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## Capacity, Intensity of Use and Programming of Multipurpose Areas in Indoor Sports Centres

by

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### Introduction

This is the fifth in a series of topic papers prepared by the Built Environment Research Group (BERG) and commissioned by the Sports Council. The data for the five papers were largely collected by BERG during studies of three very different sports centres, at Harlow Sportcentre in 1973, at the Michael Sobell Centre Islington in 1974 and at the Meadway Centre Reading in 1975. The purpose of each paper is to examine the similarities and differences which emerge. The data consists of that collected from week-long user surveys at the three centres. In the case of the Sobell Centre, two user surveys were carried out in June and November 1974 and the data collected have been aggregated. During the survey weeks half-hourly counts of users were carried out in the main spaces in the centres. These figures in conjunction with the booking sheets for the study weeks, form the basis for the calculations in this paper.

Its purposes are to formulate a

yardstick for capacity to be used as a measure of intensity of space use, to set out the differing approaches of the managements at the three centres to allocation of space to regular and casual bookings and to activity programmes, and to illustrate the intensity of use measures under various conditions at the three centres. The descriptive data will cover both the situation as found at the times of the surveys, and currently, whereas the numeric data will, of necessity, be that collected during the survey weeks. Management attitudes and the current situation at the three centres were discovered by discussions and correspondence with the three managers during 1977.

### Capacity and Intensity of use

#### *A capacity or use yardstick*

It is important that there should be defined a standard measure of capacity, or a standard level of use for indoor sports centres in order:

1. to provide a common basis of comparison of levels of use between different sports centres;
2. to compare the effect on levels of use of different programming policies in a single centre. For example:
  - (i) different activity mixes, in particular the effect of different time-tabling policies between minority activities and popular activities and between space extensive and space intensive activities,
  - (ii) different policies towards scheduling of regular bookings and casual bookings.

The dictionary definition of capacity is 'maximum possible output or performance' (Chambers Twentieth Century Dictionary) or, 'ability to take in or hold; hence content' (Shorter Oxford Dictionary). Thus, when applied to public buildings, capacity would be defined as the maximum number of people which can be accommodated at any one time.

With buildings which have a fixed maximum level of use, such as cinemas,



TABLE 7: Man-hours of use by type of booking

	Harlow	%	Sobell	%	Meadway	%
School use	540 ½	18	1,296	18	906	50
Regular use	1,867 ½	60	2,847 ½	40	399	22
Casual use	683	22	2,913	41	407	23
Special event	—	—	80	1	85	5
Total	3,091		7,136 ½		1,797	

TABLE 8: Standard use of space allocated (%)

	Harlow	Sobell	Meadway
School use	76	59	113
Regular use	123	102	104
Casual use	63	—	81
Special event	—	25	47
Total	79	50	92

TABLE 9: Space allocated to activities

Court hours allocated and percentage of space available in the survey weeks (from booking sheets)

	Harlow		Sobell (2 wks.)		Meadway*	
	No.	%	No.	%	No.	%
Archery	15 ½	2	85	3	4	1
Badminton	353 ½	36	1,079 ½	30	106 ½	37
Basketball	21	2	260	7	10	3
Bowls	14	1	—	—	—	—
Boxing	2	0.2	—	—	—	—
Cricket	16	2	5 ½	0.2	13	4
Dance	—	—	4	0.1	—	—
Fencing	3 ½	0.4	37	1	—	—
Fitness training/keep fit	—	—**	43 ½	1	—	—
Five-a-side	115	12	414	12	37 ½	13
Go-Karts	—	—	4	0.1	—	—
Gymnastics	14 ½	1	64	2	9	3
Hockey	—	—	—	—	12 ½	4
Martial Arts	14	1	181 ½	5	—	—
Minor Games	3	0.3	—	—	—	—
Netball	23	2	54	2	—	—
Table Tennis	44 ½	5	289	8	35 ½	12
Tennis	28	3	28	1	—	—
Trampoline	52 ½	5	62	2	—	—
Volleyball	16	2	44	1	11 ½	4
Yoga	9 ½	1	18	0.5	—	—
Activity not known	76 ½	8	50	1	27 ½	9
Total activity	822	84	2,723	76	267	92
Crèche	6 ½	1	6	0.2	—	—
Total use	828 ½	85	2,729	76	267	92
Unallocated	150 ½	15	857	24	23	8
Total available	979	100	3,586	100	290	100

\* excluding school use

\*\*available, but in weight training room excluded from this analysis

leaving space extensive activities (such as five-a-side and basketball) to times of lower general demand. In reaching such decisions, account must be taken of the people most likely to participate in any particular activity; for example, judo and gymnastics are both activities which appeal largely, although not exclusively, to children under the age of 15, and

therefore they must be programmed in the early evening when these children are able to attend.

