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A New Secret of the Youth Olympic Games: A Model for Olympic Facilities Reform

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The Olympic Games (OG) have captivated human interest in sport for thousands of years. The ancient Olympic Games took place from 776 BCE to 393 CE and were held at the sacred site of Olympia, Greece. In comparison, the modern Olympic Games began in 1896 CE in Athens, Greece and have since been hosted in various cities across five continents. Over time, the modern Olympic Games have become the largest and most iconic global sporting event (Gold & Gold, 2017). These Games have been closely associated with the development of incredible sporting facilities, many of which have emerged as architectural and sporting icons. However, with each iteration of the Olympic Games, the level of spending on the Games and associated venue infrastructure has significantly increased (Koba et al., 2021).

To address the rising costs and enhance the sustainability and legacy of the Olympic Games, the International Olympic Committee (IOC) has taken various measures. Efforts to combat these challenges can be traced back to the 1990s when the environment was added as the third pillar of Olympism. The 1994 Lillehammer Games were subsequently labeled as the first “Green Games,” emphasizing their focus on environmentally friendly practices. In subsequent years, the IOC continued to prioritize sustainability, with the 2010 Vancouver Games being lauded as the first “sustainable Games.” More recently, the Olympic Agenda 2020 and Olympic Agenda 2020+5 have adopted specific sustainability recommendations, further aligning the Olympic movement with environmentally conscious practices (Müller et al., 2021). These initiatives aim to address the costs associated with hosting the Games while ensuring a positive and lasting impact on both the environment and the host city’s infrastructure. By integrating these sustainability measures, the IOC seeks to improve the overall legacy and long-term impact of the Olympic Games, making them more economically and environmentally viable endeavors.

Despite these efforts to address the overall sustainability of the Olympic Games, the Games continue to struggle to improve. An independent assessment of sustainability from 1992 to 2020 including three dimensions (Ecological, Economic, and Social) and nine variables by Müller and colleagues (2021) found that the relatively older Salt Lake City (2002), Albertville (1992), and Barcelona (1992) had the best sustainability scores, and the more recent Tokyo (2020), Rio de Janeiro (2016), and Sochi (2014) had the worst sustainability scores. Two key variables in this study directly related to venues include (a) new construction relating to the share of venues as new-builds and (b) long-term viability relating to after-use of the venues. This demonstrates both the connection of venues to the overall sustainability of the Games as well as the need for additional actions to improve the OG in this area.

Exploring the model established by the newly established Youth Olympic Games (YOG) can provide valuable insights to reduce venue construction costs in the Olympic Games. The philosophy behind the YOG revolves around the principle that new permanent facilities should not be solely constructed for hosting YOG events. Instead, the emphasis lies on retrofitting existing facilities or utilizing temporary venues to meet the necessary requirements. One key aspect of the YOG approach is to prioritize any potential new construction for housing or Olympic Village projects, which can be transformed into lasting community legacies after the YOG concludes. Therefore, it is proposed that a new reform model for Olympic venues be based on the model of the YOG. Although the focus of this proposed reform model remains on venue reform, it also considers all four elements from Müller's (2015) mega-events definitional model (see Table 1). These elements include visitor attractiveness (tickets sold), mediated reach (broadcast rights fees), cost (total cost), and transformation (capital investment). Implementing this reform model creates potential to improve the overall cost and long-term impact of Olympic Games infrastructure, making it more manageable and sustainable.

Table 1

Event Classification Matrix

Size	Visitor Attractiveness <i>Ticket Sold</i>	Mediated Reach <i>Broadcast Rights Fees</i>	Cost <i>Total Cost</i>	Transformation <i>Capital Investment</i>
XXL <i>3 points</i>	> 3 million	> \$3 billion USD	> \$10 billion USD	> \$10 billion USD
XL <i>2 points</i>	> 1 million	> \$1 billion USD	> \$5 billion USD	> \$5 billion USD
L <i>1 point</i>	> 0.5 million	> \$0.1 billion USD	> \$1 billion USD	> \$1 billion USD
<i>giga-event 11-12 total points, mega-event 7-10 total points, major event 1-6 total points</i>				

Note. Adapted from Müller (2015).

