Wireless Point of Sale Device: Pilot Evaluation Report

TABLE OF CONTENTS

SUMMARY

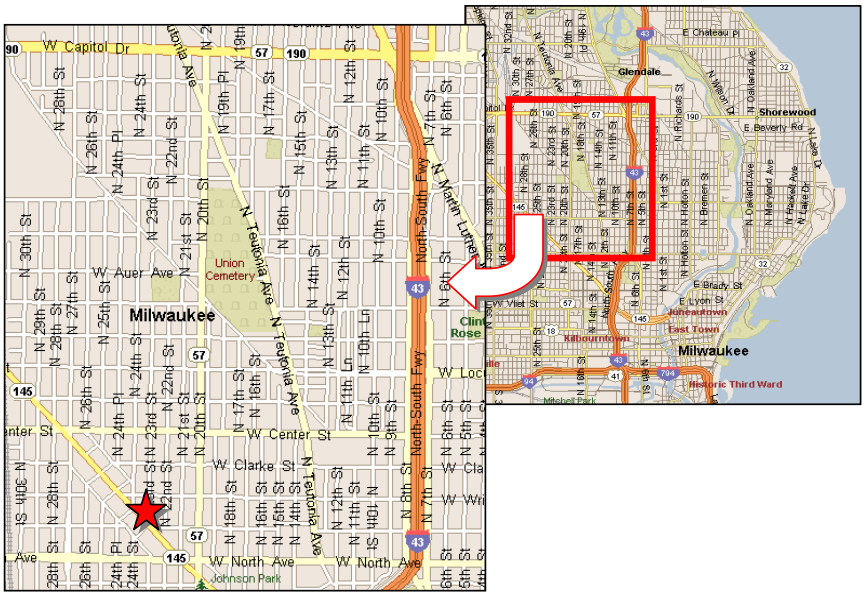
The goal of this project was to pilot the reintroduction of food stamp sales at farmers' markets in Wisconsin. The food stamp program went electronic in 2000 with the introduction of the Wisconsin Electronic Benefit Transfer (EBT) Quest® card, an ATM-style swipe card that replaced paper food stamps. Unfortunately the transition to a paperless system represented a loss to Wisconsin farmers as the technology did not exist to allow them to accept the new cards. For low-income food stamp recipients, the transition meant a reduction in the number of places where they were able to redeem their benefits.

This project is the result of a partnering of non-profit advocacy groups, private corporations, and state and federal agencies.

BACKGROUND

Something is wrong with a local food system, located within the world's richest economy, when unemployed and working-poor residents say it is easier to get emergency pantry food than it is to get and maintain food stamp benefits—and that finding a head of lettuce anywhere presents a logistical challenge. But this is the case on Milwaukee's near north side - a conclusion drawn from interviews with pantry users conducted by Hunger Task Force and our research chronicling the few supermarkets per capita in this densely populated neighborhood.

This pilot project targeted Milwaukee inner-city residents living near the Fondy Farmers Market, approximately two miles northwest of downtown Milwaukee, Wisconsin. This densely populated area, corresponding to zip code 53206, is Milwaukee's poorest and most segregated. (53206 is bounded on the North by Capitol Drive, on the West by 27th Street, on the South by North Avenue, and on the East by 7th Street).



This neighborhood has experienced decades of economic decay and urban blight. According to U.S. Census data, 57% of the zip code's 42,000 people live below 150% of poverty, and the median annual household income is only around $15,000. Many of these poor are children, who make up 40% of the neighborhood's population. Extreme segregation is the norm, with 40,606 black people and 668 whites. Only 1,800 people attend college, and 49% of adults 25 and older did not graduate from high school. Many households in this neighborhood demonstrate pervasive reliance on charities.

This project addressed the limited access to affordable, nutritious foods in the target area. Residents' under-nutrition is exacerbated by poor nutritional choices and underdeveloped

cooking skills. The few jobs available in this neighborhood tend to be low-skill, low-paying work. Access to nutritious food is limited, with even families who have enough income and private transportation facing difficulty in obtaining nutritious food due to the absence of high-quality food retailers (though there are many fast-food franchises). Contributing to the blight is an almost complete lack of safe, civic gathering spots, a fact underscored by the Fall, 2002 nationally-reported beating death of a local resident by a gang of youths just 4 blocks south of our Fondy Market. These many obstacles to "normal" food access have created rampant food insecurity among local residents and have pushed charitable feeding organizations to capacity.

