

This item was submitted to [Loughborough's Research Repository](#) by the author.
Items in Figshare are protected by copyright, with all rights reserved, unless otherwise indicated.

Stakeholder perspectives on the current and future roles of UK bus-based Park and Ride

PLEASE CITE THE PUBLISHED VERSION

PUBLISHER

© Elsevier

VERSION

AM (Accepted Manuscript)

LICENCE

CC BY-NC-ND 4.0

REPOSITORY RECORD

Meek, Stuart, Stephen G. Ison, and Marcus P. Enoch. 2019. "Stakeholder Perspectives on the Current and Future Roles of UK Bus-based Park and Ride". figshare. <https://hdl.handle.net/2134/4315>.

This item was submitted to Loughborough's Institutional Repository (<https://dspace.lboro.ac.uk/>) by the author and is made available under the following Creative Commons Licence conditions.



CC creative commons
COMMONS DEED

Attribution-NonCommercial-NoDerivs 2.5

You are free:

- to copy, distribute, display, and perform the work

Under the following conditions:

BY: **Attribution.** You must attribute the work in the manner specified by the author or licensor.

Noncommercial. You may not use this work for commercial purposes.

No Derivative Works. You may not alter, transform, or build upon this work.

- For any reuse or distribution, you must make clear to others the license terms of this work.
- Any of these conditions can be waived if you get permission from the copyright holder.

Your fair use and other rights are in no way affected by the above.

This is a human-readable summary of the [Legal Code \(the full license\)](#).

[Disclaimer](#) 

For the full text of this licence, please go to:
<http://creativecommons.org/licenses/by-nc-nd/2.5/>

Stakeholder Perspectives on the Current and Future Roles of UK Bus-based Park and Ride

Stuart Meek ^{*a}, Stephen Ison^b, Marcus Enoch^c

Journal of Transport Geography (in press).
doi:10.1016/j.jtrangeo.2008.10.007

Transport Studies Group, Department of Civil and Building Engineering,
Loughborough University, Loughborough, Leicestershire, LE11 3TU, UK.

^a S.D.Meek@lboro.ac.uk

^b S.G.Ison@lboro.ac.uk

^c M.P.Enoch@lboro.ac.uk

*Corresponding author. Tel +44 (0)1509 223401; fax: +44 (0)1509 223981

Abstract

UK bus-based Park and Ride (P&R) has increased significantly in popularity over the past 40 years although there are doubts over its role in reducing car use. This paper presents the findings from interviews with eight key stakeholders involved in UK P&R, which sought to provide insights into the popularity of P&R, particularly at the local government level, its success, and how the concept of P&R can be developed in the future to improve its role in reducing car use whilst maintaining its popularity. It is suggested that there are a range of goals for the use of P&R which extend beyond traffic reduction. It is discussed how there may be potential to develop the concept, particularly by decentralising P&R sites and developing their role as interchanges for public transport.

Keywords: park and ride, bus, interchange, integration

1. Introduction

Bus-based Park and Ride (P&R) was first initiated in the UK in the 1960s and 1970s, enjoying most success in cities historic in nature and relatively small in size, that faced capacity constraints from their inhibiting urban structure. In a range of settings across the UK however, some of which very different in size and nature to the earlier host centres, P&R has subsequently emerged as a major component of local transport policies. National transport policy over this period has nevertheless been fluid and P&R has been subject to an evolving set of policy goals. Yet the concept itself has remained largely unaffected by such changes.

P&R is not purely bus-based nor is it exclusive to the UK. For example, the London Underground has many P&R opportunities throughout its network, while the resurgence of UK light-rail over the past 20 years has brought with it P&R on most of these systems. The heavy-rail network tends to offer P&R either informally from small station car parks or in some cases, parkway stations, which are large facilities usually located on the edge of major metropolitan areas. The situation is similar internationally with P&R used in most cases as a feeder for wider public transport networks. The focus of this paper however, is UK dedicated-bus-based schemes, which are discrete instruments independent of existing networks with their own set of policy goals. Yet there are undoubtedly some important lessons here for the benefit of stakeholders internationally, including the relevance of motivations for introducing P&R, its effectiveness in addressing policy goals and potential developments of the concept.

While there are of course refinements according to local circumstances, the general model of UK P&R that has emerged comprises a dedicated purpose-built site located adjacent to radial routes, 2-6km from the urban core (Parkhurst and Richardson, 2002). Sites usually accommodate 400-1000 spaces and benefit from significant investment in passenger facilities and attractive landscaping. It is the responsibility of local authorities to initiate schemes and they can tender P&R bus services, unlike most UK public transport services. With few exceptions, bus services are dedicated with a peak frequency usually found of around 15 minutes.

P&R has become a popular instrument with the policymaker and the user; there are now over 100 full-time bus-based P&R sites in operation nationally (TAS Partnership, 2007). Yet almost since the establishment of P&R as a concept in the UK and certainly over the past 15 years or so, there has been a growing body of evidence which suggests that it can have a limited or even counter-productive impact on its policy goals, particularly those to reduce car use. Given these concerns over the effectiveness of P&R, the aim of this paper is to provide insights from key stakeholders into the reasons underpinning its popularity, particularly at the local authority level; its relative success in the contemporary policy setting, and the impediments to this; and how it should best be utilised in the future.

The paper initially outlines the development of P&R in terms of the growth in schemes and national policy, as well as presenting an account of the evidence base on its traffic effects. After providing some methodological details, it moves to outline the

findings from interviews undertaken with key stakeholders. It offers views on the reasons underlying the popularity of P&R, its success and finally, it looks towards the future and considers developments on the P&R concept.

