A Report for the Tourist Alliance

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October 2008

The likely impact on tourist activity in the UK of the adoption of SDST

Contents

Background

A cursory examination of the times of sunrise and sunset throughout the year set against the typical pattern of daily life outside sleeping hours reveals the considerable scope for a better matching of daylight with waking hours than we have at present (the GMT/BST clock). Research undertaken at Policy Studies Institute (PSI) has shown that putting clocks ahead of the current setting by an additional hour in summer and in winter (the SDST clock) would deliver wide benefits for society.

Notable among these, and set out in detail in PSI reports published in 1988 (*Making the most of daylight hours)* and 1993 (*Time for Change: setting clocks forward by one hour throughout the year*), would be a significant overall reduction in road casualties; a marked improvement in the convenience of travel, trading and communications with the majority of countries in Central and Western Europe; and savings in electricity costs. In addition, the consensus of medical opinion is that the promotion of outdoor activity, which 'more accessible' daylight (and sunlight) facilitates, would be highly advantageous for public health and for enhancing the quality of life. Recognition of these benefits has been regularly confirmed in public opinion polls. The most recent survey conducted by Gallup in 2006 recorded 86% of respondents supporting the proposed clock change.

Tourism and related industries

The PSI reports also highlighted the elastic nature of tourism and the likely changes in it and its associated leisure industries in terms of activity, income and employment as a consequence of the adoption of the SDST clock. The aim of this study has been two-fold: first, to provide further insight on this subject by additional analysis of data on temperature and monthly variations in the time of sunrise and sunset in relation to tourist activity and, second, to up-date figures from official sources on the frequency of tourist visits and related industries' earnings from these visits. At the outset, it is important to note that tourism has grown to become a major sector of the UK economy.

Tourist activity

In 2007, UK residents made 124m. trips within this country and an additional 37.5m. visits were made to the UK from overseas (an increase of close on one-third and a more than doubling of the respective figures of 15 years ago).

Earnings by the tourist industry

In 2007, spending on tourism in this country by UK residents was £21bn. (an average of £167 per trip) and spending on overseas visits to the UK was £16bn. (an average of £426 per visit). A further £45bn. came from day visits, 3bn. from fares paid to UK carriers and £1bn. from rent from second homes, making a grand total of over £86bn.

Employment in tourism

Data from the Labour Force Survey show that, in 2007, there were nearly two million jobs in all tourist-related industries in the UK, including employment in hotels and other accommodation, restaurants, bars and nightclubs, cultural and sports facilities, and in other leisure and travel services – that is close on 7% of all jobs.

This sector of employment has the additional advantage of providing a whole range of jobs from the highly qualified to the relatively low-skilled. About half of those in these industries work part-time, with employment in them catering for a much higher proportion of jobs for the less well-skilled, and for women and all adults below the age of 40 – in both the latter instances, close to two-thirds.

Taxation from overseas tourists to the UK

The Tourism Alliance has published figures showing that tourism makes a substantial contribution to the Exchequer. Whilst it could be argued that, where the taxpayers are UK residents, some of this revenue may simply be a transfer from other areas of consumer spending, that does not hold true for the £2.9 bn. - close on a quarter of the total from tourism – which is taken from the taxes paid by overseas visitors.

The role of daylight and climate

A significant amount of tourist activity varies substantially during the year owing to the attractions of going on holiday at a time of year that suits more than one individual in employment and of the need to coincide with school holidays, public holidays, including Christmas and the New Year. In addition, it can be affected by a range of other factors, such as long-term weather forecasts, the state of the economy and currency differentials between countries when decisions are made, public perceptions of the risk of terrorist acts, and the fact that, since 1 October 2007, in addition to the eight permanent Bank Holidays, all people in employment have had a statutory right to at least 24 days of paid holiday entitlement. (The number is being extended to 28 days at the beginning of next April).

For this reason, care must be taken in attempting to simply explain recorded differences. However, though it is not possible to establish an entirely linear link with them, two strongly related factors - daylight and weather, especially temperature - obviously directly or indirectly influence the extent of tourist activity.

A sizeable proportion of all holidays in the UK are taken in the spring and autumn and, even in winter, the numbers are by no means negligible. Indeed, as Tables 1 and 2 in the Appendix to this report show, rather than falling to a very low figure, tourist visits in the UK in the winter are about 60% of those in the summer and tourist visits from overseas in the winter are 75% of those in the summer. As Table 7 shows, afternoon temperatures in the summer are two to three times higher than in the winter but temperature is not an overriding factor.