Comprehensive geo-mapping of this neighborhood was undertaken in 1996 by Hunger Task Force with the University of Wisconsin – Milwaukee. This research project found that 72% of the food retailers in Milwaukee's inner city are equivalent to so-called "convenience stores," offering less-than-nutritious foods at prices between 24 – 29% higher than large suburban grocers. Nor can neighborhood residents redeem food stamps at any farmers' market (20,000 people spend $3 million worth of food stamp benefits within the 5 zip codes nearest the Fondy Market) because market vendors do not have access to the required "swipe" terminal hardware. This tragedy is especially poignant given that the Fondy Market lies directly in the center of Wisconsin's largest population of eligible food stamp recipients. According to State of Wisconsin - Department of Workforce Development, in 2002 food stamp benefits received by Milwaukee County residents averaged $8,707,522.00 per month; and the total Milwaukee County food stamp benefits given out in 2002 amounted to $104,490,268.00. Although these figures are rising—up 19% in just one year—not a single dollar of these benefits were being redeemed at the Fondy Market, which was once a leading site for redemption of this neighborhood's food stamps. To make matters worse, those food stamp dollars that once bought fresh, locally-grown produce at the Fondy Market are probably being redeemed for a larger percentage of less healthful processed foods sold through supermarkets, exacerbating Wisconsin's obesity problem.

In 1996-1997, Hunger Task Force shared its research data with the Food System Advisory Council, a comprehensive planning body representing 26 institutions throughout Milwaukee's food system. The council reviewed the findings and recommended that economic development strategies be implemented, including the creation of shared-use kitchens, farmers' markets and public markets, community gardens, and establishing more food retail outlets. Hunger Task Force investigated the feasibility of combining the public market and the commercial kitchen recommendations into a single facility. It proceeded to survey farm market patrons and forecast customer demographics, spending patterns and shopping preferences. The data confirmed that such a complex could satisfy strong, unmet demand for a variety of food products and services. Next Hunger Task Force commissioned a kitchen needs assessment which canvassed caterers, students, community groups, restaurants and others, and demonstrated significant demand for kitchen space, equipment and business development services. In 2002 Hunger Task Force opened its rebuilt outdoor farmers' market facility and continues its capital campaign seeking $4.75 million in all to add a kitchen micro-enterprise "business incubator" and year-round indoor market hall.

ORGANIZATIONS INVOLVED IN THE PROJECT

Hunger Task Force

http://www.hungertaskforce.org/

Hunger Task Force is a 29-year old community development and advocacy organization. Hunger Task Force established the Fondy Food Center Inc. to become the independent entity that will manage the overall project. Hunger Task Force's 26 employees and 11-member board lent assistance to the project. Currently Hunger Task Force provides office space and resources for the Fondy Food Center's employees and its own board of directors, and is assisting in the $4.75 million capital campaign to complete construction of the complex.

Fondy Food Center Inc.

http://www.fondymarket.org/

Is an independent, nonprofit institution responsible for managing operations at the Fondy Market. In 2003, the Fondy Food Center successfully obtained approval of 501(c)3 nonprofit status by the IRS; and became fiscally independent on October 1, 2003. Oversight is provided by the 12-member Fondy Food Center board of directors. The Fondy Food Center maintains a roster of 71 tenant farmers and recruits new growers for vacated stalls. It also publicizes eventual vendor opportunities for the site's planned indoor market hall and commercial kitchen.

eFunds Corporation

http://www.efunds.com/

Headquartered in Scottsdale, Ariz., eFunds Corporation is an industry leader with nearly 30 years of experience and expertise in electronic payments. eFunds provides electronic transaction software and processing, ATM solutions, risk management and global outsourcing solutions to financial institutions, electronic funds transfer networks, government agencies and retailers around the world. Committed to providing excellent customer service and award-winning products, eFunds enables its clients to reduce transaction and infrastructure costs, detect potential fraud and enhance relationships with their customers. eFunds is one of the largest third-party processors of electronic funds transfers (EFT), is the largest non-bank deployer of ATMs in North America, and is the provider of the world's largest debit database.

eFunds role in the Fondy Food Market pilot was the design, development, and overall operation of the Pilot Program. This included the following:

- development of the POS application software to provide EBT functionality.
- development of the POS communications software to enable Code Division Multiple Access (CDMA) wireless communications.
- establishing the CDMA wireless infrastructure between a wireless provider and eFunds.
- contracting directly with the Farmer's Market Merchants.
- providing the pilot merchants with documentation and training for the application.
- toll-free customer service support.

MAXIMUS Inc.

http://www.MAXIMUS.com

MAXIMUS is a provider of health and human services program management, consulting services and systems solutions primarily to government agencies. The Company conducts its operations through four business segments: Consulting Group, Health Services Group, Human Services Group and Systems Group. The Consulting Group provides specialized consulting services such as assisting state and local agencies in maximizing federal funding for their programs, program planning and quality assurance services; the Health Services Group administers and manages managed care enrollment programs and also provides health literacy support and consulting services; the Human Services Group administers and manages state and local government human service programs on a fully outsourced basis, and the Systems Group provides federal, state and local agencies with systems design and implementation to improve the efficiency and cost-effectiveness of their program administration.

MAXIMUS has been providing farm market technical support to the State of Wisconsin and Hunger Task Force since their involvement with the statewide implementation of the EBT Quest Card. Over the last couple years, MAXIMUS has been involved with the Milwaukee School of Engineering (MSOE) project, providing technical support on the central server application under development.