2. The development and traffic effects of UK P&R

This section provides a brief description of UK P&R policy and practice and the evidence base on its traffic effects. For a more detailed account see Meek at al (2008).

The first successful full-time P&R scheme to emerge on a notable scale was in Oxford in the early-1970s as part of the city's Balanced Transport Policy, which also included measures such as pedestrianisation and rigorous parking controls (Williams, 1999). Its uptake elsewhere was initially slow, enjoying some success in settings similar in size and character to Oxford, such as Cambridge and Bath. In larger cities schemes at this stage were less successful because of low patronage linked to the availability of city centre parking, or as in the case of Nottingham with the 'Zone and Collar' scheme, the failure of the wider package of measures with which it was introduced (Daniels and Warnes, 1980).

P&R received its first national government attention in 1990 (DoE, 1990). It was recognised as a traffic management measure but government funding was also made available for schemes through the annual Transport Policies and Programmes bidding process and the Transport Supplementary Grant (Parkhurst and Richardson, 2002; Huntley, 1993). It was following the election of the Labour Government in 1997 however, that support for P&R reached its zenith. The government initially backed the emerging view that 'predict and provide' – attempting to provide sufficient road space for predicted demand – was fuelling traffic growth (Goodwin, 1999). P&R was thus encouraged to reduce car use (DETR, 1998). It was a convenient measure as it avoided displeasing the road lobby – P&R is of course geared towards the motorist - whilst conspicuously aligning with the government mantra of 'integration'.

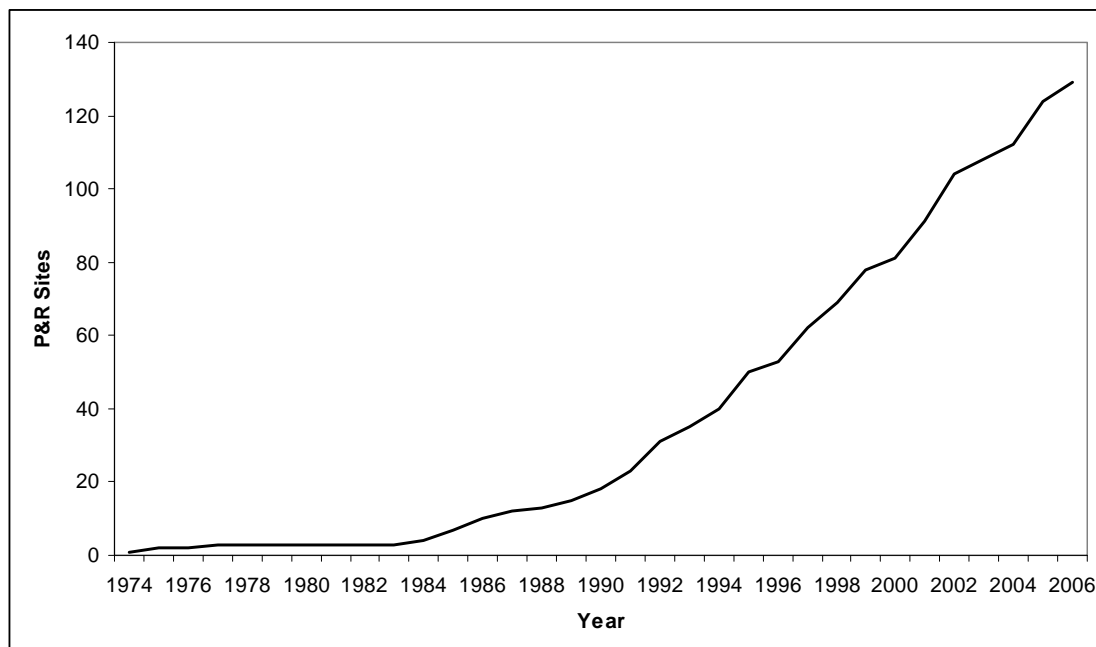
Although road building had remained on the agenda in the early-2000s (Shaw and Walton, 2001), P&R had retained its popularity with the national government announcing government funding for "*up to 100 new park and ride schemes*" (DETR 2000, p.65). Even so, by this stage 70 or so sites had been introduced (DETR, 2000), largely in historic towns which had become synonymous with P&R, but its popularity had also extended to larger cities, breaking the earlier trend of failure in these settings.

In the mid-1990s however, a debate emerged over the traffic effects of P&R that put into doubt its ability to reduce car use. Earlier surveys on P&R users (Papoulias and Heggie, 1976; White, 1977; Collins et al., 1987, Cooper, 1993) had shown that up to 39% of users had previously or would otherwise (if P&R was unavailable) use conventional public transport services or forego the trip altogether. Parkhurst (1995), with a survey of Oxford and York users, started to identify the implications. The impact of generated trips is clearly induced mileage but for public transport abstraction, access trips to P&R also represent increased car use. Underlying these effects was the subsidy of most P&R services, uncommon in most UK public transport, which induces new and longer trips and allows P&R to compete with town centre parking charges thereby simultaneously undercutting conventional public transport fares. Parkhurst thus argued that rather than achieving reductions in traffic, P&R could induce a net increase.

After this growing uncertainty over P&R, the government commissioned a report on P&R users in eight UK towns (WSA, 1998). While its conclusions were favourable for P&R, Parkhurst (1999) showed the work to have methodological weaknesses (including the omission of abstracted and generated trips) and re-evaluated the findings. He found that the high-frequency and low load factors of P&R buses resulted in a net increase in the distance travelled in three of the eight centres, in car-equivalent terms. The inclusion of abstracted and generated trips however, may well have resulted in increases in more of the centres.