On the other hand, there are, on average, approximately 16 to 17 daylight hours during the summer - about one and a half times the number in the spring and autumn, and double the number in the winter. When combined with the figures on tourist activity by season, this suggests strongly that daylight plays a more significant role in influencing the seasonal variation.

A strong indication of the actual influences of daylight and temperature on this activity can be gained from the figures in Tables 1 to 6 in the Appendix. Their contents are drawn from monthly data on tourist activity at appropriate locations and on participation in sports and recreational activities that have been compiled for the report. They provide what may be described as unsurprising evidence of more visiting when days are longer and warmer. However, they demonstrate its *extent* in a variety of activities.

The tables show that the number of tourist trips overall in the summer, including visits to National Parks, are close to double the number in the winter, with the number in the two equinoctial seasons roughly falling in between. It can be seen that, with visits to tourist locations, such as those run by English Heritage, the difference by season is even sharper. Typically, these are more than twice as frequent in the spring and autumn, and, in summer, more than twice as frequent as during these two 'shoulder' seasons. The data on seasonal variations in participation in sports and recreational activities are also very similar, in all instances reflecting the strong influence of daylight hours and temperature.

However, the data from surveys of these tourist and tourist-related activities do not provide anything like a comprehensive picture of tourist activity at different times of the year as, for instance, and for obvious reasons, there are no statistics on the frequency with which many outdoor tourist attractions are visited – Big Ben, Buckingham Palace, the Princess Diana Memorial and Blackpool Leisure Beach and Illuminations being cases in point.

Whilst during the course of this brief examination, no new data were able to be obtained on hourly sales turnover by month at tourist attractions, such as those run by English Heritage and the National Trust, earlier analysis on this aspect revealed far more afternoon attendance for visitors, particularly in mid- to late afternoon at times of the year which are not only warmer but also allow for return to home or hotel before the onset of darkness.

Changes with an SDST clock

There are generally sufficient daylight hours for outdoor tourist activity in the height of summer with the GMT/BST clock as at present. However, as Tables 7 to 9 in the Appendix show, there is considerable scope for increasing the number of light evenings simply by the adoption of SDST. In London, the most significant tourist destination especially for overseas visitors to this country, sunset with this change would occur in March and November at roughly the same time as it now occurs in April and October. Thus, lighter evenings would be likely to result in some extension of the season by enabling a later finish to the day especially during the 'shoulder' weeks of March/April and September/October, and in those spheres of tourism which are daylight-dependent.

With the SDST clock, the extra hour in the latter part of every day of the year would also allow later closing times of many tourist and other leisure facilities which have to be determined by the onset of dusk. Given that there is far more tourist activity after lunch compared with the morning, it would often prove worthwhile to lengthen opening hours in this way. Lighter evenings would also hold an additional attraction for tourists in that people on holiday prefer to travel in the light to and from facilities - other than, perhaps, clubs and other night activities.

Tourist activity, earnings and employment under the SDST clock

The question that obviously arises from the proposition that clocks be advanced by the additional hour is to what extent would the extra hour of 'accessible' daylight affect tourism.

It is obvious that the SDST clock would achieve a better relationship with the warmer time of day, that is in the evening rather than the early morning. In order gain a better understanding of the likely influence of monthly variations in daylight hours and in temperature, the Meteorological Office was asked to run a special tabulation for further

analysis for this report. Key data from it are shown in Table 7 in the Appendix. This focusses on the average temperature over the 30-year period (1971 to 2000) in each of the 24 hours of the day and 12 months of the year, thereby enabling a comparison to be made from the 288 cells of the contribution of the progress of months during the year with the time of day before sunset, as shown in Tables 8 and 9.

The generation of additional tourist activity

Analysis of the monthly variations in tourist-related activities in relation to monthly variations in temperature and the timing of sunset indicates that the extra hour of 'accessible' daylight in the latter part of *every* day of the year coming in the wake of the UK adopting the SDST clock would have significantly advantageous outcomes for the country as a whole.

The take-up of tourist activity would also be influenced by the daily opportunities of having the extra hour of daylight on *every day* of the year - during the evenings of the summer and the late afternoons of the winter - to a greater extent than would appear at first sight. The introduction of SDST would result in an average gain of 55 minutes of 'accessible' daylight hours. Opportunities to take part in sport and recreation would also be greatly expanded. In relation to typical weekday times when working adults and schoolchildren return home. The PSI report established that this would represent an average increase of 35% for leisure activity in daylight conditions in these hours.