For the Fondy Food Center project, MAXIMUS provided technical support and assistance with requirements definition and project management. To determine a hand-held wireless solution that would meet the market's needs MAXIMUS contacted other states, markets and vendors. An initial meeting was held with the only vendor with an existing hand-held wireless solution that was successfully completing EBT transactions. When an acceptable solution could not be located that met the Fondy Food Center's technical requirements, customer service needs and pricing constraints, MAXIMUS solicited interest and support for the pilot project from eFunds and VeriFone. Once eFunds and VeriFone expressed interest in the pilot and agreed to create a hand-held wireless solution, MAXIMUS provided project management, testing and implementation support.

VeriFone Corporation VeriFone, Inc.

http://www.verifone.com

VeriFone, recognized worldwide as the trusted leader in secure electronic payment technologies, provides expertise, solutions and services for today with a smart migration strategy for tomorrow. VeriFone is leading the industry in the delivery of solutions that add value to the point of sale, resulting in improved merchant retention and the generation of new sources of revenue for its partners and customers. VeriFone solutions are specifically designed to meet the needs of vertical markets including financial, retail, petroleum, government and healthcare. VeriFone has shipped over eleven million electronic-payment systems.

VeriFone's role in the Fondy Food Market EBT pilot was to provide a code division multiple access (CDMA) based wireless POS solution, known as the Omni 3600. The Omni 3600 portable wireless terminal is used to process electronic benefit transfer (EBT) cards at Fondy Farmers' Market. The Omni 3600 portable wireless terminal communicates using CDMA 2000 1X wireless technology utilizing Transmission Control Protocol/Internet Protocol (TCP/IP) over a data-packet network, and eFunds developed POS software and transaction processing. The solution delivers "always-on" connectivity, which eliminates the time-consuming dial-up process on every transaction and results in transactions being processed in less then five seconds

Milwaukee School of Engineering (MSOE)

http://www.msoe.edu/

Three senior programming and design classes at MSOE have collaborated over the past 2 years on a project to make electronic food stamps redeemable at this market and potentially at other farmers' markets in Wisconsin. The Fall 2001 class established the project's system requirements and partially developed the needed software; the spring 2002 class and fall 2002 class refined the software and researched affordable hardware for farm vendors to use.

State of Wisconsin, Department of Workforce Development (DWD)

This governmental department was, until July 2002, responsible for administering the Food Stamp Program for qualified Wisconsin residents. DWD partnered with Hunger Task Force of Milwaukee, Fondy Food Center, eFunds, MAXIMUS, VeriFone and the Milwaukee School of Engineering on the pilot project to allow electronic Food Stamp benefits to be redeemed at the market. Many of the former Wisconsin DWD staff working on the pilot were transferred to DHFS to administer the distribution of Food Stamp benefits via the Electronic Benefits Transfer (EBT) system.

State of Wisconsin, Department of Health and Family Services (DHFS)

http://dhfs.wisconsin.gov/

DHFS has explored methods by which non-traditional retailers, such as farmers' markets, can participate in the delivery of food stamp benefits under the EBT system. Though there are many reasons for the lack of farmers' market participation in the food stamp program, two key reasons have been the lack of an effective transaction processing solution at the market and the lack of a marketing platform and internal support network to encourage both recipients and farmers to participate. DHFS has provided staff resources to assist in the development of the pilot, and serve as technical consultants in the design and implementation process. DHFS also contributed more than $23,000 from October 2002 through June 2003 for its EBT consultant, MAXIMUS, to evaluate wireless devices, processors and connectivity needed to permit EBT transactions at the Fondy Market. Through this evaluation process, eFunds was selected to provide wireless devices, connectivity and EBT processing for designated Fondy Market vendors in 2003.

City of Milwaukee

http://www.milwaukee.gov/

Significant, ongoing contributions from the City of Milwaukee led to finalizing the site and allowing improvements to be made to the market structure. The City agreed to lease the market site to the Fondy Food Center, Inc. for $50 for 50 years and also deeded free-of-charge the site's largest existing structure, valued at $250,000.00. The City also reconfigured streets and alleys in consideration of the project and contributed free, needed demolition. In addition, the City provided a $50,000 reimbursement award to the Fondy Market through the Fond du Lac Avenue Economic Development Fund.

Neighbors of Fondy Market

This neighborhood "steering committee" of 20 residents was organized by Hunger Task Force of Milwaukee's Organizer in 2001. It meets half a dozen times every growing season to provide direction on security, potential events, sanitation and trash removal, and varieties of food to be offered. They have also gone door-to-door in the neighborhood conducting surveys on what people want from the market. This group has ongoing dialogue with their elected city officials and City hall departments. The group strongly supports children's activities and cooking demonstrations at the market.

