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Field Evaluation of Electronic Fee-Collection Machines for Forest Service Recreation Sites

Field Evaluation of Electronic Fee-Collection Machines for Forest Service Recreation Sites

Jerry Taylor Wolf
Project Leader

USDA Forest Service
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Introduction

Fees have been collected at USDA Forest Service recreation sites and parking areas for many years. Traditionally, the Forest Service has relied on staffed entrance stations or self-service fee depositories (fee tubes or "iron rangers"). More recently, daily and seasonal passes or permits have become popular methods for fee collection.

In 1996, Congress authorized the Forest Service to initiate the Recreation Fee Demonstration Program (Figure 1). The aim of the program is to collect recreation fees for the use of a specific facility, to experiment with different fee-collection systems, and to evaluate public acceptance of new fees. With the Fee Demo Program, up to 95 percent of the fees remain with the field unit for site maintenance and improvement, rather than being deposited in the U.S. Treasury's general account. Although acceptance has been varied, the link between fees paid and improvements made at a site has helped sell the Fee Demo Program in some parts of the country.

The need to collect more revenue and sometimes increase fees at recreation facilities has prompted Forest Service managers to look beyond conventional collection techniques, especially in heavily used areas. The costs of collecting fees, concerns about the safety of employees who handle money, vandalism, and the need for detailed record keeping are some reasons for considering different methods.

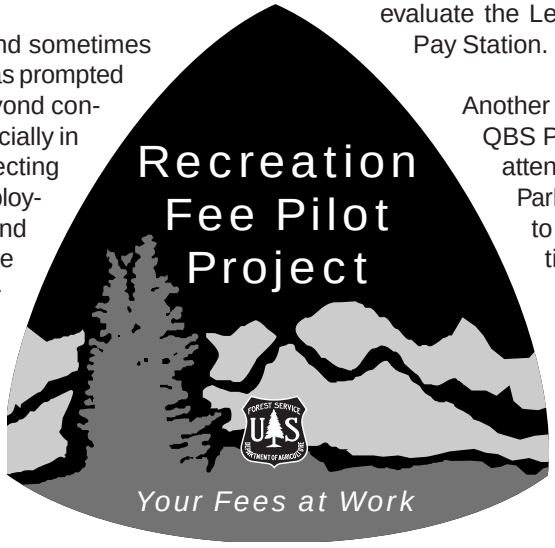

Figure 1—The Fee Demonstration Program was authorized by Congress in 1996 as a test in which fees generated at a site could remain there rather than being deposited in the U.S. Treasury.

To help those considering investing in electronic collection equipment, the Missoula Technology and Development Center (MTDC) was asked to document onsite use of fee-collection machines.

MTDC looked at two electronic fee-collection machines used by the Forest Service, the Lexis 901 Pay Station and the VenTek Pay Station. This report includes information about the machines and installations at Vancouver's Stanley Park, the Cave Creek and Tonto Basin Ranger Districts of the Tonto National Forest, and the Mt. Baker Ranger District of the Mt. Baker-Snoqualmie National Forest. Contact information and machine specifications can be found in the appendixes at the end of this report.

The fee-collection equipment hasn't been used long enough for a thorough assessment of its strengths and weaknesses. MTDC made field visits to equipment installation sites and reviewed specifications provided by manufacturers to evaluate the Lexis 901 Pay Station and the Ventek Pay Station. MTDC has not tested the equipment.

Another electronic fee-collection machine, the QBS Pay Station, has recently come to our attention. It is distributed by Dominion Self-Park Systems, Ltd. We didn't have a chance to review the machine under field conditions. However, this report includes technical specifications and contact information for the Dominion equipment.

Is Electronic Fee Collection Right For You?

Before deciding on an electronic fee-collection system, recreation managers need to carefully consider these factors.

Amount of Revenue to be Generated

Procuring, installing, and servicing electronic fee-collection machines can be expensive. Most successful electronic fee-collection systems generate revenues of $16,000 to $300,000 annually.

Risk of Vandalism

The machines are vandal resistant but not vandal proof. They are probably a poor choice in remote areas known for vandalism. In such situations machines can be leased with a service clause included in the contract.

Availability of Power

All of these machines require power. The initial cost of power lines and maintenance may be prohibitive at remote sites. Batteries can power some systems, and are used as a backup power source in other systems. Expect additional costs for a solar-powered (photovoltaic) option.

Climate

The capabilities of electronic fee-collection machines may vary as the temperature and humidity fluctuate. Building and maintaining shelters for the machines adds to their cost. Investigate the temperature operating range and the effect of moisture on any electronic system before purchasing it.

Fee-Collection Plan

Electronic fee-collection machines may be the best option at sites that receive very heavy use or at sites where the machines can supplement staffed fee-collection booths during the busiest periods and replace paid attendants during slower times. They may also be the best option when the detailed records provided by the machines can reduce fraud and theft, or when a package of service options, signs, collection, and marketing can be provided by a single vendor.

Operating Personnel

Some machines require substantial computer knowledge to program them. Does your staff have the needed skills?

Finally, an electronic fee-collection system makes sense when it can provide better customer service than other alternatives.

