

10 Steps to Consider When Moving to Multi-Space Parking

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The transition from old single-space meters to new multi-space pay stations represents a significant shift for organizations implementing these changes as well as for the public who will be using the new technology. This document contains 10 important steps to consider when transitioning to multi-space parking. Additional research may

be to complete your business plan, given your unique environment and circumstances but this document will help guide you in the right direction.

Step 1: Assess Current Situation and Determine Objectives

The first step to determine whether you should switch from single-space meters to multi-space pay stations is to examine the reasons for making this change. What is your current situation and what are your objectives? The following are examples of why an organization would consider moving to multi-space pay stations. Do any of these reasons apply to your organization?

- Servicing the single-space meters is problematic because it is difficult to obtain spare parts.
- Consumers are identifying meter problems before you do.
- Revenue security has been a problem with your existing meters.
- Revenue is being lost due to broken meters or consumers using spaces with time remaining on the meters.
- Consumers are asking for more payment options, such as bills, credit cards, and contactless payments.
- Consumers are asking for Extend-by-phone or Pay-by-phone.
- Rate increases have made coin payment with single-space meters impractical.
- Your organization needs better parking revenue reporting and analysis.

- Customer service could be greatly improved by networking the meters so that consumers could pay for parking at any meter or add time to any meter.
- The old single-space meters are having a negative impact on the look of the streetscape.
- Revenue is being lost due to inefficient processes for enforcement personnel.
- Your organization needs to increase revenue to fund other projects.
- Your organization needs a more efficient way to detect consumers who have not paid for parking.
- Your organization needs an improved method for citation payments to improve collection rates.
- Your organization needs to provide more than just the ability to pay for parking (ie: beach passes, boat launch, etc.).

All of these are valid reasons as to why you need to transition to multi-space pay stations and are achievable objectives; however, it is important to remember that this kind of change is not trivial. Careful research and planning must take place to ensure the right decisions are made so that the transition will be a success.

Some objectives that are achievable are:

- Better servicing and management of meter maintenance.
- Increased number of meters.
- Increased revenues.
- Improved aesthetics.
- Improved enforcement.
- Better detection of scofflaws and stolen vehicles.

Step 2: Conduct Market Research to Ensure Stakeholder Buy-in

In order to ensure that the reasons for transitioning to multi-space pay stations are clear and well understood, it is prudent to conduct some preliminary research. This research involves surveying current stakeholders of your parking operation (for example, consumers, maintenance personnel, accounting, enforcement officers, collections) to understand their issues and to find out where new technology could help them. This evaluation will also help point you in the right direction as to the features to be implemented into your new multi-space pay stations. Areas of your current operation to evaluate include:

- Types of parking revenue controls currently in place (single-space meters, multi-space pay stations, or no revenue control).
- Payment options you would like to provide.
- Parking rates and parking duration limits.
- Hours of enforcement operations.
- Changes to rates, duration limits, and policies you would like to introduce.
- Types of funding available, such as municipal leasing.

In government-run entities, additional research should be done with government officials to obtain their input on change so as to ensure that political and financial support will be available when transitioning. These officials can also provide good advice on how to approach the project so that it is “sellable” to all parking stakeholders, government officials, and community members. During this stage, funding options should also be with government officials. Paying for new equipment outright with funds set aside in the budget or utilizing municipal leasing are two of the most common purchasing methods. Municipal leasing provides a solution for governments that have little or no budget, allowing them to purchase equipment with little upfront cost.

Market research should also extend to the types of technologies available in the market today as well as emerging technologies. Such research will enable you to better understand what is available and what kind of platform you require to support new technologies that may emerge in the next five years.

Research can take the shape of either informal discussions with stakeholders or a comprehensive marketing study, potentially involving a third-party research firm that conducts extensive surveys and/or focus groups. These third-party research firms may also help analyze the parking market to provide preliminary ideas on the types of technology to consider and the directions to take.

Public relations (PR) should also be at this stage of the process as it is important how these messages will be communicated to the various stakeholders involved.

Step 3: Evaluate Parking Models that Best Suit Your Needs

There are both advantages and disadvantages to different parking models including Pay-and-Display (PND), Pay-by-Space (PBS), and Pay-by-License Plate (PBL).

In PND, enforcement is easier as the enforcement officer simply reads the ticket on the dashboard of the vehicle. The disadvantage is that it requires consumers to walk to a pay station and then walk back to their car to display the ticket. Other PND related issues include the use of fraudulent tickets or the transfer of tickets with leftover time and inability to remotely add time by phone.

