



# Transport Evidence Explanatory Note CD/PMP/B27

## Bath: Park and Ride Expansion

*Prepared for*

Bath & North East Somerset Council

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**Appendix A:** Existing Park and Ride Sites : Maximum Occupancy (%) - 31/01/2015-31/01/2016

**Appendix B:** EA Phasing Scenarios - Traffic Growth/Parking Demand Changes



# Acronyms and Abbreviations

B&NES	Bath & North East Somerset Council
DPP	Draft Placemaking Plan
EA	Enterprise Area
BTP	Bath Transport Package
GWML	Great Western Main Line



## SECTION 1

# Introduction

## 1.1 Context

Bath & North East Somerset Council (B&NES) published its DRAFT Place-Making Plan (DPP) on the 16<sup>th</sup> December 2015 and the formal consultation period ended on 3<sup>rd</sup> February 2016. The Place-Making Plan will upon adoption form part 2 of the Local Plan (working alongside part 1 - the adopted Core Strategy) and will supersede the 2007 B&NES Local Plan. B&NES has now submitted the DPP to the Planning Inspector for examination. The examination hearings are scheduled to take place in Summer/Autumn 2016 and if found sound, it is anticipated that the Place-Making Plan will be adopted in December 2016.

Transport evidence needs to be submitted alongside the Plan to the examination to support the proposals outlined in the DPP. One of the areas where additional evidence was considered necessary was to make the case for the necessary expansion of the Park and Ride facilities around Bath to support paragraphs 6.22 and 6.23 in Part 1 of the DPP which state:

*“The Council proposes to expand the provision of Park and Ride facilities to serve Bath. In addition to the proposed East of Bath Park and Ride site, initial investigations suggest that the existing Park and Ride sites at Newbridge, Odd Down and Lansdown are likely to need further expansion to ensure the transport network can accommodate the growth generated by the Enterprise Area, beyond the Park & Ride enhancements already implemented through the Bath Transport Package. The locations of these expansions are indicated on the Bath Spatial Strategy diagram”*

and

*“The Council has a long established policy to develop a new Park and Ride facility to the east of Bath to improve access from that side of the city, and to further reduce traffic into the centre. An independent review of potential Park and Ride sites was carried out in 2013”.*

The aforementioned review is one of the documents submitted as evidence (**CD/PMP/B25**), but is not referred to explicitly in this Evidence Note. This looked more at potential sites to the east of Bath in terms of capacity and locational impacts, rather than ‘need’.

A key piece of work undertaken in 2014 identifying the importance of expanding Park and Ride further was the S-Paramics modelling done to examine different land use mix options for the EA (Core Document **CD/PMP/B21**: Technical Report ‘Bath Enterprise Area/Transport Strategy - S-Paramics Modelling’, CH2M November 2014). It was concluded that the central highway network in Bath could accommodate little more than 3-4% growth in existing traffic in the peak time periods without unacceptable levels of congestion occurring. This work looked at a level of expansion over and above the existing Park and Ride capacity, and the extent this could be used to accommodate EA generated traffic and reduce existing traffic with the aim of maintaining this threshold. It was clear in early work on this modelling that reliance on ‘typical’ weekday spare capacity shown to be available at the existing Park and Ride sites in 2014 would not do enough to reduce vehicle demand, even allowing for rail patronage growth at Bath Spa/Oldfield Park stations and increased walking/cycling in line with the observed 2001-2011 Census growth trend.



## SECTION 1 – INTRODUCTION

In further supporting the DPP case for significant expansion of the Park and Ride expansion around Bath this Evidence Note considers:

- Current utilisation of the three existing Park and Ride sites at Newbridge, Lansdown and Odd Down, and critically how usage has changed at each since the expansions in parking capacity added under the Bath Transport Package (BTP);
- How already ‘committed’ development in Bath with planning permission would serve to affect traffic growth in the weekday peak periods (7:00-10:00am and 3:00-7:00pm), and what ‘net’ effect would arise if all the existing capacity in the three existing Park and Ride sites on a typical weekday was deemed to be taken up; and
- Relative to the ‘committed’ development scenario above, how different parts of the EA development coming forward would impact on traffic growth and demand for parking outside of that provided on-site and governed by the DPP Parking Standards for the Bath City Centre and Bath Outer zones. The collective impact of the DPP standards on EA parking demand, and critically that which may be ‘unmet’ overall is considered in a separate Transport Evidence Explanatory Note (Core Document **CD/PMP/DM27**).

In addition to the aforementioned Core Documents, the others referenced as appropriate in this Evidence Note are as follows:

- **CD/PMP/B26**: ‘Access to Bath from the East: Forecasting for A4 Eastern Park and Ride’ (Mott MacDonald) (2016); and
- **CD/PMP/B22**: Access to Bath from the East: Forecasting for Charmy Down and Box Bridge Park and Ride (Mott MacDonald) (2016).



## SECTION 2

# Existing Park and Ride Utilisation

## 2.1 Available Data

Maximum occupancy data for each of the Park and Ride sites was made available by the B&NES Transport Planning team for the period 31<sup>st</sup> January 2015 to 30<sup>th</sup> January 2016. Whilst there are some gaps in the data coverage, notably for Newbridge, there is a large volume of data available for all three sites. Critically, there are no gaps in the occupancy data for the critical pre-Christmas period.

All three sites have undergone relatively recent expansion phases as part of the Bath Transport Package (BTP) works, with parking provision increased as follows:

- Newbridge: 450 to 698 spaces;
- Lansdown: 437 to 837 spaces; and
- Odd Down: 1,022 to 1,252 spaces.

The maximum occupancy data expressed as 'percentage full' is shown plotted against the pre- and post-expansion parking capacities for each site on the graphs included in **Appendix A**.

## 2.2 Newbridge Park and Ride

The data for the Newbridge Park and Ride site shows that, post-expansion, the average parking utilisation of the site is 65% when all days are considered. This utilisation is 70% if Sundays are excluded, which is typically the day with lowest usage. Not unexpectedly, the usage of the park and ride reaches capacity in the run-up to Christmas, with the site full on all days except Sunday in the last week in November and the first two weeks in December. This roughly corresponds with the Christmas Market period.

The data also shows that typical weekday usage exceeding the former capacity of 450 spaces has regularly occurred since September 2015, illustrating that the additional parking supply provided under the BTP works has encouraged growth in usage of the Park and Ride facility here. The expanded parking at this site was opened in February 2016, but growth in usage regularly exceeding the former capacity limit of 450 spaces has, not expectedly, taken a little time to evolve.

## 2.3 Lansdown Park and Ride

The data for the Lansdown site shows that, post-expansion, the average parking utilisation of the site is 59% when all days are considered. This utilisation again increases to 64% if Sundays are excluded, which is the day with lowest usage. Not unexpectedly, regular 'peak' usage occurs in the first two weeks of December when parking capacity is fully utilised on most days, including Sundays.

Looking again at the effect of the expanded parking provided under BTP, the typical maximum occupancy of 64% represents an average maximum parking level of 536 vehicles. So, whilst significant surplus capacity is still available most days at the present time, the typical maximum accumulation level achieved now is nearly 100 vehicles higher than it would have been possible to accommodate pre-expansion.



## 2.4 Odd Down Park and Ride

The data for the Odd Down Park and Ride site shows that, post-expansion, the average parking utilisation of the site is 53% when all days are considered, and 59% if Sundays are excluded. As this site has by far the greatest parking supply, the spare utilisation with the latter usage is still very high (>500 spaces). As a result of this, the graphed data in Appendix A shows that this site still has spare capacity in the 'peak' period of utilisation in the pre-Christmas run-up. In fact, maximum occupancy exceeding 90% was only recorded on three days over the four week period from November 23<sup>rd</sup> to 19<sup>th</sup> December.

Looking again at the effect of the expanded parking provided under BTP, the effect here has been less notable than that seen at the other two Park and Ride sites. Examination of the maximum occupancy figures show that this only exceeded the former capacity of 1,022 spaces on 12 days in the period considered. Not unexpectedly, these all occurred in the Christmas period. The 230 spaces added to this site by BTP has therefore only been beneficial in the 'peak' Christmas period to-date, and has not served to promote traffic reduction in a typical weekday over that which could have been achieved pre-expansion. Part of the reason is likely to be the existing congestion on the A367 approach to the Sulis Manor Road/P&R Access roundabout in the weekday 7:30-9:00am period, serving to constrain potential traffic growth on this route and so deter additional users from trying to access the Park and Ride site.

## 2.5 Conclusions

The analysis of the existing Park and Ride sites shows that surplus capacity available now may help to alleviate potential growth in traffic in the short term. It will also serve to offset the City Centre off-street public car parking lost when the Bath Quays North development comes forward, which will result in the loss of Avon Street car park. However, this will not be the case in the run-up to Christmas when practically all of the Park and Ride capacity is fully utilised.