Lexis 901 Pay Stations

Lexis Systems, Inc., is a member of the Universal Group of Companies (Universal Parking) headquartered in Vancouver, British Columbia, Canada. When Universal Parking designed an electronic fee-collection machine, it established the Lexis Systems' manufacturing division. Prototypes were field tested for 2 years. Lexis Pay Stations are currently used in Federal, State, county, and city parks, campgrounds and boat launches, and at universities, hospitals, and hotels.

Features

The Lexis 901 Pay Station accepts all denominations of coins and bills and provides change. It also accepts credit and debit cards. The Lexis 901 Pay Station has many security features, including the ability to generate an audit report. Every payment transaction is recorded in a Microsoft Access data base, allowing for customized reports. Custom reports can include time of purchase, ticket value, and additional information. Data are retrieved using a notebook or palmtop computer. Other security features include a stainless-steel crossbar to frustrate potential thieves and a double-key system. All cash is fully secured in a locked cash bag inside a locked vault. Even fee-collection personnel have no direct access to the money.

The casing of the latest version of the Lexis 901 Pay Station is stainless steel, reducing the likelihood that humidity or salty ocean air might corrode it. The unit is firmly sealed, minimizing effects of sand and dust on internal components.

Lexis Systems is developing a wireless communications feature to allow remote communications and data retrieval by cellular telephone or satellite links. An alarm system will automatically report tampering, the need for more change, and the need to empty the cash bag. The wireless communications feature will reduce the labor needed to monitor the machines. This labor-saving feature may lower the amount of revenue needed to justify installing a machine at an economically marginal site.

Procurement Alternatives

The most comprehensive option for purchasing Lexis 901 Pay Stations is a turnkey collection package that includes machines, installation, signs, maintenance, fee collection, and compliance enforcement. Typically, Universal Parking receives a percentage of the revenues collected from the machines as part of the contract. According to company representative John Hollo, about $300,000 in annual gross revenues is needed to justify a turnkey operation. Contract bid prices reflect the number of machines, maintenance costs, and the projected amount of use.

Lexis Pay Stations may also be purchased, leased, or rented. Customized service is based on specific needs and requirements of the site. Contact Universal Parking for more information.

Installations at Vancouver's Stanley Park

In June 1995, Universal Parking was awarded the contract to install 65 electronic fee-collection machines and to provide fee-collection and compliance enforcement services at Stanley Park in Vancouver, BC (Figure 2). This contract is one of Canada's largest single-area parking management contracts.

Figure 2—Signs tower above the Lexis 901 Pay Station at the entrance to the zoo in Stanley Park at Vancouver, BC.

According to the company, compliance is over 90 percent. Most of the machines are located in secluded areas of the park and vandalism is a major problem. More than 200 transients live in over 1,000 acres of parkland. Police patrols end at sunset. Improvements to the Lexis Pay Stations since 1995 have strengthened the machines and reduced the damage caused by vandalism and break-in attempts. These improvements are reflected in the current 901 model.

Installations at the Mt. Baker Ranger District

The Glacier Public Service Center and Heather Meadows Visitor Center in the Mt. Baker-Snoqualmie National Forest each have a Lexis 901 Pay Station. In July 1999, I visited the Glacier Public Service Center with Christina Martin, Fee-Collection Coordinator for the Mt. Baker Ranger District, and Information Specialist, Debra Paul. Both sites are within a 2-hour drive of the Seattle metropolitan area. Heather Meadows is on a National Scenic Byway that accesses Mt. Baker. During the summer, Heather Meadows Visitor Center is open from 10 a.m. to 4 p.m., 7 days a week. Fee Demo revenues fund 12 seasonal and volunteer staff members at the Center. Heather Meadows was still snowed in, so I did not visit the Center.

In the fall of 1997, two Lexis 901 Pay Stations were purchased for $17,000 each. Tastefully incorporating a fee-collection machine into the historic Glacier Public Service Center (Figure 3*)* was a challenge. Luckily an existing sign frame was a perfect fit for one machine. This machine is powered by standard 120-volt AC power. It allows visitors to purchase the required passes 24 hours a day. Passes can also be obtained inside the converted Ranger Station, listed on the National Register of Historic Places.

Forest Service employees maintain the fee-collection machines at the Glacier Public Service Center and the Heather Meadows Visitor Center. They also provide compliance enforcement.

Universal Parking provided free initial training. Two District employees traveled to company headquarters in Vancouver, BC, to learn how to clean the machines. Each machine's internal components must be cleaned with cotton swabs and alcohol at the beginning of the visitor season. The machine at the Heather Meadows Visitor Center operates on a nonrechargeable lithium battery and two rechargeable automobile batteries. The charge on the automobile batteries

Figure 3—A Lexis 901 Pay Station is installed at an information board at the historic Glacier Public Service Center in the Mt. Baker-Snoqualmie National Forest.

is indicated by a monitoring light, but the lithium battery does not have a monitoring light. A low lithium battery has caused the other batteries to work inefficiently in the past and important accounting information was lost. The company now advises changing the lithium battery once a year. PC Charge, a program developed by Go Software, is used to process credit cards. This credit card process works in conjunction with the Lexis software, which stores all of the payment information until it is downloaded. When there have been problems downloading data from the machines over a modem, Lexis computer programmer, Tina Rowe, has helped. Computer knowledge is necessary to operate the system. A service call for the two machines costs about $170. In 1999, Universal Parking installed new chips in the control boxes to make the units year 2000 compliant, performed general maintenance, and cleaned the machines.