PBS is advantageous in that it does not require the consumer to return to their car and it also makes it much easier to create reserved spaces. The disadvantage, however, is that enforcement requires the generation of valid space data from the pay station that must be obtained regularly to ensure it is up-to-date. Some parking technologies can integrate this data with wireless handheld devices to reduce this additional effort. Another consideration is the display of the space numbers, if you are not already operating in a PBS environment. You should also consider the costs associated with adding space numbers, either through signage or street painting.

In PBL, consumers simply go to the pay station, enter their license plate number, and purchase time. There is no need to remember a space number, nor do consumers need to return to their vehicle to display a receipt. Benefits include fewer expenses because there is no need to mark parking spaces and no need to maintain or clean such markings. Another advantage of PBL is not relying on marked spaces so that more vehicles can park the same street space, for example 16 smart cars or 32 motorcycles instead of eight trucks. Moreover, PBL eliminates pass-back, as there are no receipts to pass. Finally, it allows for more integration to provide future services such as Extend-by-Phone or Pay-by-Phone.

Carefully consider all three parking models before making a decision. There is an option to have a hybrid model where certain areas are by PBS, others by PND, and others by PBL. If this model interests you, be sure to confirm with your equipment vendors that they can support all three methods at the same time.

Step 4: Investigate Efficient Power Options

Multi-space pay stations may be powered by either AC or solar power. When considering AC power, you will have to investigate with your local power authority how you will deliver power to each pay station location. This work can involve significant costs and may require long lead times if government approvals are required for digging up right-of-ways.

If you choose to employ solar power, you need to carefully review the potential locations. You want to ensure that the solar panels have the most unobstructed exposure to direct sunlight for the greatest number of hours during the day. Placing solar-powered pay stations under trees or street awnings is not going to help generate the maximum amount of power. To learn more about solar power considerations, refer to Appendix A.

Step 5: Review Communications Systems and Options

Networked pay stations have great advantages for your parking organization as you can have remote access to reports and alarms; and, you can remotely configure rates and settings. Another important aspect is real-time credit card processing capabilities. It is also important to have networked pay stations so consumers have the convenience to make payments at any pay station for their space. To network pay stations, the communications options that are usually available include cellular, Wi-Fi, and direct Ethernet.

Cellular communications are the easiest to implement, but can result in high monthly communications fees. In addition, you will have to research which company provides the best cellular network for your pay station locations. If the cellular network is weak in the area where the pay stations are, this will impact the benefits of the communications system.

Wi-Fi can often be a very cost-effective solution; however, it too may have challenges. Specifically, depending on the number of pay stations you are trying to access, Wi-Fi requires a series of access points and antennas that need line-of-site access to each pay station. There are also distance considerations as to how far away an access point may be placed. Security also has to be considered when setting up a Wi-Fi network. If you don't have internal expertise in this area, there are numerous third-party companies which can assist you in setting up a Wi-Fi network or work with a pay station vendor that has established partnerships with Wi-Fi networking companies.

With Ethernet communications, you have to consider how you are going to deliver a dedicated cable to each pay station. If the locations do not already have an underground conduit provisioned for such a purpose, it can involve significant work and money to deliver cable to each pay station.

Step 6: Ensure Security of Credit Card Data with PCI Compliance

If you are considering multi-space pay stations that accept cards, ensuring the protection of credit card information is critical. Security breaches are proving immensely costly for businesses, banks, and card merchants, and also negatively affect consumer confidence.

In creating policies for your parking operation, review the requirements outlined by the Payment Card Industry (PCI) Security Standards Council (www.pcisecuritystandards.org). For service providers and software vendors under consideration, ensure they can provide evidence from Visa or other major credit card companies that their services and/or equipment meet the PCI standards. The provisions of voluntary security scan reports and questionnaires, as proof of compliance, should not, on their own, be acceptable.

Step 7: Create a List of Required Features and Capabilities

New multi-space pay stations have a wide range of capabilities that you may want to consider for your project. In evaluating each of these capabilities, ask yourself the following questions:

- Will this feature help me as a municipality, university, or national park to increase my profit margins?
- Will this feature improve the parking experience?
- Will this feature help manage our business better?