This uncertainty over the effects of P&R led, at least in part, to a retreat in government support. There has been a departure from the view that P&R will specifically reduce car use, while more emphasis has been put on the indirect role of P&R in enhancing public transport ridership (DfT, 2004). Local authorities have not however shared the national government's curtailing support for P&R and it continues as a favoured option for them, demonstrated by the growth in sites (Figure 1).

Figure 1 Number of UK P&R sites 1974-2006



Adapted from TAS Partnership (2007)

Nevertheless, while the traffic impacts of the existing concept of P&R have been subject to increasing doubt, relatively little attention has been paid to advancing the concept itself. It is not implausible that the concept could be revisited to improve its role in reducing car use, thus combining efficiency with the relatively high level of public and political acceptability of the current model.

The main exception to this lack of progression is the decentralisation of P&R sites that was proposed by Topp (1995) but developed more fully by Parkhurst (2000) as the 'Link and Ride' concept. Here, P&R sites are spread along a corridor, some of which are located much farther away from the host city and would link directly with satellite settlements. Existing bus services, although enhanced in quality, would serve

the sites, thus mitigating the problem of abstraction. This would effectively increase the distance of the bus journey whilst reducing car access trips. Indeed, this model represents a significant departure from that currently used in the UK.

Yet there are some plans for elements of this approach to be adopted in reality. Construction began in 2007 on a guided busway scheme in Cambridgeshire, on which there will be up to three interchange sites. These will be located near to major residential areas, the farthest being approximately 25km away from the city of Cambridge.

This is a somewhat different model to the bus-based P&R used elsewhere in the UK. The use of a guided busway provides an innovative segregated mode on which P&R will act as a feeder, alongside conventional bus stops. Further impetus for the scheme came from proposals for a new town to be developed which lies on the route of the scheme (Cambridgeshire County Council, 2007). Whether or not this model will be extended to (non-guided) bus-based schemes, in the spirit of Parkhurst's Link and Ride model, may depend on the success of the Cambridgeshire scheme. This is unlikely to be without difficulties though. Towns generally operate in a competitive environment in which fears may exist about the transfer of economic activity as a result of longer-range P&R. Furthermore, the provision of multiple sites will provide barriers in terms of the acquisition and development of suitable land and its management as P&R facilities.

3. Method

As outlined in the preceding section, the approaches used in the existing literature have largely consisted of assessments of travel behaviour based on surveys of P&R users. The impact of P&R has thus been estimated in contrast with a situation wherein P&R does not exist in the centre studied, based on the alternative or previous behaviour of the user. This research has demonstrated that it may not fulfil policy goals, particularly those to reduce absolute levels of car use and its externalities.

This paper aims to build on this work by providing some understanding of the ubiquitous popularity of P&R, particularly with local authorities, despite its proven limited or even counter-productive role in contributing towards policy goals. Further, it considers both reasons behind its limited attainability and also if there are, in the future, ways by which it can become more efficient whilst maintaining its popularity.

To address these aims, semi-structured interviews were undertaken with eight key stakeholders, all of which had significant experience of P&R planning, operations and policy. The participants consisted of three academics, an environmental campaigner who works specifically in the area of transport policy issues, a bus operator of P&R services and three local authority officials who have been heavily involved with the introduction and operation of UK P&R schemes. Participants were selected on the basis of their significant experience and in-depth knowledge of P&R, whilst the range of individuals represented a diversity of perspective on the issues. Interviews were carried out between November 2007 and January 2008, each lasting approximately one hour.

It would of course be erroneous to suggest that the findings from a small number of interviews can be generalised normatively to represent P&R schemes and their

planners and users in the wider national or international context. Rather, the use of this ‘purposeful sampling’ was to provide a qualitative investigation which aimed to glean insights from information-rich individuals, bringing together a range of experiences of P&R (Maykut and Morehouse, 2000). The views of such individuals thus provide a source “*from which one can learn a great deal about issues of central importance*” (Patton 1987, p.52).

The interviews consisted largely of open questions based on the following themes and sub-themes:

The motivations underlying P&R use

a) The motivations underlying local authorities’ use of P&R schemes and the reasons for its growth across the UK.

b) The balance of the roles of local and national government in the policy, planning and operation of P&R schemes and the effects of this balance.

The relative success of P&R

c) The criteria that is used, and should be used, to measure the success of P&R.

d) The relative effectiveness of P&R.

e) The relationship between P&R and conventional public transport.

The future of P&R

f) The future development of P&R as a concept.

While the policy goals for P&R are generally well publicised, less so are the reasons for local authorities’ choice of P&R. Questions on this (a) were thus included to gain an understanding of some of the less conspicuous motivations for local authorities, such as political or economic reasons for its introduction. With regard to (b), the balance of responsibility for P&R policy and planning can be similarly deduced from the contextual and policy evidence, as outlined in section 2, but the effect of this balance on the uptake of P&R and its success is less clear. Furthermore, the national government has encouraged the uptake of P&R through policy and funding but once the schemes are introduced, it is the responsibility of local authorities as the operators to monitor their effects. There seems to be a lack of cohesion with regards the effects that are monitored. Some authorities may measure, for instance, simply the patronage of P&R services while others may consider its wider effects on parking demand or traffic congestion. Questions on this were therefore used (c) to glean stakeholders’ views on the effects that should be measured, as well as (d) which sought their views on the relative effectiveness of P&R in terms of its impact on traffic congestion, car use, traffic-related emissions and economic vitality. One particular effect that has been reported in the literature (section 2), is the detrimental impact of P&R on conventional bus services. Most of this evidence however focuses quantitatively on the proportion of bus users transferring to the P&R service. Interview questions were thus used (e) to understand in more detail the implications of public transport abstraction. Finally, there has been a limited amount of research which has sought to develop the concept of P&R to better fulfil transport policy goals (such as reductions

in car use, congestion and traffic-related emissions). Questions (f) were thus asked, from the benefits of the stakeholders' experience, on any ways in which the concept could be developed in the future. The following three sections discuss the findings from the interviews, following the order of the main themes outlined above, namely, the motivations underlying P&R use, its relative success and its future.

