1.0 Introduction

Encouragingly, in recent years, there is an increasing recognition amongst local authorities, developers and private and public sector organisations that parking management is a powerful travel planning tool. So often in the past, parking management was regarded as a separate strategy, isolated from other sustainable travel initiatives – solely a tool to address parking problems for car drivers to a site.

The rationale for integrating parking management into travel planning is as follows:

- Parking management provides the impetus for a shift to sustainable modes. Without changes to current parking conditions, existing car drivers have limited incentives for modal shift and are likely to continue their existing travel behaviour;

- For effective and fair parking management, sustainable travel alternatives need to be in place for individuals removed of their parking entitlement. Travel planning can deliver a ‘package’ of options for alternative travel modes and guard against potential problems from implementing parking management as an isolated strategy. These
include physical problems such as overspill parking from a site into inappropriate residential areas and attitudinal problems such as employee resentment; and

- The introduction of parking charges can raise revenue for hypothecation into sustainable transport measures. Parking management can therefore be a financing mechanism for travel plan delivery.

This paper addresses the following questions:

- Why is parking management necessary? A simpler and less contentious option would certainly be to abstain from introducing management measures;
- Can we afford not to manage car parking demand? Is the ‘do-nothing’ option realistic?;
- Why is parking management so controversial?;
- What is the rationale behind introducing car park charging?; and
- What are the various components within an effective parking management strategy?

2.0 Why is car park management necessary?

Before attempting to answer this question I would like you to read the following extracts from the DfT’s ‘Smarter Choices – Changing the Way We Travel’ report (July 2004).

A study of 49 US employers by TCRP (1994) (reported in Organisational Coaching / Schreffler 1996) found an average vehicle trip reduction of 15.3%. It was able to demonstrate that workplace travel programmes combining ‘sticks’ and ‘carrots’ were the most effective. Employers providing only information did not realise any trip reduction results. Those providing commute alternatives (such as van pools) realised an average 8.5% reduction, while those providing financial incentives (such as transit subsidies) realised an average 16.4% reduction. Employers providing both financial incentives and services realised the largest reduction in vehicle use, at an average of 24.5%.

The conclusion that travel plans combining both sticks and carrots are the most effective is echoed in a Dutch study by Lijtenmoet (1998). This included a review of other Dutch data plus new results from 40 Dutch organisations. Plans with ‘basic’ measures (such as car-sharing schemes) achieved vehicle kilometre reductions of 6-8% (or 10% if only the sample 40 organisations are considered). Plans with ‘luxury’ measures (such as public transport subsidies) and / or ‘push’ measures (such as parking management) achieved reductions in the range 15 – 20% (or 23% if only the sample 40 organisations are considered).
In another review of Dutch travel plan experience, Touwen (1999) concluded that travel plans consisting of communication-marketing measures, basic measures such as car pooling and cycle leasing, and organisational measures such as flexitime achieved an average reduction of 8% in kilometres travelled by employees driving alone to work. If luxury measures (such as company buses) and disincentive measures (principally parking management) were added, the average reduction was about 20%.

### Table 3.2 Summary of literature evidence about the effects of travel plans

<table>
<thead>
<tr>
<th>Study</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cairns et al (2002)</td>
<td>A selection of good practice travel plans reduced commuter car driving by an average of at least 18%. Plans which included parking management measures achieved an average reduction of car driving of &gt;24%, compared with &gt;10% for those that did not.</td>
</tr>
<tr>
<td>Organisational Coaching and Shreffler (1996)</td>
<td>Successful travel plans in the US typically reduce vehicle trips by 19%. Successful travel plans in the Netherlands typically reduce vehicle mileage by 20%.</td>
</tr>
<tr>
<td>Shoup (1997)</td>
<td>Eight Californian employers offering cash for parking had reduced single occupancy driving by an average of 13% and vehicle miles by 12%.</td>
</tr>
<tr>
<td>TCRP (1994)</td>
<td>49 US employers with travel plans had achieved an average vehicle trip reduction of 15%. Averages for different types of plans were: 9% if offering commuting alternatives only (such as van pools).</td>
</tr>
<tr>
<td>Ligtermoet (1998)</td>
<td>16% if offering financial incentives only (such as bus fare subsidy) 25% if offering financial incentives and services</td>
</tr>
<tr>
<td>Touwen (1999)</td>
<td>40 Dutch employers (plus unspecified numbers of others from review work) provided information about different types of plans. This suggested average reductions in vehicle kilometres of: 6-10% for plans with ‘basic’ measures 15-23% for plans with ‘luxury’ measures</td>
</tr>
<tr>
<td></td>
<td>Information from different types of Dutch travel plan suggested average reductions in single occupancy vehicle kilometres of: 8% for plans with ‘basic’ measures 20% for plans with ‘luxury’ measures</td>
</tr>
</tbody>
</table>

* Data and analysis in several of the cases were judged to lead to an underestimate (of unknown size) of the effects of the travel plan work on car commuting, as discussed further in the footnote to table 3.1.*

I would particularly like to draw your attention to the entries in the above table accredited to Cairns, TCRP, Ligtermoet and Touwen. There seems to be consistency in the view that Travel Plans that did not include a demand management mechanism achieved reduction in car vehicle miles of 10% or less while those that included demand management mechanism
in the Travel Plan package achieved reductions in car vehicle miles of 15% and above.

