

# MEASURING THE COMPACTNESS OF THE OLYMPIC GAMES VENUE

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## INTRODUCTION

The size of the modern Olympic Games has steadily and critically enlarged in all its aspects such as the number of athletes, officials, and spectators, and of the athletic events, budgets and so on especially since 1984 Los Angeles Olympics. However, because of so-called Salt Lake City Scandal which broke out in 1998, the International Olympic Committee (IOC) reviewed the way of organization and the size of Olympic Games as well for the renewal, and then changed their direction from “Enlargement” to “Non-Enlargement” and consequently the layout of the Games venues has been considerable whether they’re compact as the Olympic plan.

The IOC has evaluated the Olympic venue plan by measuring how close the venues are situated from the Olympic Village and counting the number of buildings in some range. And they officially create a table with number of venues for the evaluation (Table 1). For instance, both plans by London and Paris for 2012 Olympics were most highly rated by IOC among the final five candidate cities because of its compactness. But with this method, going into details, there occurred some uncertain matter with this comparison. Like in a range of within 30km from the village, there were 79% of venues for London and 76% for Paris and the evaluation obviously comes to close, and then within 10km range London had 40% and Paris had 67% and it’s far from close, meaning that it gives us a totally different impression depending on which range you would choose for the evaluation and it’s hard to tell which one of the plans would be a better idea location-wise on the whole. On the other hand, the current proposed Tokyo 2016 venue plan has 83% of the venues within a range of 10km, and goes to 100% up to 30km. In this case, Tokyo has a very compact venue plan surely but since it’s too compact and most venues are included in a certain range, the comparison doesn’t seem to work very well.

The purpose of this study is to find more accurate and numerical methods of measuring the compactness or the decentralization of the Olympic venues for contributing to its principle of Non-Enlargement.

Table 1. Number of Venues from the Olympic Village.

from Village	2012 London		2012 Paris		2016 Tokyo	
	venues	%	venues	%	venues	%
0-10km	13	40	21	67	30	83
10-20km	9	27	1	3	5	14
20-30km	4	12	2	6	1	3
30-40km	0	0	1	3	0	0
40-50km	0	0	2	6	0	0
50-100km	1	3	0	0	0	0
Over 100km	6	18	5	15	0	0
	33	100	32	100	36	100

Sources: IOC, 2005; Japan Olympic Committee, 2006

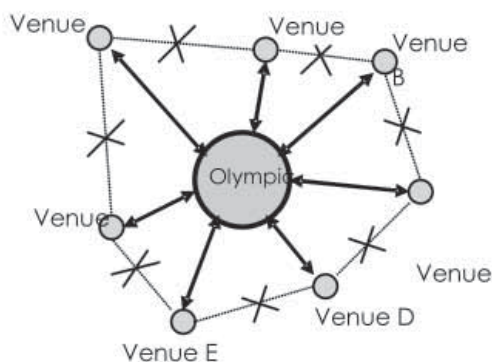


Figure 1. Model: Athletes’ Behavioral Pattern during the Olympic Games term (ABPOG)

## METHODS

Therefore, I would present a method of calculation for the comparison with a model of Athletes' Behavioral Pattern during the Olympic Games term (ABPOG, Figure 1). ABPOG indicates that Olympic athletes commute between the Village and their own venues, and do not go to any other places during the Olympiad (except for Main Stadium and practical facilities). Sample athlete "A" only goes to the Venue "A" and is not scheduled to go to Venue B, C and any others basically, nor to move to other spots from Venue A, so that the total sum of the length of the "athletes' movement" is supposed to correspond to the total distances between the Village and all of the Olympic venues (Figure 2). And the calculation consists of the total sum, the mean, and Standard Deviation (SD) for the comparison and the figures used for the calculation were referred to the actual Olympic Files, however, though there is the IOC's standard, if a building is used by plural athletic events, they do not count up the overlap, this calculation counts the number of the venues as they're used. That's why the total number of venues in a table 1 and 2 are different.

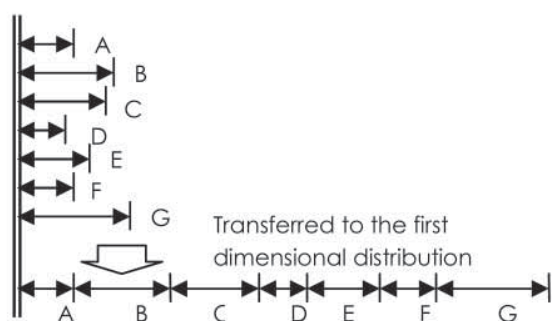


Figure 2. The first dimensional distribution of the distances between the Olympic Village and Olympic Venues.

Table 2. Concentration of the Olympic Venues (km).

	London 2012	Paris 2012	Tokyo 2016
Mean	13.824	14.875	5.566
SD	12.496	12.638	2.864
Total Distances	470	476	211.5
# of Venues	34	32	38

References: 2012 and 2016 Olympic Files

## RESULTS

The result of the comparison cleared the uncertainty of the IOC's current method (Table 2). According to the IOC's table, Paris seems to have a much better plan at a glance in terms of the figures, because 67% of the venues are located around the Village in a range of 10km, and still almost ties London even in the 30km range. But with the model of ABPOG and the calculation, there is a similarity between the total sum of London and Paris plans(470-476km), but London exceeds Paris in the mean(13.824-14.875km) and SD(12.496-12.638km), so that it comes to the conclusion that the venue distribution of the London plan is more concentrated than that of Paris. And Tokyo displays the extremely concentrated plan, even though it has 38 venues, which 4 more than London and 6 more than Paris, the total distances are less than a half of those of London and Paris. The average of the distance between the Village and each venue is 5.566km, which is nearly one-third of that of Paris.

## DISCUSSION

The Olympic Games Study Commission (2003) reports that reducing the cost of staging the Olympics will help to ensure that cities or countries are not discouraged from bidding to host the Games, and IOC hopes to give African and South American cities a chance in the future. ABPOG and the calculation should be the alternative to the IOC's current way of evaluation, and measuring the compactness of the Olympic Games venues more specifically could elevate an awareness of the cost for not only reducing the travel expenses and time but creating a network of facilities such as accommodations, emergency hospitals, police stations and so forth efficiently during the special event.

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