Electronically Controlled Cycle Parking – A Valuable Component Of Bike And Ride?

Ghent Railway Station – A Case Study

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Summary:

This paper builds on two previous ones by the author; the first presented at Velo Borealis in 1998 and the second at Velo City 99. The former set out principles of best practice of cycle parking at railway stations across Europe. The latter examined the opportunity presented by the integration of electronic control of cycle parking and electronic ticketing as a way of increasing the use of bicycles as a feeder to public transport systems.

The paper examines the experience of a rail operator which has introduced an electronic cycle parking system at a number of stations including Ghent in Belgium, the manufacturer of the system and, of course the customer.

Comparisons are made with conventional parking facilities and conclusions drawn about the value of this type of parking operation based upon the customer satisfaction survey undertaken by the rail operator and previously defined principles of best practice.

Background

It is generally accepted that in many countries the fear of having a bicycle stolen is a major deterrent to cycle use. As a result, where cycling still remains the most obvious and popular choice for short journeys despite high levels of theft, cyclists often respond by using bikes that are not attractive to thieves. This in turn can lead to other road safety problems as the result of poorly maintained machines posing a threat to the rider and other road users.

Various approaches to solving the problems of bicycle security are available. Some measures are taken by the cyclists themselves and others by local authorities and other service providers such as public transport operators. Apart from the use of bikes that are unattractive to thieves, cyclists often respond by using ever-stronger locks and attaching their bikes to a variety of immovable objects. Sadly, this usually means street furniture and all too often is at the expense of the safety and convenience of pedestrians and those with disabilities.

Whilst local authorities and service providers often do their best, the kinds of stands provided by many are not always user-friendly, especially when they become full. Despite being found all over Europe, the commonly employed bicycle rack that holds only the front wheel, and stores alternate bikes at a higher level, are perhaps amongst the worst offenders. These are not only difficult for those without the strength to easily lift their bikes into the rack, they also cause problems when one bike falls against another. In addition, they create particular problems as the result of closely packed bikes being caught by the cables and brake levers of those being lifted in or out. The particular difficulties of attaching the bike to the frame of the rack to prevent theft are another reason for the dislike of this type of stand amongst many users.

It should, therefore, come as no surprise to find that a number of cyclists respond by giving up the use of their bike. Fortunately others take a different approach by encouraging local authorities etc to provide the kind of secure parking that genuinely meets their needs. An example of one service provider's response may be taken from the experience of the Belgian rail operator SNCB/NMBS.

In the past, SNCB staff monitored cycle parking at its stations but this practice had to be abandoned due to the staff costs involved and the need to employ personnel more productively. Over time this lead to the surroundings of many Belgian railway stations becoming unsafe from the point of view of cycle security. This in turn lead passengers to ask for more secure cycle parking facilities.

In response to these requests a number of solutions were considered, including the option of automated systems. After further study and market research the product manufactured by the Belgian company PLS (Park and Locking Systems)was chosen as the most convenient and efficient system. As a result, in the past 12 to 24 months the stations of Mechelen, Antwerp and Ghent have been equipped with this fully automated parking system.

The PLS Electronic Parking System

The system is actuated by the used of an industry-standard chip card and comprises two basic components; the control unit/card reader and the bicycle stand. The control unit is mounted in a steel console and one console is used to control around twenty to thirty stands. It is worth noting that one control unit can control up to 100 stands but twenty to thirty is considered to be the optimum figure to keep delays at peak periods to a minimum.

The bicycle stand itself stand carries a unique bracket. This is specially shaped so that the front tube of the bike frame can be held securely within it. Damage to the frame (and the bike) is prevented by the use of a plastic cover. The bracket will accept more than 95% of the bikes in use today. Once the bike is in place, a rustproof steel pin is pushed home to lock the frame. The pin and, therefore the bike, cannot be with drawn until released electronically by use of the chip card.

The chip card is a pay-card. When the card is inserted into the reader the time of arrival is registered. When the bike is collected the equipment also registers the time of departure. The difference between the two determines the parking fee. The amount due is automatically deducted from the chip card. Whilst the card used in connection with this system currently provides only a single service, there is no practical reason why it should not be incorporated in another that provides ticketing on public transport or a wider range of services.

Operation

1. When the user inserts their card into the reader the system displays the validity of the card. Next it displays the operating instructions. The user can choose from four languages; Dutch, French, English, or German.

2. The system then assigns a vacant parking position. Once the bike has been placed in the stand it is secured by pushing home the locking pin. Each individual control unit offers only one parking space per card at any one time, but many bikes may be parked by using the same card at different control units.

3. To help improve the stability of the parked bike, and reduce the space occupied, the front wheel sits at an angle of approximately 40 degrees in a shallow bracket fixed to the floor.

4. When the bike is needed again, the card is inserted into the reader. If there is sufficient money credited to the card is sufficient to allow full payment to be deducted, then the system will allow the pin to be withdrawn. If not, the bike remains locked until the card is re-charged.

5. The chip card is recharged by staff who are present on pre-advertised days. In some cases a local shop or newspaper kiosk may also provide this service.

