

Case Study: Big Infrastructure Engineering

Bostonia in 1970 was a medium-sized metropolis in the land of Oz. In the 1700s, it was the first location to draw commercial development in its region, because its seaport and fishing resources were outstanding. By attracting talented people and generating capital from its embedded industries, the city grew to prominence for its innovation in the cultural arts, construction, transportation and manufacturing. As a leader in the implementation of 'the next big thing', the evolving infrastructure of Bostonia became constrained by a lack of backwards compatibility. Public transportation, for instance, consisted of a patchwork collection of platforms that were not amenable to common maintenance and spare parts support. The highway system consisted of structures that were suspended above the village paths of the past. The vibrancy and creativity of Bostonia and its region became more and more limited by the poor transportation system for both goods and labor. Aggregate commerce was increasing at a slowing rate, and the population was beginning to decline.

The regional government placed modernization of the Bostonia highway system as a top priority. The national government, having constructed a very large interstate highway system in the 1950s, was opposed to investment a singular region. The disruption by such a major construction project could destroy the existing, weakened commerce in Bostonia and pose a threat to historical landmarks and long established neighborhoods. Bostonia was known to be prone to corruption, and a project of this magnitude would be suspect from the beginning. The engineering competence and construction resources for such a project did not exist. You are a young engineer from MIT with insight into all of the above and a willingness to learn. What should you do?

Study Guide (B-I-R-A-C)

1. Define the problem as an answerable question. (**Background**)
2. What constraints limit the possible outcomes? (**Issues**)
3. What are the alternative ways of proceeding? (**Recommendations**)
4. What is your analysis that validates your selected alternative? (**Analysis**)
5. What are the consequences of accepting or rejecting your proposal? (**Consequences**)

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