As the original PSI reports showed, the introduction of SDST would also lead to an increase of 12% in the number of daylight hours for tourist activity at weekends. The increase would be about 40%.of 'accessible daylight hours' on weekdays when children and adults are likely to return home after school or work - up to the onset of dusk.

As Table 9 shows, it would result in 'accessible' daylight time between 17.00 and sunset increasing substantially, other than in the depths of winter when sunset occurs before that hour. As Table 8 shows, the clock change would also lead to an appreciable

increase in the average temperature of about 0.5 ºC in the late afternoon of the winter months and nearly 1.0 ºC on summer evenings.

There can be little doubt that the clock change would boost tourist activity and earnings. It is certain that the extra hour would result in far more outdoor sports, tourism, day trips, weekend breaks and so on. Moreover, this would be especially appreciated at the weekends. It would be very likely to accelerate the rapidly growing trend towards off-peak and short-break holidays in the UK for walking, climbing, sailing and other sporting activities. More short holidays are taken in the cooler months of March and April and of September and October than those of June and July.

The later hour of sunset would also increase opportunities for one-day leisure trips, would improve the quality of tourists' stay, and would expand opportunities for spectator sports, such as those provided by professional football clubs, the horseracing industry and sports centres. Spectator sports would also attract more revenue from the gate as matches could start from a more convenient hour on winter afternoons than at present in order to finish before dusk. It is very likely too that over time, visitors from overseas would recognise the added attractions of the lighter evenings of coming to the UK.

Most tourist destinations such as the London Zoo, Kew Gardens, Stonehenge and Cornwall’s Eden Project, have opening hours which are not influenced by the variation in the timing of *sunrise* throughout the year. As a consequence, the effects of a change to SDST, with its later timing and the somewhat lower temperature in the equivalent morning hour that are shown in Table 8 is unlikely to have any significant effect on tourism. Whilst the equivalent hour of the morning brought closer to sunrise would expose tourists to a 1.0ºC lower temperature on average, it is important to note that surveys of time use show that there is a very small rate of tourist and leisure activities in the early morning – even in the summer months – so that the loss of opportunities for them resulting from the clock change at that time of day would be very low. Indeed, the early hours of the morning are not an active time for most people engaging in tourist activity.

However, the later timing of *sunset* would of course be highly influential as, typically, closing times of many tourist attractions are two hours later in the summer compared with the winter, reflecting the fact that the onset of dusk is a strong determinant of the number of hours that the public can have access to them as well as the effect of the slightly higher temperatures that can also be seen in the table.

The extra hour of daylight in the evening throughout the year would mean that tourist facilities could remain open longer, the same closing hours could be maintained throughout the year, people would be encouraged to make more day trips and weekend breaks, and the trend towards extending the tourist season into off-peak periods would be boosted.

Extending the tourist season in this way would not only be advantageous for camping and caravan holidays which generally end in August, and conferences, the organisers of which prefer the time of year allowing for outdoor activities after formal proceedings. It is worth noting too that the switch would also lead to a similar increase in sunshine hours as sunshine is fairly evenly distributed at either end of the day.

It is of course possible that indoor activities, such as theatre and cinema-going and attendance at concerts and sporting events, would be somewhat reduced owing to the relatively improved attractions of outdoor activities, though it should be acknowledged that travel to and from them in daylight is likely to be preferred. However, tourist activity is generally greater in the afternoon than in the morning and it could be reasonably anticipated that additional evening daylight therefore would extend it significantly.

If, conservatively, only a quarter of the monthly changes in tourist activity is attributed to the temperature difference and the influence of the length of the day for daylight-dependent activity and three-quarters to other factors, such as the time of the year set for traditional holidays, tourism, including that from overseas tourists coming to the UK would be boosted by an average of between 3% and 4% in activity.

Additional earnings and employment

This scale of increase would be associated with increased earnings and employment within this sector of the economy - an addition of £2.5-£3.5bn. and 60-80 thousand jobs. Furthermore, given the relationship between the number of overseas visitors and spending by them and daylight hours and temperature at different times of the year, as can be seen in Table 2, it can be reasonably expected that the UK's balance of payments would also be improved by the extra taxation from the additional visitors attracted by the lighter evenings throughout the year. However, it is necessary to add the rider to this statement over and above what it would otherwise have been owing to the fact that both the number of UK residents' tourist trips in this country and overseas visitors to the UK could well fall owing to the world-wide economic recession that may last for some years

It is worth noting too, in considering the future of activity in this sector of the economy that visits overseas by UK residents have risen sharply in recent decades - in the last 10 years by over 50%. In 2007, over £35 bn. was spent on the 70 million such visits (an average of £500 each time). It would seem reasonable to expect that the recession, combined with the attractions of lighter evenings, not to mention the prospect of warmer temperatures due to climate change in the decades ahead, will encourage more of those who have increasingly chosen to travel abroad for their holidays in the past to take them in the UK.