When looking at a Travel Plan for an individual development or for a business park, in the absence of Workplace Parking Charges or Road User Charges, one of the most powerful tools available in Travel Plan is a good Parking Management strategy.

I consider an effective parking management strategy to be the critical component that distinguishes an average Travel Plan that may cause a small modification of travel behaviour to one that can have a noticeable effect on the road network immediately surrounding the development and also have a noticeable effect on the demand for parking spaces. For the case of Travel Plans secured through the planning system, this can mean the difference between gaining planning approval and planning approval being rejected on the grounds of unacceptable impact on the local highway networks. Organisations are becomingly increasingly conscious of the need to foster ‘good neighbour’ relations by reducing negative impacts on the local area. Reducing congestion on the surrounding local highway network through minimising single occupancy car journeys to the site can help to foster good neighbour relations.

As Figures 2.1 and 2.2 illustrate, poor parking management can result in the following issues:

- Parking in inappropriate locations e.g. on footways, grass verges;
- Compromised access e.g. emergency vehicles;
- Severance to pedestrians and cyclist movements; and
- Visual intrusion and reduction of amenity of the environment.

Figures 2.1 and 2.2 – The consequences of poor car parking management
There are other demand management tools available to the Travel Plan developer, many of which are financial, and which are important supporting components of a car park management strategy. These include the following:

- Reduction in business car mileage rates;
- Paying incentives or rewards for choosing to travel to work by modes other than car;
- Paying a one-off incentive for surrendering entitlement to a car parking space; and
Paying a cycle business mileage rate which is competitive with the business car mileage rate.

In this paper, I intend to look more closely at Parking Management in terms of why we need it, what it entails and how it can help the Travel Plan practitioner.

### 3.0 Is ‘Do Nothing’ an option?

Many existing developments are currently suffering from one or a combination of the following:

- Shortage of parking spaces with demand outstripping supply;
- Parking in inappropriate locations e.g. residential areas, access roads;
- Emergency access to building is compromised;
- The land used for parking is not productive and the potential value of the land is not being maximised;
- Car parks are far more expensive to build and maintain than many people realise; and
- For some organisations, poor accessibility by non car modes helps contribute to high staff turnover and unfilled job vacancies.

For planned developments or expansion of activity on an existing site, if the demand for parking isn’t managed then one if not several of the above will inevitably occur. The main question is not whether one of the above will occur, the question is how soon will it occur and what will be the magnitude of impact when it does occur.

For new developments the planning authority have parking standards that are influenced by national guidance such as PPG13 and by regional guidance within the Regional Spatial Strategy. Such parking standards ensure that a development doesn’t provide unrestrained parking for all its staff and visitors thus further encouraging the use of car and hence contributing to congestion.

But is ‘Do Nothing’ an option? Although you may have seen some of these before, it is worthwhile reproducing a few statistics and trends from the DfT and from the Office of National Statistics. These highlight the background growth trends in car use and ownership which Travel Planning Practitioners find themselves up against.

Firstly, as can be seen in Figure 3.1, the number of vehicles in Great Britain is increasing year on year. Since 1982, the number of vehicles licensed has increased by 75% and is likely to have doubled (relative to 1982 levels) by 2010. So this confirms the blatantly obvious that there are more cars on the road and also suggests that the number is likely to increase year on year in the future.
Figure 3.1 – Trends in Numbers of Motor Vehicles Registered in the UK (Source: Transport Trends, DfT)

Motor vehicles currently licensed, by body type: 1982 to 2004

<table>
<thead>
<tr>
<th>Year</th>
<th>Car Licensed (Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982</td>
<td>15,452</td>
</tr>
<tr>
<td>1983</td>
<td>15,582</td>
</tr>
<tr>
<td>1984</td>
<td>16,399</td>
</tr>
<tr>
<td>1985</td>
<td>16,829</td>
</tr>
<tr>
<td>1986</td>
<td>17,389</td>
</tr>
<tr>
<td>1987</td>
<td>17,856</td>
</tr>
<tr>
<td>1988</td>
<td>18,888</td>
</tr>
<tr>
<td>1989</td>
<td>19,720</td>
</tr>
<tr>
<td>1990</td>
<td>20,230</td>
</tr>
<tr>
<td>1991</td>
<td>20,253</td>
</tr>
<tr>
<td>1992</td>
<td>20,444</td>
</tr>
<tr>
<td>1993</td>
<td>20,755</td>
</tr>
<tr>
<td>1994</td>
<td>21,199</td>
</tr>
<tr>
<td>1995</td>
<td>21,394</td>
</tr>
<tr>
<td>1996</td>
<td>22,238</td>
</tr>
<tr>
<td>1997</td>
<td>22,832</td>
</tr>
<tr>
<td>1998</td>
<td>23,293</td>
</tr>
<tr>
<td>1999</td>
<td>23,975</td>
</tr>
<tr>
<td>2000</td>
<td>24,406</td>
</tr>
<tr>
<td>2001</td>
<td>25,126</td>
</tr>
<tr>
<td>2002</td>
<td>25,782</td>
</tr>
<tr>
<td>2003</td>
<td>26,240</td>
</tr>
<tr>
<td>2004</td>
<td>27,028</td>
</tr>
</tbody>
</table>

Taken From: Transport Trends 2005 Edition

Coverage: Great Britain
Source: DfT

Not only are there more cars, but also the average commuting distance has also increased significantly since the early 1980s. The average commuting distance is now 8.5 miles compared to 7.2 miles in the period 1989 to 1991. People are making lifestyle choices to live further away from work, in addition to being influenced by housing availability and prices. It remains to be seen whether the active residential development currently happening in City Centres will serve to offset this commuting distance trend.
Figure 3.2 – Growth in Car Mileage/ Use (Source: Transport Trends, DfT)

So, this suggests that there are more cars, with each person commuting further. I know this is quite simplistic and the above charts include, for
instance, the long rail commutes into London, but car commuting distances have increased since the early 1980s.

