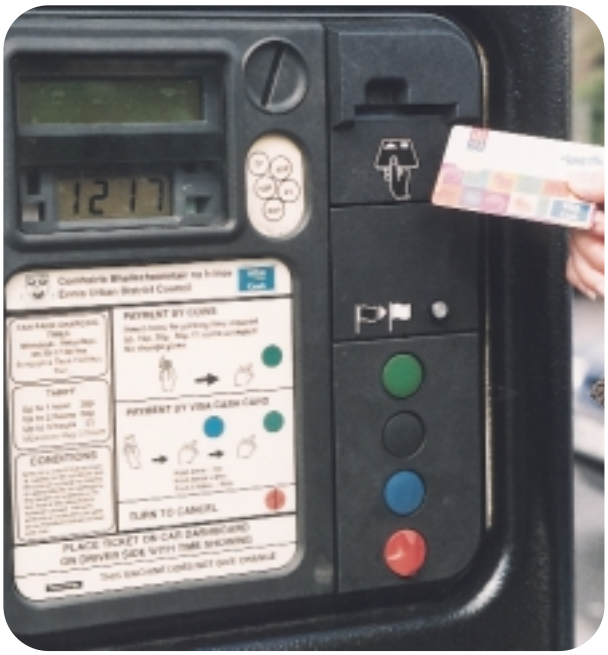
NETWORK MANAGEMENT NOTES

CASHLESS PAYMENT SYSTEMS IN PARKING



SchlumbergerSema P&D terminals in Ennis, Ireland have been upgraded to accept Visa Cash smart cards, as well as cash.

Cashless payments systems have been in use for the payment of parking fees for at least 15 years. These have ranged from pre–paid parking vouchers to chip–based smart cards that can be used to pay for a number of different services including parking fees.

Pre–paid parking vouchers

Pre–paid parking vouchers were first introduced in the UK in Bath in 1987. Vouchers are purchased from local shopkeepers, garages, council offices etc. Ideally they should be obtained prior to the commencement of a parking act. Once a car has been parked and before the motorist walks away he/she is required to score pressure sensitive areas on the surface of the voucher to indicate the commencement date and time of the parking act – the maximum permitted duration being calculated from the value of the voucher(s). The voucher is then displayed from within the vehicle for checking by traffic wardens or parking attendants. This type of control device has been introduced into a number of towns/cities including Brighton, Hampstead, Richmond upon Thames, Bognor Regis, and by Wandsworth Borough Council. User surveys and monitoring exercises undertaken by TRL for the (then) Department of Transport found that vouchers:

- were effective in controlling parking;
- were visually unobtrusive on–street;
- required a low capital outlay;
- removed the need to store cash on–street and then safely transfer it to banks;
- required the co–operation of traders to sell vouchers;
- were found to be difficult to use by visiting motorists;
- were less efficient in enforcement terms because it took longer to check a voucher than a parking meter or a pay & display ticket, and they were subject to fraud.

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Few new voucher schemes have been introduced recently. Existing voucher schemes are now tending to be completely replaced by Pay & Display machines.

Pre–paid magnetically encoded parking cards

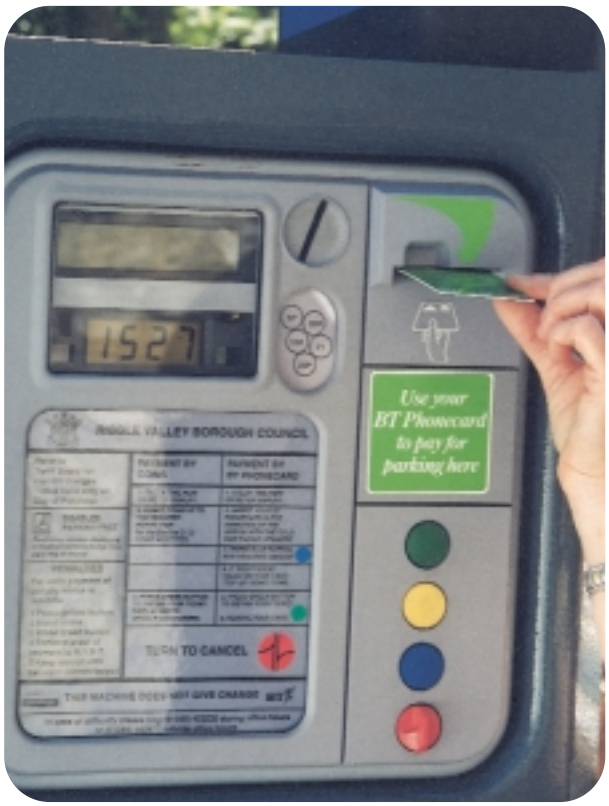
Pre–paid magnetically encoded parking cards were first introduced into the UK in significant numbers in Rushmoor in 1991. They were subsequently introduced in Canterbury, Maidenhead, Windsor and other towns/cities.