FNS/USDA Regional Office

http://fns.usda.gov/fns/

This Chicago office helped sign up vendors to take food stamps at the Fondy Market during summer 2003 and assisted Hunger Task Force and the Fondy Food Center with numerous technical questions regarding EBT food stamp transactions.

Comment: Young, I believe the Madison office certified vendors, while the Chicago office provided project support.

DESIGN AND IMPLEMENTATION ACTIVITIES

Design

eFunds designed its Farmer's Market Wireless Solution to leverage its existing EBT Infrastructure including the following:

- POS Terminal Software Application
- POS Transaction Acquiring, Switching, and Settlement
- POS Documentation and Training
- Merchant Customer Service

POS Terminal Software Application

eFunds designed its Omni 3600 Farmer's Market Application by leveraging its Omni 3200 EBT Application. By leveraging the existing code, eFunds was able to easily deliver an application that offered the basic EBT functionality that included the following:

- Food Stamp Purchase
- Food Stamp Purchase Return
- Cash Purchase (not used in pilot)
- Balance Inquiry (not used in pilot)
- Void Last
- Voucher Clear Purchase
- Voucher Clear Return
- Sign On
- Sign Off

eFunds partnered with VeriFone (software libraries), AnyData (wireless modem), and Verizon (wireless provider) to understand the respective vendors requirements related to CDMA communications. This information was used to develop the software module within eFunds Omni 3600 EBT Application to support wireless communications.

POS Transaction Acquiring, Switching, and Settlement

The wireless communications bypassed the traditional (analog) acquiring telecommunications. But, once the POS transaction was delivered to eFunds it was processed through the existing eFunds transaction acquiring and EBT gateway switches in order to deliver the transactions to the State of Wisconsin's EBT processor. All the transactions from the Fondy Food Center pilot

were settled using the existing transaction settlement applications and funds movement mechanisms.

POS Documentation and Training

eFunds prepared a documentation binder for the Fondy Food Center which included overview documentation, issue reporting documentation, and escalation procedures. In addition, eFunds created Omni 3600 Supervisor, Clerk, and Voucher Quick Reference Guides to provide to the individual Farmer's Market retailers.

eFunds and MAXIMUS provided the five pilot farmer's market retailers with hands on training of the Omni 3600 Farmer's Market application in demo mode. This allowed for the farmer's market retailers to gain early exposure to the terminal and application while the communications module was being finalized.

Testing

The eFunds Omni 3600 Farmer's Market application was unit tested and certified using eFunds standard practices. Additional customer unit/acceptance tests were coordinate with MAXIMUS and then with MAXIMUS working with the pilot Fondy Food Center Merchants. These initial customer unit/acceptance tests were done using the Omni 3600 in demo mode as the communications module was not complete. These unit/acceptance tests were used to provide the Fondy Food Center and its pilot retailers an opportunity to focus on the Omni 3600 terminal and the screen/transaction flows. Upon completion of the communications module, an end-to-end certification test was held with Fondy Food Center to demonstrate the application.

Implementation

Five farmers were recruited to participate in the pilot project. Prototype units were shown to the farmers and "dry runs" were conducted with the farmers. Some of the farmers felt extremely nervous about using the new technology, but these concerns went away after the first couple of transactions.

The EBT units went "live" on September 13, 2003. "QUEST Accepted Here" banners were created and posted throughout the market. Advertising time was purchased on two urban radio stations (WKKV FM 100.7 and WMCS AM 1290 WMCS). A press conference was held on September 20. Two local news channels covered the event.

Measuring Impact

Fondy Food Center staff created a survey to measure transaction speed (measured as the time elapsed from the customer pressing "ENTER" after inputting the PIN to the start of the receipt

printing). Staff members then approached customers after the transaction with the following questions:

1) What do you think of the idea of offering Quest machines at farmers' markets like this one? Respondents were asked to rate it on a scale of 1 to 3 – "1" indicating "I don't like it," "2" meaning the customer felt "Neutral," and "3" indicating "I like it."

2) "Was the Quest machine fast enough for you?" Responses were recorded as a "Yes" or "No."

3) "Did the food seller know how to use the Quest machine?"

4) "Will the availability of this Quest machine make you shop here more often?"

5) Customers were asked to give their home ZIP Code.

SUMMARY OF RESULTS, LESSONS LEARNED

Telecom Transaction Speed, Error Rates

On 48 occasions the observed transaction speed averaged four seconds. Speed was measured by Fondy Food Center staff members.

Application

As the eFunds Omni 3600 Farmer's Market application was created from the eFunds Omni 3200 EBT application, the design and functionality had been previously accepted in the retail community. Furthermore, by leveraging the Omni 3200 EBT application, the solution integrated seamlessly into the eFunds operations support and customer service.

eFunds did implement a small screen/transaction flow modification in an effort to accommodate the POS device being handed to the consumer to swipe their card and enter their Personal Identification Number (PIN). Though this flow was available, many of the transactions were completed by the farmer market retailers performing the card swipe and then providing the terminal to the consumer for the PIN entry.