My father-in-law has told me on several occasions that the cost of motoring is rising. This is a perception held by many and it is based predominantly on the petrol and oil prices as displayed by the green line in Figure 3.3.

Figure 3.3 – Changes in the Relative Costs of Transport (Source: Office for National Statistics)

The cost of petrol and oil have indeed been increasing and are likely to increase further as oil reserves are used up. However, the cost of motoring has decreased since the 1980. This, as the text from the Office for National Statistics text above suggests, is predominantly as a result of the real cost of cars decreasing significantly over this period. This is set alongside the rises in public transport fares, above the rate of inflation for unregulated fares.

Over the same period, the average disposable income has nearly doubled which increases people’s ability to own and run a car.
Getting back to the subject of this Paper, namely parking management, in summary, 'Do Nothing' is not a good option as these trends suggest that car ownership is likely to continue to increase as more and more people can afford to purchase a car, while rail and bus/coach fares continue to rise. This will result in increasing demand for parking spaces at existing and new developments, not withstanding the associated impacts of car trip generation on the surrounding highway network which is becoming increasingly near to capacity.

So if a development incurs problems at the moment, unless effective action is taken in the near future, the problems of parking abuse, poor access for emergency vehicles and poor access for non car owning people will only get worse in future years.

If the demand for car use to a development is directly correlated to the increase in cars licensed illustrated in the graph in Figure 3.1, then consider the following:

In July 2006, a company called Ostrich has 1000 employees, 900 of whom now drive to work. The poor souls only have 800 parking spaces. 5 years ago, this wasn’t a problem as due to sickness, holidays and working away from the office, nine times out of ten, a parking space could be found. However, the frequency with which the car park is full has increased dramatically over the last couple of years and staff are spending longer and longer ‘sharking’ around the car park with senses alert for that elusive parking space. Arguments and even fights have broken out. The Estates Director has had enough and has decided to convert one of the surface level car parks into a multi storey and thus create an additional 100 spaces.

Problem solved.

However, the planning process and construction resulted in it taking two years before the new car park was open. During the construction period the car parking problems escalated out of all proportion. OK, in July 2008, the new gleaming multi storey is open and very popular amongst the staff.

Problem solved.

However, depending on whether you assume a 2% annual growth in demand or a 3% annual growth (the average for the period presented in Figure 3.1 is 2.6%), the car park is full again on many days by either 2010 or by 2012 depending on the rate of growth. Thus the new car park cost Ostrich a lot of money, caused massive disruption during construction and resulted in two to four years worth of relief.

The Estates Manager is now thinking of doing something that influences the demand for parking because he doesn’t want to go through the same process all over again.
What can we learn from Ostrich?

- By opting for the multi-storey car parking option, the Estates Manager chose to ‘build’ Ostrich out of the current parking problem. This mirrors the traditional approach to road building and the generally accepted notion that ‘building more roads creates more traffic’;
- Providing additional parking capacity is not a sustainable solution to car park management, providing only short-term relief and a poor rate of investment return; and
- Providing additional parking capacity undermines initiatives to encourage travel by sustainable modes.

4. Why is Car Parking Management so Controversial?

Many companies have provided free parking to staff for decades. Staff have become used to this, and in many cases, they don’t even realise that it might be regarded as a perk or a benefit. I haven’t come across any examples where it is an actual condition of employment and it is referred to in the employee’s contract. However, it has become custom and practice and it is a very sensitive issue if staff feel that their ‘right to park’ is being eroded.

For some, like cars themselves, the parking space is a status symbol. That parking space right outside the main reception with a big reserved sign and a registration plate is screaming at the other employees ‘Look how powerful I am relative to you’.

If you try and change the existing parking regime, this can cause a lot of problems and hassle. I know several people who have implemented new parking regimes that have restricted availability and increased the parking charge and they have said that they were regarded as ‘the most hated person in the company’ for a 12 to 18 month period, being targeted by ‘hate’ emails and being accosted in the lunch queue! One City Council in England found that staff who had gained the backing of their Union threatened to strike when they became aware of proposals to introduce parking charging.

A common response by employees who had grown accustomed to their cheap or free parking space is to threaten to leave and move to another company, compounding the staff retention and recruitment problems that many organisations are experiencing.

It is difficult to quantify how many staff members would actually leave a job they are perfectly happy with over a parking charge that frequently, when viewed over a year, equates to less than 2% of their salary. However I am sure the figure who would actually move is very very small, particularly if the area has a relatively high employment rate or if the changing job entails a geographical move as well. The latter might involve selling and buying a house and changing schools for children under 18.
The message here is that you shouldn’t be frightened of tackling such a sensitive issue. However, the change needs to be tackled sensitively with good communications and, when appropriate, the involvement of staff and unions. It also helps if you can relate to existing problems and demonstrate how bad things will be in 5 years time. I have also found that stressing the management experiences of other organisations in a similar line of business and location offers good support to making a case for changes to parking management.