4. The motivations underlying P&R use

It could be argued that local authorities' motivations for introducing P&R have been in accord with national government policy goals to reduce traffic congestion and traffic-related pollution. While increasing awareness of the environmental disbenefits of car use resulted, to some degree, in the government's encouragement of P&R, there is also pressure from the local electorate for local authorities to control traffic effectively, '*politicians want to be seen to deal with the problem of traffic congestion*' (Campaigner). Indeed, one of the key qualities of P&R is its public acceptability,

it is a policy that appeals to people... The exception is where they are built in greenbelts and then encounter a lot of opposition, but...on one hand, [local authorities, with P&R] restrain traffic and at the same time, they give something back to the motorist (Academic).

it appeals to the broad-stream voter, the car user. A council cannot [win local elections] on the basis of the small minority of [conventional] public transport users. To most car users P&R is either an attractive option or... it removes other traffic from the road. Motorists see traffic restraint as negative; P&R is positive. It provides an additional option (Operator).

Furthermore, it was suggested by an Academic that P&R may allow local authorities to regain some control over public transport, something that had diminished after the privatisation and deregulation of the bus industry in 1986. P&R is not strictly within this industry so effectively allows local authorities to tender bus services and thus apply significant influence on service specification.

While P&R schemes require significant investment to meet both capital and operating costs, the overall view of participants was that the funding of schemes can actually be a motivation to their introduction rather than a barrier. It was suggested for instance, that P&R is a valuable component to attract funds within the package of measures presented in the Local Transport Plan (LTP), a five-yearly document submitted to the national government in which authorities present their transport provision plans related to government goals and bid for their funding. Indeed, the main role of the government in P&R planning was considered by most participants to be one of funding.

The government however, is only one of a number of funding sources for P&R. Another significant source of funding, certainly from the Officials' perspective, were Section 106 agreements (of the Town and Country Planning Act 1990, although this legislation is currently in the process of being replaced by the 2004 Planning and Compulsory Purchase Act). Here, planning permission granted by the local authority includes an obligation for the developer to contribute towards the cost of providing parking spaces at the P&R site to offset the traffic impact of their development. Furthermore, hypothecated revenue from highly profitable on-street parking provision

in city centres was also considered to be a significant source for the operation and maintenance of P&R sites.

It was pointed out by an Academic that after capital grants have been obtained for P&R sites through the LTP process or other subsidies, its efficient operation may result in an operating surplus, rather than as is often the case, being in need of operating subsidies. An Official however suggested that any perceptions, held by authorities considering P&R, of it being a means to simply generate profit were misplaced and this should not be a short-term objective for its use.

There are nevertheless, wider economic motivations for the introduction of a scheme. Town centres generally operate in a competitive retail environment with pressures from neighbouring towns and out-of-town development. P&R essentially increases the car parking stock of the town centre thus improving its accessibility whilst lowering the generalised cost of travel to its users. Several interviewees considered this an important motivation for local authorities. P&R was also perceived as a somewhat unique instrument;

[P&R is] a means by which parking policy, traffic and highway policy, bus operation and economic development are combined in a package, which is very difficult to replicate in other ways (Operator).

National government policy also plays a role in local authorities' motivations. Yet according to participants, this has been less influential on the introduction of schemes than government funding. The government has been involved with P&R policymaking, especially after the early-1990s proliferation of schemes and as a result of the strengthening of evidence which cast doubt over its traffic effects, but their involvement has been largely reactive and it is a policy that has existed primarily within the domain of local government:

For the national government it is only an acceptance of the existence of P&R (Official).

The interviews also highlighted a potential implicit effect of, and perhaps motivation for, the introduction of P&R. The introduction of a scheme may not only capture the motorist in general, but also a particular demographic of traveller - *'the vast majority of P&R users are middle-class'* (Official). Indeed, this experience of P&R was also shared by the Operator:

Middle-class people do not want to be seen as bus users but are happy to be P&R users... [P&R] has a very positive social function in making public transport for everyone.

Although it is common for P&R buses to be modern and of high-quality, the quality differentiation also extends to the P&R site and in some cases, according to the view of an Official, this also has a role in the social status of P&R:

The landscaping of the [P&R] site has to be first-class. There is a social factor; motorists do not want to get on a [conventional] bus...but if a [P&R] site is used that has the look and ambience of a golf club, they are enthusiastic about getting on the [P&R] bus (Official).

5. The relative success of P&R

5.1. *Measures of success*

‘Success’ is of course a term with very different meanings. Participants were asked what criteria should be used to measure the success of P&R. Indicators of traffic congestion, modal split and car interception were seen as key in monitoring P&R as these help indicate the degree to which it accomplishes its fundamental traffic-related goals.

There was also importance placed on operational performance measures, particularly by the Officials and the Operator, such as patronage and customer satisfaction. From the Academics’ standpoint however, societal impacts were key and especially the effect of P&R on traffic-related pollution and overall car use.

