

Project management failure: The



Based on a recently published case study in ASCE's *Journal of Performance of Constructed Facilities*¹, Sean Brady highlights the systemic management failings that resulted in huge financial cost and significant reputational damage to a high profile project.

In 1970, Montreal was awarded the 1976 Olympics, beating bids from Moscow and Los Angeles. World politics had been in Montreal's favour – there were concerns that giving the games to Moscow or Los Angeles would inflame Cold War tensions, a view subsequently confirmed by the US boycott of the Moscow Games in 1980 and the Russian boycott of Los Angeles in 1984.

At the outset, Montreal Mayor, Jean Drapeau, stated that the games would cost no more than \$124M and declared they would be the first self-financing games in Olympic history. It was planned that the self-financing would largely be achieved through the sale of commemorative gold coins and reuse of the Olympic facilities, with Mayor Drapeau suggesting that the 'real problem' would be in determining how to spend the Games' surplus.

But over the next six years the dream of a self-financing Olympics would evaporate, with the original cost estimate being revised to \$310M in November 1972, before finally blowing out to a staggering \$1 500M upon completion. The project stands as a potent example of poor planning, poor project management, fraudulent practice and corruption, and serves as a warning of the dangers of architectural and financial free-rein combined with political ambition and immovable deadlines.

Mayor Drapeau and Roger Taillibert

At the centre of the debacle were Mayor Drapeau and architect Roger Taillibert. By 1972, after two wasted years where little

planning occurred, Mayor Drapeau scrapped the original plans and selected architect Roger Taillibert, without competition, to deliver the games. Mayor Drapeau had become 'enamoured' with Taillibert's Parc des Princes, a 48 000 seater football stadium, which had been recently completed.

But neither Mayor Drapeau nor Taillibert had a good track record in financial management. Taillibert's Parc des Princes had cost \$25M, up \$16M from its original budget of \$9M, and Mayor Drapeau's 1967 Expo had cost \$430M instead of the estimated \$160M. A further consideration was that the price tag of \$124M for the Montreal Olympics appeared very optimistic – the 1972 Munich Games had cost the equivalent of \$600M.

In addition to financial considerations, the Olympic complex would include complicated structures: the main stadium and velodrome would be constructed from precast, post-tensioned concrete, which presented significant construction challenges. Additionally, the Canadian winter would require consideration, as well as the fact that the design would be completed in France, with the drawings being presented in SI units, which would require conversion to the English system.

So now, in 1972, with just four years until the games, a mayor and architect (selected without competition), with a history of cost overruns and delays, equipped with an optimistic budget and a non-negotiable deadline, set out to prepare for a world class event with Mayor Drapeau declaring that "The Montreal Olympics can no more have a deficit than a man can have a baby"¹.

Velodrome

The contract for the velodrome construction was won by Charles Duranceau at a bid value of \$12M. This bid was based on semi-complete plans, and it was the first and last part of the project to be awarded by competitive bidding – the remaining structures would, due to time constraints prohibiting a tender process, simply be awarded to contractors.

The design called for three arches supported by abutments, with the structure in plan representing a cycling helmet. The three arches were 171m long and 27m high, composed of precast concrete sections. Due to the arch's low profile, significant thrust forces had to be resisted at each of the

velodrome's four abutments. This presented the first technical challenge.

At one abutment, the rocky subsoil could not support the thrusts from the roof; a fact that went undiscovered in the original geological testing. In order to address this issue, tendons had to be driven and extensive grouting work was undertaken, blowing the foundation budget of \$497 576 to a cost of more than \$7M; more than half that budgeted for the entire structure. Delays and cost overruns continued, many caused through waiting for Taillibert to actually finish the plans. Labour issues began to plague the site. Indeed, the velodrome was due to be finished in 1974, in time for Montreal to host the World Cycling Championships, but this deadline passed, forcing the championships to be held at a temporary facility, hurriedly built at the Universite de Montreal football stadium.

In order to expedite matters, new subcontractors were hired, cost-plus contract arrangements became the norm, overtime was granted, and after spending \$34M the velodrome was still not complete – labour problems alone, such as strikes and overtime, added an estimated \$12M to the cost. In what would become part of a recurring theme, Taillibert did not consider value adding engineering. He insisted that architecture was, first and foremost, an art form.