The 'typical' maximum occupancy figures for both Newbridge and Lansdown shows that growth in patronage has been achieved by implementing the BTP expansions, as demonstrated by parking levels consistently in excess of the pre-expansion parking supply. As highway conditions and driver journey time reliability into the City Centre are adversely affected by traffic growth due to the EA and other 'committed' developments, it would not be unreasonable to predict that further take-up of the existing Park and Ride capacity will occur.

At present, the average overall utilisation of the three Park and Ride sites is circa 63% with usage on Sundays excluded. This equates to existing spare capacity of some 1,020 spaces of the 2,787 available. In considering the timing of any additional Park and Ride capacity needed, it will be necessary to monitor and review the take-up of this existing spare capacity as the build-out of already 'committed' development continues or takes place. This review will also need to take into account other planned EA development as specific applications come forward and the delivery programme is better understood.



## SECTION 3

# Effect of Committed Development

## 3.1 Development with Planning Permission

There are already a number of significant developments in Bath that have been fully or partially implemented since the 'base-line' 2013 S-Params micro-simulation model was developed, or not started but with planning permission in place. All have the potential to, or are, affecting the central area and A4/A36 highway network through Bath. These include the following developments:

- Bath Western Riverside: Phase 1 of this predominantly residential development is under construction and part occupied (785 dwellings). Phase 2 has Outline planning permission in place for a further 1,215 dwellings, so 2,000 units overall in Phases 1 and 2. This land is within the designated EA area (DPP Policy SB8 Refers);
- Bath Press: Planning permission has been granted for a residential-led mixed-use development comprising 244 dwellings (Use Class C3) and 1,485.2 square metres (GIA) flexible employment space (Use Class B1). This land is also within the designated EA area (DPP Policy SB9 Refers);
- Roseberry Place: Outline planning permission has been granted for a mixed-use regeneration comprising the erection of six buildings to accommodate up to 175 flats, flexible business employment floor-space (Use Class B1) (up to 4,500sqm gross), local needs shopping (up to 1,350sqm gross). This is again in the designated EA (DPP Policy SB10 refers);
- MOD Foxhill: Outline planning permission for 696 dwellings, with further reserved matters approval in place for 275 of these units (DPP Policy SB11 refers); and
- Lidl Foodstore: Implemented at the former Herman Miller building on the A36 Lower Bristol Road.

As will be noted from the above, most of this development is residential and whilst largely centrally located, can be expected to generate a significant volume of traffic associated with commuter trips out of Bath in the short term. However, as the EA delivers more employment into Bath over time, workplace travel patterns associated with this residential development may change.

In February 2016 the Development Management Committee approved a major re-development scheme for Pinesgate (15/05026/EFUL). This will comprise the erection of an office building (Use Class B1) totalling 15,348sqm GIA and a purpose-built educational campus comprising academic accommodation (Use Class D1) and integral student accommodation (Use Class C2) of 16,491sqm, together with basement parking. This will replace two existing blocks on the site with a combined GIA of 5,936sqm, so a net increase of 9,412sqm GIA in the Class B1 alone. However, this has been excluded from the current 'committed' development assessment because the traffic generation in the Transport Assessment was constrained to the proposed level of parking of 126 spaces, which is only 5 more than existing. In doing so, the assessment argued that 'actual' traffic generation in the Pinesgate area would be little more than existing by virtue of the parking restraint applied. Whilst this might be true it ignored the effect of the unmet parking demand, the likely traffic generation linked to this and how this demand might be accommodated elsewhere. As such, this potential impact is set out in the scenarios considered later in Section 4.



## 3.2 Road Network Changes

Since the development of the validated base S-Paramics model, a number of road network changes affecting roads in the central area and A36 corridor though Bath have been or are in the process of being implemented. The effect of these clearly needed to be considered in any assessment of highway operation with ‘committed’ development growth added. The schemes in question are as follows:

- Improvements to the A36 Lower Bristol Road/Windsor Bridge Road junction - Implemented;
- The A36 Rossiter Road scheme - Implemented;
- Alterations to the Dorchester Street/St James Parade junction and lane lining/signing on the St James Parade approach - Implemented; and
- Alterations to Green Park Road, Avon Street, Corn Street and The Ambury (Flood Alleviation Scheme) - Currently being implemented as a pre-cursor to the Bath Quays project.

In addition to the above, the full completion of BWR will include a new ‘Destructor Bridge’ installed to create a two-way linkage from this site to the A4 Upper Bristol Road. The A4 Upper Bristol Road/Midland Road junction will also be signalled as part of this linkage improvement. A new signalled junction with the A36 Lower Bristol Road between Midland Road and Windsor Bridge Road is also planned to serve the final build-out of the BWR site.

All the above network changes were therefore included in S-Paramics modelling undertaken to assess future highway operation with just this ‘committed’ development growth in place. Whilst the latter includes development on some of the land included within the EA, it excludes large parts of it and most of the non-residential development (notably B1 Office). It is also worth pointing out that, with the possible exception of the A36/Windsor Bridge Road junction changes, the highway improvements either implemented or being planned are not expected to have a significant ‘capacity enhancing’ effect on the Bath network. In other words, these are very unlikely to permit a higher level of traffic growth than the 3-4% threshold previously identified.

## 3.3 S-Paramics Assessment

### 3.3.1 Development Trip Generation

In order to calculate the expected traffic generation from these ‘committed’ development sites in the weekday 7:00-10:00am and 3:00-7:00pm periods, the trip rates in the submitted Transport Assessments were used directly. For sites located outside of the central area, and so the S-Paramics Model extent, the assumed distribution in the respective Transport Assessment was used to derive the proportion expected to route through the network of interest. As noted earlier, this differed from the methodology used to estimate vehicular trip generation from the included sites in the EA in the final ‘full build-out’ scenario for the Enterprise Area, reflecting the ‘interim’ development nature of the assessment. With all the EA ‘employment’ in place it is possible a higher proportion of the BWR and FoxHill residential population in particular could work within the city, leading to a higher use of sustainable modes and a resultant fall in vehicle generation from these new residential areas.

Using the submitted Transport Assessments as noted, the estimated generated traffic in the 7:00-10:00am period on a weekday would be some 2,300-2,400 vehicles. This quantum in the afternoon period from 3:00-7:00pm would be of the order of 4,200 two-way vehicle movements.



### 3.3.2 Net Growth and Assumptions

The validated ‘base’ S-Paramics model (2013) contains 29,629 vehicle trips in the AM period (7:00am-10:00am) and 42,514 in the PM period (3:00pm-7:00pm). The addition of the ‘committed’ development traffic would therefore, if unmitigated, result in growth of +7.9% and +9.80% in the two periods. To offset this for the purposes of assessment it was assumed that all residual capacity available in the existing Park and Ride sites would be taken up by this time (but no expansion). Assessment of the present arrival and departures at each Park and Ride site done in the previous S-Paramics work (2014) for the EA was used to estimate the potential additional vehicle trip abstraction possible on a typical weekday in the two periods, with maximum parking accumulation raised to the site capacity level. This showed that the maximum reduction overall would be circa 1,200 vehicle movements between 7:00-10:00am and 1,500 vehicle movements between 3:00-7:00pm.

Thus the ‘net’ traffic growth resulting from the full build-out of ‘committed’ development consented to date, and with existing Park and Ride capacity taken up, could be circa +3.9% between 7:00-10:00am and +6.4% over the period 3:00-7:00pm. The latter is higher than desirable, but it is accepted that increased rail patronage and growth in walking/cycling following the Census 2001-2011 trend for Bath could assist in reducing this. However, it is the ability of the network to cope in operating terms that is likely to exercise the greatest constraint on traffic growth.

### 3.3.3 Highway Operation

Table 3.1 below shows a comparison of the S-Paramics results obtained for the network as a whole over the weekday 7:00-10:00am period. BWR Option A and B in this case relate to two different junction options in accessing the A36 Lower Bristol Road, with Option B giving the better highway access to the south side of this large development site.

*Table 3.1: Network Performance Statistics, Weekday AM Peak Period (7:00-10:00am)*

Network Variable	2013 Base	BWR: Option A	BWR: (Option B)
Mean delay (s)	480	587	576
Total distance (km)	923,797	930,166	930,077
Vehs Entering Network	29,457	30,303	30,779
No. Vehs at 9:59am	1,219	1,758	1,735
Journeys Completed	28,238	28,545	29,044
Network Demand	29,629	30,779	30,779
% Demand Satisfied	99.4%	98.50%	98.60%
Mean Speed (mph)	15	12	12

The results show that even with growth limited to circa 3-4% that:

- Average delay is increased by circa 100 seconds, or circa 20%; and
- Although the vast number of network journeys are completed, albeit with increased time, there are also a greater number of vehicles still left in the number at 9:59am. This is an indicator of increased congestion and queuing.