This factor could well point to increases greater than those calculated for inclusion in the analysis for this report. However, whatever the economic circumstances, the generation of this *additional proportional* tourist activity stemming from the lighter evenings with an SDST clock over and above the level of activity with the current SDST clock is likely to remain.

Conclusions

Not surprisingly, the proposition that setting the UK clock on SDST would be widely supported by the great majority of the industries in question, including most regional tourist boards and arts associations, bodies representing travel agencies, and bodies catering for tourist accommodation. It is clear that it would contribute to the expansion of domestic tourism and attract more visitors to the UK from overseas. The calculation in this report is that earnings and employment in this key area of UK activity and in related leisure industries would represent a 3% to 4% increase in earnings. Furthermore, it could be reasonably expected that between 60,000 and 80,000 more jobs would be created. The government would also benefit from the additional taxation arising from increased earnings from the industry and from the additional contribution to the UK balance of payments from taxes drawn from overseas visitors.

As in other wide-ranging spheres of the economy and lifestyle aspects noted in earlier PSI reports, the benefits to tourism would be substantial and therefore the proposition merits serious consideration. Only a majority vote in its favour by Parliament would be needed to make the clock change – a virtually cost-free exercise.

Sources

Mayer Hillman, ***Making the Most of Daylight Hours***, Policy Studies Institute, 1988.

Mayer Hillman, ***Summertime in the European Community: An analysis of the advantages and disadvantages in the 12 Member States***, Final Report (commissioned by the European Commission [Directorate-General V11], Policy Studies Institute, August 1989.

Mayer Hillman, ***Time for Change: Setting Clocks Forward by One Hour throughout the Year****, A new review of the evidence,* Policy Studies Institute, 1993, ISBN 0 85374 546 3.

Gallup, **O*pinion poll*** conducted for Royal Society for Prevention of Accidents in 2006.

Office for National Statistics, ***Annual Abstract of Statistics, 2008 Edition,*** Palgrave Macmillan.

The VisitBritain, VisitScotland, Visit Wales and the Northern Ireland Tourist Board sponsored **United Kingdom Tourism Survey – 2007**.

Office for National Statistics', **Labour Force Survey**,

Office for National Statistics, **International Passenger Survey**, late figures on visits and expenditure from the 2007.

Sport England, ***Active People Survey 2005/6***.

Acknowledgments

The author wishes to express his thanks to the following individuals for their help in the preparation of this report:

Helen Bibby of Sport England; Robin Broke, Director, Association of Leading Visitor Attractions; Sebastian Carney, Tyndall Centre, University of Manchester; Natalie Fisher of the Brecon Beacons National Park; Roy Smith of English Heritage; and Andy Wilson of the North York Moors National Park Authority. I am especially grateful to Steve Jebson at the Meteorological Office, Exeter.

Appendix

Tables on seasonal variations in tourist activity and expenditure, and on temperature differences by hour of day and month and on sunset times

Table 1. Percentage of tourist trips in the UK, by season

	Spring	Summer	Autumn	Winter
Tourist trips	26	31	24	19
Tourist nights	26	37	22	15

Source: derived from UK Tourism Survey, 2007

Table 2. Percentage of annual visits and expenditure by overseas visitors to the UK, by season

	Spring	Summer	Autumn	Winter
Visits to UK from overseas	25	28	25	21
Expenditure by these visitors	24	30	25	21

Source: derived from the average monthly figures of the two most recent years for which International Passenger Survey data are available.

Table 3. Percentage of annual visits abroad and expenditure by UK residents, by season

	Spring	Summer	Autumn	Winter
Visits abroad by UK residents	23	32	26	19
Expenditure on these visits	23	33	26	19

Source: derived from the average monthly figures of the two most recent years for which International Passenger Survey data are available.