5.0 Are there Exceptional Circumstances?

It is important that parking management is not imposed with a ‘blanket’ approach. There are many circumstances of individual staff members that have to be taken into account. For instance, where staff start or finish their shift at an unsocial hour, then there appears to me a genuine need for adequate parking provision. Yes car share can still be encouraged and yes works buses can also be considered. However, in general public transport is generally quite poor outside of the main metropolitan centres between 19:00 and 07:00. Also, walking and cycling at such times could pose a personal safety or security risk.

It is obviously critical that an individual’s medical or welfare needs are taken into account, whether these are permanent or temporary.

There are many other staff that need regular access to a car throughout the working day for operational or business purposes. In many cases, a pool car system or a site specific car club can help address this issue, but there are still many instances where use of their own car is far more convenient and sensible. Sales Reps and midwives spring to mind as groups of people who might fall into this category.

However, there are many employees in many companies who will claim that they have a business or operational need to have a parking space. Examples I have encountered include company car owners (mainly in the private sector) and ‘Essential Car Users’ in the public sector. The company car owners suggest that if the company are going to supply them with a car, then they should also make provision for them to park it. In the public sector, the Essential Car User (ECU) status is frequently a form of additional benefit to a member of staff and does not really relate to a need to have a car at work for business purposes. One County Council I have pursued parking management initiatives with bases ECU entitlement on annual business mileage exceeding a certain threshold. One Line Manager quoted ‘I make sure I book myself into a conference in somewhere like Taunton and then I can clock up my ECU mileage!’

This therefore makes a case for parking management strategies to take into account exceptional circumstances and not impose a ‘blanket’ approach which is insensitive to business, personal or social need. A classic example, is developing a ‘points-based’ permit allocation system which either automatically allocates permits to individuals demonstrating a true business
need or personal need or awards high scores to these individuals to pretty much guarantee them a permit.

6.0 The Rationale of Charging

Providing car parking is not cheap. Apart from the opportunity cost of the land that is given over to parking that could be put to more productive use, car parks can cost anything from £1000 per space up to £32,000 per space depending on the car park type and location. A snapshot of car park capital costs is presented in Figure 6.1.
### Figure 6.1 – Capital Costs of Car Parks (Source: Parking Review Journal)

<table>
<thead>
<tr>
<th>name /location of the car-park</th>
<th>type</th>
<th>number of car spaces</th>
<th>capital cost</th>
<th>cost per car space</th>
<th>features</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Single storey</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stepping Hill Hospital car parks</td>
<td>Surface level</td>
<td>810</td>
<td>£2,000,000</td>
<td>£2,469</td>
<td>not indicated</td>
</tr>
<tr>
<td>Stourbridge Junction Station</td>
<td>Surface level</td>
<td>400</td>
<td>£2,700,000</td>
<td>£6,750</td>
<td>CCTV, help points and footbridge connecting to the station</td>
</tr>
<tr>
<td><strong>Multi Storey</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chatham</td>
<td>multi story (11 split level)</td>
<td>474</td>
<td>£1,900,000</td>
<td>£4,008</td>
<td>not indicated</td>
</tr>
<tr>
<td>Broadgreen Hospital, Liverpool</td>
<td>Decked</td>
<td>774</td>
<td>£3,150,000</td>
<td>£4,070</td>
<td>not indicated</td>
</tr>
<tr>
<td>Coventry rail station</td>
<td>multi storey</td>
<td>354</td>
<td>£2,200,000</td>
<td>£6,215</td>
<td>not indicated</td>
</tr>
<tr>
<td>St Andrews car park</td>
<td>multi-storey (6 levels)</td>
<td>1084</td>
<td>£9,200,000</td>
<td>£8,487</td>
<td>30 CCTV cameras monitored by staff in glass fronted office 24h a day</td>
</tr>
<tr>
<td>Royal Liverpool University Hospital</td>
<td>multi-storey</td>
<td>510</td>
<td>£4,500,000</td>
<td>£8,824</td>
<td>24/7 operation/CCTV/manned round the clock/WPS pay-on-foot scheme/</td>
</tr>
<tr>
<td>Musgrove Park Hospital, Taunton</td>
<td>multi storey</td>
<td>736</td>
<td>£7,000,000</td>
<td>£9,511</td>
<td>1 glass fronted hosts lodge, CCTV cameras at payment barriers</td>
</tr>
<tr>
<td>St Enoch car-park, Glasgow</td>
<td>multi storey (6 levels)</td>
<td>360</td>
<td>4500000</td>
<td>£12,500</td>
<td>several customer facilities and services + linked to central control room</td>
</tr>
<tr>
<td>Heathrow car-park</td>
<td>multi storey (4 levels)</td>
<td>1580</td>
<td>£50,600,000</td>
<td>£32,025</td>
<td>Building project utilises extensive underpinning to avoid impinging on the Piccadilly underground Heathrow Express Terminal foundations</td>
</tr>
<tr>
<td><strong>Park and Ride</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Progress Park South Cow Bridge, Bedford</td>
<td>park and ride</td>
<td>500</td>
<td>£2,600,000</td>
<td>£5,200</td>
<td>manned terminal building/ waiting area/ toilets/10mins during peak/15 mins off peak</td>
</tr>
<tr>
<td>Martlesham, Suffolk</td>
<td>park and ride</td>
<td>530</td>
<td>£3,300,000</td>
<td>£6,226</td>
<td></td>
</tr>
<tr>
<td>Chelmsford</td>
<td>park and ride</td>
<td>600</td>
<td>£4,400,000</td>
<td>£7,333</td>
<td>waiting areas, bus terminus, cycle parking</td>
</tr>
<tr>
<td>Midlothian</td>
<td>park and ride</td>
<td>250</td>
<td>£2,000,000</td>
<td>£8,000</td>
<td>not indicated</td>
</tr>
</tbody>
</table>

