

## **THE SPATIAL EFFECTS OF THE CONSTRUCTION OF THE FACILITIES FOR THE OLYMPIC GAMES IN MEXICO CITY IN 1968.**

### **INTRODUCTION**

In the summer of 1968 the Olympic Games were held in Mexico City.

In order to gain the rights to be sponsors of these games, Mexico agreed to build a series of premises which the Olympic Committee demanded for the performance of the different events that are common part of the games.

The Olympic Stadium of the National Autonomous University of Mexico (UNAM) which was inaugurated in 1952, with an original capacity for 65,000 spectators, had to be refurbished in order to comply with the standards established by the different international associations related to the different disciplines which take place in a stadium like this one, and in order to increase its capacity.

New buildings like the Olympic Pool, the Basket Ball Stadium, the Sport's Palace, the Stadium for cycling events and the Fencing Stadium were built in order to fulfill the demands of the Olympic Committee.

Also the Olympic Village was developed to give shelter to all the athletes of the different nationalities which participated in these games.

The demand for land needed to accommodate all these premises was huge, therefore, many planning studies took place in order to define the location of each of these new installations, considering the already existence of the Olympic Stadium at the University of Mexico.

The Mexican Olympic Committee, two years previous to the games started working in order to be able to finish all the facilities needed by the time of the inauguration day. For this purpose, a huge team of people from different disciplines was put together and the master plan for these activities was prepared.

Spatially speaking, a very important decision was made, and it was, that the different new facilities were placed all around the city in order to benefit different sectors. For this reason, new important infrastructure for transportation had to be planned and built at the same time as those whose purpose was for the games. One of the most important avenues, The Periférico Sur (The Friendship Route), was developed, nowadays, the main subway ring of the city. Also many other streets and avenues had to be built or rebuilt in order to give access to the different facilities connected to the games.

After 34 years from this important event, which was a "big pulsation" for Mexico City, the development of a research which deals with the effects caused by this Olympiad is necessary.

The main objective of this work is the definition of how these infrastructures influenced the spatial development of the city and also the identification of the benefits or disadvantages they produced. Specifically a territorial analysis comparing two point in times is presented, before and after the Games. This analysis shows the transformation induced by these facilities in the urban fabric and also identify how they affected

the surroundings of each one, and which was the impact of all of them together considering the whole metropolitan area.

Also, we present how all the premises transformed their use after the games, that is to say, if the original use for each specific installation is kept or which were the different uses that it has had over the period of our analysis.

## **BACKGROUND<sup>1</sup>**

In 1969 Mexico had a population of around 48.93 million, of these 58.3% were living in urban areas. At that time, Mexico City, host of the Olympiads had around 9 million inhabitants, which at the same time represented around 20% of the total population of the country.

A 3.5% growth of the GNP was estimated from 1960 to 1968, giving us, by 1968 a per capita income equal to \$550 American dollars.

In 1968 the Gross National Product, was estimated in 33.4 million of Mexican pesos, which were equivalent to 12.5 pesos per one American dollar.

The Internal National Product from 1961 to 1968 grew 7.2% yearly in real terms, while the per capita income, for the same period, registered a 3.8% annual growth.

The life expectancy in 1968 was 61 years and the literate population was calculated in 77%.

## **Organization<sup>2</sup>**

In 1963, at Baden Baden Germany, Mexico City applied for the 1968 Olympic Games. In 1964 the Olympic Committee awarded these games to Mexico.

In order to plan the Games, Mexican professionals visited Tokyo, Rome, Melbourne, London and Helsinki, and decided that for Mexico it would be better

to build the Olympic facilities all over Mexico City, because in this way the impacts of these premises would affect a much broader area of the metropolis.

The location of each building related to the games, was taken considering a distance of maximum 20 minutes from the Olympic Village, therefore, no Olympic installation was farther than 26 kilometers which was the equivalent in time to 20 minutes considering the roads and traffic in the city in those days.