When complete the structure would cost \$70M, more than five times the original budget. By way of comparison, while the 7 000 seat velodrome cost \$70M, the 60 000 seat domed stadium in Seattle, Washington, cost \$60M. From a technical point of view, Anton Tedesko, an expert in thin concrete structures, argued that the height of the roof should have been significantly increased to reduce thrust forces, and he said that the structure does 'damage to the cause of concrete', arguing that it should have been constructed in steel' (Figure 1).

But, if the velodrome represented a project management failure, the construction of the Olympic Stadium would become a project management nightmare.

Olympic Stadium

The Olympic Stadium had an elliptical, as opposed to circular, configuration and it became known as 'The Big O' (although it would come to be known as 'The Big Owe'

1976 Montreal Olympics



as construction progressed).

As with the velodrome, the contract was awarded, this time without public tender, to Duranceau. Amazingly, this occurred after it became apparent that he was running into difficulties with the velodrome.

The structure was comprised of precast concrete ribs that cantilevered out over the stadium, with the ribs being post-tensioned together - a very inefficient structure compared to a dome with a compression ring at the centre. Due to the roof's gentle slope, and because it was elliptical in plan, no two sets of ribs were the same. (It is estimated that if they had been, a saving of \$20-\$30M could have been achieved). Horrendous erection problems would ensue, with rib misalignment being common, which resulted in significant issues because post-tensioning cables had to be threaded through these ribs, requiring perfect alignment. To make matters worse, empty post-tensioning ducts filled with water, froze, and required clearing. The design failed to consider constructability: it left no room for internal scaffolding, resulting in extensive crane use to hold the ribs in place. At one point 80 cranes were in use and it was estimated that doubling the number of cranes would only have increased productivity by 25% because of crane congestion.



Figure 1
The site for the 1976 Olympics is still a clutter of cranes, rods and boards as workmen press ahead to finish construction. The roof of the velodrome (left) is the only structure to have been completed

With mounting time pressure and fear of embarrassment at missing the opening of the Games, a licence for free spending, corruption and union strong-arming flourished. Cost-plus contracts provided little incentive to reduce costs, and more and more manpower was thrown at the project, with diminishing returns. Poor weather would also hamper construction - at one stage, \$400 000 per day was being spent on heating.

Costs continued to balloon, until finally, in November 1975, the Province of Quebec stepped in and took the project away from the City of Montreal - with the Province now footing the bill for completion. Drapeau and Taillibert were off the site, and in early 1976 the Province gave an ultimatum to contractors that if work did not speed up, the project would be shut down and the Games moved elsewhere. In perhaps one of the best illustrations of how the system was being abused, this ultimatum resulted in a productivity increase of 500%.

But the damage had been done. From the original estimate of \$40M in 1970 and the Stadium's revised estimate of \$130.8M

in 1972, the final cost of the stadium was \$836M. Each seat cost \$13 000; more than five times the cost per seat of the New Orleans Superdome.

Project failure

No one reason contributed to the failure. Mayor Drapeau appointed himself project manager and gave free rein to his architect. Time pressure played a key role, preventing a tender process. Taillibert was perpetually late with plans, generating a situation that could easily be taken advantage of, and his designs were complex and paid little attention to constructability. These issues would run through many aspects of the project. In addition to the stadium and velodrome, there were significant issues with the Olympic village and the construction of a viaduct; the viaduct required formwork that was 15 times the cost of conventional formwork, and the contractor only accepted the work on a cost-plus basis and on the condition that he would not be responsible for the completed structure. In the end, a commission of enquiry would blame Drapeau, Taillibert, and the Olympic Organising Committee for the failure, as well as the labour unions, contractors and suppliers that took advantage of the situation.

In the aftermath, to retire the debt generated by the Games, the City of Montreal set up a special Olympic Tax on real estate, the Olympic Lottery was extended beyond the games, to 1979, and a special tobacco tax was imposed in 1976. Finally in 2006, a full 30 years following the 'first self-financing Olympic Games', the debt was finally paid.

Perhaps a key insight into what went so very wrong is best summarised by Taillibert himself: "That's all Canadians and the American's talk about - money, money, money" he said, "It doesn't interest me at all".

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REFERENCES:

- 1) Patel A., Bosela P. and Delatte N. (2013) '1976 Montreal Olympics: Case Study of Project Management Failure', *J. Perform. Constr. Facil.*, 27 (3), 362-369