Surveys undertaken by TRL for the (then) Department of Transport have shown that:

- Motorists are encouraged to visit towns operating with these cards more often;
- Councils receive income from lost or unused cards;
- Councils receive income ahead (often well in advance) of the parking acts;
- Virtually all users purchased another card when their existing card expired;
- There was difficulty, initially, in resolving a dispute if an audit trail had not been incorporated;
- Motorists expressed a preference for wider card acceptance in car parks in other towns.

Many of these problems have since been overcome with more sophisticated control equipment and/or cards. Smart cards have the ability to provide a more versatile and secure solution.

A related type of scheme has been tested in Clitheroe, Lancashire where Pay & Display machines were adapted to accept payment with a British Telecom Phonecard. This trial is reported to have been a technical success. However, BT is not looking to extend this concept into other local authority areas.



BT trialled the use of its Phonecard in SchlumbergerSema P&D terminals in Clitheroe, Lancashire with Ribble Valley Borough Council.

Electronic purses

Electronic purses, which are charged with value from a user's own bank account, have been tested in the UK by banks in two trials, one in Swindon and another in Leeds. The electronic purses were designed for use instead of cash in the payment of low value transactions including the payment of parking fees. Both trials have now finished and the banks are currently assessing how these systems might be taken forward. Electronic purses did not prove to be as popular with users as had been anticipated.

They have proved more successful on mainland Europe, particularly in Holland. However, although well–established schemes are also operating in Austria, Belgium, Finland, Germany, Italy and Spain, less than one percent of parking transactions are completed using e–purse cards.

Bank credit/debit cards

The payment of parking fees by bank credit/debit cards was first introduced in the UK at Gatwick Airport in 1990. Most payments at Gatwick were relatively high value because a high proportion of parking incidents were undertaken by holidaymakers that had flown off for a week or more. As a result, the cost of processing each payment was a smaller proportion of the parking fee than it would have been for the payment of most parking fees. Having introduced the system, the car park operator was able to reduce the complement of staff required to operate the airport car parks.

The use of these cards has subsequently spread to a number of airport car parks and, more recently, station car parks. NCP Ltd has started introducing this payment option into all of the car parks it operates.

Each credit/debit card payment has to be validated by the banking community before it can be accepted. This involves linking every piece of equipment (such as Pay & Display equipment) accepting this type of payment by telephone or data link to a central validating point. This validation process can delay the payment of the parking fee (by a few seconds per transaction) and also results in a relatively high processing charge for low value payments such as parking fees.

A faster process is for cards to be validated off–line. A black list of "bad" cards is maintained in order to minimise fraud.

Alternatively, clearing houses, such as 3C and Credit Call, specialise in handling large volumes of low value transactions which enables service providers to accept credit/bank payment facilities cost–effectively.

As the cost of parking increases it is anticipated that this payment medium will become increasing popular since a high proportion of motorists already have a bank

credit/debit card. This will then negate the need for the motorist to ensure that he/she has sufficient coinage to pay a parking fee. It also satisfies the motorist's aspiration (as determined in Rushmoor) that one cashless payment medium should be available for use in all car parks, regardless of the town and/or operator.

Charge Cards

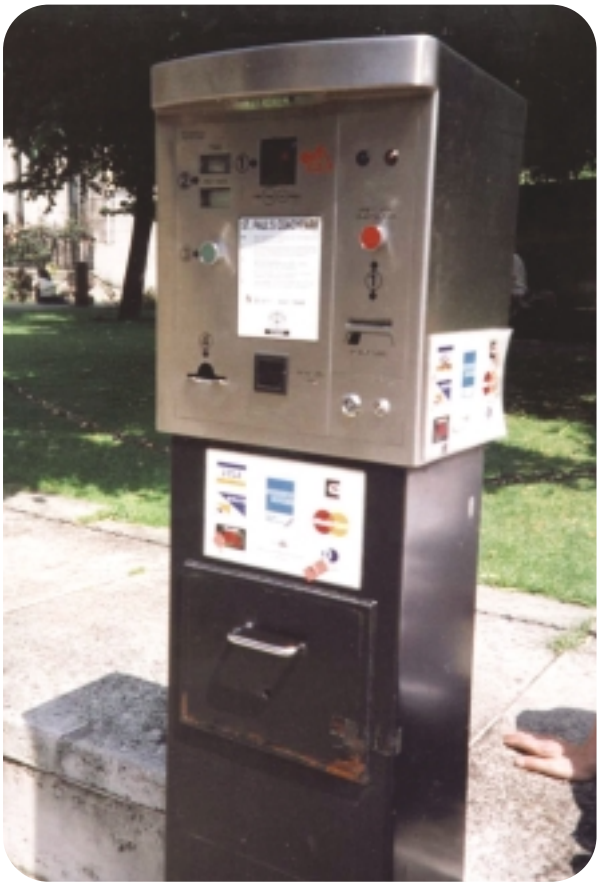
These cards have been introduced to circumvent the requirement of the banks (and the associated time delay) to validate each payment. The Charge Card issuer takes the commercial risk for non–collection of fees due. This risk is considered to be very low. Charge Cards were originally introduced for use in the post–payment of low value transactions. Each Charge Card is linked to the holder's bank account. The Charge Card account accumulates the values of every transaction made with the card. Each month (or other predetermined period) the Charge Card account is paid by direct debit from the Charge Card holder's bank account.

