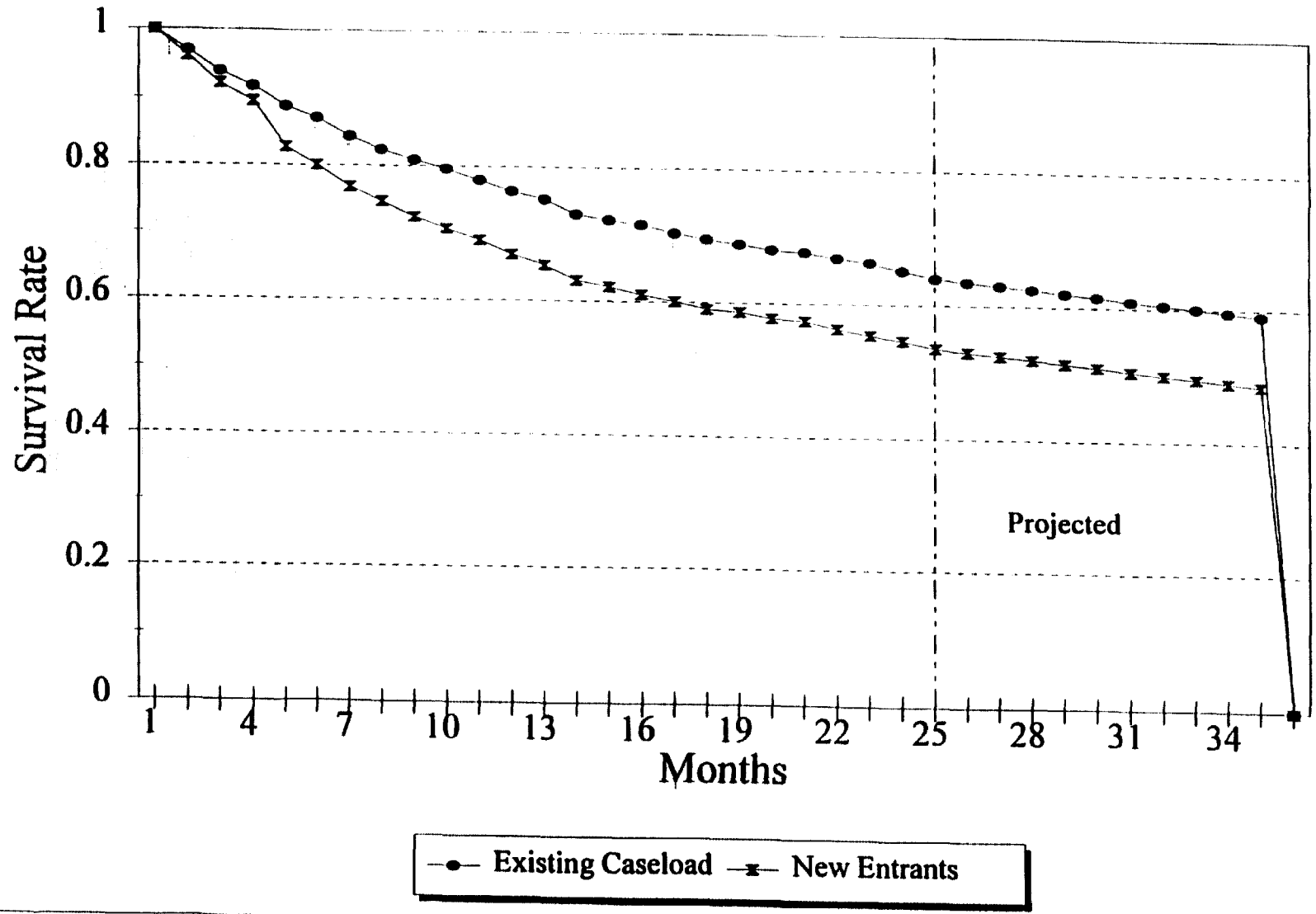


Table of Contents

The average spell length is computed by first determining a monthly departure rate. The departure rate is derived from a straight-forward subtraction of the survival rate from one and then computing the incremental change each month. The departure rate represents the probability that a household will depart the program in any given month. The sum of these probabilities over the 36 month period is 1.00 indicating that all households would leave the program. While not all households would necessarily leave the program, based upon our assumption of a maximum 36 month card life, all households would require a replacement card. The average spell length, which represents the average card life, under these assumptions is then computed by multiplying the departure probability by the month in which it occurs and summing the results. This average is 23.678 months. This average however, assumes that no household requires a replacement card due to theft, loss, or card failure.

