

## **Budget and Performance Panel**

### **Pay On Foot Parking Systems 26 February 2008**

#### **Report of Head of Property Services**

##### **PURPOSE OF REPORT**

The report provides information on the operational implications of Pay and Display and Pay On Foot parking systems.

**This report is public**

##### **RECOMMENDATIONS**

**(1) That the report be noted.**

##### **1.0 Introduction**

**1.1** This report covers the possibility of installing barriers on Lancaster City Council car parks. The Council operates 37 public access car parks across Lancaster and Morecambe that currently use a Pay and Display revenue collection system. These car parks vary in size, location and customer usage so there are many factors to consider. These factors are explained in detail within this report. The two main types of system to consider are known as Pay on Foot and Pay & Display revenue collection systems. The report highlights the advantages and disadvantages of each system.

For clarity the systems are now defined in the following paragraphs.

##### **1.2 Pay on Foot Systems**

Most Pay on Foot systems have five principal components;

- Entry lane sets each comprising a ticket dispenser and traffic control barrier
- Automatic and/or manned pay stations or pay points
- Exit lane sets each comprising a ticket reader and traffic control barrier
- A communications network linking all of the above equipment
- A central control computer and management station

A driver entering a 'Pay on Foot controlled' car park takes a machine readable ticket from a ticket dispenser in the entry lane and the traffic control barrier then opens to allow entry. The ticket allows the date, time and lane of entry to be identified. The driver parks, keeps the ticket and goes about his/her affairs. When these are complete the driver returns to the car park finds a pay point and presents the entry ticket. The parking fee due is automatically calculated at the pay point from data on the ticket and advised to the driver. Upon payment the information on the ticket is modified and returned to the driver or a new exit ticket is issued. The driver returns to the car and drives it to the exit lane where the modified/new ticket is presented to the ticket reader which verifies that payment has been made and then opens the traffic

control barrier to allow exit.

Regular users may purchase some form of season ticket that will operate the entry and exit barriers under strictly controlled circumstances - these users do not use the pay points.

Pay on Foot systems control vehicle movements by use of physical barriers.

### **1.3 Pay & Display systems**

A Pay & Display system may have one or three components;

- Pay & Display ticket machines
- A central control computer and management station (optional, but Lancaster has this component)
- A communications network linking all above equipment (optional, but Lancaster has this component)

A motorist entering a 'Pay & Display controlled' car park drives in, finds a parking space and walks to the nearest ticket machine, decides how long a parking period to purchase and uses coins (or credit card or mobile phone) to buy a ticket.

He/she then displays that ticket in the car so that it can easily be read from outside. The driver then goes about his/her affairs. When these are complete the driver returns to the car and drives out of the car park.

Pay & Display systems control motorists by the threat of financial penalties for contravention of the car park regulations. Contraventions are detected by patrolling Parking Attendants.

## **2.0 Details**

### **2.1 Systems and the Car Park**

Both systems have their strengths and weaknesses and they are not necessarily interchangeable in any given car park.

In assessing whether a system is appropriate the car park characteristics should be considered.

**2.2 Power sources** - if no mains power is available Pay & Display ticket machines which can use solar or battery power is the only option. Rural car parks only exemplify this situation.

**2.3 Small size** - Installation and operation of a Pay on Foot system will cost considerably more than Pay & Display in a very small car park and the space needed by the entry and exit lanes will be disproportionately high. Pay on Foot is rarely installed in car parks below 100 spaces.

The Council only operates 11 car parks with in excess of 100 spaces.

**2.3.1 Limited vehicle access** - A car park entry lane with no parking barrier can admit up to 15 cars per minute - place a ticket dispenser and barrier in the lane and that flow is reduced to 6 cars per minute (and occasionally too much less). If a car park has periods of high inflow (e.g. a commuter car park at 8.30am) this can be critical.