A centre must also decide whether it will try to become a 'centre-of-excellence' for one or two activities, by offering coaching to a high level and allocating a larger proportion of space, or whether to offer general coaching in a

wide range of activities and allocate the space to all these activities without bias. The decision will be affected by the amount of space available in the centre—a large centre could become a 'centre-of-excellence' for one or two activities while still offering a wide range of others—alternative facilities in the area, and user demand.

#### Harlow Sportcentre

As shown previously the Harlow Sportcentre has the equivalent of 11 badminton court areas of multi-activity space. While the three spaces outside the main hall are each approximately equal in area to a badminton court, they are not suitable for playing badminton, either due to the shape of the area or the height of the ceiling. Therefore, Harlow has three activity spaces in which to programme activities without subtracting space from badminton, or indeed five-a-side, basketball, tennis and volleyball which need larger spaces. The projectile hall, 6m x 24m is purpose-built for archery and bowls and these were the two main sports programmed here, with some time given to yoga. The recreation room, 12m x 12m, was used largely for martial arts, in particular judo, for yoga and for the crèche run in conjunction with the programme of ladies' activities. The practice hall, 12m x 12m was used largely for trampoline and table tennis, with a small amount of boxing and fencing. Some table tennis and trampoline were also programmed in the main hall where the main activities were badminton and five-a-side, with some basketball, netball, gymnastics, volleyball, cricket nets and tennis.

#### The Michael Sobell Sports Centre

Sobell has a total of 22 badminton court areas of multi-activity space, with two each in the practice hall and projectile hall, and one each in the multi-purpose hall and judo room. The projectile hall was programmed largely for archery, with a little cricket and overspill martial arts and table tennis. The judo room was used almost exclusively for judo, with a few sessions of other martial arts and yoga. The practice hall was used for fencing, fitness training, karate, table tennis, keep fit, boxing and yoga, and now also contains a *golfomat* and an artificial ski-slope. The multi-purpose hall was used for keep-fit, yoga, dance, a small amount of badminton, fencing, fitness training, some martial arts and for the playgroup run in conjunction with the ladies' programme.

This left the 16 courts in the main arena largely for badminton, five-a-side, basketball, some table tennis, and gymnastics, and for netball, tennis, trampoline and volleyball. The size of the Sobell main hall is such that it is possible always to have at least one court for five-a-side, and to programme for some badminton, and still have space to allocate to other activities or to more badminton or five-a-side. There is now a climbing wall, constructed since the time



of the study, at one end of the main arena.

### The Meadway Centre

The Meadway Centre has one single multi-activity space, namely the (5 BCU) main hall. Thus the scope for offering a large number of activities is very limited. Activities such as five-a-side, indoor hockey and basketball occupy the whole main hall, displacing all other users. The activities recorded during the survey week were badminton, cricket, volleyball, table tennis, gymnastics, five-a-side side, hockey and archery. The current schedule of activities for the centre shows in addition golf and netball, with the proviso that net sports (cricket, archery and golf) are available only subject to the Manager's discretion.

### Space allocated, by activity

Table 9 sets out the space allocated to activities at the three centres. The figures for Harlow and Sobell include some activities programmed during periods of school use, whereas school use periods are excluded from the Meadway figures since their allocation was not entirely clear. There were 17 activities on the programme during the survey weeks at both Harlow and Sobell and nine at Meadway. 'Martial Arts' at Harlow consisted almost exclusively of judo and a little aikido, while at Sobell judo, karate, kendo, aikido, Kung Fu and Tai-chi-chian were all on the programme.

There was only a very small amount of space not allocated at Meadway and this was largely on Saturday when no bookings were taken after 9pm in the main hall, and in the early evening between 5pm and 5.30pm when on some days the school had closed but no bookings were taken. The high figure at Sobell reflects the initial difficulties previously mentioned, in attracting casual bookings at the centre. At both Harlow and Sobell the areas not allocated were more likely to be the areas outside the main hall, except at Harlow on Saturdays when there was no bookings after 6pm in the main hall.