CARD LOSS, THEFT, AND FAILURE

The card failure and lost and stolen rates are derived from actual data compiled by NPC during the demonstration. Both the card failure rate and the lost and stolen rate have recently changed as a result of a change in the manufacturing process for the card and a change in the administrative procedures for replacing lost or stolen cards.

Card Loss and Theft

During the demonstration, on an annualized basis, 37.01 percent of the participating households requested replacement cards due to loss or theft. Anecdotal data suggests that this rate is similar to the replacement rates experienced in on-line EBT demonstrations. The effect of this replacement rate is to reduce the average card life. Recently, Montgomery County instituted a "10 day waiting period" for households that requested two or more replacement cards. FNS approved this waiting period on an experimental basis and has not determined if it will be continued in an expanded environment. The effect of this waiting period was reported by the County to reduce the incidence of repeat lost and stolen card reports by 20 percent. This reduced rate forms the basis for our "best case" scenario for lost and stolen cards.

Table of Contents

Card Failure

There are two generations of cards that have been issued in the demonstration. The first generation, termed the "white card" experienced a high card failure rate due to manufacturing defects as well as abuse and read/write failures. This failure rate was approximately 30.21 percent of households on an annual basis. This rate was considered by NPC and the County to be unacceptable. Approximately 89 percent of the white cards that failed were replaced at no cost under the warranty provided by the manufacturer. These no-cost replacements reduced the effective cost of each card issued from the purchase price of $9.50 to $8.79.

In February 1993, NPC began to issue a second generation of cards, termed the "green card" that was produced using a different manufacturing process. As of August 1993, the failure rate for these cards was reported by NPC at 14.5 percent.

The effect of card failures is to further reduce the average card life. The card life model assumes that the outstanding white cards will be replaced with green cards either as they are retired as households leave the program or as card replacements are issued. All new entrants are issued the green card. Therefore, the card replacement rate due to card failures decreases over time and approaches the current 14.5 percent level. The "best case" scenario assumes that card failures can be further reduced through improved manufacturing to approximately five (5) percent to accommodate some manufacturing defects and a continued level of card abuse that was experienced during the demonstration period.

Table of Contents

Appendix G

Supplemental Exhibits to the Analysis of Economic Feasibility

Table of Contents

Appendix G

SUPPLEMENTAL EXHIBITS TO THE ANALYSIS OF ECONOMIC FEASIBILITY

The following exhibits provide additional detail on the derivation of prospective costs under each of the following four scenarios:

- continued operations in the six zip code area of Montgomery County;
- expanded operations to all of Montgomery County;
- expanded operations to the remainder of the State of Ohio; and
- state-wide operations delivering both food stamp and AFDC benefits.

The prospective cost analyses present conservative estimates based upon optimum operating conditions. The resulting cost estimates, while not representing the best case, represent costs that can be expected if market conditions continue to drive down the cost of off-line technology. For this reason, these decisions should not be solely based upon these cost estimates; rather, these estimates provide only one of the many variables that should be considered when making decisions regarding the future of off-line EBT technology.

The prospective cost estimates are based upon several assumptions including:

- The infrastructure put into place for the demonstration would be replaced with newer generation cards and terminals. The costs of this conversion are not included.
- The current level of resources expended by NPC (February through June 1993) represents stable operations. The estimates utilize these costs as a baseline to determine future requirements under each of the four scenarios. Labor is increased in direct proportion to the percentage increase in the number of households. Customer service labor is reduced by the expected percentage of calls that can be handled by the audio response unit (ARU). In the low estimates, this percentage is assumed to be 60 percent. In the high estimates, this percentage ranges from zero (0) percent to 20 percent in the Montgomery County, state-wide and AFDC scenarios.
- Additional volume discounts beyond those anticipated in a limited rollout are not included. It is possible that terminal costs could decrease in a volume purchase.