There have been no significant security or compliance problems. Money has been collected from once a day to once every 5 days for both machines, depending on the need to process credit card payments by hand. The machines have double-lock and double-key systems.

Newer versions of the Lexis 901 Pay Station have eliminated some earlier problems. The first-generation machines used at the Mt. Baker Ranger District have sometimes been difficult to keep in operation.

The Mt. Baker staff has found electronic fee machines to be helpful. The machines can collect fees when no employees are around, accept credit cards for payment, and provide an alternative to visitors waiting in line at entry booths. There have been disadvantages, particularly when electronic fee machines have been used alone. Areas around the machines can become congested. If one visitor decides not to wait to use the machines, other visitors will follow that trend. Also, some visitors feel overwhelmed by machines and have a difficult time when employees are not available to assist them.

Installations on the Tonto National Forest

The Salt and Verde River Complex of the Tonto National Forest includes eight developed recreation areas on the Cave Creek, Mesa, and Tonto Basin Ranger Districts. Within these areas, 50 recreation sites are included in the Fee Demo Program. The reservoirs and rivers are in a Sonoran desert setting and provide recreation opportunities for 3 million people who live within a 1-hour drive of the complex. More than 8 million people visit the Forest annually.

Contract Features

As part of a large 1998 Southwestern Region contract with Universal Parking, 38 fee-collection sites were identified for Lexis 901 Pay Stations. Additional needs included concrete pads, ramadas (shaded picnic pavilions), and signs.

A new contract was awarded to Universal Parking in 1999 after the company successfully bid to place machines on three Ranger Districts. Universal Parking receives 17.5 percent of the predicted gross annual revenue and 50 to 75 percent of any increase in predicted gross annual revenue (to a certain level) through the end of the contract period, September 30, 2001.

The Tonto Basin and Mesa Ranger Districts originally planned to have the contractor implement the failure-to-pay option of the contract. This option would have allowed the contractor, instead of the Forest Service, to issue a failure-to-pay notice and charge a penalty fee to visitors who did not pay the required parking fee. After many weeks of discussion and negotiations, the Forest Service decided not to implement this option, due to internal concerns about personnel outside the agency being responsible for compliance.

Cave Creek Ranger District Site Visit

Fee Demo sites on the Cave Creek Ranger District include the Horseshoe Lake, Bartlett Lake, and Needle Rock Recreation Areas. In 1998 when the Cave Creek Ranger District switched from fee tubes to Lexis 901 Pay Stations, annual gross revenue increased from $350,000 to $700,000. During June 1999, I visited several of these sites.

The Horseshoe Lake Recreation Area was the first site Fee Demo Coordinator, Nancy Myers, and I visited. A bright yellow sign 14 miles from the site announced that ***All Areas Bartlett Lake*** required a parking fee (Figure 4). Two additional signs alerted visitors to the required payment for parking. All signs are the responsibility of Universal Parking as part of the contract. Specific contract requirements, including Forest Service approval of prototype signs, are

one way to ensure overall sign quality, and to avoid confusing wording, gaudy colors, flimsy supports, or improper placement. The road is paved to the Horseshoe Lake Recreation Area fee machine and then graveled for the next 10 miles to the site. The machine is a drive-up version, although it cannot be reached easily through a vehicle window (Figure 5).

Figure 4—Universal Parking furnished signs for the Cave Creek Ranger District of the Tonto National Forest. This sign, 14 miles from the recreation site, alerts visitors to the parking fees.

Figure 5—A drive-up model of the Lexis 901 Pay Station is 10 miles from the Horseshoe Lake Recreation Area in the Tonto National Forest. This machine is set back from the curb, forcing motorists to step outside their vehicles to pay the fee.

Vandalism to this machine has been a problem. Vandals have used a blowtorch to steal money, have shot the bill receiver, and have pushed worms into the coin entry. When the machine is disabled, a sign tells visitors that the machine is temporarily out of order and that they should pay on their way out. Universal Parking employees are stationed at Bartlett Lake Vista on the weekends and holidays.

The most serious problems have been verbal abuse and nonpayment. More serious problems (such as physical attacks) have not occurred. Vehicles found without passes on the dash receive a warning or a $50 citation. Because the Needle Rock Recreation Area has been associated with gang activity, Law Enforcement Officer, Bob Shields, also covers noncompliance matters. Part of his salary is paid from Fee Demo funds. Other Fee Demo fund improvements at the three recreation areas are contract refuse collection service, cleaner rest rooms, new picnic tables and grills, litter pickup, graffiti removal, replacement of shot-up signs, and other vandalism-related repairs.