An important measure of P&R is its interaction with the parking stock of the host town. P&R is used, either directly or indirectly, to reduce demand for central parking. Indicators of this demand in light of P&R provision can thus show the degree to which this has occurred or how it is counteracted by previously suppressed or restrained demand for parking. The same kind of measure can also be employed where Section 106 agreements have been made with developers and maximum parking standards imposed, to highlight how P&R operates as substitution for the parking provision of town centre development.

The vast majority of P&R sites are located on the edge of towns to intercept the incoming motorist. P&R designed in such a way is therefore targeting itself at the motorist who would otherwise use the corridor on which P&R is located to access the town. Hence, success can be measured in terms of how far this holds true, such as the spread of users’ origins in relation to the P&R site;

the key thing is to know where users come from and how far they travel [to access] P&R (Campaigner).

Such an approach can reveal the proximity of users to traditional public transport services, although the research outlined in Section 2 suggests that a significant proportion of users do have access to these services, highlighted by the high levels of abstraction.

An important point throughout the discussion of P&R, but particularly relevant here, is the package of measures within which P&R is used. The accepted wisdom is that a package of transport policies should include both demand- and supply-side measures to achieve any meaningful modal shift. Following this line of argument, because P&R increases travel opportunities, it ought to accompany measures focused on managing transport demand. The trend for many P&R schemes is for parking charges in the town centre to be used in this way, which also presents the opportunity to hypothecate revenue to P&R. There is also the more subtle effect of targeting certain user groups. The Officials interviewed for instance, outlined how the combination of city centre parking charges and P&R can be used to discourage long-stay commuter traffic from the city whilst encouraging short-stay (high space turnover) shoppers.

5.2. Effectiveness of P&R in relation to policy goals

Notwithstanding the various criteria suggested by participants, they were asked to rate the success of P&R in terms of its effectiveness in fulfilling four of its key policy goals: reducing traffic congestion, reducing overall car use, reducing traffic-related emissions and improving the economic vitality of the host centre. It is not of course the intention of this exercise to draw representative results but rather to assess the degree of disparity between the participants involved. Responses (Table 1) were given using the scale: 1 (totally effective), 2 (effective), 3 (neither effective nor ineffective), 4 (ineffective) and 5 (totally ineffective). Responses in the table marked '>5' indicate that a counter-productive effect was perceived by participants, while some participants felt that the effectiveness was between two integers on the scale and this is shown by the decimal responses.

Table 1 The Effectiveness of P&R

<i>Participant</i> ^a	Traffic Congestion	Car Use	Emissions	Economic Vitality
Academic A	4	>5	>5	2.5
Academic B	4.5	5	5	>5
Academic C	2	3	3.5	2.5
Campaigner	3	5	3	2
Official A	2*	2*	2*	2
Official B	2.5	2	2	2
Operator	2	3	2	1

Note. *Official A responded on the basis that P&R was part of a package of measures.

^a One Official did not respond to this question.

What is immediately clear is the variation among participants, with lower scores (less effective) been given by the Academics than the Officials and the Operator. The difference between traffic congestion and overall car use is an important one. It was felt, particularly by the Academic participants, that P&R induces a redistribution in traffic rather than a net reduction. By relocating parking to the edge of the city, P&R essentially creates a new destination for car trips and as it lowers the generalised cost of travel, it may induce longer trips to the site than would have otherwise been made to the city centre:

P&R reinforces car use in the non-congested areas; it becomes more convenient to use a car in rural areas to get to the P&R site where parking is free... It [therefore] moves some of the car mileage around... (Operator).

In addition, public transport abstraction may have a significant influence on the overall impact of P&R on car use because

most users travel a relatively long distance to the P&R site before they change mode and then travel a short distance on the bus. Only a small number of these people are required for the long [car access trips] to totally offset the benefits, if any, of people switching to P&R [from car use] (Academic).

Regarding traffic-related emissions, the reductions made from intercepted cars are negated to some degree by bus use because of the engine technology differential:

diesel buses with Euro-II or Euro-III engines are producing many times more NO_x emissions per vehicle than a car and they are not carrying that number of people (Academic).

The Officials perceived the overall effect of P&R on emissions to be more beneficial, but did consider the problem of bus emissions in general to be significant, particularly in town centres with a high concentration of bus traffic. There was nevertheless, some awareness of the academic debate over P&R and its traffic effects:

[The academic evidence] has got a lot of elements of truth but [it has been] overplayed in many cases. It has been damaging to the concept of P&R as it has been used by the opposition of potential sites as a major part of their case. (Operator).

There was less of a split in opinion for the economic vitality effects of P&R. It is generally accepted, although supported by little academic evidence, that P&R improves vitality by increasing accessibility thus attracting new trips. Indeed, it was widely reported in the interviews that the retail sector was strongly in favour of P&R. An Official reported one instance where a partnership had been formed with a large city centre retailer to promote a P&R scheme to both their customers and their employees. This was clearly seen by the retailer as beneficial as they had contributed financially to P&R under no obligation from the authority.

5.3. *Making P&R a popular alternative*

Whether P&R is effective in achieving its policy goals is clearly a contentious issue but less so are the factors that make it *operationally* successful, there is in reality relatively little guidance on such matters, certainly from the government.

Nevertheless it seems that some settings are more appropriate for the operation of P&R than others, although the scope for the introduction of schemes has widened recently:

It is most suitable in the smaller towns and cities...that are economically buoyant...but where congestion stifles that to some extent... Where there is potential for significant economic growth and congestion is a problem, it can have quite a major impact (Academic).