The price of cards ($4.80 plus $0.09 for the sleeve) represents a substantial decrease from the current card cost. This reduction is due to two factors. First, the capabilities of the card have been downsized from the cards used in the demonstration to meet the minimum operating requirements, and second, NPC has negotiated a current price of $5.00 per card from the card manufacturer.

- Deployment of terminals is based upon the minimum formula presented in the food stamp EBT regulations issued April 1, 1992 in the low estimates. All terminals are equipped in the high estimates. The numbers of lanes to be equipped and the computation of terminal costs is provided in Exhibit G-1.

- AFDC transactions represent 20 percent of the volume of transactions at POS terminals. Card costs are pro-rated to the two programs based on a hypothetical non-duplicated caseload. The card amortization period has not been adjusted for the impact of average spell length for AFDC recipients. Differing spell lengths could alter the average life of the card or affect the percentage allocation of card expense to either program.

- Card losses are estimated to range from 25 percent to 42 percent per year. The card failure rate is estimated at approximately 14 percent per year which is the actual rate of failure for the limited number of second generation cards that have been issued. Because of the very limited amount of data available to project this rate, increases or decreases are likely. The "best" case scenarios anticipate a failure rate of 1.8 percent which is the rate experienced by EFT applications in Europe.

- State-wide rollout would require additional design and development of the EBT system to accommodate different county procedures. This additional development is estimated at 20 percent of the original costs.

- The state-wide AFDC scenario estimates only the impact on administrative costs to the Food Stamp Program. No attempt is made to estimate either design, development and implementation or operational costs for the AFDC program. Furthermore, it is assumed that any incremental development efforts as well as any additional terminal and card deployment would be allocated to the AFDC program.

- None of the cost estimates anticipates cost sharing or reimbursement for commercial transactions. However, if dual capability terminals are implemented, it is likely that some reduction in costs to the Food Stamp Program would occur.

Table of Contents

Exhibit G-1
COST TO EQUIP RETAILER LANES

	Demonstration Site			Montgomery County			State-wide Expansion		
	Retailers/ Terminals/ Cases	Terminal Costs	Per Case Month Costs	Retailers/ Terminals/ Cases	Terminal Costs	Per Case Month Costs	Retailers/ Terminals/ Cases	Terminal Costs	Per Case Month Costs
Single lane retailers	58			71			6,119		
Multi-lane retailers	35			196			1,389		
Total Retailers	93			267			7,508		
Number of terminals per FNS regulations	N/A			521			11,500		
Total number of terminals	255			946			14,298		
Single lane terminals (a)		$63,452	$0.096		$77,674	$0.052		$6,694,186	$0.210
Multi-lane LANs (b)		$29,750	$0.075		$166,600	$0.185		$1,180,650	$0.062
Multi-lane terminals per FNS regulations (c)		N/A	N/A		$315,000	$0.210		$3,766,700	$0.118
Multi-lane terminals if all equipped		$137,600	$0.209		$612,500	$0.408		$5,725,300	$0.179
Total terminal cost per FNS regulations			N/A			$0.447			$0.390
Total terminal cost if all equipped			$0.380			$0.645			$0.451
Total number of cases	11,000			25,000			532,400		

Note(s):

(a) Single lane configuration: $1,094 per terminal amortized over five years.

(b) Multi-lane LAN: PC, LAN controller at $850 per store amortized over three years.

(c) Multi-lane terminals: Terminal plus printer at $700 per lane amortized over five years.