In terms of responsibility for the construction of the buildings needed, the main burden was placed in the Public Works Agency (Secretaría de Obras Públicas. SOP). However, the government of the city (Departamento del Distrito Federal. DDF) was in charge of the new road infrastructure needed in the city in order to fulfill the 20 minutes restriction placed by the Mexican Olympic Committee described above. Also, the local government took as its responsibility the construction of the premises for rowing and canoeing at Cuernavaca.

The Engineering Institute of the National Autonomous University of Mexico (Universidad Autónoma de México. UNAM), which nowadays participates in the Urban Program which I coordinate, was the main consultant for the SOP.

The Olympic Village, was built with a mortgage given by BANOBRAS, as far as it was designed to be transformed after the games in housing dwellings for sale.

The works were started, after a careful planning, in October 1966 and were finished in August 1968.

130 countries participated in the games, with a total of a 6,052 athletes, 2,219 officials, reporters, observers and

special guests, and more than 50,000 foreign spectators.

### **Olympic premises**

In this paper we would refer only to Mexico City, reason why it is important to clarify that two other cities held part of the games, Acapulco, 410 kilometers from Mexico City, in which aquatic sports took place and Avandaro, 120 kilometers from Mexico City, where some equestrian sports also took place.

### **New Buildings<sup>3</sup>**

Ten new buildings were built for different purposes: 1.-training and administration; 2.- rowing and canoeing; 3.-cycling; 4.-fencing; 5.-field hockey; 6.-swimming, diving and volley ball; 7.-equestrian and pentathlon; 8.-shooting, 9.-basquet ball and, 10.-the Olympic Village.

These new facilities occupied 203 hectares, from this figure, 27 hectares were devoted to parking lots, and 112 hectares were open areas. A built area of 335,143 m<sup>2</sup> is registered for these premises at a cost of 684 million of 1968 pesos.

### **Adapted facilities<sup>4</sup>**

Eight facilities were adapted for the games, for: 1.- field, track, soccer and grad prix; 2.- boxing; 3.- equestrian; 4.. gymnastics; 5.- weight lifting; 6.- ice skating; 7.- Wrestling and, 8.- Water Polo.

Their total cost was 96.8 million of 1968 Mexican pesos. These premises occupied a land area of 94 hectares, from which 20 hectares were parking lots and 41 hectares open areas. The total construction for these 8 buildings amounted to 349,173 m<sup>2</sup>.

The total cost for new and adapted facilities was 780.4 million of 1968

Mexican pesos or, 62.43 million 1968 American dollars.

### **New and Renewal Roads<sup>5</sup>**

Six new roads had to be built in order to communicate all the different sites, these, mainly because the Olympic Village and the Rowing facilities were located in the bounds of the city, decision taken, considering that new areas for urban development should be habilitated for the future of the city and the 20 minutes restriction, mentioned above.

The most important of these 8 infrastructures was the Periférico Sur (South part of the ring surrounding the city), which had 16.12 kilometers.

Another important avenue is the Viaducto Tlalpan, one of the main radial roads in Mexico, which amounted to 4.6 kilometers.

Five avenues had to be renewed in order to complete the road infrastructure system of the south of Mexico City.

The total cost of these roads for the Olympic Games, which was assumed by the government of the city was 207 million of 1968 Mexican pesos or its equivalent of 16.56 million of 1968 American dollars.

The total investment, estimated for these roads, considering different sources was 987.4 million of 1968 Mexican pesos or 78.99 million of 1968 American dollars.

If we consider a price index for 1968 equal to 0.016 and a price index for June 2002 equal to 100, the cost of the investments for the facilities for the Olympiads at Mexico City would be equal to 6,164 million of American dollars nowadays.

