

High Wycombe Town Centre Masterplan

Eden Centre Car Park Study

Transport for Buckinghamshire
Wycombe District Council

July 2011

Document Control Sheet

BPP 04 F8

Version 7 April 2011

Client: Transport for Buckinghamshire Project No: B1279846
 Wycombe District Council
 Project: High Wycombe Town Centre Masterplan
 Document Title: Eden Centre Car Park Study
 Ref. No: B1279846/CarPark/Final

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DATE 21/06/2011	INITIALS FdeB	INITIALS AB	INITIALS RS	INITIALS PS
	Document Status Draft			

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	Document Status Final			

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	Document Status Final			

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	Document Status			

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1.1 Introduction

The Transport for Buckinghamshire (TfB) Alliance between Buckinghamshire County Council (BCC) and Ringway Jacobs was established for the delivery of all transportation services across the County. Jacobs was commissioned by The Alliance and Wycombe District Council (WDC) to carry out a review of the Eden Centre Car Park. The purpose of this report is to present the issues encountered with the Eden Centre Car Park, and opportunities for improvement.

The car park is located in High Wycombe town centre, as shown in **Figure 1-A** and has a capacity of approximately 1,600 vehicles.



Figure 1-A Location in High Wycombe of Eden Centre Car Park with Entrance Locations inset

The car park has two entrances, one on Lilys Walk, accessed from the Abbey Way flyover and Desborough Road, and one located on the Oxford Road roundabout, accessed from Abbey Way flyover, A4128 Archway and A40 Oxford Road.

As part of the High Wycombe Town Centre Masterplan proposals, the current access arrangements for the car park would be altered with the removal of the

Abbey Way flyover and associated redevelopment of the town centre highway network, and it is in this context that this study was commissioned.

At the Oxford Road Entrance would have similar access arrangements from the North and West of High Wycombe, and the Oxford Road roundabout would be removed and replaced with a simpler junction layout. Abbey Way flyover would be removed, removing access to this entrance from the east of the town. Access from the north and west via Archway and Oxford Road would remain.

The Lilys Walk Entrance would no longer have access from the Abbey Way flyover either. Access would be from a dedicated link from the Marlow Hill roundabout, and also from Desborough Road. Egress would be by way of a right-turn from the Lilys Walk Exit and then a left-turn onto the proposed Gas Works Link Road. Hence, using the Lilys Walk Exit to reach destinations to the West and North of High Wycombe would prove more difficult than at present. Further detail may be found in the report 'High Wycombe Town Centre Masterplan, Highway Design Report, July 2011'.

1.2 Structure of Report

Following the introduction, **Section 2** provides an overview of the current issues affecting the car park. **Section 3** presents some recommendations to deal with the issues discussed, and **Section 4** summarises the report.

2.1 Introduction

The Eden Centre Car Park was opened in 2008, utilising the existing Newlands and Tesco Car Parks, with additional capacity constructed to the south and south-west of the existing car parks. This amalgamation has generated challenges for layout, signage and capacity particularly at peak times. As part of this study a site visit and consultation with Eden Centre management took place in May 2011 in order to establish the issues present.

2.2 Issues

2.2.1 Capacity

During peak times, the car park can reach capacity which in turn causes the barriers to no longer permit entrance and queuing at the car park entrances, in particular at the Lilys Walk Entrance. This queuing can extend back onto the Abbey Way flyover, however, at present the impact on the wider network is limited as the queuing only obstructs one of the two northbound lanes on Abbey Way. While the static capacity of the Car Park is approximately 1,600 spaces, the effective (or dynamic) capacity is likely to be somewhat lower, as this figure is dependant upon search speeds and exit times.

Vehicles queue to enter the Eden Centre car park despite the presence of variable message signs (VMS) on the approaches to High Wycombe town centre which inform motorists of parking availability in the main town centre car parks. These signs are capable of displaying the number of spaces available in the car parks, as well as of displaying a ‘full’ sign.