Source: Extracts from Parking Review Journal, November 2005 to June 2006
As a rule of thumb I have normally suggested that the capital cost of a surface level car park costs between £1,000 and £3,000 while a multi storey generally costs between £3,000 per space up to £12,000. There are more expensive examples such as the Heathrow example in Figure 6.1.

The capital costs of new underground car parks can easily approach the £20,000 per space figure.

These costs frequently do not include the purchase cost of the land itself but can include the costs of CCTV cameras, barriers, pass reading equipment and possibly a security control room as well as the ground preparation, surfacing, planting and white lining costs. These are generally all costs that wouldn’t be incurred if the car park wasn’t there.

There are also significant operating costs or annual costs relating to car parks. These can range from £150 to £300 per space for surface level car parks up to £1,000 per space for multi storey car parks. These annual costs do not just relate to the cost of maintaining the car park surface and white lining every couple of years. They also include the cost of security personnel, the power costs of the barriers, lights and CCTV as well as the maintenance, repair and replacement costs of the barriers, lights and CCTV cameras.

Thus as an example, the cost of a 700 space car park are presented for illustrative purposes in Figure 6.2.

**Figure 6.2  700 Space Multi Storey Car Park**

<table>
<thead>
<tr>
<th>Costs</th>
<th>Number of spaces</th>
<th>Unit Cost</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Cost</td>
<td>700</td>
<td>£10,000</td>
<td>£7,000,000</td>
</tr>
<tr>
<td>Operating Cost</td>
<td>700</td>
<td>£500</td>
<td>£350,000</td>
</tr>
</tbody>
</table>

**Potential Revenues**

- **Scenario A**  @ £400 per annum
  - 700  £400  £280,000
  - Deficit incurred by company  -£70,000

- **Scenario B**  @ £600 per annum
  - 700  £600  £420,000
  - Surplus enjoyed by company  £70,000

©Association for European Transport and contributors 2006
In this example, imagine if a company charges their staff £400 per annum to park. This equates to £1.60 per day or £8 per week based on a 50 week year. Ignoring the capital cost and any interest charges on the £7m, the company is, in effect, subsidising car park users to the tune of £100 per annum. This company can be regarded as encouraging travel by car to its site due to this subsidy. This is displayed graphically in Figure 6.3. The ‘gap’ between the parking revenue line and the capital and maintenance cost line is effectively the level of subsidy to users of the car park. It should be appreciated that this subsidy is not being awarded to non-users of the car park, therefore raising equity issues and undermining sustainable travel initiatives.

**Figure 6.3 - Subsidy to Car Park Users**

![Graph showing subsidy to car park users](image)

However, continuing with the example, if the car park charges are increased to say £600 per year, then the revenue will exceed the cost of provision. See Figure 6.4. This then produces a source of revenue that can then be used to fund measures and initiatives that encourage travel by non car modes. This hypothecation can be used as a ‘selling point’ for the introduction of increased charges.
As an aside, referring back to the previous example, the 700 space multi storey car park, the 10 year cost of multi storey car park is £7m plus 10 lots of £350k in operating costs. Thus the total over the 10 years, in simplistic terms, is £10.5m. This could be used to offer the 700 staff £15,000 each to subsidise or fund other ways of travelling to or from work. This £15,000 could more than fund an annual public transport travel passes, a brand new motorbike or scooter, a new bicycle (every 4 or 5 years) or top of the range walking shoes and clothing every two years, and still have a bit spare.

I know this is rather simplistic, and it ignores the need to ‘reward’ those who have chosen not to drive, but I think such an alternative should be considered and assessed to see whether it better meets the overall objectives.

7.0 What Measures are in an Effective Car Park Management Strategy?

Best practice evidence has suggested the following ‘ingredients’ to success in a car park management strategy:

- Combination of ‘soft’ (promotional) and physical measures;
- Enforcement and access control to prevent illegal/ inconsiderate parking;
- Administrative systems to support individual car park management measures e.g. permit allocation system;
- Marketing and communication, both in advance of implementation and following implementation; and
- Flexibility to accommodate changes in staff numbers, parking ‘need’, development aspirations etc.

There are basically two categories of management measures – those based on the supply-side and those based on the demand-side.
7.1 Supply-side – Increase/ decrease total supply or reallocate existing supply

Supply-side measures are involved with changes to the current provision of car parking, whether that might be an increase, decrease, relocation or reallocation of other uses. These measures are summarised as follows:

- Increase/ decrease total supply – parking standards – restricted provision at new developments (PPS standards);
- Relocation e.g. off-site leasing of car parking capacity;
- Reallocation of parking for new development, cycle/ motorcycle parking or car sharer parking; and
- Reallocation of existing supply – dedicated space per car sharers – increases number of people per parking space etc.