Table of Contents

Exhibit G-2

DEMONSTRATION SITE CONTINUED
Prospective Costs

Cost Category	Low Estimate: Estimated Monthly Cost	Low Estimate: Cost per Case Month[a]	High Estimate: Estimated Monthly Cost	High Estimate: Cost per Case Month[a]
EBT Vendor				
Direct labor	$18,250	$1.66	$18,250	$1.66
Customer service	1,500	0.14	2,500	0.23
Data center hardware/software				
Hardware usage	4,615	0.42	4,615	0.42
Hardware maintenance	900	0.08	900	0.08
Software maintenance	2,450	0.22	2,450	0.22
Audio response units	500	0.05	500	0.05
Terminals	4,180	0.38	4,180	0.38
Communications	2,625	0.24	3,280	0.30
ACH expenses	345	0.03	345	0.03
Card costs	4,770	0.43	6,290	0.57
Total	**40,135**	**3.65**	**43,310**	**3.94**
Local Agency				
Local agency labor and equipment	10,800	0.98	14,985	1.36
Photo identification card	1,245	0.11	1,245	0.11
Total	**12,045**	**1.09**	**16,230**	**1.47**
State of Ohio	**2,300**	**0.21**	**4,375**	**0.40**
Food and Nutrition Service				
Headquarters	1,255	0.11	1,255	0.11
Regional office	835	0.08	835	0.08
Field office	175	0.02	175	0.02
Total	**2,265**	**0.21**	**2,265**	**0.21**
Contingency[b]	**N/A**	**N/A**	**6,620**	**0.60**
Grand Total	**$56,745**	**$5.16**	**$72,800**	**$6.62**

Notes: [a] Based on average estimated monthly FSP caseload of 11,000.
[b] Contingency reflects 10% of the estimated monthly costs.
N/A = Not applicable

Table of Contents

Exhibit G-3

EXPANDED MONTGOMERY COUNTY
Prospective Costs

Cost Category	Low Estimate: Estimated Monthly Cost	Low Estimate: Cost per Case Month[a]	High Estimate: Estimated Monthly Cost	High Estimate: Cost per Case Month[a]
EBT Vendor				
Direct labor	$18,250	$0.73	$18,250	$0.73
Customer service	2,275	0.09	4,545	0.18
Data center hardware/software				
Hardware usage	4,615	0.18	4,615	0.18
Hardware maintenance	900	0.04	900	0.04
Software maintenance	2,450	0.10	2,450	0.10
Audio response units	665	0.03	1,250	0.05
Terminals	11,170	0.45	16,130	0.65
Communications	6,000	0.24	7,500	0.30
ACH expenses	400	0.02	400	0.02
Card costs	10,845	0.43	14,305	0.57
Total	**57,570**	**2.31**	**70,345**	**2.82**
Local Agency				
Local agency labor and equipment	24,500	0.98	29,000	1.16
Photo identification card	2,750	0.11	2,750	0.11
Total	**27,250**	**1.09**	**31,750**	**1.27**
State of Ohio	**4,250**	**0.17**	**7,750**	**0.31**
Food and Nutrition Service				
Headquarters	1,255	0.05	1,255	0.05
Regional office	835	0.03	835	0.03
Field office	175	0.01	175	0.01
Total	**2,265**	**0.09**	**2,265**	**0.09**
Contingency[b]	**N/A**	**N/A**	**11,210**	**0.45**
Grand Total	**$91,335**	**$3.66**	**$123,320**	**$4.94**

Notes: [a] Based on average estimated monthly FSP caseload of 25,000.
[b] Contingency reflects 10% of the estimated monthly costs.
N/A = Not applicable

Table of Contents

Exhibit G-4

EXPANDED STATE-WIDE
Prospective Costs

Cost Category	Low Estimate: Estimated Monthly Cost	Low Estimate: Cost per Case Month[a]	High Estimate: Estimated Monthly Cost	High Estimate: Cost per Case Month[a]
EBT Vendor				
Direct labor	$163,760	$0.31	$163,760	$0.31
Customer service	48,400	0.09	96,365	0.18
Data center hardware/software				
Hardware usage	38,175	0.07	38,175	0.07
Hardware maintenance	7,430	0.01	7,430	0.01
Software maintenance	20,300	0.04	20,300	0.04
Audio response units	4,000	0.01	4,000	0.01
Terminals	227,860	0.43	263,770	0.50
Communications	154,400	0.29	191,670	0.36
ACH expenses	2,715	0.01	2,715	0.01
Card costs	230,905	0.43	316,600	0.60
Total	**897,945**	**1.69**	**1,104,785**	**2.09**
Local Agency				
Local agency labor and equipment	303,500	0.57	521,700	0.98
Photo identification card	N/A	0.00	58,565	0.11
Total	**303,500**	**0.57**	**580,265**	**1.09**
State of Ohio	**47,915**	**0.09**	**47,915**	**0.09**
Food and Nutrition Service				
Headquarters	1,255	0.00	1,255	0.00
Regional office	15,970	0.03	15,970	0.03
Field office	5,325	0.01	5,325	0.01
Total	**22,550**	**0.04**	**22,550**	**0.04**
Contingency[b]	**N/A**	**N/A**	**355,905**	**0.67**
Grand Total	**$1,271,910**	**$2.39**	**$2,111,420**	**$3.98**