2.2.2 Layout

The car park incorporates several interconnected structures which were separately developed and then joined as part of the overarching construction of the Eden Centre. These various elements of the car park which are discussed in this report are illustrated in **Figure 2-A**.

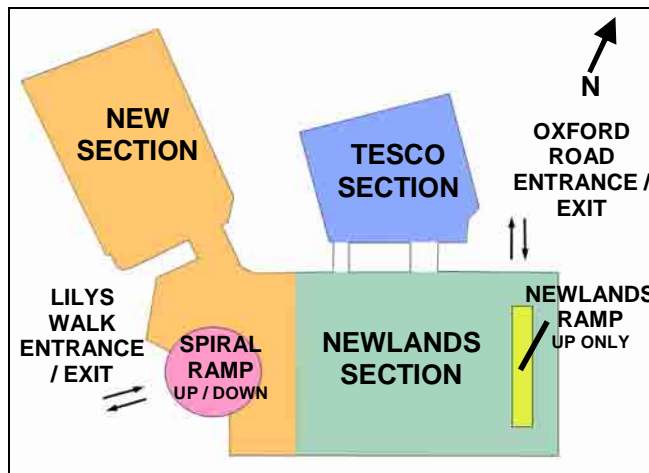


Figure 2-A Eden Centre Car Park Layout

Due to the car park incorporating several different independently constructed elements the possibility for a harmonised layout and associated intuitive search patterns is constrained. This directly impacts upon the effective capacity of the car park, as longer search times and exit times reduce throughput and space utilisation.

There are two up ramps in the car park, one at the Lilys Walk Entrance and one near the Oxford Road Entrance. However there is only one down ramp in the car park, adjacent to the Lilys Walk Entrance.

2.2.3 Entrances / Exits

The Lilys Walk Entrance is the busier of the two, with 59% of entries to, and 69% of the exits from the car park occurring here, according to average barrier figures. The disparity in entrances and exits at this point is most likely due to the single down spiral ramp in the car park being adjacent to this exit. This is exacerbated by a lack of signage highlighting the location of the Oxford Road Exit from the down ramp and the one-way system in the car park reducing the attractiveness of this exit. In addition, the single sign present for the Oxford Road Exit, shown in **Figure 2-B**, signs the exit as 'Alternative Exit (A40)'. The use of this term and legibility of the sign both serve to reduce awareness of the exit by patrons.



Figure 2-B The Single Sign for Oxford Road Exit

Throughput at the entrance barriers does not appear to be an issue, with sufficient capacity of the car park to cope with peak hour entry volumes. Queuing external to the car park is being caused by the capacity being reached. Conflicting movements outside this entrance, in particular in the context of the Masterplan proposals, where all vehicles exiting from the Lilys Walk Exit are required to turn right, may lead to increased queuing within the car park for exiting vehicles.

2.2.4 'Last Chance' Pay Machine

The position of the 'Last Chance' Pay Machine and associated lay-by at the Lilys Walk Exit were considered. From the discussion with the Director of the Eden Centre and on site examination, it is not felt that the presence or location of this pay machine causes operational difficulties within the car park. However, usage of the machine is currently reported as low, if usage increased the potential obstruction could cause significant disruption at this exit.

2.2.5 Signage and Road Markings

The one-way system in the car park exacerbates the issues caused by the physical layout of the car park. This system, as demarcated by the signage and road markings within the car park, results in increased search and exit times.

The interface between the main car park and the 'Tesco' section is poor and involves ambiguous priority and a confused layout. Some attempt has been made to superimpose a new one-way system on this section of the car park, however this has been done without adequately removing the old markings, leading to a very confused layout and interface.

The examples shown in **Figures 2-C** and **2-D** illustrate some of the issues with the markings in this section of the car park. Ambiguous markings, in particular for exiting vehicles will cause delay and conflict within the car park.



Figure 2-C *Conflicting Signage in Tesco section of Car Park*



Figure 2-D *Ambiguous Signage in Tesco section of Car Park*

The system of priorities on the spiral ramp does not provide clear priority to any one movement. Vehicles travelling upwards have to give way to exiting vehicles at one point, and vice versa. It is possible, under the current arrangements, for upward and downward traffic streams to block each other causing congestion. **Figure 2-E** shows a section of the spiral ramp arrangement.