7.2 Demand-side – Reduce demand for parking (total demand or peak demand spreading)

Demand-side measures are involved with altering the current demand for parking, whether total demand or timing of demand (shifting a proportion of demand from peak hours to off-peak hours). These measures are summarised as follows:

- Incentives for alternative modes – public transport, walking, cycling – physical measures and ‘soft’ promotional measures;
- Managing demand/ entitlement to demand through permit allocation system
- Fiscal measures - Charging – introducing/ increasing permit charges, introducing/ increasing daily charges, extending parking to wider groups e.g. visitors; and
- Peak demand spreading – flexi-working, differentiating charges by time of day (would deliver additional benefits to highway congestion). The Highways Agency is currently heavily working with key trip generators on the strategic highway network to encourage this as part of the Agency’s Influencing Travel Behaviour Project.

7.3 Practical Experience with Implementing Car Park Strategies

This section discusses the various demand and supply side approaches to parking management, supported by practical case study examples. When considering potential strategies, it is important to recognise that a parking management system should fulfil the e³ test:

- **Equitable** - the costs should be met by those who cause them to be incurred. Also if incentives are offered to staff to encourage them not to drive and park on-site, then consideration should be given to rewarding those who have already chosen not to drive;
Effective - it needs to target those staff who have a safe and convenient alternative means to get to the site by a mode other than car; and

Economic – the proposals need to be affordable to the company and reasonable to the individual.

Option: Ban all On-Site Parking

A simplistic (although unrealistic) strategy would be to ban all on-site parking and release land for development/alternative uses. However, this option is completely unworkable in view of the following:
- Severe parking overspill issues;
- Huge recruitment and retention issues; and
- Unworkable for operational users.

Option: Increase Parking Supply

Another simplistic strategy would be to increase parking supply by, for example, constructing new car parking facilities, leasing of off-site spaces. However, this option is considered ineffective for the following reasons:
- Lack of land availability;
- Poor use of land resource;
- Need to secure planning permission;
- High capital and maintenance costs;
- Short term ‘fix’ with poor rate of return (as illustrated by the Ostrich case study in section 3); and
- Undermines sustainable travel initiatives.

Option: Financial Measures – Introduction of increases to parking charges

To illustrate this option, I have considered a case study example of a University with the existing parking and accessibility issues:

- Parking available to staff on campus;
- All staff who request permit are issued with one;
- Permit cost has remained unchanged for over 10 years;
- Public transport is good – served by a number of bus routes and a short walk from railway station;
- Free parking available on campus for visitors; and
- Unauthorised parking on campus.

Staff currently pay £120 per annum to park on-site. Assuming 48 weeks in a working year, the current annual permit charge of £120 equates to 50p per day.

Justifications for increasing staff permit charges are:
- Current charges are below comparable public transport costs;
- Current charges are less than many other universities in city centre locations;
Current charges are significantly lower than at nearby public car parks; Charges have remained at the same level since 1992; and Low parking charges at present give little disincentive for single occupancy vehicle travel.

A recommended measure might be to increase permit charges incrementally over the following years. It is considered that these charges reflect an adequate rise to encourage a switch to alternative travel modes (by some staff on some days) and are acceptable in relation to city centre parking charges and comparable public transport fares).

**Table 7.1 – Recommended Staff Parking Charges**

<table>
<thead>
<tr>
<th></th>
<th>Annual Charge</th>
<th>Daily Charge Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>£120</td>
<td>£0.50</td>
</tr>
<tr>
<td>Aug 06</td>
<td>£240</td>
<td>£1.00</td>
</tr>
<tr>
<td>Aug 07</td>
<td>£360</td>
<td>£1.50</td>
</tr>
<tr>
<td>Aug 08</td>
<td>£480</td>
<td>£2.00</td>
</tr>
<tr>
<td>Aug 09</td>
<td>£600</td>
<td>£2.50</td>
</tr>
</tbody>
</table>

The £600 annual charge equivalent in 2009 is still below current charges for city centre parking e.g. a daily charge of £7.50 or an annual equivalent of £1,800 at the nearby, city centre NCP car park and the annual charge of £900 for lease of a space at the nearby Local Authority administered car park. It should also be recognised that 2009 takes into account three years of annual price rises in line with inflation.

There is currently no parking charge for visitors, therefore to ‘soften the blow’ for staff who are being faced with increased charges, it is proposed that a visitor charging strategy is introduced.

It is critical that the following points are considered when proposing the introduction if a charging system:

- Needs to be supported by robust communication and marketing strategy;
- Charges can be differentiated by grade/salary to address equity concerns; and
- Advertised as a revenue-neutral scheme. Staff should recognise that charging is not being implemented as a revenue raising scheme, but rather a way of raising revenue for investment into managing car parks or developing sustainable travel initiatives.

**What level should parking charges be at?**

As referred to earlier, there is very often a hidden incentive to staff to drive to, and to park at work as the amount they pay is less than the actual operating cost of the car park itself. There can also be an incentive to drive rather than go by bus as the cost of driving and parking is often perceived to be considerably less than the equivalent cost of an annual public transport pass. The perceived cost of the car journey is perceived by many as just being the...
petrol cost and the parking cost. In saying this, unless the price of fuel at the pumps is featuring regularly on the news, many often underestimate the daily cost of the petrol for the commuting journeys, as the filling up with petrol task is not undertaken on a daily basis. Thus the actual parking charge paid becomes a significant focus of attention, hence the sensitivity towards it.