This concept is relatively new. To date there has been no application of this medium for the payment of parking fees.

Chip–based Smart Cards

This type of pre–payment medium consists of a plastic card (the size of a bank credit card) with a chip embedded in it. This chip can be programmed to allow use in certain circumstances or to collect data on usage.

Solar–powered Stelio P&D terminals in Woking, Surrey accept cash and smart card payments.



Cashless payment facility at St Paul's coachpark in the City of London.

For instance, in the parking context, it could be used to permit parking in specific car parks at certain times of day for a reduced parking fee. It could also be used to register usage in a car park and support a host of incentive schemes, eg, discounted parking for card holders and retailer rebate schemes, when parking is paid for by the card. Cards need not be restricted for the payment of just one service. They can be multi–functional. When and if these types of card become more widespread in our everyday life it is anticipated that they will be more widely accepted for the payment of parking fees.

There are a number of different formats currently available. The Government is seeking to create a standard that will be applicable to all smart cards issued. Until this happens, it is possible for parking equipment manufacturers to provide facilities that permit the processing of different card formats by the same parking control device.

The chip–based smart cards are tending to supersede the pre–payment magnetically encoded cards as the data encoded on them is more secure.

GSM–based payment systems

These systems have only recently become available. They are operated by an agency that would be contracted by a local authority to collect parking fees using this system. The system is based on the use of the mobile telephone network and the cost of parking is added to the phone bill. It is best suited to off–street car parking where there are no maximum length parking periods.

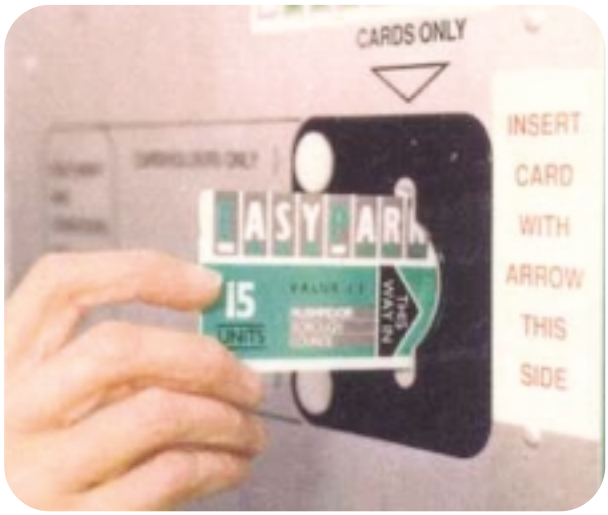
Pre–registered schemes for on–street parking enable motorists to telephone a central call number and by using the mobile telephone keypad indicate that they had commenced a parking act in a particular location. This information would then be relayed to parking

A unique application developed by itsmobile enables a driver to charge P&D parking fees instantly via his/her mobile to the phone's bill or a credit/debit card.

attendants notifying them that the vehicle had had a parking fee paid. On his/her return the motorist would use their mobile phone again to inform the parking control centre that the parking act had terminated. The appropriate fee for the parking incident would then be calculated and added to the motorist's "parking account". Once a month (or more frequently by agreement) the total value of all the parking acts would be debited from the user's bank account.

To date these have not been used in the UK so the effectiveness of these systems and their acceptability by the public has yet to be determined.

For on–street parking, a system soon to be piloted in Dublin could provide a solution. The cost of parking is added to a mobile phone bill after the phone number is keyed into specially equipped Pay & Display machines. These then issue parking vouchers, in the usual way, for the length of time paid for. Scheme registration can be completed via the phone network the first time a driver encounters such a machine.



Cashless payment and pay and display machines in Farnborough, Hants.

In–car parking meters

These parking control devices were introduced into Israel, Scandinavia and the US some years ago. A motorist purchases an in–car meter that is about the size of a pocket calculator. Each in–car meter is charged with a monetary value. At the commencement of a parking act the motorist would, by depressing keys on the meter, enter details of the parking zone and then depress the *Commencement of Parking* key. The meter would be affixed to the windscreen to enable a parking attendant to interrogate the meter by an infra–red reading device to determine that the parking act was being paid for. The value on the card would then be deducted per unit of time whilst the vehicle was parked. On his/her return the motorist would press another key to indicate that the parking act had finished thereby ensuring that further value was not deducted from the card. Once there was no (or little) value remaining on the card the motorist would either dispose of the meter or have it recharged with monetary value. To date these meters have not been introduced by any local authority in the UK.

Conclusion

The use of cashless payment systems for the payment of parking fees will inevitably increase with the increase in parking fees.

As part of an integrated transport strategy local authorities may wish to direct motorists to particular car parks or inhibit/encourage usage at certain times of day through the levying of differential parking fees. Some of the cashless payment systems outlined above could be used to effect these types of policy. It should also be possible to use some of these systems for other travel related applications such as integrated public transport fare collection and the payment of bridge tolls together with the payment of parking fees.

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