As discussed previously, the signage and exit path from the down ramp to the Oxford Road Exit are poor and reduce the attractiveness and awareness of this option. On the downward ramp, in order to exit via the Oxford Road Exit there is a requirement to give way to traffic entering the car park from Lilys Walk. This acts as a disincentive for traffic to use the Oxford Road Exit. In addition, there are a further two give way points for exiting traffic along this route increasing exit times.



Figure 2-E *Traffic Priority Arrangements at Spiral Ramp*

In the Newlands section of the car park, the main circulating pattern is around the outside of the car park, with the parking spaces arranged along internal lanes. This one-way system, and hence the exit route, is disrupted at a number of points with traffic required to give way to vehicles exiting from internal lanes. In addition, there is no consistency to these arrangements throughout the car park.

Signage frequently conflicts with the road markings within the car park, and even with other signs, as shown in **Figure 2-F**. Here, a no right turn sign displayed in the foreground clearly conflicts with the road markings and signage present at the next aisle.



Figure 2-F Conflicting Signage in Newlands Section of Car Park

The signage can also be obstructed due to the structure of the car park, as shown in **Figure 2-G**.

2.2.6 Spiral Ramp Operation

At present, the pair of ramps at Lilys Walk operate with normal drive on the left rules applying. As such, the outer spiral ramp is designated as the up ramp, with the inner ramp being the down ramp. Consideration has been given to reversing this operation, and the opportunities and challenges this would present.



Figure 2-G Obstructed Signage in Newlands Section of Car Park

As discussed above, the potential for increased conflict outside the Lilys Walk Entrance exists under the Masterplan proposals. By reversing the operation of the ramps the predominant movements will no longer conflict. However, a new conflicting movement will be introduced between vehicles turning left into the Entrance and vehicles exiting and turning right. This, in combination with the potential for confusion and errors that would exist due to an unfamiliar 'drive on right' scenario would negate to some degree the benefits accrued at this Entrance from altering the ramp configurations.

Altering the configuration of the ramps would require a major revision to the one-way system in operation throughout the car park. This could present an opportunity to completely revise the one-way system to maximise efficiency, however the alteration to the crossover points for entering and exiting vehicles at the spiral ramps could lead to delays, in particular as vehicles entering the car park would be required to give way to exiting traffic on each floor while searching for spaces. Additionally, changes to the one-way system could require altering the up ramp in the Newlands section to a down ramp, due to the physical limitations of the car park in this area. This would then require that the Oxford Road Entrance and Exit be reversed, involving a 'drive on right' situation at this Entrance as well. The significant changes required to the one-way system from reversing the spiral ramp operation would increase the distance between the spiral ramp and the Oxford Road exit, negating some of the possible benefits of reversing the operation for motorists using this exit. A feasibility study would be necessary to determine whether any physical changes would be required within the car park to facilitate altering the configuration of the ramps and revising the one-way system.

As a rule, vehicles using the up ramp are searching for spaces, while vehicles using the down ramp are exiting, hence keeping exiting vehicles on the inner ramp minimises conflict within the car park as, predominantly, these vehicles do not leave the ramp until their exit, as opposed to vehicles entering the car park which are searching for spaces, potentially on each floor.

3.1 Introduction

In this section some possible improvements, to enhance the usability of the car park and redress the imbalance between the Lilys Walk and Oxford Road Entrances and Exits, are discussed. A summary table of possible options is included in **Appendix A**.

3.2 Recommendations

3.2.1 Capacity

When the car park is at capacity queuing can occur on the approach roads. This is despite the presence of roadside VMS detailing the number of spaces available in car parks in the town centre. The quality of the directional signage which follows these VMS could be improved to enhance driver awareness of the location of alternative car parks in the town centre, once they've been made aware that the Eden Centre car park is at capacity.

While options to increase the physical capacity of the car park are beyond the scope of this study, the issues examined do serve to restrain the turnover and hence the effective capacity of the car park and the options to improve the turnover are discussed further in this chapter.