The package of policies within which P&R is used is central to its popularity. Bus priority is clearly beneficial to the P&R service as it increases the speed of transfer between the P&R site and the city centre whilst creating, in a sense, the problem of congestion for motorists. It was argued by an Academic then, that it is thus able

to convey the image that it is quicker than using the congested roads to get into the city. It creates the image...that visibly buses are going past the traffic; this is part of the wider marketing of P&R.

The importance of this is indeed emphasised when considering the time penalty incurred by the P&R user for transferring mode, which involves detouring, a parking act and bus waiting time.

Regarding the P&R service itself, site positioning may influence its strength as an alternative to car use. At the most basic level, this involves minimising the distance from a given radial route to the P&R site and therefore the time penalty of using P&R. The distance between the P&R site and the host town is typically 2-6km, which although is considered influential in intercepting motorists, may have a detrimental impact on the effectiveness of P&R. This issue is returned to later in Section 6.

Overall service quality is a key component of marketing the service. In addition to the high frequency of bus services, it is typical in P&R operations for the bus to be modern and of high quality, particularly to capture the motorist who is accustomed to the comfort of the car. It was also suggested that there is a role in making P&R perceived as an acceptable alternative:

It needs to be considered as high quality; that makes it socially acceptable which governs its role and how it is perceived locally (Operator).

The price of the service to the user is clearly fundamental but more important, it seems, is the price in relation to parking charges in the town centre, as this is the most comparable element of the alternative travel choice.

Economics is the key thing. If a scheme is launched that is unattractive in economic terms then other incentives like visitor centres need to be provided... They would of course be welcomed...but passengers would not be willing to pay much extra for them. Fundamentally, people need a strong economic incentive to use P&R. If that is delivered through high city centre parking, that will be what provides a high number of users (Academic).

5.4. *The P&R - public transport relationship*

The body of empirical evidence discussed in Section 2 indicated that a large proportion of P&R users were those abstracted from public transport. Indeed there was a view, expressed particularly by the Campaigner and Academics, that conventional bus services are undermined because

P&R offers a better frequency at a discounted ticket price, rather than a commercial ticket price. P&R therefore undercuts longer-distance services (Academic).

It was also suggested however, that P&R may engender a more positive attitude towards conventional services:

it is 'bus mindedness' ... a lot of people have never been on a bus... P&R helps people to see that buses are not as bad as they perhaps thought. It proves that buses are comfortable, efficient and relatively cheap (Officer).

6. The future of P&R

The immediate future for P&R may be considered similar to the immediate past. Most participants saw P&R being used in much the same way but the number of schemes to grow continually. Indeed, traffic congestion will undoubtedly continue to increase in urban areas provoking policymakers to seek solutions that are both practical and that are perceived as effective. The concept of bus-based P&R however, has remained static; *'the model of P&R has stood still, it has not developed'* (Campaigner).

Several participants advocated the decentralising of P&R sites along access corridors to host centres with the use of existing, although enhanced, bus services. Somewhat surprisingly given the inertial treatment of the traditional P&R model, the local authority officers also proposed this model. Steps had in fact been taken to decentralise P&R in their experience;

Out-of-town, market town P&R sites have been considered... because there is a perceived problem in that journeys are increased in the rural areas going towards P&R... [The] plan was for smaller P&R sites, with no staffing, so that P&R buses could call at the smaller sites en route to the main site. It has not got anywhere however, it was shelved because of the neighbouring districts... it may attract their populations to divert to [the P&R hosting city] and therefore stifle their economies (Officer).

Clearly then, there may be significant institutional barriers that need to be overcome to develop P&R in this way. A slightly different concept is that of P&R adopting a more integrated interchange role:

There is a future in using P&R sites more as transport interchanges. It is difficult for rural bus services to be commercially viable so small shuttle buses could travel around neighbouring villages close to the P&R site and use that as an interchange. [So] rather than having one bus per day through a village [as is the case now], the same bus goes through several times (Officer).

There is also the use of shared-use sites for P&R car parks. Here, P&R utilises car parks used for other purposes but in periods of low demand for its existing use, such as the car parks at churches, leisure facilities or sports stadia. The UK has very limited experience with this, although it has been more popular in the US and some European cities. Indeed, this could eliminate many of the disbenefits of P&R site construction, for which most public opposition to P&R is levelled against. The difficulty with this approach of course, is finding and negotiating access to appropriately positioned sites.

7. Discussion

P&R was first initiated in the UK by experimental local authorities facing capacity constraints in atypical towns of a historic character that were economically buoyant with the resultant high demand for access. It has since diffused to a much wider range of settings. Although the national government's policy goals for P&R were outlined

in Section 2, this research has presented indicators that there may have been other goals for the introduction of P&R at the local level. After all, it seems that the government's policy role within the development of P&R has largely been a reactive one.

In the 1990s, national government funding sources for P&R were introduced, as well as mechanisms to attract private sector funding for schemes. It has been suggested here that this may have resulted in a rather peculiar situation in which the availability of funds can actually be a motivation, rather than a barrier, to the introduction of P&R. Furthermore, there was little doubt among stakeholders that P&R is economically beneficial to its host centres which is certainly in accord with the sentiments of government policy.

Some participants also placed high value on attracting the middle-class motorist to P&R. These assertions based on the experience of some stakeholders present an important social consideration. Conventional public transport in many developed countries including the UK, is commonly considered an inferior good and as income rises, the private car becomes a viable alternative. But according to the views of the stakeholders, this is not the case for P&R. P&R is essentially a different product. There may be aspirations for some policymakers, it seems, for P&R to provide not only a higher quality than conventional bus services, but also to embody a distinction in the social status of the service.