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Figure 3.1 compares the mean network speed change over time throughout the modelled 7:00-10:00am period. As expected, the effect of the ‘committed’ development shows that the reduction in mean speed is seen from 8:00am onwards, with the lowest value reached in the peak hour 8:00-9:00am.

Figure 3.1: Mean Network Speed Change, Weekday AM Peak Period (7:00-10:00am)

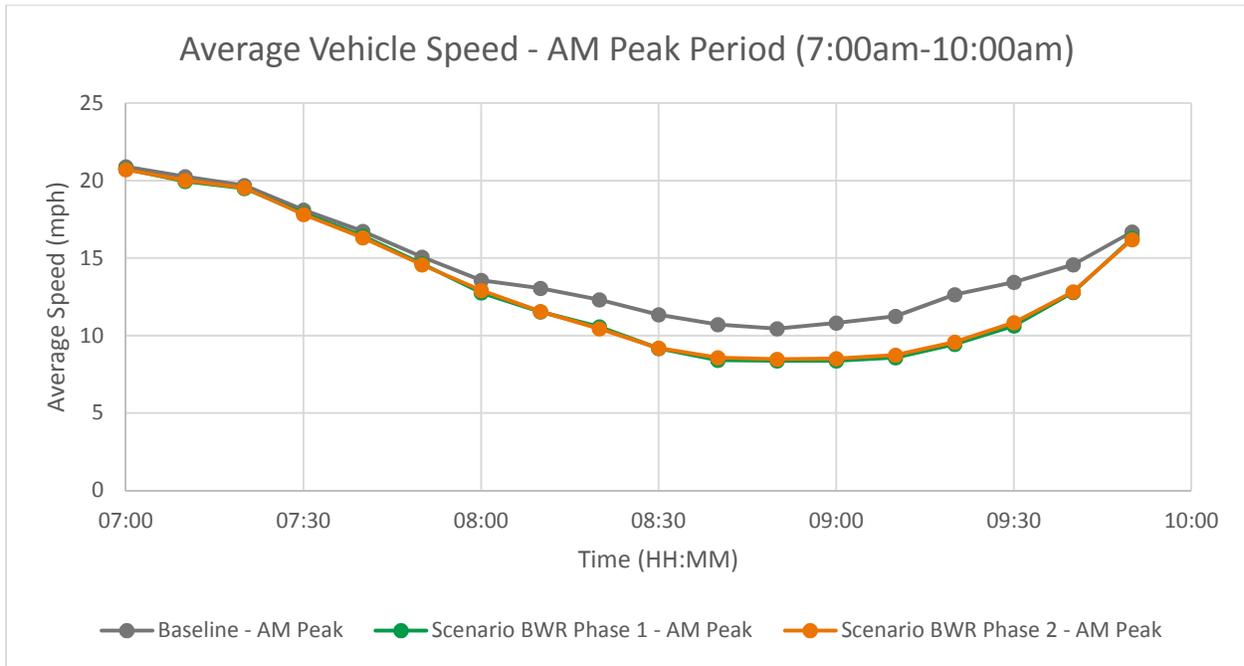


Table 3.2 below shows the same global network statistics for the weekday 3:00-7:00pm period.

Table 3.2: Network Performance Statistics, Weekday PM Peak Period (3:00-7:00pm)

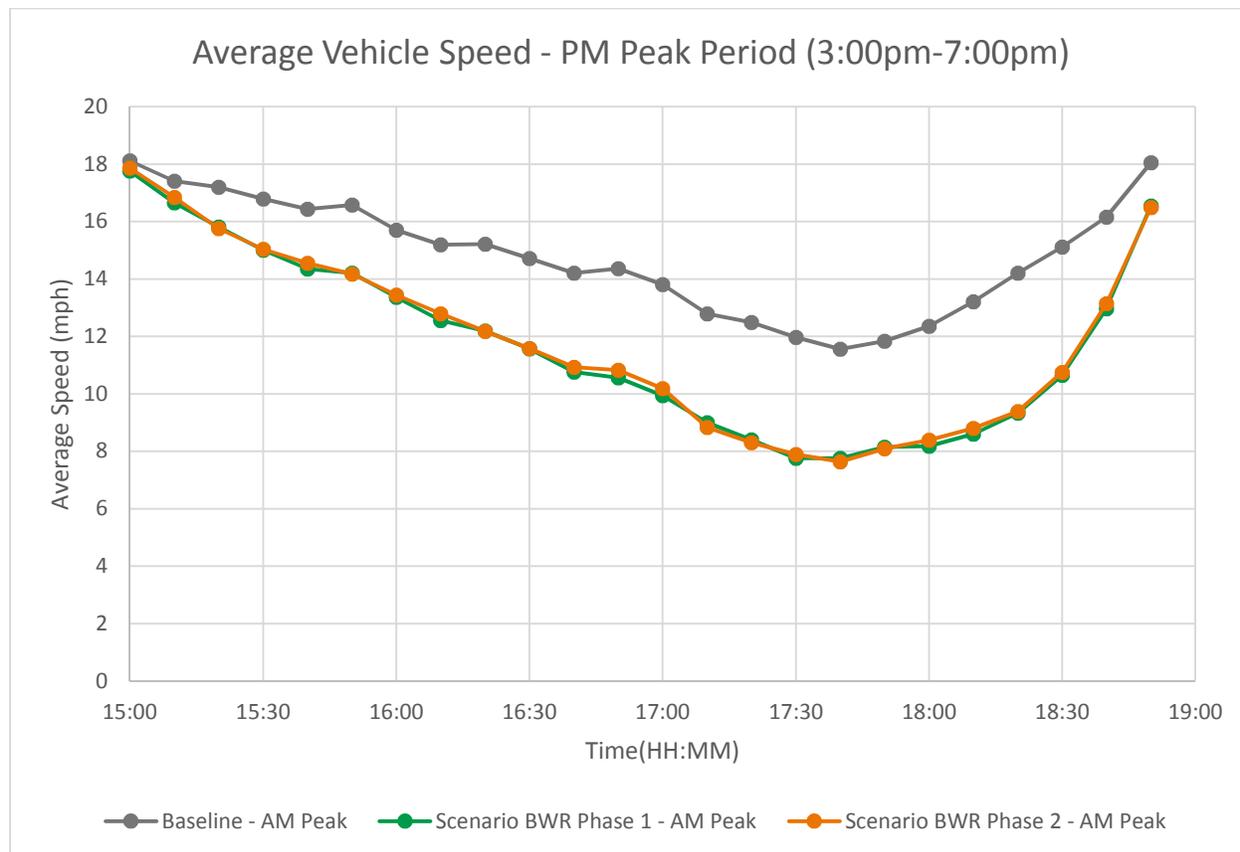
Network Variable	2013 Base	BWR: Option A	BWR: (Option B)
Mean delay (s)	418	603	579
Total distance (km)	124,594	127,452	128,944
Vehs Entering Network	42,331	43,992	44,336
No. Vehs at 18:59pm	1,015	1,905	1,681
Journeys Completed	41,316	42,087	42,655
Network Demand	42,514	45,074	45,074
% Demand Satisfied	99.6%	97.60%	98.40%
Mean Speed (mph)	16	11	11

This shows a higher deterioration in average network conditions than the 7:00-10:00am period, with the mean delay time for all journeys between 3:00-7:00pm increasing by nearly 3 minutes. However, the network is just capable of passing the increased demand with around 98% of all traffic accommodated, although the number of vehicles still present in the network at the end of the simulation period is noticeably higher in the ‘with committed development’ scenarios. As noted before, this is due to increased congestion and queuing. Figure 3.2 again shows the change in the mean network speed over



time in this period. As expected, the greatest effect is seen in the 5:00-6:00pm ‘peak’ hour, when the average network speed drops to circa 8.0mph.

Figure 3.2: Mean Network Speed Change, Weekday PM Peak Period (3:00-7:00pm)



### 3.4 Conclusions

The conclusions arising from this work are as follows:

- A full take-up of the existing capacity at the Newbridge, Lansdown and Odd Down would be necessary to bring expected traffic growth with just ‘committed’ development down to acceptable levels. Whilst some of these ‘committed’ sites with existing planning permission are within the EA area, most of the development anticipated for the EA in the DPP is not even accounted for;
- The ‘net’ change in expected traffic and growth would still reach the desirable threshold of +3-4%. Whilst the S-Paramics modelling shows that vehicle passage throughout the network would generally be maintained, this would be at the expense of increased congestion and slower mean journey times in both the weekday 7:00-10:00am and 3:00-7:00pm periods; and
- Further development proposed within the EA and allied traffic generation would have to be balanced by equivalent ‘reduction’ achieved through expanded Park and Ride, increased rail patronage or walking/cycling. As this work shows, the 3-4% growth ‘allowance’ could already be taken up by ‘committed’ development with current planning permissions.

