



### **Consulting Engineering Theme**

*Expanding societal needs and a shortage of public funds has put an exuberant amount of pressure on public services to maintain and expand their system structure in order to cope with future operations. If public services are not as efficient as they could be, it provides less than desirable return on investment, and requires taxpayers and users to pay more, either through subsidies or user fees. It also can discourage public investment in services that most would consider to be “essential”.*

*Improving the efficiency of a public service's subunits is one way to increase overall efficiency. However, overall system efficiency can be increased by correctly identifying the underlying constraints and issues, and then improving upon them until the system's performance is consistent with the system structure, goals and constraints.*

*The real challenge lies in identifying and quantifying objective measures that reflect the variable outputs and inputs that the public sector faces.*

Engineers are involved with the planning and design of a broad spectrum of projects in the public sector, ranging from multi-billion dollar infrastructure projects to establishing a new department or office that offers a new service to the public. However, too often an engineer's role ends once the project finally is fully implemented and goes-live. While the project may function as originally designed, the factors around which the project was planned may have deviated in reality or been entirely incorrect.

As a result, engineers may need to be brought in to retrofit or tweak the initial design in order to optimize the system so that the initial investment wasn't wasted. Failure to do so could potentially mean running a system with huge deficits; loss of taxpayer, government and stakeholder trust, as well as potential lawsuits if negligence can be found against one of the parties involved.

The problem will test your ability to optimize under-utilized public-sector systems.

### **Useful Resources**

Resources in the following areas may be useful in solving the problem:

- Structural design
- Organizational design and technology
- Human factors engineering
- Sustainable design
- Transportation principles, planning and operations

### **Required Software**

During the competition, competitors will have to create a power point 2003 (.ppt) file or an adobe pdf file for their presentation. Competitors should have legal copies of software to produce one of these file formats.