There are some factors however, that contest the degree to which these notions of the superiority of P&R actually results in a different class mix of users. If it is assumed that suggestions of 'middle-class' passengers are associated with relative wealth then P&R is not exclusive to these users; P&R fares are relatively low, often enabled through subsidy support, so it can compete with car use, which can also result in conventional bus fares being undercut.

Furthermore, the research on P&R indicates, as outlined in section 2, that a significant proportion of P&R users are those that are abstracted from conventional bus services. Indeed, it is feasible that those abstracted used conventional buses out of choice rather than necessity and they are attracted to P&R because of its lower cost or higher quality. But still, the bus previously represented an acceptable option.

P&R is however excludable to the non-motorist to some degree, in the physical sense. P&R schemes rarely serve bus stops between P&R sites and town centres to minimise journey times (TAS Partnership, 2007), while the sites themselves are generally located with the intention to intercept traffic on the approach to towns so are often inaccessible by green modes.

Nevertheless, the evidence base on the traffic effects of P&R has grown sufficiently to suggest that P&R may increase the distance travelled of its users. There was an awareness of this by stakeholders here but they suggested that there may be some hesitation over its validity at the local level. Indeed, this may not be an indicator of success commonly used at the local level, but operationally focused indicators are more prevalent, certainly in the experience of the participants, such as passenger numbers and customer service levels.

Local authorities operate in a democratic environment in which authority constituents elect those who formulate policies into their posts. There is then, pressure to deal with the problems facing the car-owning majority. Experience operating in this environment may bring reluctance to welcome some of the more negative views about P&R increasing car use or abstracting passenger from conventional public transport. It may be a matter of prioritisation. These issues may appear less important side-effects which are outweighed by the impact of P&R as a conspicuous means to both increase bus ridership by those who would otherwise avoid conventional services and improve the overall accessibility of its host town.

Although the national government's influence may have provided beneficial contextual conditions the growth of P&R, their involvement has been minor but it has become very popular at the local government level. Yet the evidence on the effects of P&R has generally been unfavourable. This raises the possibility that P&R has grown largely on the basis of the local-level goals discussed here. Indeed, this paper has suggested that P&R seems to appeal to the electorate and is less controversial than other more radical measures to deal with these problems. P&R is undoubtedly a conspicuous, even perhaps symbolic, tool and it may help to show that politicians are taking an active role in tackling traffic problems whilst allowing local authorities to directly influence, and indeed control, some public transport provision.

Considering the rising popularity of P&R across the UK, it can be assumed that it will continue to grow. The concept of P&R has changed very little but there are potential developments that may improve its role in reducing car use. In particular, it was suggested that P&R could be decentralised along access corridors to host centres, which echoes the 'Link and Ride' model proposed by Parkhurst (2000). There was some confidence with participants that this seemed to be a beneficial way forward. It was highlighted nevertheless, that institutional barriers may be significant, particularly with economic concerns from neighbouring centres. Developments to combine P&R with a public transport interchange may also mitigate the problem of public transport abstraction, a major source of additional car use for P&R.

8. Conclusions and implications for policy

Research on UK bus-based P&R has hitherto focused on the degree to which it has fulfilled its policy goals, particularly those to reduce overall car use. The aim of this paper was to build on this body of work by providing some in-depth views into the growth, success and future of P&R. A study of this type, of course, presents an exploration of the issues rather than findings on which generalisations can be made.

This paper suggests that in terms of the growth and success of P&R, there appears to be a degree of disparity between motivations for its use at the local and national government levels. While there may be some belief that P&R can fulfil its national policy goals, in particular those to reduce car use and its negative externalities, situations can occur in which local political motivations may be at least equal in importance. The conspicuousness of P&R and its appeal to the car-owning majority provide favourable conditions in which it can be implemented. Local politicians can be perceived to be addressing local traffic and environmental problems. Yet the evidence suggests that for absolute levels of car use, P&R can have a detrimental effect. The development of UK P&R may thus have resulted in a policy instrument

that is more tried-and-tested for its support publicly and politically than for its de facto effectiveness.

This does raise the issue of the limited involvement of the national government. It could be argued after all, that P&R development has gone unchecked even in light of negative findings in the research. Local authorities do not operate in a vacuum but the intervention of national government can potentially influence the degree to which the diffusion of a transport policy measure contributes towards transport policy goals.

While this paper is based on the UK experience of bus-based P&R, there are some important lessons for policy internationally and irrespective of the link-mode used. For instance, it is of course beneficial in terms of reducing car use for the user mix of public transport to be maximised. This is perhaps something that policymakers in developed countries internationally seek to do. There have been suggestions here that P&R may play a role in providing an alternative mode for the demographic of motorist, described above as 'middle class', who is usually associated with being among the most difficult to attract away from the use of the private car. Assuming P&R had the potential to reduce car use then, it could provide a viable alternative for these motorists.

Even so, by providing a service superior in quality and lower in price, existing evidence shows a significant degree of transfer from conventional public transport. Thus, although public transport may be considered an inferior good, it should not be presumed that all of its users are those without car access. The more general lesson here is that by targeting the characteristics of a transport service to one market group, it may appeal to others, thus potentially inducing detrimental effects.