This ‘committed’ development assessment does assume that full build-out of all the presently consented sites will occur before any other EA development comes forward. In the case of BWR in particular, the completion of both Phases 1 and 2 and full occupation of the 2,000 dwellings will take a



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number of years, during which time it is more than conceivable that other EA development will come forward. Similarly, whilst the existing spare capacity in the Park and Ride sites is likely to be taken up as drivers respond to increasing congestion and parking restraint, this will take time. However, whilst hypothetical in this sense, the assessment does illustrate that, long term, the full take-up of the current spare capacity at the Park and Ride sites may only serve to balance out the impact of ‘committed’ development already consented in maintaining the satisfactory operation of the highway network.

In the next part of this Evidence Note the different ‘extra-over’ traffic generation and parking demand effects of different phases of the outstanding EA development is considered.



## SECTION 4

# EA Phasing and Park and Ride Expansion

## 4.1 Scenario Considerations

As noted in the last section considering ‘committed’ development, the latter excludes most of the non-residential employment development envisaged as coming forward in the EA. As such, what comes forward and at what time will have a bearing on the programme for the delivery of additional Park and Ride capacity around the city. As such, this section of the Evidence Note considers a number of possible EA development phasing scenarios in respect of:

- Predicted traffic generation in the weekday 7:00am-10:00am and 3:00-7:00pm periods, both ‘unconstrained’ and with the DRAFT DPP parking standards (restraint) in place;
- Maximum parking demand with ‘unconstrained’ on-site parking, and the ‘unmet’ demand with the DRAFT DPP parking standards in place;
- The potential traffic growth range based on the above, with no ‘background’ reduction made to existing traffic;
- How Park and Ride expansion could be managed to keep pace with expected ‘displaced’ parking demand, taking account of potential mode shift to rail, bus, walking and cycling.

**Appendix B** sets out the details of each scenario considered, the quantum of unmet demand and assumptions made.

## 4.2 Scenario Review

### 4.2.1 Content and Assumptions

The EA phasing scenarios considered and set out in Appendix B are as follows:

- Scenario 1: Full completion of the Pinesgate development with the proposed college (Kaplan) and the 15,348sqm of B1 offices fully occupied;
- Scenario 2: Full completion of Bath Quays North (BNQ), combined with the Scenario 1 build-out of Pinesgate above;
- Scenario 3: Full build-out of the South Quays and South Bank development land, again with Pinesgate also completed. However, the completion of BQN is not assumed;
- Scenario 4: Full build-out of the Pinesgate, BQN, South Quays and South Bank developments;
- Scenario 5: Full build-out of the EA development plots comprising Green Park West, Green Park East, Manvers Street and Cattle Market; and
- Scenario 6: Completion of all development considered in Scenarios 4 and 5.

In keeping with earlier work on different EA land use options, the rail patronage growth profile over the period 2013-2024 for ‘Bath Stations’ has been used to estimate what level of car driver trip reduction could accrue with planned improvements to the rail infrastructure serving Bath. The latter include electrification of the Great Western Main Line (GWML), and locally the completion of the Bristol Metro Phases 1 and 2. For the purposes of assessment, it was assumed the ‘Quays’ developments could be



completed by 2019, and the whole of the development considered in Scenario 6 by 2024. Assumptions as to the level of ‘parking demand’ reduction possible due to increased car driver abstraction to rail is set out in the ‘Notes’ section against each scenario in the Appendix B table. As this note deals exclusively with the traffic generation and parking demands associated with non-residential developments within the EA, only the growth in the ‘alighting’ passenger demand has been considered in the 7:00-10:00am period. Furthermore, only Bath Spa station is considered.

## 4.2.2 Findings

### *Scenario 1*

The Pinegate Transport Assessment (TA) undertaken by IMA considers only a ‘reduced’ traffic generation situation based on the provision of 84 spaces for the 15,348sqm of B1 offices proposed. However, consideration of the potential parking demand based on the vehicle trip rates in the same TA suggest that maximum accumulation would be around 550 vehicles. The TA does not purport to say how this would be met, but implies that on-site parking ‘restraint’ would serve to encourage the use of other modes of travel to the site. However, a ‘shortfall’ in unmet parking demand of around 460 spaces would have to be addressed in this way. On-street parking in Oldfield Park/Twerton and some increased walking/cycling may account for some of this, but a not insignificant amount of parking demand will need to be met elsewhere. It is considered this could be met by targeted Park and Ride expansions at Lansdown and Odd Down, without an immediate need to consider new site provision east of Bath. Depending on the pace of delivery of this development, and the ‘committed’ development identified in Section 3, the existing spare capacity in the Park and Ride sites may suffice in the interim.

### *Scenario 2*

The development at Bath Quays North (BQN) is dominated by proposed B1 office development (20,000sqm GFA). Together with the very restricted B1 parking standard in the City Centre zone proposed by the DPP (1 space/400sqm GFA), there is a big discrepancy between supply and ‘potential’ parking demand. The analyses suggest the shortfall here could be nearly 750 spaces overall, taking into account the fact that A1/A3 land uses also have zero permitted parking provision within this inner zone. Another consideration will be the ‘net’ City Centre public off-street parking lost when this development is complete.

As with Pinegate, a virtually nil impact on traffic growth in the central area due to applied site parking restraint would be dependent on all the potential parking demand being met elsewhere, or wholesale driver mode-shift to rail, bus or walking/cycling. Assuming that BQN is completed by 2019, the expected ‘alighting’ rail passenger growth at Bath Spa station between 7:00-10:00am over the period 2013-2019 is expected to be circa 28% (774), so about 600 potential car-trips otherwise removed from the network assuming predominant car-driver abstraction (83%). As Pinesgate is also likely to be completed and occupied by this time, the ‘net’ parking shortfall overall is likely to be 600-700 spaces, which ignores any effect on existing City Centre parking. Again, this should be possible to meet by considering expansions to the present Park and Ride sites, with this informed by a review made at ‘start construction’ as to the existing capacity likely to remain available at BQN completion, if any.

### *Scenario 3*

The South Quays/South Bank sites also contain a significant quantum of B1 development, but as these lie within the ‘Outer Zone’, a higher level of on-site parking provision is permissible under the DPP standards. The ‘unmet’ parking demand is around 400 spaces so, combined with Pinesgate, about 800-900 spaces. However, using the same assumption about a 2019 completion date and possible rail mode-shift, the ‘net’ demand shortfall may only be 200-300 spaces. This again could be met with targeted Park



and Ride expansion at Lansdown and Odd Down, without an express need to bring forward an eastern site at this stage. However, this does assume that BQN is not developed in the same timeframe.

#### *Scenario 4*

The full build-out of the 'Quays', South Bank and Pinesgate could lead to a potential non-residential parking 'shortfall' of 1,600 spaces, when comparing unconstrained demand (TRICS) with the parking supply afforded under the proposed DPP standards. However, making the same allowance for car-driver mode shift to rail with GWML improvements the net shortfall would be circa 1,000 spaces. This may be too high to be addressed with simple capacity expansions to the existing Park and Ride sites, so points to the need to bring forward a further site to the east of Bath before the quantum of development in the EA reaches this level. This might be addressed at this stage as follows:

- Further 300 space expansions at both the Lansdown and Odd Down Park and Ride sites; and
- The implementation of a new site to the east of Bath with capacity in the first instance for 400-500 spaces.

#### *Scenario 5*

The completion of the EA sites at Cattle Market, Manvers Street and Green Park (West and East) is collectively predicted to result in a non-residential parking shortfall of nearly 800 spaces when assessing potential demand against supply. This block of development also contains 672 proposed dwellings, which results in a residual traffic generation much higher than the combined 'Quays'/South Bank development considered in Scenario 4. This is because no consideration is made in this Note to residential parking and constraint on ownership/car use this may serve to achieve, insofar as this would not create a potential demand for 'edge of city' Park and Ride.

Assuming a slightly later date for full completion by 2022, expected 'alighting' rail passenger growth at Bath Spa station over the period 2013-2022 is forecast to be circa 35% (974), or about 800 potential car-trips otherwise removed from the network assuming predominant car-driver abstraction (83%). Taking into account the above, and the build-out of Pinesgate, 'net' parking provision of circa 450 spaces would still be needed under this scenario. In theory this could again be met by expansions to the existing Park and Ride sites only, but in reality it seems highly improbable that no development in the 'Quays' or South Bank will have come forward by this time given the advanced state of the current planning work for both areas.

