

SMARTRIDER - A SMARTCARD TICKETING INITIATIVE AT THE COST OF 10% OF A NEW BUS

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1. INRODUCTION

Mabberley Limited is a new bus company trading as Sureline based at Tradecroft Industrial Estate, Portland, Dorset, United Kingdom which commenced operations in August 2002. Mabberley Limited is a private limited company with a share capital of £2 (€3) - the Company is owned by myself, there is one other Director and my sister acts as Company Secretary.

The Company was formed to provide local bus services in West Dorset to meet identified passenger needs that are not adequately provided for by existing operators. I had personal knowledge of the area gained from working as Divisional Director Dorset for the Southern National bus company from July 1997 until the Company's acquisition by First Group in April 1999. With the Company's acquisition by First Group I became General Manager of the Southern National Division with responsibility for the Company's operations in Somerset and Dorset until May 2000. Following a period of time working overseas I returned to Dorset and saw that an opportunity existed for the development of a new bus company serving passenger needs that the existing operators were not providing.

Following the granting of planning permission in May 2002 from Weymouth & Portland Borough Council to use Southwell Business Park, Portland as an operating centre an application was made to the Western Traffic Commissioner for an Operator Licence. In the UK there are 7 Traffic Commissioners appointed by the Secretary of State for Transport – each Traffic Commissioner has responsibility in their designated geographical area for the licensing of operators of both goods vehicles and buses and coaches, the registration of local bus services and for taking any disciplinary action that might be necessary against drivers of goods vehicles, buses and coaches. The application for an Operator Licence was granted in June 2002 with authorisation to operate up to 7 buses. In the United Kingdom the operation of local bus services, outside London, is deregulated and operators are able to introduce, change or withdraw local bus services on a commercial basis by giving just 56 days notice to The Traffic Commissioner.

Operations commenced on Saturday 24th August 2002 when Sureline started operating an inter-urban route between Portland, Weymouth and Dorchester (a round trip of 56 kms) every 30 minutes Monday to Friday whilst on Saturdays a service was operated between Portland and Weymouth. This new route restored a direct service that, with the exception of a limited number of morning and evening peak journeys, had been withdrawn by the established operator (First) in March 2002. The withdrawal of the through service between Portland and Dorchester had created problems for a significant number of passengers. Although the resident population of Dorchester is only 15,000 the town is an employment centre being the

location of the administrative offices for Dorset County Council. Dorchester is also the location of the area's main hospital and the withdrawal of the through bus services had caused particular inconvenience to elderly people living on Portland who find it difficult to change buses. Interchange between buses provided by the established operator is not helped by the fact that the buses between Portland and Weymouth terminate in one location of Weymouth (Commercial Road) whilst the buses between Weymouth and Dorchester terminate in another location of Weymouth (King's Statue). In order to change buses passengers are faced with a significant walk. Apart from the needs of passengers travelling to and from Dorchester for work and to visit the hospital Dorchester is also the location of a very popular Wednesday market people visiting the market can increase demand for travel to and from Dorchester by up to 30% on Wednesdays.

The established operator continues to provide higher frequency services between Portland and Weymouth, and between Weymouth and Dorchester. A comparison of the level of Monday to Friday daytime service operated by the established operator (First) and Sureline is given in the table below.

Journey	First	Sureline
Portland and Weymouth	Every 10 minutes	Every 20 minutes
Weymouth and Dorchester	Every 20 minutes	Every 20 minutes
Portland and Dorchester	Limited Peak Service	Every 20 minutes

Since commencing operations the number of passengers using Sureline's services has steadily increased - at present Sureline is carrying up to 1500 passengers a day. In order to meet increasing passenger demand the level of service operated was increased in November 2002 and April 2003. Sureline now operates between Portland, Weymouth and Dorchester every 20 minutes, Monday to Friday whilst on Saturdays a service is operated between Portland and Weymouth every 10 minutes for most of the day. At present no evening or Sunday services are operated - in part this reflected the planning restrictions imposed by Weymouth & Portland Borough Council on Sureline's use of Southwell Business Park due to the proximity of residential development.

In order to meet this increased level of service The Western Traffic Commissioner granted the Company's application to increase the number of vehicles that could be operated at any one time from 7 to 10.

The services are operated using a fleet of 13 Mercedes midibuses - 12 buses are Mercedes 709 midibuses seating between 23 and 27 passengers. These vehicles date from 1994.