Bartlett Lake is the most popular of the three District sites**.** A drive-up version of the machine is located on a large covered median. Although it can be reached from a vehicle, a first-time customer needs to get out to read the operating instructions, some of which are on the back of the machine. Because customers do not tend to read signs, the fewer signs the better. Any signs must be easy to understand. Multilingual signs are available at this site.

Originally, the daily fee covered a 30-hour period from 12:01 a.m. to 6:00 a.m. the following day. The additional 6 hours (12:00 a.m. to 6:00 a.m.) were added to accommodate overnight anglers. The 30-hour period confused visitors. Customer consensus was that a daily fee for 24 hours from the time of purchase would be easier to understand and improve compliance. The Lexis 901 Pay Station was reprogrammed to print the recorded time of purchase on the ticket, creating a 24-hour pass.

I accompanied Nancy Myers to the Needle Rock Recreation Area at the end of the day. Several Forest visitors made abusive comments as they drove by without purchasing passes. The complaints may have been in response to the fee-collection machines, her uniformed presence, or both.

Tonto Basin Ranger District Site Visit

Recreation Planner, Dave Killebrew, and District Ranger, Tina Terrell, were my hosts on the Tonto Basin Ranger District. The District's Fee Demo sites generated over $500,000 in 1998. The District Interpretive Specialist calls local radio stations on Saturday morning to let the public know where space is available for recreation. The Tonto Basin Ranger District has 22 recreation sites; five are free.

The Burnt Corral Recreation Area is on Apache Lake. Campsites close to the water and natural shade make it the favorite campground on the District. With 79 campsites, this location was a logical choice for a fee-collection machine.

The Cholla Recreation Area has one of the largest solar-powered campgrounds in the United States. The campground has received a Department of Energy award and attention in several magazines, including *Solar Today*. Fee Demo funds pay to train employees who operate the equipment and maintain the facility (Figure 6).

Figure 6—Universal Parking employees install a Lexis 901 Pay Station next to information boards at the Cholla Recreation Area in the Tonto National Forest.

Some changes have already been made to improve the Lexis 901 Pay Stations. A crossbar was added to prevent vandals from opening fee machines illegally (Figure 7). Another improvement is a larger display screen that is easier to read. Tina Terrell said that new informational signs with large lettering would be placed next to the machine. Although the upgraded machines were scheduled to be operational by Memorial Day weekend, they were not operational until the first week of August 1999. This delay was due to installation problems and extra time needed to acquire customized signs.

Figure 7—A stainless steel crossbar may help prevent thieves from illegally breaking into Lexis 901 Pay Stations.

VenTek Pay Stations

VenTek Corp. manufactures the second type of electronic fee-collection machine evaluated (the System 5 and the Model 400). The Oregon Dunes National Recreation Area in the Siuslaw National Forest uses VenTek Pay Stations as do other private and public installations in the Seattle area.

The VenTek System 5 Pay Station is powered by 120 volts AC. An internal battery backup will power the machine for at least 24 hours if the primary power is interrupted. The battery does not have to be monitored. Optional solar power is available. The exterior housing is reinforced to prevent vandalism. The case is insulated and equipped with a thermostatically controlled heater that keeps the interior temperature above 35° F. When the interior temperature exceeds 90° F, a cooling fan expels air.

The VenTek System 5 Pay Station offers 60 different tickets for multiple-choice ticket dispensing. VenTek developed this quick-pick feature about 4 years ago to give customers more choices. An MS-DOS based personal computer can be used in the field to adjust the program that controls the rates, or the changes can be programmed remotely over a phone connection. The machine is available with or without a keypad that can be used for computer applications and campground data entry, such as issuing multiple-day passes or Golden Age and Golden Access permits. The printer issues a ticket on moisture-resistant paper stock.

Installations at the Oregon Dunes National Recreation Area

In October 1996, the Oregon Dunes National Recreation Area began planning to implement day-use fees. The desired system had to be simple to use, offer visitors a wide choice of payment methods, and be located as near as possible to the recreation area (Figure 8).

The system implemented at Oregon Dunes included 10 steel fee tubes, 6 electronic fee-collection machines, and 3 staffed collection booths. The collection booths are generally near electronic fee-collection machines and replace the machines when visitation is heavy.

Northwest Parking Equipment, a distributor for VenTek Corp., was awarded the contract to supply electronic fee-collection machines. At that time, the VenTek System 5 Pay Station was the only one that could meet the contract specifications.

Advance site work for the machines (installation of power and telephone lines, shelters, and machine pedestals) was completed in June 1997. Forest Service employees finished installing the machines by mid-August. Roy Whipple, of Northwest Parking Equipment, activated the electronic modules and provided routine maintenance and operational training.

Routine maintenance involves keeping bill acceptors and printers dust free, adding paper, and adding change. The bill acceptors need to be removed and cleaned when bills are not accepted consistently. Cleaning is a 5-minute process most easily performed in the office. Occasionally the acceptor needs to be sent back to the distributor for tuning or new parts. This procedure has been infrequent and inexpensive. Turnaround is prompt because most servicing is handled by the distributor rather than the factory. Spare bill acceptors were purchased to ensure that machines would continue operating even when bill acceptors were being serviced.