**Table 1. NEW FACILITIES FOR THE OLYMPIC GAMES. 1968**

**BUILDINGS**

No.	Sports/Activity	Name of the Facility	Land Area (m2) (a)	Parking Lots (m2) (a)	Built Area (m2) (a)	Open Areas (m2) (a)	Cost millions	Cost millions
<b>NEW FACILITIES</b>			<b>2,029,019</b>	<b>276,531</b>	<b>335,143</b>	<b>1,119,572</b>		<b>684</b>
1	Training and administration	Deportivo Olimpico Mexicano	183,799	9,260	23,514	153,631		42.6
2	Rowing and Canoeing	Pista de Remo de Cuernanco	570,949	46,400	18,766	544,078		217
3	Cycling	Velódromo	61,059	21,780	11,152	25,090		42.6
4	Fencing	Sala de Armas	24,136	4,100	10,152	17,948		23
5	Field Hockey	Centro Deportivo Magdalena Mixuca	93,475	7,260	6,814	45,245		23
6	Swimming, Diving and Volley Ball	Alberca Olímpica y Gimnasio	79,679	42,432	36,650	10,609		119.2
7	Equestrian and Penthatlon	Campo Militar No. 1	294,659	7,245	4,596	39,680		20.7
8	Shooting	Polígono de Tiro	220,000	14,425	8,260	83,384		
9	Olympic Village (904 apartments)	Villa Olímpica	300,977	24,124	158,340	121,007		62.8
10	Basquet Ball	Palacio de los Deportes	200,286	99,505	56,899	78,900		132.7
<b>ADAPTED FACILITIES</b>			<b>934,769</b>	<b>203,566</b>	<b>349,173</b>	<b>408,954</b>		<b>96.8</b>
1	Field, Track, Soccer and Grand Prix	Estadio México 68	669,000	79,325	274,548	243,387		78.9
2	Boxing	Arena México (54-56)	11,039	8,212	26,132	880	A	
3	Equestrian	Campo Marte	86,590	23,822	7,911	56,746	A	
4	Gymnastics	Auditorio Nacional	128,739	72,700	19,420	102,700		1.9
5	Weight-Lifting	Teatro Insurgentes (51)	4,864	2,413	2,451	0	A	
6	Ice Skating	Pista de Hielo Revolución	4,897		4,897		A	
7	Wrestling	Pista de Hielo Insurgentes (62)	10,633	4,550	5,927	5,241	A	
8	Water Polo	Alberca Olímpica C.U. (51)	19,007	12,544	7,887		A	
							TOTAL A	16
<b>TOTAL NEW AND ADAPTED FACILITIES IN MILLIONS OF PESOS 1968</b>								<b>780.40</b>
<b>TOTAL NEW AND ADAPTED FACILITIES IN MILLIONS OF DOLLARS 1968</b>								<b>62.432</b>

**ROADES**

No.	Sports/Activity	Name of the Facility	Distance (Km)	Cost millions	Cost millions
<b>NEW AVENUES</b>					
1	New avenue	Periférico de San Jerónimo a Cuernanco		B	
2	New avenue	Viaducto Tlalpan - Periférico - Carr. Cuernavaca		B	
3	New avenue	Ampliación Viaducto Tlalpan		B	
4	New avenue	División del Norte de Periférico a Unidad Deportiva Xochimilco		B	
5	New avenue	Glorieta San Jerónimo a Estadio de CU		B	
6	New avenue	Calzada Acoxta		B	
<b>RENEWAL AVENUES</b>					
1	Avenue renewal	Insurgentes Sur		B	
2	Avenue renewal	Av. Pedregal		B	
3	Avenue renewal	Prol. Cerro del Agua		B	
4	Avenue renewal	Av. de las Torres		B	
5	Traffic distributor	Viaducto		B	
				TOTAL B	207
<b>TOTAL NEW AND RENEWAL AVENUES IN MILLIONS OF PESOS 1968</b>					<b>207</b>
<b>TOTAL NEW AND RENEWAL AVENUES IN MILLIONS OF DOLLARS 1968</b>					<b>16.56</b>
<b>GRAN TOTAL BUILDINGS AND AVENUES IN MILLIONS OF PESOS 1968</b>					<b>987.4</b>
<b>GRAN TOTAL BUILDINGS AND AVENUES IN MILLIONS OF DOLLARS 1968</b>					<b>78.992</b>