The application was designed with an "always on" connection to the wireless provider. This design allowed for the 13-second data connection to the wireless provider to occur once and for subsequent EBT transactions to take 2-4 seconds. As a result of concerns related to the life of the Omni 3600 battery, the merchants choose to power off the terminals between transactions. By powering off the terminal after each transaction, the data connection to the wireless provider was lost. When powering the terminal off between transactions, the EBT transaction time was 20 seconds as it included the data connection to the wireless provider and the time to service the EBT transaction.

The application printed two receipts as a part of each transaction, one for the consumer and one for the retailer. During the pilot, it was suggested that only the consumer receipt be printed to complete the transaction and that the retailer's receipts be stored until the closing of the terminal at which time all transaction receipts would be printed.

Overall, the eFunds Omni 3600 Farmer's Market application was reliable and easy to utilize.

Equipment

For the pilot, the VeriFone Omni 3600 hand held and portable electronic payment point of sale terminal was utilized. The sleek, lightweight, ergonomic designed device fit comfortably into the retailer's or consumer's hand. During the pilot, this device proved durable, reliable, and easy to utilize.

The device utilized the VeriFone intuitive, ATM Style, back lit display, which was readily accepted and easily utilized by both the retailers and consumers. The display was clear and easy to read whether it was being used in partial or full sun. The multi-line display allowed for the application to be intuitively displayed to the end user. The multi-buttons allowed for the application to be logically present and easily flowed for the end users to accomplish the required transaction. An overlay was designed and created to further enhance the use of the keys functions.

The device utilized an integrated card swipe and integrated PIN pad. The card swipe is well placed on the device with a diagram to communicate that the card may be swiped in either direction. The swiping of cards was easily accomplished by either the retailer or consumer. The integration of the PIN pad resulted in the device being streamlined for a wireless implementation. The standard keypad was used to allow the consumer to enter the PIN resulting in a seamless and quick input of a required portion of the transaction.

The device utilized an integrated high-speed thermal printer that offers easy paper loading. The integrated printer easily opens using the quick relapse button. As there is no spindle required, the paper can be easily placed into position with a pinch of paper fed out as the printer door is closed and clicked into a locked position. The device printer performed flawlessly during the pilot. A concern going into the pilot was the perceived small amount of paper. A new roll of receipt paper is 25' in length. The eFunds application receipts are about 6" in length allowing for approximately 50 transactions per roll. During the pilot, the number of transactions per roll was not raised as an issue.

The device utilizes a long lasting, removable lithium-ion battery. The battery can be charged either in the terminal (3 hrs to charge) or the accompanying base (2 hours to charge). A concern going into the pilot was the battery life. eFunds performed tests independent of the pilot to evaluate the battery life. As a result of these tests, it was identified that the application would require a 'sleep mode' in order to ensure the battery life was used optimally. Unfortunately, due to the pilot start date and the complexity of the developing a sleep mode feature, which maintained the 'always on' connection, eFunds chose to place this development on hold. During the pilot, the retailers could chose to either power the terminal off between transactions or replace the partially drained battery with a fully charge battery during the market hours. Each pilot merchant was equipped with a terminal, two batteries, and one base. A battery is easily replaced on the device as the current battery clicks out and the new battery is clicked into place. As a result of replacing the battery, the connection to the data network will be lost. However the next transaction, automatically and transparent to the user, reconnects to the data network. During eFunds phase II development, the application will be enhanced with a 'sleep mode' feature.

The device requires an antenna that can be either 900 MHz (single band) or 1800 MHz (Dual Band). Because the pilot was in Wisconsin, the Wireless provider required the 1800 MHz antenna. eFunds tested the signal strength of the device in various areas within the city of Milwaukee. The signal strength of the 1800 MHz device was very strong in it's testing.

The device utilizes a third party wireless modem. The wireless modem has functioned very well. During the pilot, there was one wireless modem failure. The wireless modem manufacturer has not yet certified to the wireless providers specifications as it relates to the implementation of static TCP/IP addresses. This results in a large TCP/IP range having to be defined in the eFunds core router for a layer of security. eFunds will be working with VeriFone, the third party modem provider, and the wireless provider to implement static TCP/IP addresses during phase II development.

The device utilizes a base unit that is needed to inject the encrypted PIN Pad key, download the software from the eFunds POS download server, and to charge batteries. The base functioned as required. eFunds intends to work with VeriFone to implement support for POS software downloads via the wireless communications.

Settlement

As eFunds leveraged its existing transaction acquiring, switching, and settlement infrastructure, all transaction settlement was completed without issue.

Help Desk

As the VeriFone Omni 3600 Terminal and the eFunds Omni 3600 Farmer's Market Application performed reliably, there were very few calls to the eFunds Help Desk. The calls made to the help desk were handled effectively.

During the pilot, one VeriFone Omni 3600 experienced a failed wireless modem. This was determined after troubleshooting assistance from the Help Desk and eFunds onsite support.