Notes: [a] Based on average estimated monthly FSP caseload of 532,400.
[b] Contingency reflects 20% of the estimated monthly costs.
N/A = Not applicable

Table of Contents

Exhibit G-5

EXPANDED STATE-WIDE WITH AFDC
Prospective Costs

Cost Category	Low Estimate: Estimated Monthly Cost	Low Estimate: Cost per Case Month[a]	High Estimate: Estimated Monthly Cost	High Estimate: Cost per Case Month[a]
EBT Vendor				
Direct labor	$163,760	$0.31	$163,760	$0.31
Customer service	46,000	0.09	93,500	0.18
Data center hardware/software				
Hardware usage	38,175	0.07	38,175	0.07
Hardware maintenance	7,430	0.01	7,430	0.01
Software maintenance	20,300	0.04	20,300	0.04
Audio response units	4,000	0.01	4,000	0.01
Terminals	191,400	0.36	213,650	0.40
Communications	153,700	0.29	190,800	0.36
ACH expenses	5,430	0.01	5,430	0.01
Card costs	143,100	0.27	196,100	0.37
Total	**773,295**	**1.46**	**933,145**	**1.76**
Local Agency				
Local agency labor and equipment	302,100	0.57	519,400	0.98
Photo identification card	N/A	0.00	58,300	0.11
Total	**302,100**	**0.57**	**577,700**	**1.09**
State of Ohio	**47,700**	**0.09**	**47,700**	**0.09**
Food and Nutrition Service				
Headquarters	1,255	0.00	1,255	0.00
Regional office	15,900	0.03	15,900	0.03
Field office	5,300	0.01	5,300	0.01
Total	**22,455**	**0.04**	**22,455**	**0.04**
Contingency[b]	**N/A**	**N/A**	**316,200**	**0.60**
Grand Total	**$1,145,550**	**$2.16**	**$1,897,200**	**$3.58**

Notes: [a] Based on average estimated monthly FSP caseload of 530,000
[b] Contingency reflects 20% of the estimated monthly costs.
N/A = Not applicable

Table of Contents

Appendix H

List of Abbreviations

Table of Contents

Appendix H

LIST OF ABBREVIATIONS

ACH	-	Automated Clearing House
ACF	-	Administration for Children and Families
ACO	-	assistance control office
AFDC	-	Aid to Families with Dependent Children
ARU	-	audio response unit
ATM	-	automated teller machine
ATP	-	authorization-to-participate
CAO	-	compliance area office
CRIS-E	-	client registration information system - enhanced
CSE	-	Child Support Enforcement
DCU	-	data control unit
DDA	-	demand deposit accounting
DES	-	data encryption standard
DTAR	-	daily time allocation records
DV	-	debit voucher
EBS	-	electronic benefits system
EBT	-	electronic benefits transfer
EEPROM	-	electronically erasable programmable read only memory
EFT	-	electronic funds transfer
EOD	-	end of day
FCDD	-	food coupon deposit document
FCO	-	fiscal control office
FI	-	financial institution
FNBD	-	First National Bank of Dayton
FNS	-	Food and Nutrition Service
FO	-	field office
FPS	-	food program specialist
FRB	-	Federal Reserve Bank
GAD	-	grant award document

Table of Contents

LIST OF ABBREVIATIONS
(continued)

ROM	-	read-only memory
SPOM	-	self programmable one chip microcomputer
UPC	-	universal product code
WIC	-	Special Supplemental Food Program for Women, Infants and Children