In order to accommodate the increasing fleet the opportunity has also taken to move the Company's operating base to Tradecroft Industrial Estate, Portland (approx 3 kms from Southwell Business Park) - this is a more suitable site for operating a bus company for which planning permission was granted by Weymouth & Portland Borough Council without any restrictions.

The service operated by Sureline is provided commercially without any subsidies apart from reimbursement for participation in the Dorset countywide concessionary fare scheme that allows elderly people (aged over 60) resident in Dorset to travel at half fare whilst blind people can travel free of charge. Participation in the concessionary fare scheme is compulsory for all operators and reimbursement is made on a calculated basis using information derived from electronic ticket machines supported by surveys.

2. CHOICE OF SMARTCARD TICKETING TECHNOLOGY

The UK Government is keen to encourage the development of smartcard ticketing technology. The UK Government's transport strategy document "Transport 2010 : The Ten Year Plan" published in 2000 recognised the potential contribution of new technologies and specifically identified smartcards as enabling convenient and versatile ticketing systems as an important element in the provision of better public transport. In particular smartcards are seen as one of the means through which use of public transport can be encouraged especially by younger people who relate more easily to modern technology. There have been a number of smartcard initiatives in the UK – some of which are summarised below :-

- Bradford : First Group introduced a limited smartcard initiative in 1997 which proved successful and led to the launch of First Card across all Bradford in April 2000 as part of a £400,000 (€600,000) investment in Wayfarer 3 electronic ticket machines. This scheme was the first commercial smartcard scheme in the United Kingdom with the First Card be offered for use either as a stored value card or as a prepaid travel pass;
- Devon : Devon County Council in partnership with First Group and North Devon College introduced a smartcard based scheme to encourage greater use of public transport by students over the age of 16. These smartcards give students free travel to and from North Devon College and half fare travel during weekday evenings and at all times during the weekends and during college holidays. Associated with this particular scheme has been enhancement of local bus services, particularly during the evenings and at weekends, and investment in new low floor buses. Funding for this total package of initiatives has largely been due to a grant Of £373,000 (€560,000) from the UK Government's Rural Bus Challenge Fund;
- Northern Ireland : 143,000 smartcards (Senior SmartPass) have been issued to concessionary fare passengers as a means of recording journeys from 1st May 2002. In Northern Ireland concessionary passengers are entitled to free travel and the use of smartcards enables reimbursement to the operator to be made on the basis of actual trips made. This ticketing project cost £6.3 million (€9.5 million) and was funded by a grant from Northern Ireland's Department for Regional Development. This initial investment has allowed other smartcard ticketing initiatives to be developed – in November 2002 Translink's Belfast Citybus operation replaced their paper based 4

journey tickets with a smartcard based multi journey ticket promoted as Smartlink;

- Cheshire : July 2002 saw the introduction of the smartcard based Chester and East Flintshire Travelcard funded by a grant of £200,000 (€300,000) provided jointly to Cheshire County Council and Chester City Council through the UK Government's Capital Challenge programme. These particular smartcards can be used on buses operated by three different operators;
- Suffolk : August 2002 saw the introduction of a smartcard based multi – journey ticket for Ipswich's Park and Ride service; and
- London : By far the most ambitious initiative is Transport for London's smartcard scheme that is being promoted as Oyster. At present smartcards have only been issued to Transport for London staff as a means of testing the preparatory investment in infrastructure that has taken place over the last 4 years.

Although the above list is not exhaustive it does reveal that, apart from the scheme introduced by First Group in Bradford, most smartcard ticketing initiatives have only been implemented with significant Government grants whilst in some cases the application of smartcard technology has been for a specific purpose e.g. in Devon and Northern Ireland.

One has to question the reasons why smartcard schemes have been slow to develop in the UK and it would appear that the initial cost involved is prohibitive factor. As a consequence many operators appear to be only willing to implement smartcard initiatives if there is some form of grant funding. Against this background it is little wonder that many small bus operators believe that the cost involved in implementing a smartcard based ticketing scheme is beyond their financial resources.

As far as we are aware the Sureline initiative is one of the few smartcard applications in the UK that has been introduced at the full commercial risk of the operator. It is certainly one of the smallest applications of smartcard ticketing technology that has been introduced at the full commercial risk of a bus operator.