What factors should be taken into account when deciding upon a charging level?
I think the following, in no particular order, should all be taken into consideration:

- Funding required for initiatives to travel by non car modes;
- The previous level of charges in place;
- The cost of annual and/or rail pass in the area for an average commuting distance;
- The number of spaces available;
- The cost of land in the area; and
- The comparable cost of parking at publicly available car parks within 2 kms.

In addition there is a social equity issue here. There may be staff on lower than average incomes who do not have a reasonable alternative to the car. Thus they have to drive to work. Should they be paying as much as a top earner at the company in order to park?

One option available is to relate the charge they pay to their salary. Such an approach is not new: examples from a few universities are presented below:

<table>
<thead>
<tr>
<th>University Name</th>
<th>Location</th>
<th>Parking policy/ charges ( in approx 2004)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sussex University</td>
<td>Falmer on the outskirts of Brighton</td>
<td>Salary based permit: &gt;£22000/yr = £300/yr. ≤£22000 = £150/yr. Salary based Pay and Display: &gt;£22000 = £2/day ≤£22000 = £1/day</td>
</tr>
<tr>
<td>University of Bath</td>
<td>One and a half miles from the centre of Bath.</td>
<td>Parking zones (5 zones). Annual charges dependant on zone/salary. Staff earning ≤£14,356/yr =£50/yr. Staff earning &gt;£14,356 pay between £100 and £316/yr dependant upon zone. Named spaces available at a premium price.</td>
</tr>
<tr>
<td>Bristol University</td>
<td>City centre</td>
<td>Charge of £10 for annual parking permit. Daily parking coupons must then be pre purchased. The cost of these varies from £0.77 - £5.60 dependant upon salary. Three categories of permit (A,B,C). Category A are for formal car sharers and/or university vehicles and disabled staff and students. Category B permits are limited and only issued to those who scored sufficient points in an application questionnaire. Category C is unlimited and are a ‘licence to hunt’</td>
</tr>
</tbody>
</table>

At Bristol University in 2002/03, the daily parking charge was calculated as being 0.006% of gross contractual salary per working day.
Examples drawn from case studies of Car Park Management

Needs Based Permit Allocation System

A ‘needs’ based permit system could be introduced as a means of allocating parking permits according to identified “need” criteria. The system is operated using a database which holds information on the permit applicant’s personal circumstances and weightings are applied to allow prioritisation. The system restricts the number of staff who are entitled to apply for parking space by excluding those staff who have can use a good alternative form of transport – defined as those staff who live within the “accessibility zone”. An ‘accessibility zone’ may be defined as the area around the site, within which there are good options available to access the site by frequent public transport services or by a reasonable walking distance, i.e.:

- Home address is within 2 kms of the site, which is a reasonable walking distance taking up to 30 minutes; or
- Home address is within approximately 400m of a frequent bus or train service (operating at least every 20 minutes between the hours of 07.30 – 09.30 and 16.30 – 18.30 direct to the site or to within approximately 500m of the main entrance.

Figure 7.1 shows an ‘accessibility zone’ developed for an office site to form the basis for a needs based permit allocation system. This was developed by plotting staff postcodes of residences, acceptable walking distance isochrones and existing public transport services.

Figure 7.1 – Accessibility Zone
In the example presented in Figure 7.1, staff living within the green accessible zone are viewed as having good access to the office site by a sustainable mode. Thus these people are unlikely to be eligible for a parking permit, or if they are, they are very low priority.

A Needs Based Permit system enables the car park manager to prioritise parking permit applicants by taking into account accessibility by sustainable modes as well as taking account of some or all the following:

**Personal Requirement:**
- **Disability/medical condition,** requiring confirmation by Occupational Health (Orange/European blue badge holders would automatically be given a parking permit); and/or
- **Childcare/other caring responsibilities,** which in relation to working hours prevent the staff member from using a mode other than car for the journey to work. This would count as a low priority for permit allocations and strict definitions of eligibility would need to be written to prevent abuse.

**Business Requirement:**
- **Shift workers,** who work shifts regularly with official start/finish times before 07.00 and after 19.00 hours (i.e. this would apply to some non call-centre staff; and/or
- **Business use,** staff that require their car for business use during office hours.

Inclusion of additional criteria as well as the assignment of weightings can be used to refine the permit allocation system. It should be noted that eligibility for a company car may not mean eligibility for a parking permit under the e³ criteria. Liaison with management representatives and staff consultation exercises should be undertaken to ensure that the system, when implemented, is accepted.

Where demand for the parking spaces outstrips demand, points can be applied to each applicant taking into account the criteria discussed above together with any associated weighting. Each applicant is then ranked against the others to produce, in effect a league table. If there are for example 100 spaces then permits could be offered to the applicants that are in the top 100 based on the number of points they have.

**Car Share Priority Spaces and Permits**

Registered car sharers would be eligible for a permit if one or more sharers live outside the ‘accessibility zone’ described above. A car park space would then be allocated to each identified group of car sharers and a database of staff names and car registration numbers would be established.

**Switch from Annual to Daily Staff Permit Payment System**

In the University case study described above, the current annual permit charging system for the majority of staff encourages staff to travel by car to the campus on all
occasions to maximise permit ‘value for money’ and reduce the daily charge equivalent. This gives no incentive for switching to alternative modes on at least some days. Charging on an annual basis also penalises staff who work from home or in other places away from the campus on one or more days per week.