Badminton accounted for by far the highest proportion of space at the three centres, followed by five-a-side and table tennis at Sobell and Meadway, and trampoline at Harlow. This high placing of trampoline at Harlow was a management policy continued over several years, and which has produced highly skilled participants who have been very successful in competitions. It is interesting to note how closely the space taken by badminton (about 40%) and five-a-side (about 15%) corresponded. It is the residual 45% of space which was allocated in different ways, trampoline and table tennis being significant at Harlow, table tennis, basketball and martial arts at Sobell, and table tennis at Meadway.

The limited space and high demand at Meadway clearly constrained activity programming, but it seems that, certainly at the time of the survey, the

TABLE 10: Take-up of Space at Three Centres

Number of court hours for each activity as percentage of space allocated to that activity (from book-up sheets and head counts)

	Harlow		Sobell (2 wks.)		Meadway*	
	No.	%	No.	%	No.	%
Archery	11	71	61 ½	72	4	100
Badminton	242	68	689 ½	64	108 ½	95
Basketball	19	90	176	68	10	100
Bowls	8 ½	61	—	—	—	—
Boxing	2	100	—	—	—	—
Cricket	10	63	5 ½	100	13	100
Dance	—	—	—	—	—	—
Fencing	1 ½	43	26	70	—	—
Fitness training/keep fit	—	—	28	64	—	—
Five-a-side	—	—	4	100	—	—
Go-Karts	—	—	4	100	—	—
Gymnastics	14 ½	100	60	94	9	100
Hockey	—	—	—	—	12 ½	100
Martial Arts	12 ½	89	165 ½	91	—	—
'Minor Games'	1	33	—	—	—	—
Netball	17 ½	76	20	37	—	—
Table tennis	39 ½	89	231 ½	81	35 ½	100
Tennis	8	29	22	79	—	—
Trampoline	44 ½	85	49	79	—	—
Volleyball	14	88	36	82	11 ½	100
Yoga	7 ½	79	5 ½	31	—	—
Activity not known	8	14	3	6	10	43
Crèche	6	92	6	100	—	—
Total	566	68	1,839	67	245	92
% total space actually used		58		51		84

\*excluding school use  
Intensity of use by activity

space available at Harlow offered almost as much flexibility as the greater amount at Sobell. However, Harlow was a long established centre in 1973, while Sobell in 1974 was still trying to establish its clientele.

Whilst there are arguments that providing a single large facility as opposed to several small local centres reduces accessibility, there is no doubt that a large centre gives much greater flexibility in terms of activity programming.

The very large space at Sobell is advantageous in a number of ways; firstly space extensive activities such as five-a-side can be programmed often without completely taking over the main hall. Thus the centre is able to offer one court (four BCUs) to five-a-side football at almost all times. It also helps to reduce time spent in setting up equipment since badminton nets, for example, can remain on at least one court almost permanently. The large space is also very valuable in the running of special programmes and *The Saturday Club* for large numbers of children, because several activities can be set up simultaneously.

Table 10 shows the amount of space used for each activity at the three centres and the proportion it represents of the space allocated to each activity as shown in Table 9. The first thing to notice is the very high proportion of space taken up at

Meadway, which reflects its tight capacity. The large proportion of space left unused at Harlow and Sobell has already been explained. Generally the space take-up was high for activities which can occupy their space allocation even if not all of the expected participants turn up. Such activities include gymnastics, trampoline, martial arts and yoga.

### Intensity of use by activity

The figures in Table 11 indicate that as to be expected, the space intensive activities are gymnastics, martial arts and yoga. The levels at Harlow seem to be generally higher than at the other two centres, possibly indicating that some figures included people waiting to play. This appears to be the case for archery, basketball, netball and trampoline. Trampoline and archery are similar to gymnastics in that participants can have several short turns, alternating with short waiting/rest periods. In basketball there is a recognised substitute system which could be why non-participants were counted.