Sureline wished to provide passengers with a ticketing system that would attract passengers to its new service as well as providing an attractive ticketing alternative to the established operator (First) with whom Sureline competes for local passengers between Portland and Weymouth, and between Weymouth and Dorchester. It was particularly important that a ticket system offering some form of travel pre payment was available on the bus since Sureline has no other ticket outlets and the Company was reluctant to pay the set up costs and ongoing commission to establish a network of agents in other outlets e.g. shops.

After careful consideration the company chose to fit its vehicles with the latest generation Wayfarer TGX ticket machines equipped with smartcard readers. Sureline's smartcard readers are ISO compatible which represents the standard that has been adopted within the public transport industry.

3. EVALUATION OF COSTS

As already identified with other initiatives the implementation of smartcard ticketing technology involves significant costs. Fitting each Wayfarer TGX ticket machine with a smartcard reader increased the cost of each ticket machine by over 50% – a basic Wayfarer TGX ticket machine costs £700 (€1,050) whilst a Wayfarer TGX ticket machine with a smartcard reader costs £1,100 (€1,650).

As far as the commissioning and issuing of smartcards was concerned it had been hoped to undertake this task through on bus ticket machines but, although not technically impossible, performing this task through on bus ticket machines posed a number of problems. The Company, therefore, decided to purchase a POS (Point of Sale) ticket machine to first commission and issue smartcards - this cost a further £1,200 (€1,800).

In addition the Company also had to purchase the smartcards themselves - because of the relatively small scale of the application the unit cost was relatively high. Initially the Company ordered 250 smartcards at a unit cost of £3.40p (€5) - this unit cost would not have been lower unless a much more significant number of smartcards had been ordered. Of all the costs involved in implementing a smartcard scheme it is the high cost of the smartcard itself when compared with other paper based ticketing schemes that is probably perceived by operators to be the most prohibitive factor in implementing smartcard schemes.

There were no other additional software costs - the necessary software configuration was already included by Wayfarer in the cost of the ticket machine configuration and was already an integral part of the Inform management information software package that had been purchased to analyse the information collected by the ticket machines. The additional cost of implementing a smartcard ticketing system totals £6,050 (€ 9,050) – a breakdown of the costs involved is given in the table below.

Equipment	Cost	Cost
Additional Ticket Machine Cost 10 Machines @ £400 (€600)	£4,000	€6,000
Point of Sale Machine	£1,200	€1,800
250 Smartcards	£850	€1,250
Total Cost	£6,050	€9,050

The implementation cost was, therefore, less than 10% than the cost of a new bus. Sureline has, however, commenced operations with 9 year old Mercedes midibuses that have been purchased at a significantly lower cost than purchasing new vehicles - even so the cost associated with the implementation of smartcard ticketing technology has represented less than 5% of the company's start up costs. Such additional costs are, however, sometimes more easily accommodated within start up costs since additional costs are sometimes more difficult to bear at a later date.

4. INTRODUCTION AND PROMOTION OF SMARTCARDS

The smartcards themselves are promoted as “SmartRider” and the system went live in November 2002. Initially a small number of regular passengers were invited to test the system to ensure that there were no technical problems. The first SmartRider cards were sold to passengers from December 2002 and at the time of writing this paper (August 2003) there are 98 SmartRider cards in circulation. SmartRider cards are used by all types of passengers including children travelling to and from school, adults travelling to and from work, and by retired passengers seeking to save a little more of their limited disposable income when travelling at concessionary fares.

To date there has been no specific promotion of SmartRider cards. In the early days encouraging existing Sureline passengers to use SmartRider cards would have merely reduced cash revenue by 10%. Currently further details of SmartRider cards and an application form are available on the Company's website (<http://www.surelinebuses.co.uk>). SmartRider cards are also promoted by on bus notices with application forms being available on request from the Company's offices and from all Sureline drivers. The most effective promotion has, however, proved to be through word of mouth from passengers already holding SmartRider cards. At the time of writing this paper approx 5% of passenger trips (and revenue) is accounted for by passengers holding SmartRider cards.