Other Facilities

The nature of the system allows monitoring of all functions. This means that levels and duration of use may be determined. This helps match service delivery to customer needs. In the event that a card is lost then authorised staff may release a bike with a special card. If a bike should be removed by unauthorised use of a card, then the time of removal can be established to help in tracing the stolen bike. Monitoring lengths of stay can identify bikes left abandoned within the system. These can then be removed by use of the operator's card. Back-up at times of power loss is provided by a battery within the console. This can be charged either through the mains electric system or an optional solar panel.

Other Benefits

In addition to the fact that use of a large number of consoles reduces the time taken to remove bikes at peak periods, the opportunity to assign stands to any user means that maximum use of all the stands can be achieved at all times of the day. This can provide greater capacity for example, than lockers solely assigned to individual commuters. Equally, visitors to the city may use stands during weekends, thus allowing use beyond that which would be normal for assigned parking for use by commuters.

From the provider's point of view the fact that system is fully automatic there need be no staff costs involved. Since various supply and maintenance packages are available from the manufacturer it is possible to achieve regimes that relive the provider of the service from all involvement from its day-to-day running.

Ghent Station

On an average weekday several thousand bikes can be found parked around the station at Ghent. In response to requests from passengers for improved facilities SNBC has installed 600 automated cycle parking stands. These have been placed in a covered area 97 metres by 11 metres, specially provided to house the parking. The stands are in four rows of 150. The space available is slightly in excess of the minimum required for such a layout of 85m x 10m, which contributes to the spacious feel.

The building is approximately 50 metres from the main entrance to the station and lies between it and a major area of car parking. Much of the roof is glazed and this creates a bright and airy feel to the parking area. The use of different colours for the steel columns which support the roof also add a pleasing note to the atmosphere and offer an additional reminder to users of where they left their bike.

To add to the security of the parking, entry to the building is also controlled by the same smart card that parks the bikes. Glazed steel automatic sliding doors at both ends allow for easy entry and exit when pushing a bicycle.

SNCB/NMBS Evaluation Of The Cycle Parking System

As stated earlier, the cycle parking system is in operation in three different Belgian cities. At the time of writing railway stations at several other cities are also programmed for similar schemes.

As is to be expected that, in view of the investment necessary to create such projects, this parking system has been the subject of evaluation, both from the provider and customer's perspective. The results of SNBC's monitoring are summarised as follows:

- Users need to be introduced to the system;
- Once explained, the system is very user-friendly;
- No complaints have been received from the users;
- The three parking sites are all fully occupied;
- The parking areas are cleaner and more user-friendly;
- There have been no technical breakdowns in the system;
- The level of vandalism is negligible; and
- No thefts have been reported.

Comment

Anecdotal evidence from the manufacturers suggests that initially customers were unsure about the need for apparently complex systems such as this. However once familiar with its operation, customers are very happy with both it and the security it provides. To introduce users to the system a range of activities have been undertaken to both publicise the facility and help them learn how to use the equipment. This has included open days, instruction manuals and signposting etc. The only technical breakdowns, which have occurred during the introduction of the project, have been as the result the works of others e.g. power cuts due to construction works etc.

Sadly, it is to be expected that in most societies that the kind of equipment provided would be subject to vandalism. Whilst the equipment employed is very robust and itself a deterrent to tampering, some individuals have still felt it necessary to try. Fortunately, experience shows that this is minimal and confined to areas where additional security measures had been already incorporated. Frustrated would-be vandals soon learn that their actions are fruitless and then leave the equipment alone.

The author should be contacted directly for details of typical costs for installation, management and maintenance. For use, it may be taken as a guide that indications are that cyclists across Europe are willing to pay between 7.5 and 10 Euro per month for such services.

Conclusion

In a paper on the principles of best practice for cycle parking to the Velo Borealis Conference held in Trondheim in 1998 the author suggested that good cycle parking should be:

1. Visible

2. Accessible

3. Secure

4. Covered

5. Affordable

6. Easy to use, well managed and maintained.

7. In a position of prominence and advantage.

8. Attractive

9. Coherent

10. Able to maximise the involvement of other "partners" and funding sources

11. Linked to other needs of cyclists.

12. Part of a "Cycling Culture"

When compared against these principles, the electronically controlled cycle parking at Ghent station scores very highly. It is easy to find, access is equally easy and its security is proven. Bikes left all day are covered from the effects of the weather and the fact that the stands are full is testimony to the fact that customers are happy to pay the fee. The equipment is easy to use and the sites have proved to be well managed and maintained. Being close to the station entrance and closer than some car parking, the importance attached to cycling is recognised. The author has insufficient experience to comment on the links to the cycle network but it is clear that this facility ably meets the needs of a sector of the cycle parking market and the level of cycling shown by the number of cycles parked at the station would indicate that Ghent is already a "cycling city".

Any facility that encourages people to cycle as a part of a longer journey by successfully removing the fear of theft is to be applauded. As ticketing of public transport moves towards the use of smart cards for service delivery the use of such cards to provide a wider range of services is to be expected. So long as cycle theft can be expected to continue, the electronic control of cycle parking has, therefore, a valuable role to play in the promotion of bike and ride.

Perhaps the most telling statement can be taken from the summary of SNCB's evaluation "No thefts have been reported". How many other operators and manufacturers can make that proud boast and how better to encourage people to leave their cars behind in the certain knowledge that their bicycle will be there when they get back after their journey?

Notes:

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