## SUMMARY AND CONCLUSIONS

### Standard use yardstick

The need for a measure of capacity of sports centres against which to measure



TABLE 11: Standard use space taken-up by each activity (%)

	Harlow Man hrs. % s u	Sobell Man hrs. % s u	Meadway* Man hrs. % s u	Expected use for this activity
Archery	168 ½ 383	204 83	2 ½ 16	100%
Badminton	940 ½ 97	1,982 72	386 ½ 93	150%
Basketball	86 113	381 ½ 54	33 82 ½	100%
Bowls	58 ½ 172	—	—	62 ½ %
Boxing	24 300	—	—	100% +
Cricket	51 ½ 129	50 227	25 52	200%
Fencing	15 250	160 ½ 154	—	100%
Fitness training/ keep fit	—	133 119	—	150%
Five-a-side	217 ½ 55	582 ½ 58	74 49	HIGH
Go-Karts	—	4 25	—	62 ½ %
Gymnastics	158 ½ 273	528 224	86 239	—
Hockey	—	—	25 50	HIGH
Martial Arts	248 ½ 487	1,629 ½ 246	—	75%
'Minor Games'	10 250	—	—	HIGH
Netball	81 116	63 ½ 79	—	—
Table tennis	205 130	1,000 ½ 108	195 137	87 ½ %
Tennis	13 54	23 26	—	(150%)
Trampoline	452 ½ 254	199 102	—	25%
Volleyball	41 73	71 49	36 ½ 79	200%
Yoga	102 ½ 342	25 114	—	75%
Activity not known	47 ½ 148	23 192	27 ½ 69	HIGH
Crèche	175 729	66 ½ 277	—	HIGH
Total	3,091	137 7,136 ½	97 891 92	—

\*excludes school use

†s u = standard use i.e. 4 man-hours of activity per badminton court hour

By this measure basketball, five-a-side, volley ball and tennis are the most space extensive activities.

which would not be too demanding on staff time to provide answers to specific questions.

### Method

To apply the method, head-counts are needed in the areas of the centre at the specific times to be tested. In some cases the counts would need to go on over several weeks, especially where a single time-period or a single block-booking was to be assessed against other periods or bookings. In others, counts in a single week would be adequate. It is important that the times of head-counts do not coincide with session change-over times. In those centres where ticket sales or booking sheets record the *actual* numbers of people (and not 'guesstimates') counts would not be needed.

Finally, while this is not a capacity measure in the true sense of the word, it is put forward as a standard measure for broad comparisons in use by types of group and different activities between different sports centres. Bodies per square metre per hour is only one measure a manager must balance against many other considerations. It is claimed that this method provides a rigorous means of assessing use in complex programmes.

levels of use both to compare centres and to look at trends within a centre over time, has been put forward by various writers. This paper has proposed a measure of usage of multi-activity areas to be used as a yardstick for levels of use rather than as an absolute capacity figure in the dictionary sense of the word. Such a figure is impossible to arrive at for a multi-activity space. A capacity can be arrived at only in relation to a particular programme, and can be evaluated only in terms of specific management objectives. The yardstick put forward is that of the 'badminton-court-unit' that is four man-hours of activity equal to that provided by one badminton-court area per hour.

The advantages of this method are that most multi-activity areas are reasonably easily converted to badminton court equivalents, that badminton is a very significant activity in sports centres, and that some activities need more space per man hour than the badminton court unit and others need less, so that this standard measure provides a datum for intensity of use.

The capacities of special purpose areas must be assessed separately to obtain a total capacity which can be measured in *activity man-hours*.

### Application of the yardstick

The situations in which this approach might be applied to a sports centre programme include:

- to assess the intensity of use of the centre at different times of the day or week. For example, the intensity of use at weekends might be compared with that during weekday evenings, or one particular evening (Fridays for example) might be compared with the other evenings;
- to assess the intensity of use during block bookings compared with individual bookings, for one or more activities. One particular block booking could be looked at in isolation to see if use levels were satisfactory;
- to look at the effect of timing a certain activity at different times of the week. This would apply mostly to activities where space per player is not fixed, such as gymnastics or martial arts;
- to look at how intensity of use varies within casual bookings when they are timetabled at different times. A similar thing could be done for block bookings, to see which is more robust against being moved to an unpopular time.
- to look at changes over time: counts and calculations at say annual intervals could show whether changing groups or activities have improved intensity of use, or whether particular groups have themselves made better use of their allocated space and time.

In general, therefore, the method could be used for short one-off analyses

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