Bay-Specific Parking Guidance would greatly reduce search time for patrons by immediately directing them towards available spaces by the most direct path. It would also increase throughput by allowing patrons to enter the car park once a space has been vacated, instead of waiting for the exit barrier to register that there is a space free. A cost-benefit study of the implementation of such a system should be undertaken to identify if installation is justified.

3.2.2 Entrances / Exits

The queuing observed at the Lilys Walk Entrance appears to be predominantly caused by the car park reaching capacity, and is not a function of the throughput capacity of the barriers. As such, no alteration to the configuration or operation of the barriers is recommended.

Under the Masterplan proposals, there will be no left turn allowed for vehicles exiting at this point and the current two lane exit will need reconfiguration after the barriers to take this into account, with traffic required to merge back into one lane for the right turn manoeuvre. This traffic would then use Lilys Walk to access the Gas Works Link Road and the south of High Wycombe.

Improvements recommended to the signage, markings and priority for certain movements enhancing the usability of the Oxford Road Exit may serve to reduce vehicular movements at the Lilys Walk Exit, hence reducing the impact of the potential conflict point noted on Lilys Walk. The potential for conflict remains, however, and once Saturday survey data is available and the planning for the Gasworks Link site is more advanced a more detailed examination of options for redressing this conflict should be undertaken.

3.2.3 Signage and Road Markings

Awareness of the Oxford Road Exit needs to be enhanced throughout the car park. The single sign at the decision point is insufficient to ensure that everyone who enters the car park via the Oxford Road Entrance exits the same way. The amount of space available for signage at the decision point is limited and it is recommended that a more comprehensive signage scheme is used throughout the car park to raise awareness of this Exit. One possibility, which would compliment the existing colour scheme in the car park, would be to colour code the Exits and position signage throughout the car park alerting drivers as to which colour exit sign to follow for their desired destination. This would allow for an informed choice of Exit while taking into account the limited space available at the decision point between the two Exits.

On the spiral ramps, an alteration to the priority system would reduce the potential for blocking and allow improved priority for traffic using the Oxford Road Exit. This would take advantage of a natural give way point observed at the point where the up ramp levels out at each floor. In addition, 'yellow box' markings at potential blocking points at the spiral entrances and exits may assist exiting traffic. The recommended new layout is shown in **Figure 3-A**.