#### *Scenario 6*

The full build-out of the EA sites comprising the 'Quays', South Bank, Green Park (West and East), Manvers Street and Cattle Market could create a potential non-residential parking demand shortfall of nearly 2,500 spaces. Added to this will be the potential impact of the three EA sites in the City Centre in removing existing public off-street parking, with 836 spaces reduced to the 'Getting Around Bath' (CD/PMP/B5) Policy GABP7 threshold of 500 spaces. Allowing for car driver abstraction to rail by 2024, the 'net' parking demand that may need to be provided for is some 1,800 spaces, although other modal shift responses such as increased walking/cycling or use of bus could serve to drive down this potential need. The residual need could be part met by further planned expansions to the existing Lansdown and Odd Down Park and Ride sites, and possibly Newbridge, but the level of potential unmet parking demand confirms a need for a new bespoke site to the east of Bath as set out in the DPP.



## 4.3 Other Forecasting Work - Comparison

By way of comparison, the following forecasting reports for Park and Ride examining ‘Access to Bath from the East’ have been considered in the light of the EA parking analyses presented in this Evidence Note:

- **CD/PMP/B26:** ‘Access to Bath from the East: Forecasting for A4 Eastern Park and Ride’ (Mott MacDonald) (2016); and
- **CD/PMP/B22:** Access to Bath from the East: Forecasting for Charmy Down and Box Bridge Park and Ride (Mott MacDonald) (2016).

The first of these reports (**CD/PMP/B26**) considered a new eastern Park and Ride location near the western end of the A4 Batheaston Bypass, indicated as either Sites A, B or F in Figure 3.1 to this report. Table 4.5 in the same report predicted a Do Minimum maximum parking demand for 2,899 spaces across all three existing sites in 2029 so, in effect, a full take-up of all existing capacity with some additional demand warranting a need for local expansion. With the addition of a new eastern Park and Ride site the overall demand for Park and Ride was estimated to require a need for 3,422 spaces with a service route operating as far as the City Centre only. With an extended service to the Royal United Hospital (RUH), the forecast maximum demand was 3,732 spaces. Thus, this report predicted an expansion need for 635-945 spaces by 2029.

The second report (**CD/PMP/B22**) considered the impact of two new sites to the east and north-east at Box Bridge and Charmy Down respectively. Table 4.5 showed a predicted maximum usage requiring 3,465 spaces overall, so an uplift of 678 spaces relative to the parking supply available at the three existing Park and Ride sites. This analysis considered a service in each case serving the City Centre only.

Whereas the analyses based on the potential parking demand and supply seek to identify a maximum possible need for Park and Ride, these studies explicitly predict likely patronage taking into account all the other options available to drivers. A restraint on parking available within the EA developments designed to discourage car travel will inevitably encourage a greater use and demand for Park and Ride, but it could equally encourage a mode shift towards walking/cycling where travel distance permits, greater bus use, or lead to some drivers seeking on-street parking in areas around the City Centre and wider EA development corridor. As such and not unexpectedly, the possible ‘need’ derived from the parking analyses is higher than the estimated actual Park and Ride patronage change forecasts in the two Mott MacDonald reports.

## 4.4 Conclusions

Section 3 of this Evidence Note outlined how existing surplus capacity at the Park and Ride sites could most likely be taken up over time in response to worsening highway conditions created by the build-out of existing ‘committed’ development alone. In considering how, where and when further capacity to Park and Ride facilities around the city would need to be added to address the further development impacts of the EA, it is clear from the various phasing scenarios considered that simple expansions to the existing sites will only go so far. As work to date is most advanced on the ‘Quays’ and South Bank, it is not unreasonable to presume that these sites would come forward first, whilst a major redevelopment scheme for the Pinesgate island has already received planning permission. Whilst the analyses suggest that the potential unmet parking demand effects associated with Pinesgate and South Quays/South Bank could be offset with expansions to the existing sites, the added effect of BQN is likely to trigger the



need for a new Park and Ride site, with the DPP identifying a potential location to the east of Bath to address the gap in geographic coverage which exists now.

The full build-out of the EA sites comprising the ‘Quays’, South Bank, Green Park (West and East), Manvers Street and Cattle Market is estimated to create a potential non-residential parking demand shortfall of nearly 2,500 spaces. However, taking into account the future effect of rail patronage growth linked to planned GWML improvements by 2024, the predicted supply shortfall could be 1,800 spaces, although other modal shift responses such as increased walking/cycling or use of bus could serve to drive down this potential need. However, the level of potential unmet parking demand is likely to remain high, so it is considered that expanded Park and Ride as set out in the DPP is the best way of meeting this need, whilst discouraging car travel into the City Centre to guard against excess traffic growth.

Park and Ride patronage forecasting work undertaken for a 2029 horizon year predicts a demand for an additional 700-1000 spaces over the existing supply with various ‘East of Bath’ site options. Interestingly, the Do Minimum scenario with no new site predicts a demand by this time which is only marginally greater than the current overall capacity level. The large jump in predicted patronage growth with an eastern site included clearly shows that significant additional demand for Park and Ride that would be generated by a new site serving this approach to Bath. The fact that this demand does not materialise in the Do Minimum scenario is a reflection of the fact that the potential detour required to access the existing sites will remain an unattractive option for most drivers entering the city along the A4 and A363 to the east.

The interim build-out of the ‘Quays’, South Bank and Pinesgate could lead to a potential non-residential parking ‘shortfall’ which is too high to be addressed with simple capacity expansions to the existing Park and Ride sites, so would point to the need to bring forward a new site to the east of Bath before the quantum of development in the EA reaches this level. This might be addressed at this stage as follows:

- Further 300 space expansions at both the Lansdown and Odd Down Park and Ride sites. However, the patronage forecasting work suggests that greater emphasis should be directed at additional parking capacity provision at Lansdown rather than Odd Down. This is because use of Lansdown Park and Ride is a potential option for some drivers accessing Bath from the east, namely via the A420, whereas Odd Down is much less accessible from this direction; and
- The implementation of a new site to the east of Bath with capacity in the first instance for 400-500 spaces.

This would add around 1,000 new spaces to the overall Park and Ride capacity serving Bath, whilst meeting a clear demand for a new site serving the eastern corridor. The current patronage forecasting work does not suggest a demand for greater provision than this by 2029, although the analysis of potential unmet parking demand associated with the EA developments suggests that need in the longer term could be greater. This will depend on the successful delivery of other measures to limit car use and provide greater travel choice, notably the delivery of planned rail capacity improvements. As such, there will remain a need to assess/review the case for capacity expansion beyond an initial strategy for delivering around 1,000 new spaces.



## SECTION 5

# Summary and Conclusions

## 5.1 Summary

In making the case for expanding Park and Ride around Bath this Evidence Note has set out:

- The current utility of the three existing Park and Ride sites at Newbridge, Lansdown and Odd Down, and critically how usage has changed at each since the expansions in parking capacity added under the Bath Transport Package (BTP);
- How already 'committed' development in Bath with planning permission will serve to affect traffic growth in the weekday peak periods (7:00-10:00am and 3:00-7:00pm), and what role the existing capacity in the three existing Park and Ride sites will need to play to control growth in seeking to maintain satisfactory highway operating conditions; and
- Relative to the 'committed' development scenario above, how different parts of the EA coming forward could impact on traffic growth and demand for parking outside of that provided on-site and governed by the DPP Parking Standards for the Bath City Centre and Bath Outer zones. Critically, how this will serve to dictate how, where and when new Park and Ride capacity would need to be added, taking account of potential car-driver shift to other modes over time, notably rail.