**2.3.2 Limited vehicle exit lanes** - A similar argument applies. Car parks that serve theatres, cinemas and sports facilities often have high peaks of exit flow. These peaks often pass without comment, where there are no exit ticket readers and

barriers to restrict the flow. Introduce these Pay on Foot features when there are insufficient pay stations or exit lanes and long queues may form at both.

- 2.3.3 'Grace periods'** - An essential feature of Pay on Foot systems is the 'grace period'. This is the time period allowed to the driver, who has just paid for his/her ticket, to return to the car, to drive to the exit and to present the paid ticket to the exit ticket reader. Commonly this period is set at 10 or 15 minutes. If a driver takes longer to present the exit ticket it will not open the barrier. A further payment will be required to achieve exit.

If a queue has already delayed the driver in reaching the exit a demand for further payment will be unacceptable. Furthermore the driver who is held up by this demand simply lengthens the following queue and subsequent drivers become increasingly likely to exceed their grace periods. This is a potentially explosive situation. It is normally avoided by prompt system intervention by car park staff - but that means that staff must be in attendance at all times.

- 2.4 Traffic on local roads** - If there is heavy traffic on the roads adjacent to the car park vehicles may not be able to exit the car park freely. In this case exit queues may form within the car park and, if a Pay on Foot system is operational, some drivers may not reach the exit within the grace period. The presence of highway traffic signals immediately 'downstream' of a car park exit can cause this problem. It is probable that some drivers will wrongly attribute these delays to the barrier system.

## **2.5. Internal layout and structure**

- 2.5.1 Car park dynamics** - Car park dynamics are good when vehicles and pedestrians are able to move freely and easily to their intended location in the car park without obstruction from others or from the physical characteristics of the car park. This freedom from obstruction is particularly important at times when high levels of entry and exit coincide and there is considerable vehicular and pedestrian traffic.

Wide aisles and parking stalls, sensible turning radii and ramps, good sight lines and coherent signage, uniform lighting levels and well designed search and exit routes all facilitate good vehicle dynamics. The vehicle dynamics are particularly relevant to the payment system near to the vehicle entry and exit points. The optimal flow rates of 15 vehicles per minute (no barriers) and 6 per minute (with barriers) mentioned above can only be achieved if vehicles can move freely towards and away from the entry and exit points.

- 2.5.2 Driver considerations** - In a Pay & Display car park payment for parking time begins after the car has been parked and it effectively ends when the driver returns to the car. If no space is found there is no question of payment no matter how long the search.

A driver who enters a Pay on Foot car park starts to pay for time as soon as he/she takes an entry ticket and is paying for time whilst searching for and occupying a parking space. Although payment for time ends when the departing driver reaches the Pay on Foot pay point and pays there is still a time pressure to exit within the 'grace period'.

The point of the previous two paragraphs is to indicate that good car park dynamics gain extra importance when a Pay on Foot system is installed.

- 2.5.3 Pedestrian Considerations** - Every driver parking in a Pay on Foot car park makes two pedestrian movements across the car parking area - to and from the exit or

stairs/lift. Every Pay & Display car park user makes two more - to and from a the ticket machine which is located on the car parking area.

Good pedestrian routes to and from Pay & Display machines are important. They should be short and should keep clear of the main vehicle entry and exit routes. Drivers do not want a 50 metre plus walk to and from the ticket machine because this can easily take two minutes. This means that the provision of Pay & Display ticket machines should be greater than one per 80 spaces in a regularly laid out car park and with greater provision in unusually shaped car parks.

Other features in the siting of Pay & Display ticket machines include high visibility, clear signage, good lighting levels, CCTV coverage and consideration for the costs of cabling and conduiting to the location.

- 2.5.4 Structural Considerations** - Before considering the installation of Pay on Foot entry and exit lanes on the suspended deck of an established multi-storey car park, you need to ensure that the design and the weight of the equipment islands and the fixing of detector loops have the written approval of a structural engineer.