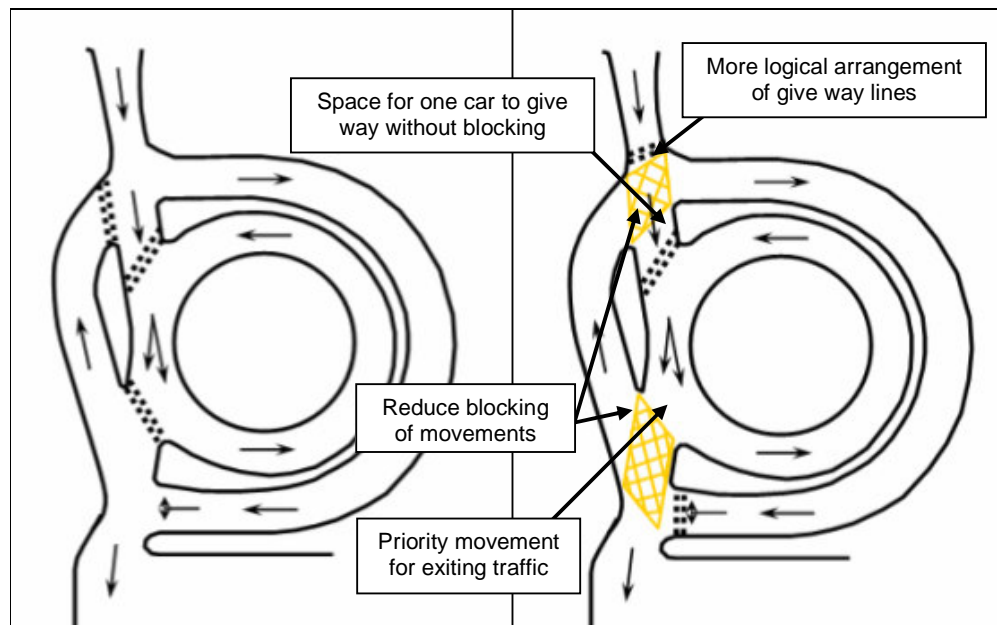


Figure 3-A Current and Recommended Layouts of Spiral Ramp Give Way Lines

Once on level one, vehicles going from the spiral ramp to the Oxford Road Exit lack priority through the one-way system. Giving priority to this movement, in conjunction with improved signage on all floors highlighting the location of this Exit, would improve the usage of the Oxford Road Exit and reduce the pressure on the Lilys Walk Exit and the surrounding road network. This will assist in negating the impact of the required right turn out of the Lilys Walk Entrance upon exiting.

The one-way system in the car park requires a review in order to increase consistency and enhance search and exit speeds. In particular, markings and signage in the Newlands and Tesco sections of the car park need to be reviewed. Traffic circulating around the periphery in the Newlands section of car park should be given priority at all points in order to improve consistency, search and exit times.

Jacobs was commissioned by Transport for Buckinghamshire and Wycombe District Council to undertake a review of the current operation of the Eden Centre Car Park, in the context of the changes the surrounding road network would undergo as part of the Town Centre Masterplan proposals.

During a site visit and discussions with the Eden Centre management, a number of issues, including the capacity, layout, current configuration and unbalanced usage of exits of the car park were identified and discussed.

The existing issues which act to constrain effective capacity and limit the attractiveness of the Oxford Road Exit, as compared to the Lilys Walk Exit have been discussed and illustrated with examples taken from the car park. A number of recommendations have been made, including:

- Enhance directional information associated with car park VMS on the approaches to the town centre
- Improve the consistency of the signage, road markings and one-way system to improve search and exit times
- Alter the one-way system and enhance signage to make usage of the Oxford Road Exit more attractive
- Alter the give-way system at the spiral ramp to reduce the likelihood of blocking

While there is no one option which would act to resolve the current difficulties occurring, we have made a number of recommendations which, taken together, would act to increase the effective capacity of the car park by allowing greater throughput and encouraging greater use of the Oxford Road Exit. The potential of each of the measures recommended and their effectiveness in combination will be more thoroughly understood once the Saturday survey data, which is the car parks peak time of operation, is available.

Appendix A Options for Improvements to Car Park

Option	Description	Overall Impact	Indicative Cost*
Additional capacity	Build capacity in the car park through additional decks or rebuilding	Additional capacity would reduce external queuing	£5M+
Additional down ramp	Build a down ramp, adjacent to the existing up ramp in the Newlands Section of the car park	This option would enhance the attractiveness and usability of the Oxford Road Exit, while allowing new search paths in the car park	£1M+
Bay-Specific Parking Guidance	Install Bay-Specific Parking Guidance to reduce search times and make best use of existing capacity	This option would introduce detailed parking guidance to the car park, allowing customers to directly go to available spaces and making better use of existing capacity	£1-2M+
Enhanced signage for Oxford Road Exit	Consistent and adequate signage from all floors highlighting Oxford Road Exit	By improving the signage for the Oxford Road Exit, usage of this exit will be encouraged, alleviating pressure on the Lilys Walk Exit and surrounding road network	£10K+
Alter spiral ramp priorities	Alter priorities on the spiral ramp to provide more priority for vehicles exiting the spiral	By improving the priority system the use of the Oxford Road Exit can be improved while reducing potential blocking	£5-10K
Change one-way system and signage	Review full one-way system and signage to ensure consistent and most efficient layout used. Option could also include reversing the operation of the spiral ramps.	This option will improve search and exit times, making better use of existing capacity	£20K+

Table A1 Options for Improvements to Car Park

** Indicative costs would be subject to feasibility studies / preliminary designs and therefore may not reflect the final costs.*