## 5.2 Conclusions

The conclusions arising to further support the DPP case for expanding the Park and Ride facilities around Bath are as follows:

- The 'typical' maximum occupancy figures for both Newbridge and Lansdown shows that growth in patronage has been achieved and promoted by implementing the BTP expansions, as demonstrated by parking levels consistently in excess of the pre-expansion parking supply. As highway conditions and driver journey time reliability into the City Centre are adversely affected by traffic growth due to the EA and other 'committed' developments, it would not be unreasonable to predict that further take-up of the existing Park and Ride capacity will occur;
- At present, the average overall utilisation of the three Park and Ride sites is circa 63% with usage on Sundays excluded. This equates to existing spare capacity of some 1,020 spaces of the 2,787 available. In considering the timing of any additional Park and Ride capacity needed, it will be necessary to monitor and review the take-up of this existing spare capacity as the build-out of already 'committed' development continues or takes place. This review will also need to take into account other planned EA development as specific applications come forward and the delivery programme is better understood;
- A full take-up of all the existing 'spare' capacity at the Newbridge, Lansdown and Odd Down sites may be necessary to bring expected traffic growth with just 'committed' development down to acceptable levels. Whilst some of these 'committed' sites with existing planning permission are within the EA area, most of the development anticipated for the EA in the DPP is not even accounted for. Even so, the 'net' change in expected traffic and growth would still reach the desirable threshold of +3-4%. Whilst the S-Paramics modelling shows that vehicle passage throughout the network would generally be maintained, this would be at the expense of increased



## SECTION 5 – SUMMARY AND CONCLUSIONS

congestion and slower mean journey times in both the weekday 7:00-10:00am and 3:00-7:00pm periods;

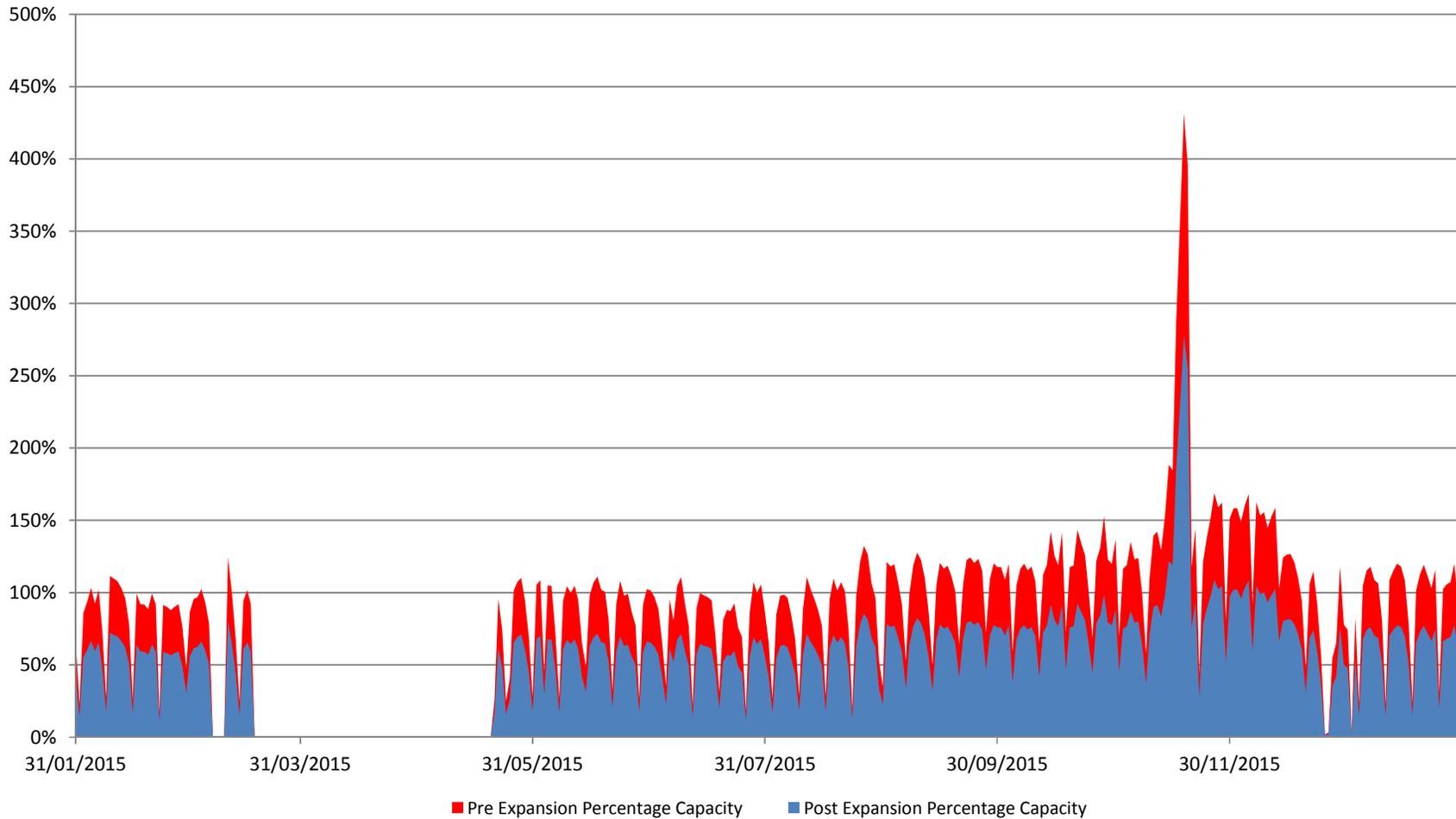
- The full build-out of the EA sites comprising the ‘Quays’, South Bank, Green Park (West and East), Manvers Street and Cattle Market is estimated to create a potential non-residential parking demand shortfall of nearly 2,500 spaces. However, taking into account the future effect of rail patronage growth linked to planned GWML improvements by 2024, the predicted supply shortfall could be 1,800 spaces, although other modal shift responses such as increased walking/cycling or use of bus could serve to drive down this potential need further. However, the level of potential unmet parking demand is likely to remain high, so it is considered that expanded Park and Ride as set out in the DPP is the best way of meeting this need, whilst discouraging car travel into the City Centre to guard against excess traffic growth;
- The interim build-out of the ‘Quays’, South Bank and Pinesgate could lead to a potential non-residential parking ‘shortfall’ which is too high to be addressed with simple capacity expansions to the existing Park and Ride sites, so would point to the need to bring forward a new site to the east of Bath before the quantum of development in the EA reaches this level. This might be addressed through a delivery programme as follows:
  - Further 300 space expansions at both the Lansdown and Odd Down Park and Ride sites. However, the patronage forecasting work suggests that greater emphasis should be directed at additional parking capacity provision at Lansdown rather than Odd Down. This is because use of Lansdown Park and Ride is a potential option for some drivers accessing Bath from the east, namely via the A420, whereas Odd Down is much less accessible from this direction; and
  - The implementation of a new site to the east of Bath with capacity in the first instance for 400-500 spaces.
- This delivery strategy would add around 1,000 new spaces to the overall Park and Ride capacity around Bath, whilst meeting a clear demand for a new site serving the eastern corridor. The current patronage forecasting work does not suggest a demand for greater provision than this by 2029, although the analysis of potential unmet parking demand associated with the EA developments suggests that need in the longer term could be greater. This will depend on the successful delivery of other measures to limit car use and provide greater travel choice, notably the delivery of planned rail capacity improvements. As such, there will remain a need to assess/review the case for capacity expansion beyond an initial strategy for delivering around 1,000 new spaces.