As far as the means of encouraging passengers to purchase SmartRider cards is concerned other smartcard schemes offer a wide range of incentives. First Bradford, for example, offers a system of 'Bus Miles' (with 1 bus mile being awarded for every £1 spent and 100 bus miles being converted into £1 of stored value - effectively a discount of 1%) whilst the Cheshire scheme offers 10% extra travel. The majority of bus passengers generally have limited amounts of disposable income and are, therefore, more interested in the fare that they actually pay. Sureline, therefore, decided to first offer a stored value ('electronic purse') smartcard. The first type of SmartRider card to be introduced, therefore, offers regular passengers a 10% discount on cash fares (with cash fares for most journeys already lower than the fares charged by the established operator). It was Sureline's view that a 10% discount on cash fares would be perceived as offering greater value than offering 10% extra travel. This discount applies to all passengers purchasing SmartRider cards – adults, children and concessionary passengers.

Attention has already been drawn to the fact that SmartRider cards have to be first commissioned and issued through the company's offices but can then be recharged by the driver of any Sureline bus that a passenger boards.

Despite the high initial production cost of SmartRider cards these are offered to passengers at no cost so long as there is a minimum purchase of £10 (€15) of bus travel. Most other smartcard schemes require an administration fee to be paid to contribute either in part or in full towards the production cost of the smartcard itself. The Cheshire Travelcard, for example, requires each

passenger to pay a £1.50p registration fee (€2.50). Such administration charges are, however, seen by the company as discouraging use of smartcards. The minimum amount required to recharge a SmartRider card is £5 (€7.50).

Sureline is now approaching its first birthday and has now established its own passenger base so it is now thought that the time is right to start aggressively promoting SmartRider cards to encourage new users. A promotional campaign is, therefore, currently being devised - the objective of such a promotional campaign will primarily be to encourage passengers currently using either other modes of transport (e.g. cars) or the other bus operator to use Sureline services.

The first approach that is being adopted is to offer major employers an incentive to encourage their employees to purchase a SmartRider card. Such an approach should be welcomed by major employers in their development of Green Travel Plans through which their employees are being encouraged to make greater use of public transport to travel to and from work. It is currently proposed to offer an initial incentive in the form of an amount of travel at an even greater discounted rate e.g. offering up to £50 (€75) of travel at half price. This would, however, only be an initial discount to gain new passengers by tempting employees to purchase SmartRider cards – having purchased and discovered the benefits of using a SmartRider card passengers will top up their SmartRider cards and continue to use Sureline services. It is also proposed to investigate the possibilities of offering on going incentives although these are more complex to administer. The first employer that is being approached with such an offer is Weymouth & Portland Borough Council.

5. AN APPRAISAL OF SMARTCARD USERS

A profile of the users of SmartRider cards by age and sex is obtained when passengers wishing to purchase a SmartRider card complete the necessary application form. An analysis of the 98 application forms submitted to date reveals that 61 SmartRider card users are female (62.2%) whilst 37 SmartRider card users are male (37.8%). Such figures appear to reflect the general passenger profile of bus users. A more detailed analysis by age is given in the table below :-

Age Range	Total Passengers
Under 20	14.6%
21 – 30	7.9%
31 – 40	13.5%
41 – 50	24.7%
51 – 60	21.3%
61 – 70	11.2%
71 – 80	3.4%
Over 80	3.4%

One of the perceived attractions of smartcard technology is that it should appeal to the younger generation – it is, therefore, a little surprising that 46% of SmartRider passengers are aged between 41 and 60, reflecting the more general age profile of bus users. This would suggest that the introduction of smartcard technology in itself is not sufficient to encourage greater use of public transport by younger passengers.

In order to discover a more detailed insight of the users of SmartRider cards a postal questionnaire survey was undertaken during July 2003 to establish demographic characteristics, frequency of use and journey purpose – a total of 86 questionnaires were issued. In order to encourage the highest possible response rate an incentive was offered with one passenger being chosen at random to receive a £30 top up of their SmartRider card. A total of 63 replies were received – a response rate of 73.2%.