(a) Instalaciones Olímpicas. Secretaría de Obras Públicas. México. 1969

### Generated Employment for the construction of the Olympic Facilities

In accordance with some estimates done for some other works that I directed, the average net income for the construction workers is 1.92 times the minimum salary, therefore, the average salary for these workers nowadays is 96 Mexican pesos, or the equivalent to 9.6 American dollars per day.

It has been estimated that 49% of the total cost of construction would be a good estimator for hand labor in the construction sector in Mexico.

Considering the factors mentioned above and 22 months of constructions, we could derive a cost close to 3,020 million of American dollars of actual money for the payment of labor, and a labor force of 15,000 workers approximately.

The distribution of the salary of these workers could be estimated considering data published by the Works Agency (Secretaría del Trabajo) and presented in Table 2.

Table 2. Monthly Salary Distribution

CONCEPT	%	Millions of American dollars (2002)
Food and Beverages	57.8	79.34
Clothing	8.9	12.22
Transportation and Communication	5.9	8.10
Furniture, Home appliances and Maintenance	7.3	10.02
Rents, Electricity, Gas and Repairs	7.4	10.16
Other goods and services	4	5.49
Recreation	2.7	3.71
Transferences	2	2.75
Medical Care and Hospitalization	2.8	3.84
Education	1.2	1.65
<b>TOTAL</b>	<b>100</b>	<b>137.27</b>

From these figures, it is remarkable the amount that goes for food and beverages which almost represents 60% of the workers income.

### Generated Employment as a Function of the Purchases in Materials and Equipment

The indirect employment product of the construction of the Olympic premises, derived from the purchase or rent of machineries and materials is estimated in 4,425 workers, or as 29.5% of additional employment of the directly employment needed for construction.

Table 2. Employment in the Industrial Sector

SECTOR	%	EMPLOYEES
Basic Metal Mechanic Industry	15.8	699
Cement Industry	28.9	1,279
Chemistry Industry	9.5	420
Other Industrial Sectors	17.5	774
Non Basic Metal Mechanic Industry	28.3	1,252
<b>Total</b>	<b>100</b>	<b>4,425</b>

From these figures we can see that the Cement and Non Basic Metal Mechanic Industries absorbed almost 60% of this employment effect.

### SPATIAL EFFECTS DERIVED FROM THE CONSTRUCTION OF OLYMPIC FACILITIES

In order to measure the spatial effects derived from the construction or adaptation of buildings or premises needed for the games, a classification was done according to the degree of impact.

	Spatial impact	No spatial impact
New	Type 1	Type 2
Adapted	Type 3	Type 4

### ***Type 1. New facilities which produced urban impacts***

Roads built south of the city, are by far the infrastructure that caused the highest territorial effects, since they were built in empty areas and for two purposes:

- To communicate Olympic buildings located out of the city and,
- To prepare the south of the Metropolis for future urban development.

The Periferico Sur, which is the main highway in this area, worked as a dorsal spine in the arrangement of the urban structure and land uses, therefore, its construction had an enormous and very rapid effect in the occupation of territories bordering it, so its effects could be classified as of regional impacts.

Depending upon the tram that we analyze of this road, a different impact is estimated. Some urban areas in the fringe of the city were already there when the Periferico was constructed, so in them, a substantial revaluation and land use changes occurred.

In other trams, where the Periferico was placed crossing empty lands we could observe an occupation derived from this highway of more or less one kilometer at each side. Other urban developments farther away I think are not caused by this road.

The estimated total area of occupation because of the Periferico and other new and renew avenues close to them is 2,410.27 hectares. This occupation taking place in the following 30 years after the games.