Transaction Volumes

From a "go live" date on September 13 to September 30, 2003, there were 25 approved transactions at the market, averaging $5.78 per purchase. Merchants recorded 71 approved transactions in the month of October, averaging $5.52 per transaction. In November there were 6 transactions averaging $21.31.

It is important to note that September is late in the growing season in Milwaukee, and the produce offerings at the Fondy Farmers' Market tend to be limited. Higher transaction volumes will be realized during the peak portion of the growing season, typically in June, July and August.

Damaged Food Stamp Cards

Of the 102 approved transactions, 18 users had food stamp cards that were unreadable by the swipe reader and had to be manually entered by the merchant. A preliminary review of the

transaction history of these cardholders at other stores showed that these card holders had the same problems at other stores, thus indicating that the EBT unit's swipe reader was not the cause of these problems.

Client Responses

As mentioned above, the market staff surveyed 48 food stamp clients that were observed making Quest card purchases.

- 46 food stamp clients responded favorably to the project, saying that they liked the addition of food stamp purchase ability at farmers' markets.
- Two customers said they felt "neutral" about the project.
- 47 out of 48 said that the transactions were completed quickly enough.
- One respondent expressed frustration with the EBT unit's inability to read his Quest card. His card number was entered manually.
- 42 out of 48 said that the merchants knew how to use the machines.
- The 6 that were not happy with the merchant's ability to use the EBT units had cards that were not readable. Their numbers had to be keyed in manually.
- When asked if the presence of the Quest machines would encourage them to shop at the market in the future, 46 responded with a "Yes."
- 2 respondents chose to not complete the survey at this point. Fondy staff commented that with the stigma still attached to food stamp users, these customers may have felt they were put in an awkward situation by the survey.
- Of the 46 that responded, 73% lived in areas immediately surrounding the Fondy Market: 53025, 53206, 53208, 53210, 53212, and 53216.
- The remainder generally came from areas near "feeder" streets that make for easy access to the market along Fond du Lac Avenue, Lisbon Avenue, and North Avenue.

Vendor Responses

Feedback from the vendors was generally positive. The units were easy to use, even when the food stamp client's card was damaged and the card numbers had to be entered manually. Questions persist, however, concerning the initial set up and monthly ACH fees, which will need to be lowered if the EBT units are to be used without subsidies from the markets.

Staff Response

Staff response was positive. Farmers and vendors adapted quickly to using the devices with a minimum of training. "It's just like an ATM" was a typical comment from the farmers.

Ongoing concerns about the EBT units revolve around unit anti-theft measures and battery life. The Fondy Market is located in a high crime area. The EBT units are small and presumably easy to steal. In the future, vendors will need to have some sort of holster or sling to deter theft.

A solution to the short battery life is needed. Batteries tended to last for four hours when the units were kept powered up. Market staff solved the problem by turning the units on only when needed and keeping fresh batteries in the market office.

Participation Costs

eFunds participation costs included the design, development, implementation and operations.

As eFunds incorporated this solution into its overall infrastructure, the most significant cost was the development and testing of the Omni 3600 Point of Sale software, which was approximately $75,000. The ongoing operations were leveraged with the exception of the wireless infrastructure.

In addition to staff time, which has not been determined, DHFS has provided $23,000 in consultant fees in support of the wireless POS effort. Fondy Food Center received a grant from the Public Service Commission of Wisconsin, of which $14,000 was spent on consultant fees.

Approximately $6,000 was spent on radio advertising to publicize the project and drive food stamp recipients to the farmers' market. $2,500 was spent on "Quest Accepted Here" banners and other colorful signs. $1,200 was spent by the agency to offset initial set up fees and monthly charges for the merchants.

Now that the technology has been developed, we estimate the first year cost of implementing this project at another farmers' market to be as follows:

Item	Qty	Unit of Measure	Price Each	Total
*VeriFone Omni 3600 Point-of-Sale EBT Unit **	5	Each	$1,350	$6,750
*EBT Unit carrying sling ***	5	Each	$40	$200
*Personnel ****	416	Hours	$12	$4,992
Safe for overnight EBT Unit storage	1	Each	$200	$200
Advertising				$3,000
Point-of-Sale banners and other publicity materials				$500
Initial Activation Fee	5	Each	$150	$750
			Total:	$16,392

* Pricing is preliminary, based on a five unit price and current market conditions. Price will decrease with higher order quantities and over time as the market matures.

** A fabric and velcro carrying sling will keep the EBT unit at the merchants side at all times.

*** Personnel will be responsible for distributing units at market opening, storing units at close of day, plus troubleshooting. Cost based on a market being open two days per week, 16 hours per week, for a 26-week selling season.

Ongoing monthly costs will be as follows:

Item	Qty	Unit of Measure	Price Each	Total
Monthly CDMA charges	5	Each	$15	$75
Monthly merchant terminal support, help desk access	5	Each	$30	$150
			Total:	$225

Realizing that the five participating farmers in this pilot project would balk at paying the above fees, the FFC chose to reimburse the merchants for these charges using grant funding. The FFC will do the same for 2004.