Other spare modules were purchased, including the processor, power supply, printer, and coin changer. Having spare modules is the key to repairing vandalized machines and troubleshooting problems. Suspect modules can be swapped out to isolate problems.

Figure 8—Visitors at the Oregon Dunes National Recreation Area are sheltered from the weather while using a conveniently located VenTek Pay Station.

Software programming is based on MS-DOS, so it is helpful to have an employee proficient with MS-DOS instructions. Programming fee-collection machines can be complicated. In this situation, the software for transmitting credit card transactions is controlled by a credit card processing firm, not by the equipment manufacturer. It took about 4 months to get the software updates that made the two offline machines Year 2000 compliant. Loading new processors can be particularly complicated.

The VenTek System 5 Pay Stations are programmed to dispense nine different tickets at the Oregon Dunes National Recreation Area. Tickets dispensed in 1999 included a $3 day-use pass, two types of $1.50 discount day-use passes, 2-, 3-, 4-, and 5-day passes, and two types of annual passes.

Tickets being dispensed in 2000 include a Regional annual pass and coupons for overnight camping in nearby campgrounds. Oregon Dunes would like to be able to accept credit cards, eliminating the need for campers to write checks or to pay in cash. Banks do not charge for electronic deposits, but they do charge for the time bank employees spend counting deposits in fee envelopes.

Vandals have made several attempts to break into the machines and two attempts to disable them. Vandals have tried hammering and prying the machines, building a fire on them, and pouring unknown liquids into them. Repair costs were minimal.

Maintenance costs have included refinishing equipment casings. The factory finish was not adequate for a coastal environment. Some corrosion has occurred on the outside of the machines, possibly because of poor application of the primer coat. No corrosion has been found inside the machines or on the interior components even though the machines are not totally sealed. The internal components have held up well through the mild, wet winters on the Oregon coast. Three-sided shelters protect all the machines. The casings are somewhat insulated, allowing heat from the electronic modules to keep the interior from getting too cold. The pedestals were ordered with a hot-dipped galvanized finish that has protected them.

Machine placement is a critical consideration. The machine should not face the direct sun unprotected because visitors will have a hard time reading the LCD (liquid crystal display) screen.

After three seasons, the VenTek System 5 Pay Stations' capabilities have been flexible enough to meet new and changing needs. Plans are underway to include another machine in a high-use campground.

Seattle Area Installations

Roy Whipple, founder of Northwest Parking Equipment Company in Seattle, has been a dealer for VenTek Pay Stations since 1989. Northwest Parking and other VenTek distributorships can provide training, install fee-collection machines, and maintain them.

VenTek has sold more than 60 fee-collection machines to the National Park Service, including the first fee-collection machine purchased by Mt. Rainier National Park in 1996. Various models of VenTek Pay Stations are available. Whipple showed me a Model 400 Pay Station and a System 5 Pay Station in use at La Conner, WA.

La Conner is busy during the summer's annual Marine Tulip Festival. It is also the departure point for whale-viewing excursions, as well as other tourist activities. Because parking is often a problem, the town built an 89-spot parking lot. A Model 400 Pay Station was installed at the lot 4 years ago. It is a simple, low-maintenance machine, designed for an area where parking revenue is low (Figure 9).

Figure 9—The VenTek Model 400 Pay Station is suited for seasonal parking lot applications.

The VenTek Model 400 Pay Station processes credit cards offline and is set at a $2 flat rate. The machine does not provide change to the customer. Because this style of machine cannot be hooked into telephone lines, an audit ticket is printed when the front of the machine is opened. For employee safety and security purposes, fees are collected by two people.

The Model 400 Pay Station has a large backlit LCD display and an ATM-style, menu-driven interface that prompts customers to choose from several predefined rates. If use increases, the Model 400 Pay Station can be upgraded to include more selections using the quick-pick feature and a larger coin hopper.

A VenTek System 5 Pay Station is used at a nearby lot where boat trailers are parked (Figure 10). A simple shelter at Anacortes Park in Washington protects a VenTek Pay Station in a campground (Figure 11). VenTek Pay Stations are also used in various State and city parks, hospitals, and universities.

Purchase prices and specifications for VenTek Pay Stations can be obtained directly from VenTek or from an authorized distributor.

Figure 10—A tall sign allows boaters to spot the VenTek System 5 Pay Station in the parking lot even when the lot is full. Metal pipe protects the shelter and machine from vehicles.

Figure 11—A simple shelter protects a VenTek Pay Station at a campground in Anacortes Park, WA.

QBS Pay Stations

After MTDC had conducted its field evaluations, the Center learned about a third type of electronic fee-collection machine, the QBS Pay Station. The machine is manufactured in South Korea by QBS Electronic Co., Ltd. MTDC staff did not review any field installations of QBS equipment. Dominion Self-Park Systems, Ltd., in North Vancouver, BC, distributes the Accord, the Apex, and Concord models of the QBS Pay Stations. Dominion, which was founded 8 years ago, is owned and operated by Tom Lucas. He cites the following advantages for the QBS Pay Stations:

❑ **Ease of Maintenance**—A few tools and basic technical aptitude are all that are needed to maintain these machines. Dominion provides initial and ongoing training and supplies a complete service manual for software and hardware. Telephone assistance is available 7 days a week.