In the case of a new build car park these matters should be incorporated in the design at the start, rather than added as an afterthought. Experienced architects and designers who are unfamiliar with car park design can overlook this and give rise to serious problems.

- 2.6. Pedestrian Routes** - Once a driver has placed the Pay & Display ticket in the car the payment for parking is complete. The route by which he/she leaves the car park and returns to the car has no relevance to the payment process. Pay & Display suits car parks where there are many possible pedestrian routes.

In an ideal Pay on Foot installation returning pedestrians do not have to deviate from their chosen return route to pay for their parking because at least one pay point is available on every pedestrian return route to the car park. In a car park where there are few possible return routes this is quite practical.

In car parks with many pedestrian return routes such provision of pay points may prove too expensive. The less popular pedestrian return routes may therefore have no pay points while the more popular require two or more. It may even be appropriate to close off the least popular return routes - but care must be taken that such action does not interfere with fire escape routes.

Pay on Foot specifics need to ensure that the public will still be reasonably served by pay points when one of the units is out of service - this is particularly important where a small number of units (say less than 5) are to be installed. Machines, even the most reliable, do have periods out of service and this is most likely to happen during busy periods.

Siting Pay on Foot pay points in established car parks is not always easy - in addition to being adjacent to an established return route each site needs to be highly visible, well signed, well lit and easily covered by CCTV and it also needs to be large enough.

The machines themselves have quite a small foot print (say 1.0m x 0.5 m). Public space around pay points needs to accommodate all types of users including single car groups of 3 or 4 people, some with pushchairs, some with bags or supermarket trolleys or other bulk, and there must be space for others to queue and for yet others

to pass by. Proper provision must also be made for disabled drivers to access the equipment easily. Occasionally sufficient suitable locations for pay points are not available.

### **3.0 Systems and the users**

#### **3.1 Types of User**

**3.1.1 Commuters** and other very regular users of a car park will probably pay by purchase of a season ticket - whether they then display a windscreen permit in a Pay & Display car park or use a pass card to operate the barriers on a Pay on Foot car park. If however this class of user is the main occupant of the car park, the provision of a Pay on Foot system for the minority users may be hard to justify.

**3.1.2 Shoppers** who use a car park for a regular weekly purpose probably know how long they will park for and may be content with Pay & Display. They will normally come with the right coins available to pay for their expected stay. Shoppers who do not wish to predetermine their length of stay or who have no suitable change prior to shopping (to purchase a Pay & Display ticket) will probably prefer the Pay on Foot system.

**3.1.3 Business visitors** - will probably not wish to predetermine their length of stay and therefore prefer Pay on Foot. At Pay & Display they may well pay for longer than they expect to need.

**3.1.4 Recreational/social** - regular users may seek a season ticket or concessions related to the recreational facility that they visit. Occasional users may prefer Pay & Display if the tariff is simple and unlikely to require change giving (e.g. 50p for up to 4 hours and £1.00 for all day).

If the tariff is complex and/or high then Pay on Foot may be preferable because parking stay need not be predicted, payment need not be calculated and note payment and change giving facilities can be made available.

**3.1.5 Blue Badge Holders** may be accustomed to free parking and any change to this will require political endorsement and the provision of pay points that are universally accessible. However if free parking is to continue this may also require special arrangements to open barriers for disabled drivers.

**3.1.6 Shop Mobility schemes** are often located in town centre car parks and may be affected by the introduction of a change in parking control system.

**3.1.7 Motorcyclists** may be permitted to use car parks where there are no traffic control barriers but it is not advisable for them to travel through barrier controlled entry and exit lanes. The induction loops that control the barriers may not operate reliably for motorcycles and this presents a safety hazard. If barriers are to be introduced alternative arrangements will be required for motorcyclists.

**3.1.8 Permit Holders** may be people who are permitted to use the car park outside normal operating hours - for example local residents. Will their concessions be continued and if so what system changes will be needed to ensure their entry and exit movements.