There is a $0.0375 charge per transaction, which was paid for by the participating farmers. There is also $7.50 fee for each transaction adjustment. This service was not used over the course of the project.

NEXT STEPS

Overall the pilot project was very successful. All stakeholders were satisfied with the solution.

eFunds will analyze the overall cost of designing, developing, implementing, and operating the Farmer's Market Wireless POS in order to develop pricing to offer the product throughout the United States. Additionally, eFunds will be evaluating the feedback from the Fondy Farmer's Market Pilot in order to enhance the product as a part of its Wireless Phase II project. Phase II enhancements will include multiple merchant support on a single terminal, placing POS device in "sleep mode" to conserve on battery life, optional printing of merchant receipt, and on display indicators for battery life and telecommunications signal strength.

Fondy Food Center will obtain up to 15 additional units for the 2004 farmers' market season.

DEFINITIONS, ACRONYMS, ABBREVIATIONS

This appendix was compiled with assistance of leading publications and vendors serving the POS/ATM transaction processing community including eFunds and VeriFone. Though these terms can be interpreted differently, this list represents our attempt to define these terms in the context of the Pilot Evaluation Report.

Note: For those of you receiving this document in an electronic version, I have provided some imbedded webopedia links (www.webopedia.com) to the terms and definitions used aiding further clarification, if so desired. These text links are underlined and noted in *blue italics*. By using your mouse to click on these links, additional detail can be researched.

Term	Definition
Acquiring	Acquiring is the receipt or routing of point of sale (POS) transactions that require payment authorization as well as the related hardware and software to support and complete this activity.
Always On	"Always on" packet data connection supported by Code-Division Multiple Access (CDMA,) only requires a one-time "dial" connection with the carrier during the active period of sending transactions. "Always on" eliminates the need to dial the network each time a transaction needs to be sent, for the terminal modem maintains a virtual connection to the wireless data network. This virtual connection provides a constant connection, resulting in a 2-4 second transaction time, making wireless transactions simpler and faster.
Analog	Almost everything in the world can be described or represented in one of two forms: analog or digital. The principal feature of analog representations is that they are continuous. In contrast, digital representations consist of values measured at discrete intervals.
Application	A complete, self-contained program that performs a specific function directly for the user. This is in contrast to system software such as the operating system, server processes and libraries which exists to support application programs.
ATM	Automated teller machines (ATMs) allow customers to carry out bank transactions without the assistance of a "live" teller.
CDMA	Short for Code-Division Multiple Access, a digital cellular technology that uses spread-spectrum techniques. Unlike competing systems, CDMA does not assign a specific frequency to each user. Instead, every channel uses the full available spectrum. Individual conversations are encoded with a pseudo-random digital sequence. Background The world's first cellular networks were introduced in the early 1980s, using analog radio transmission technologies such as AMPS (Advanced Mobile Phone System). Within a few years, cellular systems began to hit a capacity ceiling as millions of new subscribers signed up for service, demanding more and more airtime. Dropped calls and network busy signals became common in many areas. To accommodate more traffic within a limited amount of radio spectrum, the industry developed a new set of digital wireless technologies called TDMA (Time Division Multiple Access) and GSM (Global System for Mobile). TDMA and GSM used a time-sharing protocol to provide three to four times more capacity than analog systems. But just as TDMA was being standardized, an even better solution was found in CDMA. Commercial Development The founders of CDMA, QUALCOMM, realized that CDMA technology could be used in commercial cellular communications to make even better use of the radio spectrum than other technologies. They developed the key advances that made CDMA suitable for cellular, then demonstrated a working prototype and began to license the technology to telecom equipment manufacturers.