❑ **Security**—The machines have a secure locking system, heavy-duty construction, onsite alarm, and can have a remote alarm.

❑ **Bilingual**—The machines can communicate in any two Romance languages, such as English, French, and Spanish. A third language, using any script, can be added for an additional cost.

❑ **Easy-to-Use**—Three-color, easy-to-follow instructions show users how to operate the machines.

❑ **Rate Choices**—The machines supply as many as 30 rate choices. Different kinds of ticket stock can be used as an alternative to the standard thermal paper. For example, a thermoplastic permit with a preprinted liability waiver (similar to those issued at ski areas) could be used at snowmobile parks and boat launches.

❑ **Remote Access**—Sales records and audit information can be downloaded onsite, or a network computer and software can be supplied for $13,700 that will allow the machine's owner to access the machine from a remote location. Internet and telephone reservations for campgrounds can be uploaded to ensure that the same campsite is not sold twice on the same day. As many as 15 components, such as the printer, credit card reader, and bill acceptor, can be checked with diagnostic software to see if they are working properly. Screen messages and choices can be edited from an office computer. A telephone line provides credit card authorization and the ability to use debit cards. Wireless point-of-sale authorization will be available with the new Concord Pay Station in the fall of 2000. Designed as a combination of the Accord and Apex models, this machine will feature an audible help system that can access information by radio waves, telephone lines, and cell or satellite links (Figure 12).

❑ **Number/PIN Pad**—The Apex Pay Station has a PIN pad feature that allows campsite numbers to be entered as they are purchased to prevent duplicate sales. A printout of sites that are paid or unpaid can help campground hosts check whether campers have paid or not.

The Accord, Apex, and Concord Pay Stations accept all forms of payment: coins, bills, tokens, smart card, or credit cards; they make change; and they stack bills. These machines feature components that can be swapped in the field and the machines can be networked. They come complete with battery backup, a pedestal, a 1-year supply of tickets, a comprehensive warranty, and a parts replacement policy.

Installations of QBS Pay Stations can be found at the Pacific Rim National Park in Canada and many other National Parks in the Canadian Park System. Machines may be purchased or leased. A turnkey option is available.

Figure 12—The QBS Concord Pay Station, a combination of the Accord and Apex models, has a motion sensor that triggers a recording when customers approach. Customers can push the *Help* button to repeat the instructions.

About the Author

Jerry Taylor Wolf received a bachelor's degree in education from Indiana State University. She began her Forest Service career as a civil engineering technician on the Flathead National Forest. She served as a Survey Party Chief on the Beaverhead and Lolo National Forests. In 1994 she came to the Missoula Technology and Development Center to work as a mechanical engineering technician.

Appendix A—Contact Information

Forest Service Contacts

Mt. Baker-Snoqualmie National Forest
Debra Paul, Public Services
Phone: 360–856–5700 ext. 220
E-mail: dcpaul@fs.fed.us

Tonto National Forest
Dave Killebrew, Recreation Planner
Phone: 602–225–5200

Cave Creek Ranger District
Nancy Myers, Fee Demo Coordinator
Phone: 408–595–3300

Oregon Dunes National Recreation Area
Siuslaw National Forest
Theo Theobalt, Recreation Planner
Phone: 541–271–3611

Lexis Systems, Inc.

1682 West 75th Avenue
Vancouver, BC Canada V6P 6G2
Phone: 604–224–4444 or 888–755–3947
Fax: 604–267–7275
Web site: www.parking.bc.ca

Company Representatives
General Information: John Hollo
Sales: Robert Ziola
Operations: Justin Powell
Customer Support: Rigi-Ladez

VenTek International, Inc.

975 Transport Way
Petaluma, CA 94954
Phone: 707–773–3373 or 800–748–6267
Fax: 707–773–3381
Web site: www.ventek-intl.com

Distributor
Northwest Parking Equipment Co.
15029 Bothell Way NE, Suite 200
Seattle, WA 98155

Company Representative
Roy Whipple
Phone: 206–363–5265
Fax: 206–367–6578

Dominion Self-Park Systems, Ltd.

239 East 1st Street
North Vancouver, BC, Canada V7L 1B4
Phone: 604–988–6042 (Toll free, Canada and USA: 888–424–2677)
Fax: 604–988–6624
Web site: www.parkingmeter.com
E-mail: champs@portal.ca

Company Representative
Hayward Kirsh
Phone: 250–352–6021
E-mail: haywardk@uniserve.com

Customer Contact
Scott Aitken, Finance and Administration Manager
Pacific Rim National Reserve
2185 Ocean Terrace, Box 280
Ucluelet, BC, Canada V0R 3A0
Phone: 250–726–4704
Fax: 250–726–4720
E-mail: scottaitken@pch.gc.ca

Appendix B—Pay Station Specifications

Lexis Systems, Inc.
901 Model

General Specifications: Height: 37 inches; width: 25 inches; depth: 15 inches; and weight: 220 pounds.

Warranty: One year parts and labor.

Rates: Progressive, regressive, holiday, special, flat, and early bird. Rates are variable according to the time of the day, and day of the week. There is no charge on special days. There are minimum and maximum time periods.