Features to consider include:

- Payment options that include coins, bills, credit card, and contactless payments.
- Smart card acceptance.
- Ability to operate in PND, PBL, and/or PBS mode.
- Rate choices that include hourly, daily, events, and incremental.
- Customizable messages on the screen.
- Multilingual capabilities.
- Real-time credit card processing.
- Networked operations to provide the ability to pay or add time from any pay station.
- Remote management for real-time reporting and easy updating of pay station rates and configuration.
- Proactive alarming for maintenance issues and security.
- Extend-by-phone or Pay-by-phone capability.
- License plate recognition (LPR) enforcement and citation management.

- Support for numerous communications methods — cellular, Wi-Fi, Ethernet.
- Extensive reporting options.
- Open architecture platform that allows for future expandability.
- Easy to maintain.
- Aesthetically pleasing design.
- Bright, easy-to-read color screen for displaying instructions.

Mandatory features you should consider are:

- PCI Data Security Standard compliance.
- Payment Application Data Security Standard (PA-DSS) compliance.
- Americans with Disabilities Act (ADA) compliance.
- CSA and UL electrical compliance.

Step 8: Compile a List of Trusted Vendors

When looking at various vendors, ask yourself the following:

1. Does the vendor have equipment with the options I have identified as mandatory?
2. Has the vendor been in business for more than five years with a broad installation base?
3. Does the vendor have installations across various climate zones (for example, cold winters, hot, dry summers, and areas of high humidity)?
4. Does the vendor have a large number of references that can speak positively about the equipment and service?

5. Does the vendor provide service offerings or are they just trying to sell me technology?
6. What services do I want the vendor to provide (for example, telephone support, on-site support, extended warranty)?
7. If the vendor is not local, do I need to have access to a local support firm certified by the vendor or do I have the internal resources that can handle maintenance and service activities with telephone support from the vendor?
8. Does the vendor provide comprehensive training and support?

Evaluate several of the vendors by meeting with each of them, ask about their options and recommendations, and then prepare and send out Request for Proposals (RFP) based on the complete set of information gathered.

Step 9: Create a Formal Request for Proposal (RFP)

After all of the questions have been answered and more information has been gathered, you can then consider preparing a formal RFP or Request for Information (RFI). Either of these documents provides a formal structure for potential vendors to respond to you so that you can evaluate each of the proposals on an equal footing.

In thinking about the preparation of your RFP, you have to consider the following:

1. What are the objectives of the document?
2. Is the RFP to formally evaluate technology options with an end goal of a pilot program or a finalized purchase?
3. If it is for a pilot program, how many vendors do you want to have as part of the pilot program, and have you determined in advance where this pilot program will take place? The number of vendors should be fairly limited in order to focus your decision. Three are probably optimal.
4. How long will this pilot program last? You do not want to leave your trial open-ended. A one- or two-month trial should be reasonable, but in establishing the trial timeframe, you also have to consider what you will do when the trial is over so as not to disrupt your operations.

5. What timeframe will you give to vendors to respond to your RFP and what deadlines will you them to meet for a trial or purchase?

All of these questions should be thought of before preparing and issuing an RFP. An RFP takes considerable work for vendors to respond to and requires them to make a commitment to deliver on specific objectives if they are chosen. As a result, it is important to respect the time and effort of these vendors to ensure you have everything in order on your end to successfully execute your commitments that are included within the RFP. To receive a copy of a sample RFP document, please contact info@t2systems.com.

Step 10: Develop an Optimal and Realistic Implementation Timeline

In preparing the RFP and thinking about your rollout, it is important to have an overview of the implementation timeline and the milestones that should be considered. This timeline is even more important to consider once you have a vendor.

Please note that the following timeline is optimal, and may be adjusted to meet your specific needs and the scope of your project. If necessary, it can be compressed into a very short period of time—weeks or even days. Generally speaking, any advanced planning, no matter how compressed, is better than none at all. Here is an example of a timeline you can consider:

Nine months out

- Research and analyze existing parking operations.
- Evaluate equipment and vendor options.
- Issue RFP to equipment vendors.

Six months out

- Select a vendor for implementation and order equipment.
- Schedule weekly progress meetings with your vendor-assigned project manager.
- Develop potential questions, complaints, and concerns to address.
- Develop key messages for your communications plan.
- Evaluate possible communication methods and programs.

Three months out

- Apply key messages in all communications and advertising.
- Create and post advanced warning signs.
- Issue press release and launch branded informational website.
- Meet with businesses and organizations affected by the new parking system.

One month out

- Issue second press release.
- Begin distribution of informational brochures.
- Organize staff so that all media calls and interviews go through one person.
- Install and test pay stations; keep “bagged” or off until actual go-live day to avoid confusion.
- Post all appropriate signage; keep covered until actual go-live day to avoid confusion.