Term	Definition
	The first CDMA networks were commercially launched in 1995, and provided roughly 10 times more capacity than analog networks - far more than TDMA or GSM. Since then, CDMA has become the fastest-growing of all wireless technologies, with over 100 million subscribers worldwide. In addition to supporting more traffic, CDMA brings many other benefits to carriers and consumers, including better voice quality, broader coverage and stronger security.
CDMA 2000 1X Wireless Technology	CDMA2000 1X technology supports both voice and data services over a standard (1X) CDMA channel, and provides many performance advantages over other technologies. First, it provides up to twice the capacity of earlier CDMA systems (with even bigger gains over TDMA and GSM), helping to accommodate the continuing growth of voice services as well as new wireless Internet services. Second, it provides peak data rates of up to 153 kbps (and up to 307 kbps in the future), without sacrificing voice capacity for data capabilities. (Note: one kbps is 1,000 bits of data per second.) CDMA2000 1X phones also feature longer standby times. And because it's backwards-compatible with earlier CDMA technology, CDMA2000 1X provides an easy and affordable upgrade path for both carriers and consumers.
Code	In the context of this report, the use of the word "code" refers to the source code or program that provides instructions to the POS device causing it to behave in a predetermined manner.
Communications Module	Refers to a communications software package that makes it possible to send and receive data over telephone (analog) or wireless (digital) connections through modems.
Data-Packet Network	Packet A piece of a message transmitted over a packet-switching network. See under *packet switching*. One of the key features of a packet is that it contains the destination address in addition to the data. In Internet Protocol (IP) networks, packets are often called *datagrams.* Packet Switching Refers to protocols in which messages are divided into packets before they are sent. Each packet is then transmitted individually and can even follow different routes to its destination. Once all the packets forming a message arrive at the destination, they are recompiled into the original message. Most modern Wide Area Network (WAN) protocols, including TCP/IP, X.25, and Frame Relay, are based on packet-switching technologies. In contrast, normal telephone service is based on a circuit-switching technology, in which a dedicated line is allocated for transmission between two parties. Circuit-switching is ideal when data must be transmitted quickly and must arrive in the same order in which it's sent. This is the case with most real-time data, such as live audio and video. Packet switching is more efficient and robust for data that can withstand some delays in transmission, such as e-mail messages and Web pages
EBT	The United States Department of Agriculture (USDA), Food and Nutrition Service (FNS) definition of Electronic Benefit Transfer (EBT) is an electronic system that allows a recipient to authorize transfer of their government benefits from a Federal account to a retailer account to pay for products received.
EFT	Electronic Funds Transfer (EFT) provides for electronic payments and collections
Gateway Switches	The gateway switch provides a connection between all EBT transaction acquirers and EBT card issuers (EBT processors such as eFunds Corporation.) This allows an EBT card to be used at an acquiring device regardless of who owns the device or who owns the cardholder's account and approves the transaction
Leveraging	This term was used in two different contexts: software and support. In regards to software, leveraging the Omni 3200 EBT software application refers to the ability to edit the existing Omni 3200 software without creating a new software application from scratch. In regards to support, leveraging on the Omni 3200 EBT software refers to the ability to utilize the existing reporting, settlement and customer support structure that is already in place for the Omni 3200 device, making minor changes as required rather than creating new processes.
MHz	Abbreviation for *megahertz*. A megahertz (MHz) is one million (10^6) hertz, a measure of frequency. A MHz represents one million cycles per second. The speed of microprocessors, called the clock speed, is measured in megahertz. For

Term	Definition
	example, a microprocessor that runs at 200 MHz executes 200 million cycles per second. Each computer instruction requires a fixed number of cycles, so the clock speed determines how many instructions per second the microprocessor can execute. To a large degree, this controls how powerful the microprocessor is. Another chief factor in determining a microprocessor's power is its data width (that is, how many bits it can manipulate at one time). In addition to microprocessors, the speeds of interfaces are also measured in MHz. Single Band vs. Dual Band: Band refers to the frequency of the wireless network. Sprint and Verizon originally created single band networks to process wireless data. These were referred to as 800MHz. These networks are now being upgraded to provide greater bandwidth and speed and referred to as Dual Band, 1800/1900 MHz. At this time, states may support only Single Band or a combination of Single and Dual Band. As demand increases, the goal is to offer Dual Band is all states.
Modem	Short for *modulator-demodulator.* A modem is a device or program that enables a computer to transmit data over, for example, telephone or cable lines. Computer information is stored digitally, whereas information transmitted over telephone lines is transmitted in the form of analog waves. A modem converts between these two forms.
PIN	PIN stands for Personal Identification Number, a four digit password used for security and authentication. EBT processing utilizes a PIN number for identify and approval verification.
POS	Point of Sale Device
Protocol	An agreed-upon format for transmitting data between two devices. The protocol determines the following: the type of error checking to be used data compression method, if any how the sending device will indicate that it has finished sending a message how the receiving device will indicate that it has received a message Also see TCP/IP.
Settlement	A daily procedure that adjusts the financial position of each member (the State, eFunds, clients, merchants and networks) participating in an EBT program. (Chris, this is out of eFunds Glossary.)
Software Libraries	A software library is a collection of subprograms used to develop software. Libraries are distinguished from executables in that they are not independent programs; rather, they are "helper" codes that provide services to other independent program. (Louise)
Software Module	A software module is a section of the program, (see “Code” above) which provides instructions to the POS device.
Static	This term was used in reference to “static TCP/IP addresses” and refers to programming that is fixed and not capable of action or change. The opposite of static is dynamic. (Chris)
Switching	See Gateway Switches
TCP/IP	Transmission Control Protocol/Internet Protocol (TCP/IP) is a set of protocols used to transmit data. Transmission Control Protocol/Internet Protocol is the suite of communications protocols used to connect hosts on the Internet. TCP/IP uses several protocols, the two main ones being TCP and IP. TCP/IP is built into the UNIX operating system and is used by the Internet, making it the de facto standard for transmitting data over networks. Also see protocol.

Term	Definition
Wireless Infrastructure