The main findings of the questionnaire survey were as follows :-

- As to be expected SmartRider cards are mainly used by regular passengers. 52% of passengers used their SmartRider cards daily whilst a further 36% of passengers used their SmartRider cards every 2 – 3 days;
- SmartRider cards did not encourage loyalty – 72.5% of SmartRider card passengers still continued to use the services of another operator although for the majority of passengers their use of another operator was mainly occasional (and may have on other routes on which Sureline does not provide a service);
- Having purchased a SmartRider card there was a high level of continued use with 88.5% of holders still using their SmartRider cards. All of those passengers who no longer used their SmartRider cards had found SmartRider cards beneficial and were no longer using their SmartRider cards due to changes in personal circumstances;
- Having purchased a SmartRider card 80% of passengers use their SmartRider card for every journey with 88.9% of female passengers and 66.7% of male passengers using their SmartRider card for every journey;
- 85.7% of passengers only use their SmartRider card on weekdays with very little use of SmartRider card holders using their smartcard for discretionary travel at weekends;
- Passengers mainly used their SmartRider cards for journeys to and from work;
- 95.6% of passengers had topped up their SmartRider cards – 34.8% of passengers topped up their SmartRider cards weekly, 32.6% of passengers topped up their SmartRider cards every 2 to 3 weeks, 32.6% of passengers topped up their SmartRider card monthly. Female passengers tend to top up their SmartRider cards more frequently – 48% of female passengers topped up their SmartRider cards weekly whilst 61.1% of male passengers topped up their SmartRider cards every 2 – 3 weeks;
- 60% of passengers who topped up their SmartRider cards weekly added £5 (€8) credit whilst 78.6% of passengers who topped up their

SmartRider cards every 2 to 3 weeks added £10 (€15) credit and 78.6% of passengers who topped up their SmartRider card monthly added at least £20 (€30) credit;

- Although SmartRider cards are issued to one person they can be used by more than one passenger but only 22.2% of SmartRider cards are used by more than one passenger. Of those SmartRider cards that are used by more than one passenger most were only used by one other passenger; and
- The technology appears to be fairly robust – only 6% of passengers reported they had experienced any problems when using their SmartRider cards.

6. FUTURE DEVELOPMENTS OF SMARTCARD TECHNOLOGY

Smartcard technology offers a wide range of possible future options. At this stage only a stored value smartcard has been introduced but consideration is being given to other applications - in due course unlimited travel pass and multi journey versions of the SmartRider card may be introduced. Wider applications are also obviously possible to allow SmartRider cards to be used for other purposes or to allow other smartcards (e.g. bank debit cards) to be used for purchasing bus travel. There is also a longer term hope of introducing a multi-modal, nationwide smartcard ticketing system across the UK. Such wider applications of smartcard technology, whilst technically feasible, would involve a wider range of involved parties each with their specific interests and needs which cause conflicts. It seems at this stage that whilst we have the technology our first priority should be to learn how to walk rather than run!

7. CONCLUSIONS

The main conclusions of Sureline's experience of SmartRider are as follows :-

- the cost of introducing a smartcard based ticketing scheme is not as prohibitive in cost as many operators perceive. Sureline has introduced its SmartRider ticketing scheme for a total cost of £6,050 (€ 9,050), which is less than 10% of the cost of a new bus;
- At present there are 98 passengers holding SmartRider cards and the number continues to increase;
- Although there has not, as yet, been any specific promotion of SmartRider cards passengers using SmartRider cards account for approx 5% of passenger trips (and revenue);
- The passenger survey has revealed that once a passenger has purchased a SmartRider card they are likely to continue using their SmartRider card and add credit to their SmartRider card on a regular basis. The only reason that some passengers have ceased using their SmartRider cards is due to a change in personal circumstances;
- The questionnaire survey revealed that SmartRider cards tend to be used by regular passengers as a means of reducing their travel costs;
- Surprisingly 46% of holders of SmartRider cards are aged between 41 and 60;

- The smartcard system has proved to be fairly robust with only 6% of passengers reported that they had experienced a problem whilst using their SmartRider card.

Apart from developing its initial service between Portland, Weymouth and Dorchester Sureline is also looking to expand its operations as and when suitable opportunities arise. In May Sureline introduced a new service between Weymouth and Wyke Regis operating during the daytime every 30 minutes, Monday to Saturday – this service requires 1 bus. As a consequence Sureline has had to purchase 3 more ticket machines and in order to operate the SmartRider scheme on all buses this involves an additional cost of £400 (€600) per ticket machine.

Sureline is also now seeking to pursue a more active campaign to encourage more passengers to use SmartRider cards. Greater use of SmartRider cards would have the operational benefit of marginally speeding up boarding times which can only help to maintain service reliability. The first approach that is being adopted to increase the number of passengers holding SmartRider cards is to offer major employers an incentive to encourage their employees to purchase a SmartRider card.