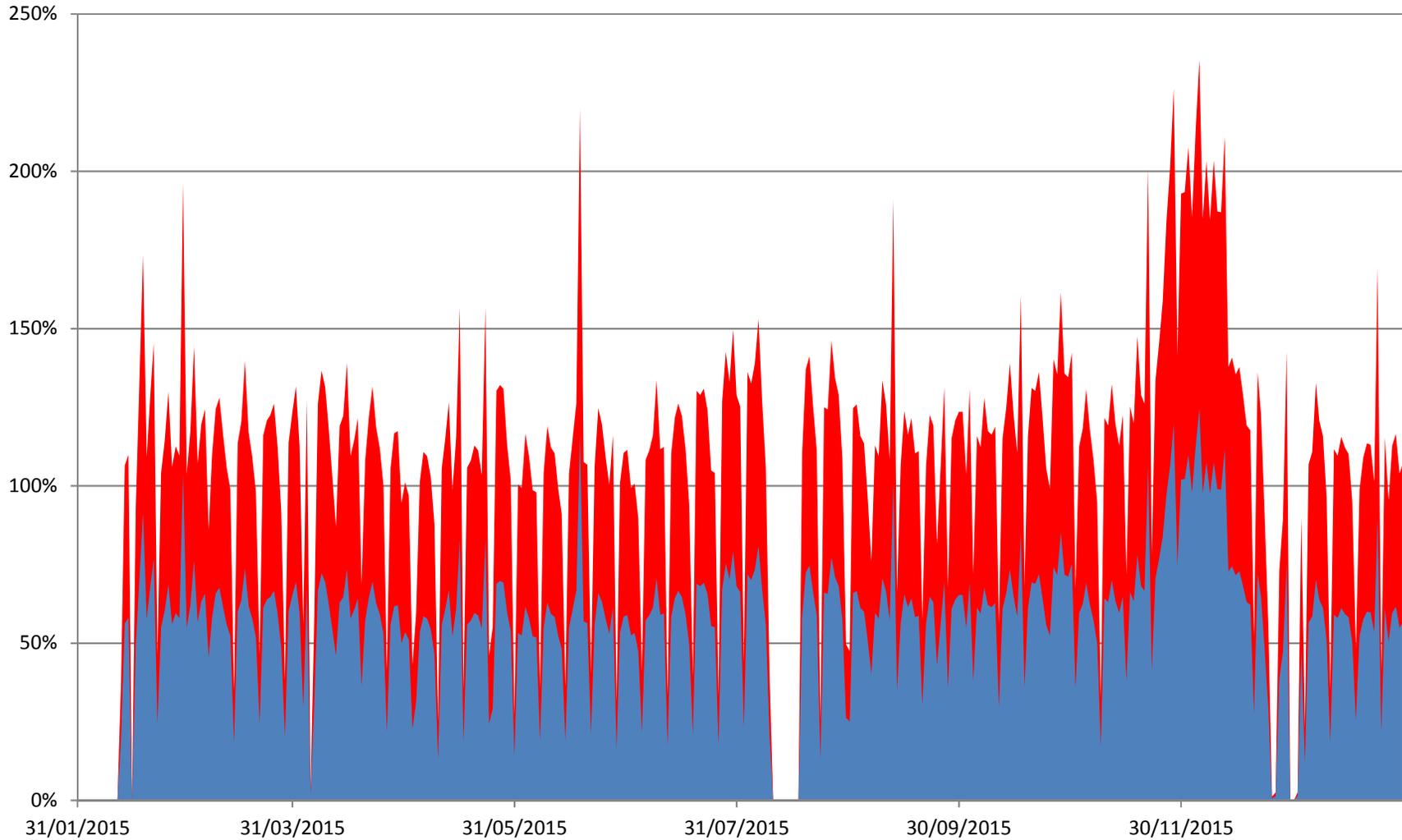
# Appendix A

Existing Park and Ride Sites: Maximum Parking Occupancy (%) - 31/01/2015 to 31/01/2016

# Annual Daily Maximum Percentage Occupancy (including Sundays) Pre and Post Expansion of Park and Ride Sites NEWBRIDGE

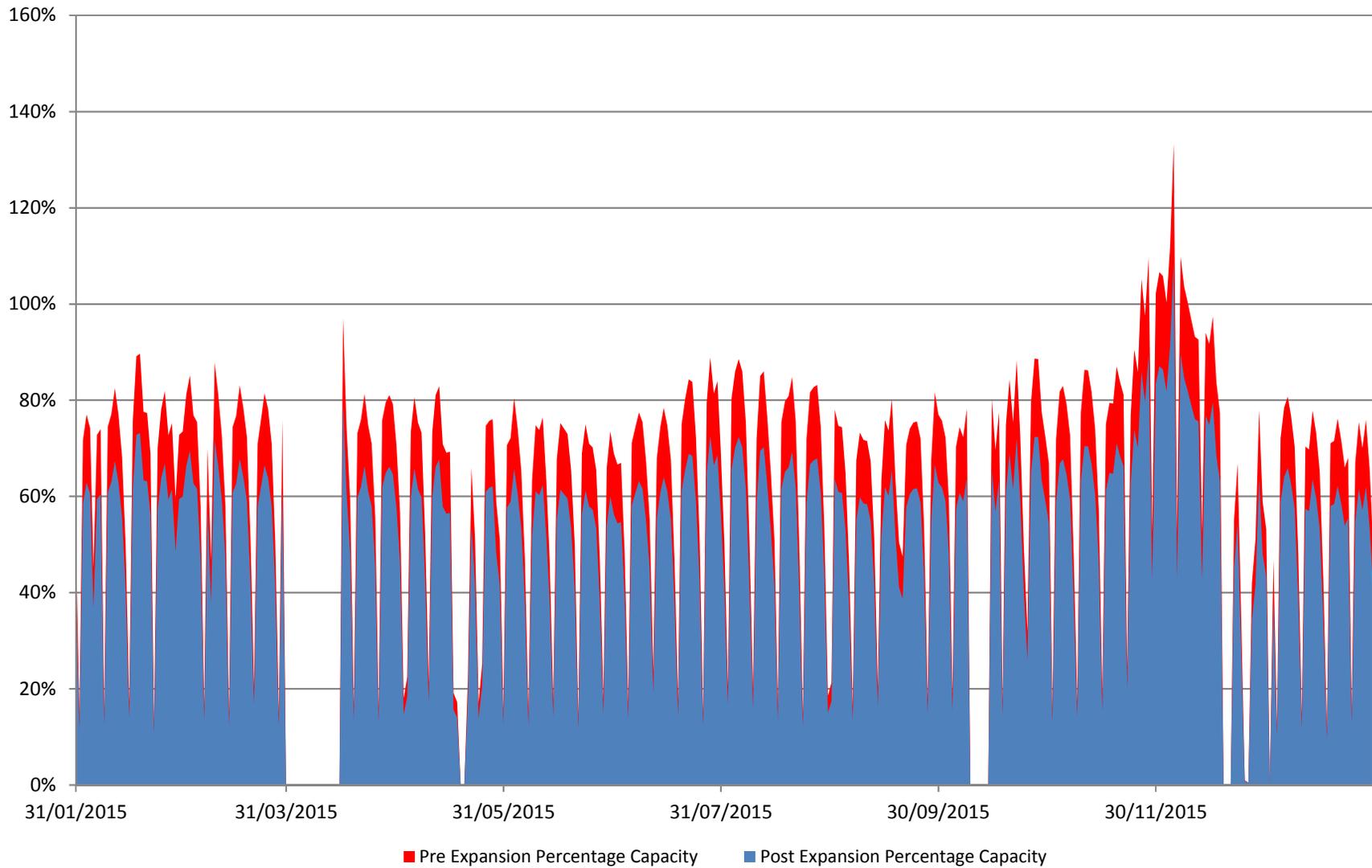


# Annual Daily Maximum Percentage Occupancy (including Sundays) Pre and Post Expansion of Park and Ride Sites LANSDOWN



■ Pre Expansion Percentage Capacity    ■ Post Expansion Percentage Capacity

# Annual Daily Maximum Percentage Occupancy (including Sundays) Pre and Post Expansion of Park and Ride Sites ODD DOWN





# Appendix B

EA Phasing Scenarios - Traffic Growth/Parking Demand Changes

## Appendix B EA Expansion Scenarios and Effect of Growth/Parking Demand in the Central Area of BATH

Scenario Description	Predicted Traffic Generation: Weekday 7:00am-10:00am and 3:00-7:00pm (Vehicle Movements)  'Unconstrained' and with DRAFT PMP parking standards (restraint) in place	MAX Non-Residential Parking Demand  'Unconstrained' demand and unmet demand with DRAFT PMP parking standards in place	Traffic Growth Range  Relative to existing - 2013 Base	Notes
<p><b>Scenario 0</b> - Committed development to date including BWR Phases 1 and 2, Bath Press and Roseberry Place (all within EA). Also MOD Foxhill redevelopment</p> <p><b>POTENTIAL Base-Line</b></p>	<p>As set out in Section 3, predicted traffic generation was based on trip rates extracted from the relevant Transport Assessments (TA).</p> <ul style="list-style-type: none"> <li>7:00-10:00am - 2,361</li> <li>3:00-7:00pm - 4,184</li> </ul>	<p>Not Assessed. Most of the parking is residential or 'origin' based. So MAX will depend on car ownership as well as usage. TRICS does not consider the former</p>	<p>AM: +3.9%</p> <p>PM: +6.4%</p>	<ol style="list-style-type: none"> <li>'Net' growth assumes full take-up of all existing Park and Ride capacity at Newbridge, Lansdown and Odd Down. No expansion beyond BTP.</li> <li>No allowance is made for any increased rail patronage growth.</li> <li>Results suggest 'committed' development traffic could take up the spare network capacity, even allowing for full use of all existing Park and Ride capacity.</li> </ol>
<p><b>Scenario 1</b> - Full build-out of the permitted Pinesgate development (15/5026/EFUL). 15,348sqm GIA B1 and a purpose-built educational campus comprising academic accommodation (Use Class D1) and integral student accommodation (Use Class C2) of 16,491sqm.</p>	<p>Unconstrained:</p> <ul style="list-style-type: none"> <li>7:00-10:00am - 808</li> <li>3:00-7:00pm - 846</li> </ul> <p>Restrained:</p> <ul style="list-style-type: none"> <li>NIL at Pinesgate in both time periods when considering the extant use and small parking change relative to the existing.</li> </ul>	<p>The maximum office parking accumulation based on an 'unconstrained' scenario would be circa 550 vehicles, but on-site parking will be restricted to 84 spaces. Unmet parking demand is therefore circa 460 spaces.</p>	<p>AM: Nil to +2.7%</p> <p>PM: Nil to +2.0%</p>	<ol style="list-style-type: none"> <li>The potential 'unconstrained' vehicle trip generation for this site has been calculated using trip rates taken from the Pinesgate Transport Assessment (IMA).</li> <li>A 'Nil' effect on traffic growth would assume that site parking restraint is effective in maintaining 'network' traffic associated with this site at 'extant' levels. If so, the unmet driver demand for parking (460 spaces) would have to be taken by provision elsewhere or mode shift to rail/bus/walk or cycle.</li> </ol>