Operating Environment:
Temperature range: 32° F to 140° F (0° C to 60° C).
Temperature range with a heater: -40° F to 140° F (-40° C to 60° C).

Time Clock: The clock is accurate to within a few seconds per week. Adjusting time is a simple procedure using a portable computer. The clock operates continuously and tracks: year/month/day and day of the week. The meter automatically adjusts for daylight saving time.

Paint: Powder-coated for strong protection and quality appearance. Standard colors are dark blue, forest green, powder white. Other colors are available on request.

Service Door: Reinforced 12-gauge stainless steel, anti-crowbar door protection, vandal-resistant piano hinge, Swiss-engineered three-point locking mechanism, and protective stainless-steel cross bar.

Locks: Door—drill- and pick-resistant Medico plug lock. Cross bar—high-security stainless-steel disc lock. Cash vault—stainless-steel pin lock.

Display: Dimensions are 5 inches wide by 3 inches high. There are four lines of text, each line having a capacity of 20 characters. The display is protected by a Lexan cover and has backlighting for easy reading at all times of the day.

Coin Acceptor: Self-calibrating, self-cleaning, high coin discrepancy (optoelectronic and magnetic measurements), four coin tubes for change, and modular design for easy maintenance.

Printer: Thermal printer (1,500 tickets per roll), programmable messages, receipt portion, and self-cleaning (low maintenance).

Electrical and Electronic Components: All components are modular and replaceable onsite and are upgradeable.

Power Supply:
- Rechargeable battery, standard (battery life 4 weeks).
- AC power, 110 volts (optional).
- Solar power recharge of battery (optional).
- Trickle battery charge (optional).

Future Options: Wireless communications, Fall 1999.

The Lexis 901 is currently being upgraded to allow wireless communication with an offsite computer. The computer will be able to provide the following information upon request.

- ❏ Meters out of service.
- ❏ Meters to cash collect (dollar value in coin box).
- ❏ Meters that need new batteries.
- ❏ Meters that are being vandalized (police contact).
- ❏ Report retrieval.
- ❏ Credit card authorization.

VenTek International, Inc.
Model 400

General Specifications: The unit is about 16 inches wide by 22 inches high by 18 inches deep. Shipping weight is about 175 pounds. It is made with an 8-inch-square pedestal for mounting in the ground or on the surface (optional). Choice of Pay-by-Space or Pay-and-Display units.

Rates: Hourly, daily, and long-term rates as well as rates that vary by time of day. It is field programmable with multirate tables ("Quick Pick" rate structure). Special event tables may be programmed up to 1 year in advance (optional).

Operating Environment: Fully insulated case. A thermostatically controlled heating system is optional.

Time Clock: Microprocessor-controlled date and time.

Paint: High-visibility yellow is used with black-and-white graphics. A customized case color and graphics are options.

Case Construction: Ten-gauge steel with $^{1}I_{4}$-inch-thick steel reinforcements.

Locks: There is one locking cash bag with a capacity of 600 bills. A master series lock program is optional.

Display: Large backlit four-line by 40-character LCD display.

Coin Acceptor: Accepts nickels, dimes, quarters, and $1 coins. A multidenomination bill acceptor is available. Credit card acceptance is optional.

Printer: Low-maintenance, high-speed thermal printer with more than 5,000 tickets per roll. It prints the location name, transaction number, machine number and code, date and time of purchase, date and time of expiration in large bold print, with additional space for special instructions or messages.

Electrical and Electronic Components: PC programmable with software included.

Power Supply: 120-volt power or battery operated, with battery backup included. Solar power is optional.

Security: Generates audit and revenue reports automatically when cash is removed from the system or when credit card data are collected. Collection reports detail denominations and totals of all coins, all bills, and credit card purchases.

VenTek International, Inc. System V

General Specifications: About 24 1/2 inches wide by 35 inches high by 17 inches deep, shipping weight is about 300 pounds, 12-inch-square pedestal for mounting in the ground or on the surface (optional). Pay-by-Space version optional.

Rates: Hourly, daily, and long-term rates as well as rates that vary by time of day. Rate changes of up to 1 year can be programmed onsite or from a remote location. Quick-Pick rate structure. Special-event tables may be programmed up to 1 year in advance.

Operating Environment: Fully insulated case, thermostatically controlled heater and cooling fan.

Time Clock: Microprocessor-controlled date and time.

Paint: High-visibility yellow or blue with black-and-white graphics. Customized case color and graphics are optional.

Case Construction: Ten-gauge steel with 1/2-inch steel reinforcements.

Locks: The bill acceptor can hold 1,000 bills and can be locked for a sealed cash system. There is one locking cash bag with a capacity of approximately 600 bills. A second locking cash bag and bill acceptor is optional. It has a high-security Medico lock and locking bar. A master series lock program is optional.

Display: Large backlit four-line by 40-character LCD display.

Coin and Bill Acceptor: Accepts nickels, dimes, quarters and $1, $5, $10, and $20 bills. The acceptor can give full change, partial change, no change, any combination, or refund tickets, and has a $30 self-replenishing change supply. The high-capacity, 500-quarter change feature, high-capacity (600) Susan B. Anthony $1 coin change feature, and credit, debit, and smart-card acceptance are all options.