One week out

- Train meter greeters on pay station operations and transaction process.
- Train enforcement personnel on new pay station operations.

Go-live day

- Remove covers for new signage prior to going live.
- Have staff on hand to explain how the new pay stations work and answer questions.
- Have a manager ready to handle any media coverage that may occur.
- Invite local merchants and retailers to learn how to use the new pay stations.

Go-live first week

- Keep staff on hand as needed to explain the new pay stations.
- Have a manager on standby to handle any enquiries.
- Issue warnings for non-compliance and include an informational brochure.

Go-live first month

- Keep staff on hand as needed.
- Conduct communications evaluation.
- Evaluate the program and make changes.

To see a more detailed sample schedule with estimated timeframes for each event, refer to Appendix B.

Implementing new multi-space pay stations can offer many benefits including efficiency, increased revenues, improved security, and more. With the 10 steps outlined in this white paper and a trusted vendor, you can build a solid parking program to readily reap these benefits.

Appendix A

Solar Power Considerations

Because there are so many variables impacting solar power, it is very difficult to predict whether or not a solar panel will be sufficient to keep a battery charged. This section is intended to provide detailed information to anyone in making decisions regarding power and solar installation.

1. Environmental Variables

Latitude

The latitude, or the distance north or south of the equator, will impact the effectiveness of the solar panel. The further north a solar panel is installed, the less effective it will be both because of the increase in the amount of atmosphere the sunlight needs to pass through and because of the reduced number of daylight hours during winter.

Climate

Clear, dry climates are better than wet, cloudy climates. A dry climate can have a significant beneficial impact and increases the success rate of a solar installation in northern latitudes.

View Corridor

Trees, buildings, signs, and other obstructions will have a significant impact on the amount of sunlight reaching the solar panel. As much

as possible, a clear view south should be allowed for the solar panels. If even a small portion of the solar panel is in the shade, the amount of power generated drops significantly.

Non-Sunlight Light Sources

Unfortunately, there are few sources of light that can be converted by a solar panel into electricity. Standard street lights will not work. Electrical lighting should not be considered a source of energy for charging batteries via the solar panel.

Indirect Sunlight

Indirect sunlight is converted by the solar panel into electricity. Therefore, during cloudy days, or if light is reflected from a building onto a solar panel, charging will occur. However, the amount of energy collected is significantly reduced.

2. Performance Variables

Number of Transactions

The number of transactions performed per day will have a significant impact on the success of a solar panel and its ability to replenish the batteries.

Payment Type

The type of payment by a consumer has a significant impact on the amount of power used per transaction. Studies have shown that the lowest power payment method is using a magnetic stripe card such as a credit card or smart card. Encouraging consumers to use these payment methods will increase the success rate of solar installations. After the card reader, the second lowest power consumption payment method is the bill acceptor. The coin acceptor consumes the most power of the three payment methods.

Number of Coins/Bills

When consumers are paying by cash, the more bills or coins that are inserted, the more the power consumption will be affected. Rounding rates to the nearest dollar or half dollar will have a positive effect on your power consumption.

Time of Day

If transactions are concentrated during a specific time of the day, this impacts the battery's ability to meet the power requirements. For example, commuter lots where all of the transactions are in a short time period early in the morning are not good candidates for solar power unless there is enough battery to sustain the equipment through the morning and then recharge all day. Most on-street applications have turnover throughout the day meaning that the battery will not be significantly depleted at any one point in time.

Time of Year

In combination with the latitude, the time of year can have a significant impact on the charging ability of a solar panel. In the winter, when days are short and the sun is low on the horizon, you may encounter a situation where normal usage patterns result in batteries being depleted whereas in the early spring or late fall this is not the case.

3. Equipment Variables

Online or Offline

The real-time communication capability will increase power consumption unless the connection is hard-wired. However, the amount of power used by modems is similar to adding a payment option such as a bill acceptor or coin acceptor.

Communications Type

Of the communications options available, hard-wired Ethernet consumes the least amount of power. A modem on the GSM/GPRS network is slightly better than a CDMA modem. The 802.11b/g option currently has the greatest power consumption of the wireless communications methods currently available.

Sleep Timer

Usually configurable through software, the Sleep Timer is the amount of time the pay station waits before powering down if there is no activity. Generally, the shorter this amount of time, the lesser the power consumption. However, some amount of time (30 seconds) should generally be the minimum to allow for consumers who are lined up behind one another.