Table 4. Percentage of annual visits to five English Heritage locations, by season

	Spring	Summer	Autumn	Winter
Belsay Hall & Gardens[1]	27	37	25	10
Carlisle Castle[2]	25	45	21	9
Kenilworth Castle[3]	29	37	22	12
Tintagel Castle[4]	22	55	19	4
Stonehenge[5]	25	44	20	11

Opening and closing times vary by season with the following result

[1] Opening hours: winter 6hours; summer 7 hours

[2] Opening hours: winter 6 hours; summer 7½ hours

[3] Opening hours: winter 6 hours; summer 7 hours

[4] Opening hours: winter 6 hours; summer 10 hours

[5] Opening hours: winter 6½ hours; spring 8½ hours; summer 10 hours; autumn 8½ hours

Table 5. Percentage of annual visits to two National Parks, by season

	Spring	Summer	Autumn	Winter
Brecon Beacons[1]	26	34	22	17
North York Moors[2]	20	39	20	20

[1] Visits to the Visitor Centre [2] Day visitors

Table 6. Percentage of adult population participating at least once in the last four weeks in seven outdoor-dependent sports and recreational activities, by season

	Spring	Summer	Autumn	Winter
Angling	23	35	27	15
Athletics (all)	27	27	23	23
Tennis	25	37	23	15
Swimming outdoors	13	58	22	6
Golf	25	29	24	21
Rowing	24	29	20	24
Sailing	22	40	30	9

Source: compiled from data in the Active People Survey 2005/2006

Tables on temperature differences by hour of day and month and on sunset times, and on variations in the number of 'accessible' daylight hours

Table 7. Average temperature (°C) 1971 to 2000 by hour of day and month (GMT) *

Hour	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
08 -09	3.2	2.9	4.7	6.7	10.3	13.4	15.0	14.9	12.6	8.6	5.7	4.3
09 -10	3.4	3.5	5.8	7.7	11.4	14.3	16.1	16.1	13.0	9.7	6.2	4.4
10 -11	3.9	4.4	6.8	8.7	12.2	15.2	17.1	17.1	15.1	10.8	7.1	4.9
11 -12	4.5	5.1	7.6	9.5	13.0	15.9	17.9	18.0	16.0	11.7	8.0	5.6
12 -13	5.0	5.8	8.1	10.1	13.7	16.5	18.5	18.7	16.8	12.4	8.6	6.1
13 -14	5.4	6.3	8.5	10.6	14.2	16.9	19.1	19.3	17.3	12.8	9.0	6.4
14 -15	5.6	6.5	8.8	10.9	14.5	17.3	19.4	19.7	17.6	12.9	9.0	6.5
15 -16	5.5	6.5	8.9	11.0	14.5	17.5	19.6	19.9	17.6	12.9	8.9	6.2
16 -17	5.2	6.3	8.7	10.9	14.4	17.5	19.6	19.8	17.3	12.5	8.3	5.8
17 -18	4.7	5.7	8.3	10.6	14.2	17.1	19.3	19.5	16.8	11.7	7.6	5.4
18 -19	4.4	5.1	7.6	9.9	13.6	16.7	18.8	18.8	15.9	10.7	7.2	5.1
19 -20	4.2	4.6	6.8	9.0	12.8	16.0	18.0	17.8	14.7	10.1	6.9	5.0
20 -21	4.0	4.3	6.2	8.0	11.6	14.9	16.8	16.4	13.8	9.7	6.7	4.9
21 -22	3.9	4.0	5.8	7.4	10.6	13.7	15.6	15.5	13.2	9.3	6.5	4.8

* The figures are for GMT at the Coleshill Meteorological Office site near Birmingham which is the closest one to the UK's centroid of population.

Table 8. Changes in temperature (°C) at 10.00 in morning and at 17.00 and 20.00 in evening, with SDST in lieu of current setting, by month,

Change	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
10.00	-0.5	-0.9	-1.0	-1.0	-1.1	-0.9	-1.1	-1.2	-1.3	-1.1	-0.9	-0.5
17.00	+0.5	+0.6	+0.6	+0.1	+0.1	+0.0	+0.0	+0.1	+0.3	+0.4	+0.7	+0.4
20.00	+0.2	+0.3	+0.6	+0.9	+0.8	+0.7	+0.8	+1.0	+1.2	+0.6	+0.2	+0.1

Figures for Coleshill Meteorological site near Birmingham on the 15th of each month

Table 9. Minutes of daylight between 17.00 and sunset with GMT/BST and SDST

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
GMT/BST	2	31	55	118	161	179	178	153	113	73	-	-
SDST	62	91	115	178	221	239	238	213	173	133	44	41

Figures derived from analysis of Coleshill Meteorological site data for the 15th of each month