Youth Olympic Games Background

The Youth Olympic Games have emerged as a relatively new addition to the Olympic movement, consisting of international support festivals. The inaugural YOG took place in Singapore in 2010. Initially, the YOG faced a significant challenge with low awareness both within and outside the sports community, earning it the reputation of being the “best kept secret in sports” (Judge et al., 2009). However, despite these challenges, the YOG has now become a vital component of the Olympic movement. The YOG is a multi-sport festival that occurs every four years, featuring both summer and winter editions. It is specifically catered to athletes aged 15 to 18 years and is organized directly by the International Olympic Committee (IOC). When IOC president Jacques Rogge established the YOG, he implemented certain infrastructure provisions for bids. These provisions required that sport venues be located within one city and discouraged the construction of new venues (IOC, 2009). However, these bid provisions did allow for the construction of new athlete housing as part of the Youth Olympic Village (YOV), which contributes to the objectives of the Culture and Education Program (CEP).

The YOG bid process includes consideration of nine key elements including: (a) governance, (b) general infrastructure, (c) sport and venues, (d) culture and education program, (e) Youth Olympic Village, (f) financial plan, (g) transportation operations, (h) accommodations, and (i) security (Schnitzer & Chappelet, 2014). Three of these elements relate directly to facilities used in the event, and this aligns with the important role that venues play within the YOG and its success. Overall, the YOG has continued trends of moderate growth in the number of athletes, nations, sports, and events included, but the overall size and scope of the YOG remains notably smaller than the OG. Despite these differences in overall size and scope the YOG has numerous operational aspects worthy of emulation by the OG.

The initial four iterations of the YOG since its founding met the bid infrastructure goals of no new sport venues. However, the two most recent YOG hosts did require the construction of one sport venue each (see Table 2). For the 2018 Summer YOG in Buenos Aires, the Youth Olympic Park was constructed to host numerous events, and for the 2020 Winter YOG in Lausanne, the Vaudoise Arena for hockey and opening and closing ceremonies was constructed. Additionally, every YOG hosted to date included the construction of athlete housing within a YOY. It should be noted, however, that these housing projects create a straightforward conversion to local resident housing and contribute to the community legacy of the YOG after the event concludes. The venue components of the YOG planning and implementation provide a potential new “secret” solution that could be applied to the OG.

Olympic Game Venues

The modern Olympic Games include more than a century of history, and the event has grown considerably with the first Games in Athens featuring nine sports, 295 athletes, and seven venues compared with the most recent Tokyo Games featuring 33 sports, 11,656 athletes, and 41 venues (see Table 3). The continued growth of the OG has made the event the largest, most complex, and most costly sporting event in history with the venue and infrastructure composing the primary drivers of these costs. From an economic perspective, hosting the OG is commonly reviewed as a financial mistake as only two cities

since 1932, Los Angeles and Barcelona, have netted a profit primarily due to their use of existing venues (Khraiche & Alakshendra, 2021).

The Olympic Games and their host cities are renowned for some of the most iconic sports venues in the world, including the Beijing National Stadium (Bird's Nest), the Los Angeles Coliseum, the London Aquatics Center, and the Japan National Stadium. However, alongside these notable venues, the OG have also encountered instances of what are referred to as “white elephants.” These are Olympic venues that have been excessively large, expensive, and sometimes excessively designed for post-Olympic use (Furrer, 2002). Examples such as the Stadium Australia in Sydney and the Olympic Stadium in Montreal illustrate this issue on a single-venue basis. Meanwhile, the Athens OG, accumulating more than \$10 billion in debt, and the Montreal OG, requiring more than 30 years to repay its debts, demonstrate this phenomenon at the scale of the entire OG (Beattie, 2017; Khraiche & Alakshendra, 2021). These cases highlight the challenges associated with designing Olympic venues that strike a balance between meeting the needs of the Games and ensuring their sustainability and long-term usefulness.

Various interventions to the facility spending problem have been proposed, such as utilizing a single-site permanent location for the games or designating a select number of cities (four for summer and three for winter) that could rotate staging duties for the Olympic Games (Baade & Matheson, 2016). Although these proposed solutions might indeed greatly reduce venue costs over time, they would create their own new set of problems with equity in the selection of a single or select group of locations. The selection process of a single host city or rotating host cities for the Olympics could potentially face increased pressure toward corruption and scandal as has occurred in the past along with increased scrutiny over any selection made. Such a high-stakes selection process would far surpass the challenges presented by the current single rotation of the Games.

Table 2

Youth Olympic Games Growth for Athletes, Sports, and Venues

Host City	Year	Nations	Competitors	Sports	Events	Total Sport Venues	Existing	New	Temporary
Singapore	2010	204	3,524	26	201	11	11	0	6
Innsbruck	2012	69	1,059	7	63	10	10	0	2
Nanjing	2014	203	3,579	28	222	14	14	0	11
Lillehammer	2016	71	1,100	7	70	9	9	0	0
Buenos Aires	2018	206	3,997	32	239	16	15	1	0
Lausanne	2020	79	1,872	8	81	11	10	1	1

Note. Adapted from Hanstad et al. (2014).