Scenario Description	Predicted Traffic Generation: Weekday 7:00am-10:00am and 3:00-7:00pm (Vehicle Movements)  'Unconstrained' and with DRAFT PMP parking standards (restraint) in place	MAX Non-Residential Parking Demand  'Unconstrained' demand and unmet demand with DRAFT PMP parking standards in place	Traffic Growth Range  Relative to existing - 2013 Base	Notes
<p><b>Scenario 2</b> - Completion of the Bath Quays North (BQN) development:</p> <p>20,000sqm B1, 2,000sqm A1, 2,000sqm A3 and 69 dwellings.</p>	<p>Unconstrained:</p> <ul style="list-style-type: none"> <li>• 7:00-10:00am - 1,097</li> <li>• 3:00-7:00pm - 1,440</li> </ul> <p>Restrained:</p> <ul style="list-style-type: none"> <li>• 7:00-10:00am - 71</li> <li>• 3:00-7:00pm - 73</li> </ul>	<p>The maximum parking accumulation based on an 'unconstrained' scenario would be circa 808 vehicles, but on-site parking would be restricted to 50 spaces MAX. Unmet parking demand is therefore circa 750 spaces.</p>	<p>AM: +0.2 to +3.7%</p> <p>PM: +0.2 to +3.4%</p>	<ol style="list-style-type: none"> <li>1. The effect of the 69 flats proposed is discounted.</li> <li>2. As with Pinegate, a virtually nil impact on traffic growth in the central area due to applied site parking restraint would be dependent on all the potential parking demand being met elsewhere, or wholesale driver mode-shift to rail, bus or walking/cycling.</li> <li>3. Assuming BQN completion in 2019, expected 'alighting' rail passenger growth at Bath Spa station between 7:00-10:00am over the period 2013-2019 is expected to be circa 28% (774), or about 600 potential car-trips otherwise removed from the network assuming predominant car-driver abstraction (83%).</li> <li>4. Taking into account the above, and the effect of Pinegate, 'net' unmet parking demand could still be 600-700 spaces.</li> </ol>
<p><b>Scenario 3:</b> Completion of the South Bank and South Quays developments:</p> <p>15,500sqm B1, 1000sqm A3 and 178 dwellings.</p>	<p>Unconstrained:</p> <ul style="list-style-type: none"> <li>• 7:00-10:00am - 864</li> <li>• 3:00-7:00pm - 1,089</li> </ul> <p>Restrained:</p> <ul style="list-style-type: none"> <li>• 7:00-10:00am -293</li> <li>• 3:00-7:00pm - 506</li> </ul>	<p>The maximum parking accumulation based on an 'unconstrained' scenario would be circa 579 vehicles, but on-site parking would be restricted to 205 spaces MAX. Unmet parking demand is therefore circa 400 spaces.</p>	<p>AM: +1.0 to +2.6%</p> <p>PM: +1.2 to 3.4%</p>	<ol style="list-style-type: none"> <li>1. The effect of the 178 flats proposed is discounted.</li> <li>2. Assuming the same level of modal transfer to rail as Scenario 2, Pinegate but no BQN, 'net' unmet parking demand would be circa 200-300 spaces</li> </ol>

Scenario Description	Predicted Traffic Generation: Weekday 7:00am-10:00am and 3:00-7:00pm (Vehicle Movements)  'Unconstrained' and with DRAFT PMP parking standards (restraint) in place	MAX Non-Residential Parking Demand  'Unconstrained' demand and unmet demand with DRAFT PMP parking standards in place	Traffic Growth Range  Relative to existing - 2013 Base	Notes
<b>Scenario 4:</b> SC1-3 combined	Unconstrained: <ul style="list-style-type: none"> <li>7:00-10:00am - 2,769</li> <li>3:00-7:00pm - 3,375</li> </ul> Restrained: <ul style="list-style-type: none"> <li>7:00-10:00am - 364</li> <li>3:00-7:00pm - 579</li> </ul>	The maximum parking accumulation based on an 'unconstrained' scenario would be circa 1,937 vehicles, but on-site parking would be restricted to 339 spaces MAX. Unmet parking demand is therefore circa 1,600 spaces.	AM: +1.2 to +9.3%  PM: +1.4 to +7.9%	<ol style="list-style-type: none"> <li>Assuming the same level of modal transfer to rail as Scenario 2, 'net' unmet parking demand could be circa 1,000 spaces.</li> <li>Whilst some of this demand may be taken up with increased use of other sustainable modes, the level of unmet parking demand would suggest a need for bringing forward a new east of Bath Park and Ride site when EA development reaches this level.</li> </ol>
<b>Scenario 5:</b> Full re-development of Green Park East and West, Manvers Street and the Cattle Market Site:  25,500sqm B1, 9,300sqm A1, 2,700sqm A3, 6,000sqm C1, and 672 dwellings	Unconstrained: <ul style="list-style-type: none"> <li>7:00-10:00am - 1,986</li> <li>3:00-7:00pm - 3,002</li> </ul> Restrained: <ul style="list-style-type: none"> <li>7:00-10:00am - 841</li> <li>3:00-7:00pm - 1,585</li> </ul>	The maximum parking accumulation based on an 'unconstrained' scenario would be circa 1,050 vehicles, but on-site parking would be restricted to 138 spaces. Unmet parking demand is therefore circa 790 spaces.	AM: +2.9 to +6.7%  PM: +3.8 to +7.1%	<ol style="list-style-type: none"> <li>The residential development is ignored, insofar as any parking under-provision would not be met elsewhere.</li> <li>Assuming a slightly later completion by 2022, expected 'alighting' rail passenger growth at Bath Spa station over the period 2013-2022 is expected to be circa 35% (974), or about 800 potential car-trips otherwise removed from the network assuming predominant car-driver abstraction (83%).</li> <li>Taking into account the above, and the build-out of Pinesgate, 'net' unmet parking demand would be circa 450 spaces in this scenario.</li> <li>The higher levels of potential residual traffic (and growth) with 'restraint' than Scenarios 1-4 reflects the residential development which is not 'capped'.</li> </ol>

Scenario Description	Predicted Traffic Generation: Weekday 7:00am-10:00am and 3:00-7:00pm (Vehicle Movements)  'Unconstrained' and with DRAFT PMP parking standards (restraint) in place	MAX Non-Residential Parking Demand  'Unconstrained' demand and unmet demand with DRAFT PMP parking standards in place	Traffic Growth Range  Relative to existing - 2013 Base	Notes
Scenario 6: SC4-5	Unconstrained: <ul style="list-style-type: none"> <li>• 7:00-10:00am - 4,755</li> <li>• 3:00-7:00pm - 6,377</li> </ul> Restrained: <ul style="list-style-type: none"> <li>• 7:00-10:00am - 1,205</li> <li>• 3:00-7:00pm - 2,164</li> </ul>	The maximum parking accumulation based on an 'unconstrained' scenario would be circa 3,000 vehicles, but on-site parking would be restricted to about 500 spaces. Unmet parking demand is therefore circa 2,500 spaces.	AM: +4.0 to +16%  PM: +5.0 to 15.0%	<ol style="list-style-type: none"> <li>1. Assuming all this development is completed by 2022, expected 'alighting' rail passenger growth between 7:00-10:00am at Bath Spa station over the period 2013-2024 is expected to be circa 44% (1,246), or about 1030 potential car-trips otherwise removed from the network assuming predominant car-driver abstraction (83%).</li> <li>2. The 'net' loss of central area parking within the current EA sites in the City Centre (836 spaces) needs to be factored in. With GAB seeking to retain at least 500 spaces, the expected loss would be 336 spaces.</li> <li>3. The above suggests that net unmet non-residential parking demand could be circa 1,800 spaces.</li> <li>4. This restrained EA growth is still too high when the net potential growth impact of consented committed development in Scenario 0 is added. As such, a reduction in existing traffic and that associated with currently consented development will be necessary over time through mode shift. This may result through changing travel patterns over time, with a greater proportion of work trips being wholly 'internal' to Bath as the new EA employment base builds-out.</li> </ol>

Notes:

1. The total number of vehicle trips in the validated 2013 'base' Paramics model of Bath (Central Area and A4-A36 corridors) is 29,629 for the AM peak period (7:00-10:00am) and 42,514 for the PM peak period (3:00-7:00pm)
2. Any assumed vehicle trip reductions due to rail are based on the expected patronage growth profile at Bath Spa station. Further details are provided in the CH2M report describing the testing of various land use options for the EA (Core Document **CD/PMP/B21**: Technical Report 'Bath Enterprise Area/Transport Strategy - S-Paramics Modelling', CH2M November 2014).