**3.1.9 Service providers** may need to bring vehicles to the car park to carry out a service in or adjacent to the car park - for example, delivery vehicles in a shopping centre car

park, buses in a park and ride car park, AA and similar breakdown services. The system must accommodate their needs

### **3.2 Local custom and practice**

Introducing a local population to a new type of parking system can require some determination - particularly with a barrier controlled system like Pay on Foot where the system imposes a precise performance on every user from day one. Every user has to learn and it is advisable to have plenty of personnel on hand to teach in the early days.

## **4.0 Management Matters**

### **4.1 Pattern of occupancy, 4.2 Hours of use and 4.3 Parking Attendants**

It is desirable for revenues to exceed costs for every day when the car park is open and therefore daily revenues and operating costs must be considered.

Modern parking systems of either type can provide very detailed information about patterns of occupancy and hours of use and management can use this data to develop pricing and marketing strategies that will optimise revenues.

Many car park operating costs (such as lighting, lifts and cleaning) will not be affected by the choice of revenue collection system - however equipment and personnel costs will be.

Equipment costs per 100 spaces will be higher for Pay on Foot than for Pay & Display.

Personnel needs for enforcing Pay & Display systems and for operating Pay on Foot do vary. It should be noted that staff on a Pay on Foot car park tend to be dedicated to that one car park and cannot be easily deployed to other locations.

Pay and Display systems justify a high level of patrolling when parking activity is high so as to maintain revenues. When activity is low patrolling can be reduced to match. Patrol resources required will be closely related to the car park capacity.

Pay on Foot systems require a minimum operator level during all opening times regardless of activity but operator level increases more slowly with rising activity levels and car park size.

Thus Pay and Display may be more appropriate for car parks which are open for long hours with low activity levels whilst Pay on Foot may be more appropriate for car parks which are generally busy.

### **4.4 Security**

Security has four important components

- the feeling of security for users of the car park
- the risk of vehicle theft
- the risk of theft from vehicles
- the risk of damage to vehicles

Good lighting, CCTV cover, help points, smart uniformed patrols and a clean and tidy environment are all important components of the user's perception of security. The type of payment system chosen has little effect on these characteristics.

The Pay on Foot system barriers may slightly diminish the risk of car theft, however well placed CCTV cover is also a strong deterrent to vehicle theft regardless of which payment system is installed.

Entry and exit barriers do little to affect theft from and damage to cars in the car park. It can be argued that CCTV, lighting and uniformed patrolling (which is an essential part of Pay & Display parking control and an increasing component of Pay on Foot) is a bigger deterrent to these 'in car park' crimes.

## **4.5 Tariffs**

### **4.5.1 High and low Tariffs** - A tariff of more than £1.50 per hour might currently be considered as high and 50p or less per hour as low.

High tariffs will mean that many users wish to pay by notes or credit/debit cards. This probably means that high tariff car parks will need the note and card readers with change givers that a Pay on Foot system provides.

Low tariffs often mean that the parking vend can be achieved exactly with a single or multiple coins which favours Pay & Display equipment.

### **4.5.2 Change giving** - Change giving equipment is complex, expensive and space consuming. It also provides extra challenge for accurate auditing of the system (see 4.7.1 below).

The virtues of Pay & Display equipment include compact dimensions and relatively low price. These two statements indicate that Pay & Display and change giving are incompatible. If change giving is needed Pay on Foot will generally be required.

### **4.5.3 Simple and Complex tariffs** - The simplest tariff might be £1.50 per visit whether that is all day or for 30 minutes. The driver has absolutely no difficulty deciding how much should be paid at the time of arrival.

Examples of complex tariffs will include non-linear hourly charge rates, free or fixed rate overnight parking, and different rates at weekends and Bank holidays. These tariffs even challenge management to define them comprehensively and it is unreasonable to expect a driver to evaluate and pay the parking fee in advance.

These two extreme examples strongly favour Pay & Display and Pay on Foot respectively.