The Olympic Village with 904 apartments, located in the intersection of Periferico Sur and Insurgentes Sur (the main avenue in the whole city), without any doubt, was the second most

important producer of urban impacts, this, mainly because the surrounding areas were empty. However, its effects could be classified as local impacts.

In its surroundings a huge transformation has taken place since the Olympiads. In front of it, two of the biggest shopping malls in the city were built, Perisur and Plaza Inbursa-Cuicuilco. To one side of the Village, two luxury hotels, one cinema, five high tower office buildings, one lower office building and a sport center were developed.

The cycling stadium produced a very local impact, because it was built in an occupied area, never the less, in its surroundings a main avenue and a housing project were built.

### ***Type 2. New facilities which didn't produced urban impacts***

The main characteristic of this type of premises is that they were built on remnant lots or sport parks inside the urban area, therefore, its size and the concomitant number of spectators are not factors of impacts.

In this category we have the Sport Palace-Basket ball the biggest after the Olympic Stadium, the Fencing Stadium and the Olympic Pool.

The neighborhoods where these three buildings are located were already conformed and they didn't suffer almost any transformation because of these new constructions.

### ***Type 3. Adapted facilities which produced urban impacts***

In this classification we identify two avenues that were renewed, Insurgentes Sur and Av. de las Torres.

On both sides of these two avenues land use changes took place.





These two avenues nowadays are an important part of the road infrastructure in the south of Mexico City, as far as they communicate a vast area of new urban developments that didn't exist in 1968. Avenida de las Torres is also very important because it was designed to contain one of the main electric infrastructures of this region of the city.

The changes product of the construction of these two avenues compared to others mentioned above are insignificant.

**Type 4. Adapted facilities which didn't produced urban impacts.**

Eight facilities fit in this classification.

No.	Sport	Name
1	Field, Track, Soccer and Grand Prix	Estadio México 68
2	Boxing	Arena México
3	Equestrian	Campo Marte
4	Gymnastics	Auditorio Nacional
5	Weight-Lifting	Teatro Insurgentes
6	Ice Skating	Pista de Hielo Revolución
7	Wrestling	Pista de Hielo Insurgentes
8	Water Polo	Alberca Olímpica C.U.

The main characteristic of these facilities is that all of them were existing buildings for public spectacles, therefore, the participation of huge amounts of people was not new in the neighborhoods where they were located, in any case their urban impacts, because the involvement of public, took place before the Olympiads.

As we can see in the following picture of a tram of the Periferico Sur -classified as a new facility that produced urban impacts- empty lands surrounding it were totally occupied. Hence, we can assume that urban growth in this area is a consequence of the construction of this

highway. This road produced a very broad regional effect.



Periférico 1966, before the Olympic Games



Periférico 1994, after the Olympic Games

In the case of the Olympic Village, located in the south of the city, -classified as a new facility that produced urban impacts-, the spatial effects covered a radius of about 500 meters, reason why we classified its effect as local.

All lands surrounding the Village, were occupied in a period of less than 10 years after the Games, with the exception of the Cuicuilco Ruins, which is a National Park located south east of the intersection of Periferico and Insurgentes.

A basic problem to solve beside that of the basic functions of the Village, was to provide easy access to the different Olympic installations. This was possible by situating the Village next to the south express way, linking it with the most important traffic system in Mexico City on those days.



A total of 29 housing buildings were constructed, 13 had ten floors and 16 had 6 floors, making a total of 904 apartments.



Olympic Village 1966, before the Olympiads.



Olympic Village 1987, after the Olympiads.

In the case of the Sport Palace (Basket ball) and the Fencing Stadium, located in the east central area of Mexico City - classified as new facilities which didn't produced urban impacts-, we can observe that apart from the constructions of these two buildings, the surrounding areas are basically equal 10 years after the Games.

The reason of this, is because both premises were built on a public park and

also because their neighborhood was fully developed.

The Sport Palace, due to its importance was considered the most representative installation for the Olympic Games. It was not only design for these competitions, but also for other events in the future such as expositions, conventions and current spectacles.



