

# Reasons for cost overruns and delays construction essay



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## **Introduction**

The Boston's Central Artery/Tunnel project, also known as "The Big Dig" was one of the largest construction projects which took place in one of America's busiest city Boston. The main aim of this mega project was to improve traffic flow by constructing a tunnel and 2 bridges in the centre of Boston city.

(<http://www.omegacentre.co.uk>, 2010) Many technical challenges were faced in this project which ultimately led to delays, loss of public trust and disasters in financial and quality control. This was due to management problems, incomplete construction design drawings and lack of experience. (Robert W. Poole, 2011) This report will discuss the project's original scope, its final outcome, and describe its failures encountered and what steps should be taken to manage this project better.

## **Original Scope and Final Outcome**

The original scope and final outcome of the project: (<http://www.omegacentre.co.uk>, 2010)

## **The Big Dig**

This project consists of 2 sub-projects:

### **Ted Williams Tunnel Project:**

The tunnel connects the Logan Airport in South Boston to 2 interstates: I-93 interstate highway (from west) and I-90 interstate highway (from north), extending throughout the entire South Boston Industrial area. In 1991, construction commenced, and by 2003, majority of this project was finished. By 2007, this entire project was completed and opened to public. (Boston Big Dig, 2010)  
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## **Two 14-lane bridges Project:**

These bridges were constructed over the Charles River. These bridges connect the Ted Williams tunnel to the Logan Airport across the Charles River. Each bridge consists of four-lane expressways which extends the I-90 interstate highway towards the airport via the Ted Williams Tunnel. (Robert W. Poole, 2011) Construction for this project began in 1991 and completed in 2007. (<http://www.omegacentre.co.uk>, 2010)

### **Original Scope**

Initial estimated Cost of the project: \$2. 56 Billion  
Initial estimated construction Period: 1991-1998

### **Final Outcome**

Final Cost of the project: \$14. 8 Billion  
Actual construction Period: 1991-2007  
By 1987, the project cost initially kept at \$2. 56 billion. Construction commenced in 1991. Several sites of Ted William's tunnel were opened to public in 1995 with project price growing to \$5. 8 billion. In 1994, when the majority of the project's designs were completed, the cost of project rose to \$7. 8 billion. Upon completion in 2007, the final cost of the project was \$14. 8 billion, more than five times the predicted value. (Robert W. Poole, 2011)

### **Reasons for Cost Overruns and Delays**

Even though stakeholders were equipped with many innovative sophisticated tools for reducing project's risks to carry out easy management of the project, there were several factors which raised the cost and cause delays in the completion of project. (Greiman, 2009)

## **Mismanagement and Inflation**

Even though, there was no calamity or many contracts to deal with during the construction, there was wide mismanagement across the project management ultimately which led to cost escalation. One reason was that people involved in project, had lack of experience and knowledge in managing such a highly complex project. Another was that the stakeholders underestimated the impact of Inflation on the project, which led to massive cost overruns as the stakeholders calculated the project budget according to then-current rate rather than taking future rate into consideration. (Greiman, 2009)

## **Design and Construction Risks**

The project management team underestimated the subsurface conditions avoiding standard industrial survey practices and faced lot of consequences when construction commenced. Issues such as ground-water conditions, weak soil and many health and safety issues were not reviewed properly during the planning. Two engineering firms Bechtel Corp and Parsons were hired in 1986 for managing the project and providing designs and drawings to the contractors for the works to be carried out. These companies did not examine these regions accurately and provided the contractors with inadequate drawings. They believed that it would be essential for the contractors to begin works on certain areas before the designs for other areas were finished. (Raphael Lewis, 2003) However, these actions proved to be quite expensive as it led to frequent design alterations. Resolving and repairing all these errors added up to around \$1.6 billion plus also led to many delays during the construction process. An extra \$500 million was

spent for sweeping street grounds and provision of new shipment documents for new concrete slabs. By early 1990's the cost of the project had already increased to \$8 billion (Gelinas, 2006) In 2004, few months after some of Ted Williams Tunnel were opened to public, leaks along the ceilings were discovered. This was due to inadequate designs provided to contractors and unexpected site conditions. Plus the contractors were under tremendous pressure to complete the work in hurry. In 2006, part of the ceiling in the tunnel collapsed and killed 2 commuters crossing the tunnel. Wrong epoxy fasteners were used for holding the ceiling concrete slabs which led to this calamity. During these scenarios, the tunnel was closed for repairs which led to delays in other works and cost escalation. (Boston Big Dig, 2010)

## **Lack of Communication and Collaboration**

The project's organizational structure was one of the main reasons which caused many problems. Since this project was a design-bid-build model, the contractors and designers were negotiated separately during the planning stages. This led to lack of collaboration and communication between them and, many other internal and external stakeholders. Moreover, the project's organizational structure did not follow a systematic centralized decision-making concept for carrying out all operations of the project. The communication channels between the government, designers and project managers were inadequate, which led to many delays. Since many tasks in the project involved complex scenarios and procedures, controlling and maintaining these operations in a uniform manner proved to be quite difficult. Social and Community costs were initially mis-calculated, the management team did not predict that it would be quite expensive to take

care of community interests, communicating with the media and regulatory agencies. (Greiman, 2009)

## **Lessons from Big Dig**

If a similar type of project was managed by me: (Robert W. Poole, 2011)I would initially set up an organizational structure which follows a design-build model. This model employs both the contractors and designers simultaneously thus allowing them to collaborate and form strong professional relationship with each other from the beginning. I would take inflation into consideration. I would carefully set various goals and project schedules in more systematic manner, and account for any foreseen or unforeseen problems. I would set up a more centralized communication system between the government and managers to avoid any delays.