There is also the significant issue of equity. It has been discussed how P&R sites may be physically inaccessible to the non-motorist because of their location. P&R is often supported heavily by subsidy, thus in effect subsidising car parking provision for the motorist. Accordingly, where P&R is being considered, the non-motorist should also be taken into account and specifically, how they can be better served by the superior, lower priced services. Furthermore, the position and catchment area of a P&R site needs to be considered, as lowering the generalised cost of travel may induce new or longer trips from any market.

At the more general level are the matters of monitoring and evaluation. Goals for a transport project such as P&R need to set a priori, but their effects may change temporally. So while local objectives - political, transport-related or otherwise - are important in local policymaking, schemes need to be closely evaluated against their specific policy goals. Indirect benefits ought to be secondary.

Regarding the future of P&R, as policymakers continue to seek solutions to increasing traffic congestion in urban areas, support for P&R will undoubtedly grow. While there are doubts over its effectiveness, it is clear that it has become generally popular. This paper sought to understand if there are ways in which the concept can be adapted to harness this popularity whilst better equipping it to tackle the negative externalities of car use. Suggestions here include placing more focus on sites as interchanges for both motorists and non-motorists and the decentralisation of P&R sites over a longer-range. The main barrier identified however, particularly with the latter, is the concern for the transfer of economic activity from neighbouring centres. Although transport is

an intermediate good and its demand is derived from the relative strength of destinations, the establishment of P&R services does not lead to only one-way movement and there may be shared benefits. Thus, alongside the arguments above for national government involvement in the monitoring of the effects of P&R, national or regional government may provide a more co-ordinated approach to its provision.

This paper has raised a number of opportunities for further research. Since the findings are based on a small number of qualitative interviews, a better understanding is required of the wider situation. The disparity between national policy goals and local motivations requires further investigation. Suggestions have been made here for instance, about the differences that may exist between the user mix of public transport and P&R. A wider understanding of this could provide important lessons on how attempts to reduce private car use could have a broader impact. Furthermore, a clear opportunity lies in an exploration of potential developments to the concept, both those presented here and others, and particularly the effect of potential improvements in efficiency on the popularity of P&R.

References

- Cambridgeshire County Council, 2007. *Cambridgeshire Guided Busway: Information about the Scheme* (information leaflet). Cambridge: Cambridgeshire County Council.
- Collins, S., Dykesman, K., Cornwall, S., Marsh, S., and Robinson, I., 1987. *The Park and Ride Experience: Thornhill-Seacourt One Year On*. Student Project. School of Planning, Oxford Brookes University.
- Cooper, B., 1993. *An Investigation into the Behaviour and Attitudes of Users of Peripheral and City Centre Parking in York*. M.Sc. Thesis. Transport Studies Group, University of Westminster.
- Daniels, P.W., and Warnes, A.M., 1980. *Movement in Cities: Spatial Perspectives on Urban Transport and Travel*. London: Methuen.
- DETR - Department of the Environment, Transport and the Regions, 1998. *A New Deal for Transport: Better for Everyone*. Cm 3950. London: HMSO.
- DETR, 2000. *Transport 2010: The 10-Year Plan*. London: HMSO.
- DfT - Department for Transport, 2004. *The Future of Transport: A Network for 2030*. Cm 6234. London: TSO.
- DoE - Department of the Environment, 1990. *This Common Inheritance*. Cm. 1200. London: HMSO.
- Goodwin, P., 1999. Transformation of transport policy in Great Britain. *Transportation Research Part A*, 33, 655-669.
- Huntley, P., 1993. Park and ride: strategic modal shift or cheap overflow? *Local Transport Today*, 22 July, 12-13.
- Maykut, P., and Morehouse, R., 2000. *Beginning Qualitative Research: A Philosophical and Practical Guide*. London: Routledge.
- Meek, S., Ison, S., and Enoch, M., forthcoming. The role of bus-based park and ride in the UK: A temporal and evaluative review. *Transport Reviews*, in press.
- Papoulias, D., and Heggie, I.G., 1976. *A Comparative Evaluation of Forecast and Use of Park and Ride in Oxford*. Working Paper 22. Transport Studies Unit, University of Oxford.
- Parkhurst, G., 1995. Park and Ride: Could it lead to an increase in car traffic? *Transport Policy*, 2(1), 15-23.
- Parkhurst, G., 1999. *Environmental Cost-Benefits of Bus-based Park and Ride Systems*. Working Paper 1999/4. London: ESRC Transport Studies Unit, University College London.
- Parkhurst, G., 2000. Link-and-Ride - A longer-range strategy for car-bus interchange. *Traffic Engineering and Control*, 41, 319-324.

Parkhurst, G., and Richardson, J., 2002. Modal integration of bus and car in UK local transport policy: The case for strategic environmental assessment. *Journal of Transport Geography*, 10, 195-206.

Patton, M.Q., 1987. *How to use Qualitative Methods in Evaluation*. London: Sage.

Shaw, J., and Walton, W., 2001. Labour's new trunk-roads policy for England: An emerging Pragmatic Multimodalism? *Environment and Planning*, 33(6), 1031-1056

TAS Partnership, 2007. *Park & Ride Great Britain*. 4th ed. Skipton: TAS Partnership.

Topp, H.H., 1991. Parking policies in large cities in Germany. *Transportation*, 18, 3–21.

Williams, R., 1999. Oxford's park-and-ride system. *Municipal Engineer*, 133(3), 127-135.

White, C.J., 1977. *Park and Ride in Oxford and a Survey to Investigate the Possibility of Closing the Botley Road Site*. Unpublished Student Project. Department of Geography, University of Reading.

WSA - W.S. Atkins, 1998. *The Travel Effects of Park and Ride*. Epsom: W.S. Atkins Planning Consultants (for DETR).