Most tariffs will fall between and the balance of advantage for one system or the other will vary along the scale.

### **4.5.4 Discounts** - Parking discounts are sometimes given to particular categories of users. These are easily given to Pay on Foot users by modifying their machine-readable ticket so that it qualifies for a reduced tariff when presented at the automatic pay station. The full process is accurate to audit within the system.

Pay & Display users may also receive benefits by various methods such as the issue of a two-part ticket - one part for display in the car and the other to be exchanged for

cash or discounts on goods or services at local shops, cafes etc. Audit arrangements and cost allocation may be difficult to manage.

- 4.6 Cash less Payments** - Parking equipment is generally installed with a view to use over 7 to 10 years so in choosing equipment today it is important to consider the level of charges which may be common in the future.

Coin only payment was almost universally acceptable 10 years ago but this is less often the case now. Note handling is complex and expensive not least because it must be accompanied by change giving capability - hence the pressure for cash less payment systems.

Credit and debit card payment facilities are now fairly commonplace for Pay on Foot systems and increasingly available for Pay & Display. Practical mobile phone payment systems are already in use on some Pay & Display ticket machines and are increasingly popular.

#### **4.7 Control Information**

- 4.7.1 Audit Information** - All systems have audit information and it is a vital part of management control of the cash collected. Pay and Display is straightforward because a machine starts a working period with an empty coin box and all coins accepted by the machine should go straight to it. The machine records and totals coins accepted and when the coin box is removed it locks automatically and the machine automatically prints out the amount that is in the box. Management must ensure that cash and print out reconcile or fully investigate discrepancies.

Pay on Foot is more complex because it accepts notes and coins and gives change in coins.

The note safe follows similar procedures to the Pay & Display coin box – every note accepted should go straight to the note safe – this locks automatically on withdrawal and a print out of contents is generated for reconciliation.

The change giving mechanism always gives a variable cash float of coins of different denominations (typical total value of £200 per automatic pay point). Coins accepted by the pay point may go to top up the change reservoirs or, if these are at the required level, they go to the coin box. The amount in the coin box at the end of the shift should match the amount printed out by the pay point and this gives a basic control. If a full audit is required then an exact count of the value in the coin box and note safes being removed and in the change giver is needed.

- 4.7.2 Management Information** - Modern Pay on Foot and Pay & Display systems record details of all system transactions and many other events. These can be assembled in many different report formats that help management fully to understand the pattern of use of the car park, to spot trends and abuses and to identify the impact of local events and changes. These in turn provide the basis for management action and future business plans and forecasts.

- 4.8 System Costs** - Pay on Foot systems will prove more expensive to own and maintain than the Pay & Display systems.



## **Appendix - Some Frequently Asked Questions**

### **Which system collects more money?**

Motorists who use Pay on Foot always pay the calculated amount for their parking – however many who use Pay & Display pay more than the correct amount (either they overestimate their stay for safety or because they do not have the coins needed to pay exactly) and this may offset those who underpay or do not pay. With Pay on Foot there are no penalty charges to collect so this income is lost.

### **Which system do motorists prefer?**

It depends, amongst other things, on which system they are used to, the nature of their reason for parking, and the frequency with which they park and the location of the pay points or Pay and Display ticket machines. There may be no strong preferences for either system.

### **What are the staffing implications of each system?**

The purpose of uniformed Parking Attendants patrolling is increasingly regarded as a necessary feature for security and customer comfort, in addition to enforcement.

When considering revenue collection only, the desirable patrol pattern (and hence staffing) for Pay & Display car parks depends on the nature of the car park (short term/long term) and the size and tariffs. A large short-term car park with high tariffs will require frequent patrols during charging hours. A small long-term car park will require just a few minutes per day. The occasional absence of any staff on either is of little consequence.