Table 3*Summer Olympic Games Growth for Athletes, Sports, and Venues*

Host City	Year	Total Athletes	Total Sports	Total Events	Total Venues	Temporary Venues
Athens	1896	295	9	43	7	-
Paris	1900	1,077	20	95	16	-
St. Louis	1904	630	16	94	5	-
London	1908	2,666	24	109	13	-
Stockholm	1912	2,054	16	102	16	-
Not Celebrated	1916	-	-	-	-	-
Antwerp	1920	2,591	24	154	17	-
Amsterdam	1928	2,971	16	109	11	-
Los Angeles	1932	1,331	16	117	13	-
Berlin	1936	3,980	19	129	21	-
Not Celebrated	1940	-	-	-	-	-
Not Celebrated	1944	-	-	-	-	-
London	1948	4,062	17	136	26	-
Helsinki	1952	5,867	17	149	21	-
Melbourne	1956	3,342	17	145	24	-
Rome	1960	5,396	18	150	24	-
Tokyo	1964	5,586	19	163	30	3
Mexico City	1968	6,626	18	172	22	-
Munich	1972	7,830	21	195	25	-
Moscow	1980	5,923	21	203	25	-
Los Angeles	1984	7,055	23	224	30	6
Seoul	1988	9,417	23	237	34	-
Barcelona	1992	9,356	25	257	43	-
Atlanta	1996	10,705	26	271	31	4
Sydney	2000	10,651	28	300	39	1
Athens	2004	10,882	28	301	36	2
Beijing	2008	10,942	28	302	37	8
London	2012	10,500	26	302	37	11
Rio de Janeiro	2016	11,238	28	306	38	3
Tokyo	2020	11,656	33	339	41	6

Note. Adapted from Darcy and Traylor (2013) and Gold and Gold (2017).

The New Secret Solution from the Youth Olympic Games

Upon reviewing the YOG from a facility perspective, a new “secret” emerges from this event, which holds the potential to establish a groundbreaking model for the OG. This model aims to prioritize the development of a more sustainable and efficient global sport mega-event. Although this new model would address the venue aspects of the event, it would also expand to address all four factors of the elements of the mega-event framework. Müller (2015) developed a framework for the classification of sporting events as major, mega or giga-events based upon four factors: visitor attractiveness (tickets sold), mediated reach (broadcast rights fees), cost (total cost), and transformation (capital investment). The transformation factor is connected primarily to facility and infrastructure spending related to the event. By considering opportunities to modify or scale back elements of the OG, the overall goals of sustainability and legacy of the Olympic Games could be enhanced.

Within the transformation factor of capital investments (venues and infrastructure), the OG should adopt a no new sport venue requirement for bids. This provision would eliminate new sport venues through utilization of existing sport venues and temporary venues, and it would focus any new construction on athlete housing that can most efficiently be converted to post-event community legacy use. This no new sport venue requirement would greatly decrease overall venue costs for the OG, but it would not eliminate costs, as renovations and upgrades to existing venues would typically be necessary to bring existing venues up to the standards required for top-level international competition. The use of temporary sport venues in the OG began in Tokyo (1964) when three temporary venues were utilized, and temporary venues reached their highest level of usage with 11 in place for London (2012). While roughly 33% of the Summer OG have implemented temporary venues, the YOG has employed temporary venues in four of six festivals, or 67% (see Tables 2 and 3). The YOG’s strong reliance on temporary venues provides another example to be emulated by the OG. Although the modern stadiums of today and the future focus on fan experience and community fit, reductions in environmental damage and increasing sustainability will continue to be driving forces (Francis et al., 2023). Utilizing existing venues, even with minor or major renovations, or temporary venues within the OG align with sustainability efforts generally desired by the public at large.

Within the visitor attractiveness factor (tickets sold), the size of venues and the makeup of OG live spectators should be transformed. In general, the OG draw a global following of fans who descend upon the host city to attend events in person. These OG tickets are typically costly and often outside the means of many local residents. In contrast to the OG, the YOG generates a greater level of availability and access for residents to attend the events. The YOG event tickets cost substantially less (at times provided free of charge) than the OG, and this provides residents with the opportunity to engage in the event. The future adoption of smaller existing venues and temporary venues and prioritizing local attendance lowers the environmental impact of the event by reducing the total travel emissions of global and regional attendees.