Battery Age

Most parking pay station batteries are sealed. The charging and discharging of the batteries are regulated to the manufacturers' specifications. As a result, normal operating units should see a three- to five-year battery life. As the battery approaches its end-life, the performance will be degraded.

4. Important Installation Considerations

Signs

Any signage must be placed below or to the north of the solar panels. Signage blocking the solar panel for even part of the day can have a significant impact on the amount of light collected.

Plants

When planning installations, it is important to take into account plants not only as they are but also as they will be. Leaves and growth significantly affect plants and can lead to noticeably blocked solar panels.

Direction

In the case of pay stations with solar panels, in almost all situations, the panels should be facing toward the equator—due south or north.

To learn more about solar power, read the T2 white paper, *Solar Energy and the Parking Industry*.

Appendix B

Sample Implementation Timeline

Days	Start Date	Complete	Description	Task Type
1	29-Jul	30-Jul	Kick-off meeting	Preparation
1	30-Jul	31-Aug	Contract discussions and finalization	Contract
1	4-Aug	5-Aug	Receive pay station custom paint color options	Finalize Configuration
21	5-Aug	26-Aug	Review pay station custom paint color options	Finalize Configuration
14	23-Aug	6-Sep	Finalize custom paper requirements	Finalize Configuration
14	23-Aug	6-Sep	Review of pay station custom decal options	Finalize Configuration
5	23-Aug	28-Aug	Finalize pay station site selection and Pay-by-Space numbering sequence	Install Preparation
1	23-Aug	24-Aug	Test Wi-Fi or cellular coverage at site locations	Install Preparation
35	23-Aug	27-Sep	Finalize rate schedule - important to complete prior to signage preparation	Install Preparation
50	23-Aug	12-Oct	Signage preparation	Install Preparation
20	24-Aug	13-Sep	Development of pre-installation key themes and signage ideas for PR communication plan	Communications
3	24-Aug	27-Aug	Finalize pay station communications methods (Wi-Fi or cellular) and costs	Install Preparation
3	26-Aug	29-Aug	Prepare sample rendering of pay station color choices	Finalize Configuration
3	29-Aug	1-Sep	Finalize pay station custom paint color choice	Finalize Configuration
60	1-Sep	31-Oct	Manufacturing of pay stations by vendor	Manufacturing
14	1-Sep	14-Sep	Obtain quotes for AC power installation and book install dates	Install Preparation
14	6-Sep	20-Sep	Finalize pay station custom decal options	Finalize Configuration
1	13-Sep	13-Sep	City council approval of the PR communications plan	Communications
1	14-Sep	15-Sep	Pre-training review of BOSS software	Training
25	15-Sep	10-Oct	Produce and post advanced warning signs (subject to council approved PR communication plan)	Communications
3	15-Sep	18-Sep	Produce and publish first news release (subject to council approved PR communication plan)	Communications
3	15-Sep	18-Sep	Produce and post website content (subject to council approved PR communication plan)	Communications
1	15-Sep	16-Sep	Set up all media calls and interviews to go through a single contact person (subject to council approved PR communication plan)	Communications
21	11-Oct	1-Nov	Set up card merchant account processor	Install Preparation

Appendix B

Sample Implementation Timeline (continued)

Days	Start Date	Complete	Description	Task Type
14	13-Oct	27-Oct	Install Pay-by-Space numbers	Install Preparation
14	20-Oct	3-Nov	Document employee procedures for operation	Install Preparation
7	20-Oct	27-Oct	Set up cellular account	Install Preparation
10	27-Oct	7-Nov	Prepare sites for installation (concrete pads, conduit, etc.)	Install Preparation
3	3-Nov	6-Nov	Produce and publish second news release (subject to council approved PR communication plan)	Communications
	10-Nov	10-Nov	Receive pay stations	Install Preparation
10	14-Nov	24-Nov	Install pay stations	Installation
1	14-Nov	24-Nov	Install all appropriate signage and cover signage until go-live	Installation
2	16-Nov	18-Nov	Receive staff training on software, maintenance, and enforcement from vendor	Training
14	25-Nov	9-Dec	Conduct post-installation live phase - pay stations go live for first time, staff on hand to explain how pay stations work and field questions (subject to council approved PR communication plan)	Communications
1	9-Dec	9-Dec	Pay station go-live event - day involving city councilors (subject to council proved PR communication plan)	Communications
14	10-Dec	24-Dec	Evaluate program and make any needed changes (subject to council approved PR communication plan)	Communications
4	3-Jan	7-Jan	Implement needed changes and communicate changes via news release, advertising, and/or website	Communications