Printer: Low-maintenance, high-speed thermal printer with more than 5,000 tickets per roll that prints location name, transaction number, machine number and code, date and time of purchase, date and time of expiration in large bold print, with additional space for special instructions or messages.

Electrical and Electronic Components: PC programming software included, but remote support software is optional.

Power Supply: 120-volt power or battery operated; battery backup is standard. Battery backup that will function for 48 hours or 1,000 transactions is optional, as well as solar power.

Security: Detailed audit and revenue reports are generated for total coins, bills, and tickets sold, and for each transaction. Detailed service procedures are included. It also has an audible alarm system.

Dominion Self-Park Systems, Ltd. QBS Pay Stations

United States price list of QBS Products, June 2000

COMPONENT PRICES **(U.S. dollars)**			
Dispenser	**Simplex coin**	**Phoenix coin/card**	**Accord/Apex coin/card/bills**
Base unit	$4,865	$9,075	$12,000
Pedestal	210	225	300
External locking bar	170	170	170
Cash vault	330	—	—
After-hours security cover	500	500	500
Additional coin hopper	—	—	300
Heater	170	170	170
Solar panel, each (number required depends on location)	350	350	350
Networking software	—	6,700	6,700
Network server	—	7,000	7,000
Handheld unit for Simplex	Included	—	—
Software requirements	—	Windows 95/98, NT 4.0	Windows 95/98, NT 4.0
Banking software	—	600	600
Point of sale authorization (credit/debit card)	—	2,500	2,500
Install and train, 2 days* (travel expenses extra)	2,000	2,000	2,000
Install and train, 3 days* (travel expenses extra)	3,000	3,000	3,000

Notes: Prices are for single dispensers. Price may vary due to current exchange rate. Discount will vary depending on number of the first machines ordered. Banking software is required to send credit card transactions electronically to bank, but only needs to be purchased for the first machine. If Point-of-Sale Authorization is used, banking software is not required. One-year warranty on all components. Loaner components are provided free of charge if repairs are necessary.

***Installation and Training:** Will vary depending on number of dispensers to be installed and number of staff to be trained. We will supply specifications and diagrams for installing the pedestal, electrical and telephone hookups. It is the purchaser's responsibility to ensure that these items are in place and connected, prior to final assembly and installation. On orders of six or more dispensers, installation and training are included in the purchase price.

Dominion Self-Park Systems, Ltd.
QBS Pay Stations

United States price list of QBS Products, June 2000

REPLACEMENT COMPONENT PRICES **(U.S. dollars)**				
Dispenser	**Simplex**	**Phoenix**	**Accord**	**Apex**
Printer	$1,600	$1,600	$1,600	$1,600
LCD	200	400	400	400
Coin acceptor/selector (one piece)	330	330	—	—
Coin changer/selector (two pieces)	—	—	700	700
Bill acceptor with stacker	—	—	3,000	3,000
Card reader	—	310	310	310
Coin box	—	150	150	150
Cash vault	330	—	—	—
Controller	700	3,500	3,500	3,500
Battery	125	150	150	150
Handheld unit for Simplex	500	—	—	—
AC power	150	150	150	150
Cables, per set	300	400	500	500
Button	86	86	86	86
Decal package	75	150	200	200
PIN pad	—	100	—	100
Roll of tickets	60	60	60	60

Notes: Any items on this list, excluding custom tickets, can be shipped overnight or 2-day delivery. If repairs to dispenser components are required, loaner components can be shipped overnight or 2-day delivery to keep the permit dispenser operational.

Library Card

Wolf, Jerry Taylor. 2000. Field evaluation of electronic fee-collection machines for Forest Service recreation sites. Tech. Rep. 0023-2844-MTDC. Missoula, MT: U.S. Department of Agriculture, Forest Service, Missoula Technology and Development Center. 16 p.

Describes electronic fee-collection systems used at Forest Service recreation sites. These systems have not been used long enough for a thorough assessment of their strengths and weaknesses. Factors to be considered when deciding whether to use electronic fee-collection equipment include: amount of revenue to be generated, risk of vandalism, availability of power, climate, fee-collection plan, and operating personnel. Contact information and specifications for three electronic fee collection machines (Lexis, VenTek, and QBS) are included.

Keywords: compliance, fee demo, pay stations, recreation management, revenue, signs

Additional single copies of this document may be ordered from:

USDA FS, Missoula Technology & Development Center
5785 Hwy. 10 West
Missoula, MT 59808-9361
Phone: 406–329–3978
Fax: 406–329–3719
Internet: wo_mtdc_pubs@fs.fed.us

An electronic copy of this document is available on the Forest Service's FSWeb intranet at:

http://fsweb.mtdc.wo.fs.fed.us

For further technical information, contact Jerry Taylor Wolf at the address above.

Phone: 406–329–3978
Fax: 406–329–3719
Internet: jtwolf@fs.fed.us
Lotus Notes: Jerry T Wolf/WO/USDAFS