Within the mediated reach factor (broadcast rights fees), another secret from the YOG would be the enhancement of social media and other new media within the reach of the OG. Considering the call to increase the local resident attendance of OG events, this would necessitate an increase and improvement in both media and social media coverage to address global interest and following. The YOG has been touted as being far more progressive than the OG in the implementation of social media and new media

and thereby might provide additional “secrets” for the OG to follow for increasing the media following of the Games. Within such a setting, the media following outside of television and streaming contracts for the OG would need to be monetized to maximize future revenues.

Within the fourth and final total cost factor of Müller’s (2015) framework, it is important to recognize the leading role that venue construction plays within the total budgets for the OG. Indeed, there are striking similarities between a mega-construction project overall and a mega-event for sport (Lee, 2021). One area of difference would be that, for the Olympic Games from 1960–2012, 100% ran overbudget in total costs with an average of 179% in nominal terms (Gold & Gold, 2017). Over the 25-year period from 1990 to 2015, total cost (in U.S. dollars for 2018) ranged from \$3.12B (Athens) to \$15.85B (London) for the Summer Games and from \$2.12B (Albertville) to \$23.20B (Sochi) for the Winter Games (Koba et al., 2018). These totals certainly appear exorbitant, and they are seldom publicly posted or debated. With the YOG operating at a fraction of the OG total budgets, the YOG model for total spending indeed seems worthy of emulation.

Drawing from the theoretical lens of institutional isomorphism, it becomes evident that the YOG has predominantly existed in the shadow of the OG. However, an intriguing viewpoint arises from a statement made by an IOC official, bolstering the notion that the YOG might now be poised to offer its own valuable insights or “secrets” to enhance the OG. This IOC leader emphasizes that the YOG were initially shaped by the same objectives that guided the creation of the OG. Interestingly, the official suggests that the YOG’s continued relevance today is perhaps unfortunate, given the divergence from the OG’s original objectives. This prompt raises the question of whether the time has come for the Youth Olympic Games to take on a leadership role in redefining venue usage and expenditure practices within the framework of the Olympic Games (Parent et al., 2015). Consequently, the YOG can provide valuable guidance in charting a path toward reformation and improvement in these areas of the OG.

Conclusion

The desire of cities to host the Olympic Games has been diminishing over the years, as evidenced by the decrease in the number of bids submitted for each edition. From 11 cities bidding for the 2004 Games, the number has steadily declined to just one bid for the 2028 Games (Khraiche & Alakshendra, 2021). This trend indicates a shift in attitudes towards hosting such a massive event. An interesting development in recent Olympic bids is the case of the 2028 Los Angeles Games. Their bid proposed a “radical reuse” approach, which aims to host the event without constructing any new venues (IOC, 2021). This innovative approach suggests that we may be witnessing the emergence of a new paradigm for Olympic Games host cities, focusing on maximizing the use of existing infrastructure rather than relying on extensive and costly new constructions.

Nevertheless, the singular and unopposed bid for the 2028 Games raises concerns about the long-term sustainability and health of the Olympic Games as a whole. It underlines the need for broader participation and competition among potential host cities to ensure the continued success and attractiveness of the event. In contrast to the OG, the YOG have experienced a more robust interest from cities. The first four summer YOG editions received bids from 18 cities, with only the 2014 YOG attracting less than four

bids (Edes, 2021). This suggests that cities are more willing to host the YOG, which may be attributed to its smaller scale and more streamlined requirements compared to the OG. By applying the successful “secret” model of the Youth Olympic Games (YOG) to the Olympic Games (OG), the potential exists to transform the Olympics from an unsustainable giga-event to a more manageable mega-event. This shift would significantly reduce the environmental impact while still delivering a superb experience for athletes and fans worldwide. The YOG has emerged as a potential blueprint for enhancing the sustainability and attractiveness of the Olympic Games.

In conclusion, the diminishing interest in hosting the OG and the continued robust bidding for the YOG indicate the need for a new approach to the Olympic Games. The “radical reuse” model proposed by the 2028 Los Angeles bid offers a potential path towards sustainable hosting, but it also highlights the importance of broader participation for the long-term health of the event. By incorporating successful elements from the YOG into the OG, we can create a more environmentally friendly and appealing Olympic Games for future generations. This evolution challenges the perception of the YOG as the “best kept secret in sport” and positions it as the “Olympic Game(s) changer,” serving as an inspiration to reinvent the larger OG on a global scale.

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