Pay on Foot systems tend to be automatic and if they are reliable, in theory, they too can operate without staffing. However they cannot accommodate some of the incorrect actions and unusual circumstances of the users. Examples of these are;

- Attempting to insert a folded ticket in the ticket slot
- Attempting to insert a banknote in the coin slot
- Presenting an unpaid ticket at the exit ticket reader
- Having a mutilated ticket which the automatic pay station can not process
- Having insufficient funds to pay the amount required.

When the user/machine interface fails for any reason the user will not be able to drive out of the car park, and may obstruct others from doing so. Rapid human intervention is then necessary.

If 1% of drivers have a problem there can be 20 or 30 daily events in a busy car park which is one every 20 minutes. Each event can quickly become unmemorable (or even a positive score for customer service) if it is tactfully and quickly resolved by a member of staff. However if it is not tackled because the car park is unmanned it soon escalates to a crisis - because somebody's car is impounded and the departure of many others may be delayed.

### **Which system represents the future?**

Pay on Foot has been around for more than twenty years - its origins were with airport car parking which is a 24/7 operation and it has been widely taken up in shopping centres. There have been many product developments. These include note readers, credit/debit/smart card readers, improved change givers, better ticket systems, better networking, and better management information.

Pay & Display has been around for longer and has also achieved most of these developments plus solar power and now payment by mobile phone technology.

## **5.0 Conclusion**

- 5.1** There are only eleven car parks in excess of 100 spaces operated by the Council. Six of the car parks (Battery Breakwater, Coastal Road, Heysham Village, Festival Market, Telephone Exchange and the Town Hall) are located in the Morecambe area. These car parks are predominantly used either seasonally or by permit holders.

The criteria in the report indicates they are best suited to the Pay and Display system. The remaining car parks are located in Lancaster. Three of these car parks (Auction Mart, Edward Street and Upper St Leonardsgate) are again, predominantly used by permit holders so are best suited to a Pay and Display system.

The remaining two car parks (Nelson Street and St Nicholas Multi-storey) have a different class of user, but would appear unsuitable for Pay on Foot when considering traffic on local roads (proximity to the one way system), driver considerations and car park dynamics.

- 5.2** The estimated cost of a Pay on Foot system per car park would be in the region of £100,000 plus installation and staffing. A Pay and Display ticket machine currently costs £2,600 plus installation and staffing.
- 5.3** Therefore when considering all the factors mentioned in this report there appears to be no car parks currently operated by Lancaster City Council that would benefit from a change of the current Pay and Display revenue collection system.

### **CONCLUSION OF IMPACT ASSESSMENT**

**(including Diversity, Human Rights, Community Safety, Sustainability and Rural Proofing)**

Both Pay and Display and Pay on Foot payment systems could potentially have community safety implications through vehicle and personal security. Pay on Foot systems could increase traffic congestion if car park entry lanes are incorrectly positioned near the highway.

### **FINANCIAL IMPLICATIONS**

To purchase a Pay on Foot System would cost in the region of £100,000 per car park, whereas each Pay and Display machine costs £2,600 to purchase. A detailed feasibility study would be required to accurately quantify the installation, staffing and other operating costs for each car park. The same feasibility study would be required to accurately predict increases or decreases in income from changing the existing system.

**SECTION 151 OFFICER'S COMMENTS**

The Section 151 officer has been consulted and has no further comments

**LEGAL IMPLICATIONS**

None arising directly as a result of this report.

**MONITORING OFFICER'S COMMENTS**

The monitoring officer has been consulted and has no further comments.

**BACKGROUND PAPERS**

Budget and Performance Panel Minutes  
27/11/07

Morecambe, Retail, Commercial and  
Tourism Cabinet Liaison Group 03/12/07

Lancaster and District Liaison Group  
04/12/07

Comments from Morecambe and District  
Chamber of Trade and Morecambe Hotel  
and Tourism Association on parking fees and  
policies 04/12/07

Comments from Lancaster District Chamber  
of Commerce, Trade and Industry on parking  
fees and policies 06/12/07

BPA Parking Practice Notes December 2004

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