Sport Palace 1966, before the Olympiads.



Sport Palace 1987, after the Olympic Games.

In the case of the Olympic Pool, located in the central south part of Mexico - classified as new facilities which didn't produced urban impacts-, we don't observe any spatial impacts.

The above mainly because, the neighborhood where this facility is located was fully developed when the construction started.

However, it is important to say, that Churubusco avenue, located south of this building, suffered a drastic transformation because of the increasing traffic.

On this avenue and over the crossing avenue a huge bridge was built.



Olympic Pool 1966, before the Olympiads.



Olympic Pool 1987, after the Olympic Games.

The Olympic Swimming Pool complex is located in the south sector of Mexico City, ten kilometers from the Olympic Village.

It was designed to fulfill the Olympic needs as well as the post Olympic needs.

The project also includes a gymnasium for volley ball.

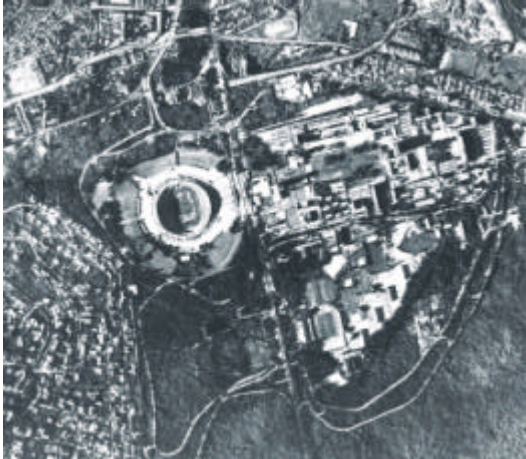
A complex formed by two large buildings was the project constructed, joined by means of a common axis of columns from which the two roofs hang.

The Olympic Stadium for field, tracking, soccer and grand prix, and the swimming pool for water polo, which were already built, are part of the premises of the National Autonomous University of Mexico, located to the south part of Mexico City, 4 kilometers from the Olympic Village.

The Olympic Stadium was finished in 1954 and remodeled for the Olympic Games in 1966. This included enlarging the sitting capacity to 70,000 persons, increasing the constructed area by 57,000 m<sup>2</sup>, as well as making changes on the existing track and field. The swimming pool at the University City, was also refurbished for the Games.

These two buildings, as can be noticed, in the pictures above didn't cause any urban impact, this because they already existed before the Olympiads and were part of the university.





Olympic Stadium 1966, before the Olympiads.



Olympic Stadium 1997, after the Olympic Games.

## Conclusion

The conclusion of this analysis could be expressed in the following points.

1. The number of spectators is not correlated to urban impacts as the ones analyzed in this paper. This because urban expansions are much more related to new demands for housing than to huge audiences which can cause other type of impacts, that weren't material of this analysis.
2. Adapted buildings, like the ones presented here, do not cause any impact, since they are related to the audiences.

3. New facilities scattered through out the city, caused lesser impacts as presumably those concentrated in just one place.
4. Road infrastructure expansions on empty areas, as those built in the south part of the Metropolis, affected the territorial shape and size of the city very fast, since they pushed the opening of new urban areas almost immediately.
5. The size of an enterprise, as the Olympic Games of Mexico City, is a enormous pulsar in any city, since it significantly increases the amount of the construction labor force for a short period of time.
6. Practically all the economic sectors of the country, benefit from a venture like this.
7. Finally, Mexico being a developing country, gained trust and respect from many other nations because of its capacity for the organization of these Games.

<sup>1</sup> Interamerican Development Bank. (1969) *Progreso Socioeconómico en América Latina. 9th. Annual Inform.* Washington;

<sup>2</sup> Secretaría de Obras Públicas. (1970) *Instalaciones Olímpicas.* México.

<sup>3</sup> Table 1

<sup>4</sup> Idem

<sup>5</sup> Idem