A switch to a daily parking charging system could be implemented. This will give an incentive for staff to consider alternative modes (at least on an occasional basis).

**Sustainable Travel Award Schemes**

As an alternative to charging for parking spaces an option could be implemented whereby employees are rewarded for not using a parking space through the implementation of a Travel Award Scheme.

Below are suggestions of other forms of Travel Award Scheme which could be adopted:

- Staff who can show that they have car shared, taken public transport, journeyed by moped/motorcycle, cycled or walked, earn points on a daily basis. Accumulation of points could equate to a financial reward, a gift, or time off work. However, this system may prove to be difficult and onerous to monitor.

- Contribution towards a public transport season ticket, towards the purchase of a bicycle/equipment, towards waterproof clothing. With regards to the latter two, a monitoring system would be required to ensure that the equipment is used for the journey to/from work and not just for leisure purposes.

- Prize Draws may be held which involve only those staff who do not hold a ‘solo car driver permit’.

- Staff who can demonstrate that they previously drove to work and are willing to give up a parking space are provided with a contribution towards the cost of his/her newly adopted transport to work. It should be noted that this scheme alone would not be equitable to those who already use a sustainable form of transport as they would not be rewarded.

**Parking Management Enforcement Systems**

Regular unauthorised parking can undermine staff confidence in a parking management system. Management systems should therefore be supported by a robust enforcement system, delivered by a number of methods:

- Parking attendant/security staff;
- Clamping; and
- Barrier controls at the entrance and exit points.
An effective Travel Plan comes at a cost and they aren’t cheap. Any measure that involves the operation of a new bus service will be expensive. For example, a bespoke Works Bus or a shuttle from a remote park and ride site. Ignoring any potential revenues that might be collected on the service, the leasing of a bus plus a driver for one day operating from 07:00 to 19:00 can cost between £200 and £300 per day. Thus for a five day week and 50 weeks per year, the one bus plus one driver can cost between £50k to £75k per annum. I have even heard examples of a bus plus driver costing nearly £200k per annum. This was in London for extended hours each day and for 7 days a week. The point of these examples is to reinforce the earlier statement that effective travel plans aren’t cheap.

The potential cost of a Travel Plan can often result in an organisation cherry-picking the travel plan measures and avoiding some of the more expensive components – mainly on the grounds of cost. To others it is a ready made excuse for not going forward with a Travel Plan. However, I would like to demonstrate one of the main advantages of a good car parking management. It can enable a good effective Travel plan to be cost neutral. By using parking charges you can achieve a double whammy. The parking charges will help modify travel behaviour and encourage car drivers to consider alternative (hopefully more sustainable) ways of getting to work. At the same time, the additional parking revenues can help fund the package of travel plan initiatives and provide staff with good quality alternatives to the car.

Using the example in Table 7.1, assume the University in question currently has 650 parking spaces. Assume that they have issued a total of 700 parking permits at a cost of £120 each. They are currently receiving a parking revenue of £84k per annum. If the parking charges rise to £600 per annum, a level that is still less than the equivalent charge at nearby public car parks, then the revenue they will raise increases to £420k. This is an increase of over £300k per annum. Over a ten year period, this represents a cool £3m. If this sum of money is hypothecated and ring fenced for the Travel Plan measures, then I would propose that a very effective sustainable Travel Plan could be produced and maintained.

The other way of funding a Travel Plan was hinted at in Chapter 6 of this paper. If an organisation is planning to build there way out of on-site parking problems by building a new multi-storey car park, then as an option during the feasibility stage, consideration should be given to what Travel plan measures could be afforded using the new car park cost. For instance, the total cost of the scheme presented in Figure 6.2 is over £10m when viewed over a ten year period.

In summary, an effective Travel Plan need not be something only high profit, private sector organisations produce at high cost to themselves. An effective Travel Plan with good car park management approach can be produced at all organisations including those that are continually battling with budget problems and under-going cost cutting exercises.
9.0 Conclusions

Parking problems are clearly evident at a number of existing organisations and are virtually guaranteed to increase in the future, both with a combination of site-specific circumstances e.g. increasing pressure to develop existing car park land and background national trends for increasing car ownership and use and increasing commuting distance.

Estates Managers, developers, indeed, whoever is involved in Travel Planning initiatives needs to face the task of developing a car park management strategy head on. This does not mean the ‘knee-jerk’ reaction of building new parking capacity which is likely to undermine sustainable travel initiatives and provide only a temporary solution to parking problems. Careful consideration needs to be given to developing a strategy which fulfils the E³ test of being effective, equitable and economic.

No-one is saying that car park management will be an easy task.

The following diagram shows the steps involved in most theories of behavioural change, which can be applied in this case to accepting a car park management system and participating in changing to sustainable modes. It shows the importance of information and publicity at each of the steps.

![Diagram](https://via.placeholder.com/150)

However, practical experience has highlighted a number of factors for success:

©Association for European Transport and contributors 2006
Parking management must be supported by good options for travel by sustainable modes;

Parking management should not impose a ‘blanket’ approach, but be sympathetic to the legitimate business and personal needs of staff;

Parking management, specifically charging should not be ‘sold’ as a revenue-raising scheme to boost company accounts, but rather as a scheme which can raise revenue for investment into sustainable travel initiatives parking management; and

Parking management can enable a Travel Plan to be cost neutral. Thus cost of implementation should not be a reason why an effective or luxury Travel Plans aren’t more commonplace.