MECHANICAL ENGINEERING DEPARTMENT
ME/ISyE 8773-8774

Ambulance Location and Relocation*

by

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Wednesday, March 12, 2008
3:15 p.m. — Refreshments before the seminar
3:30 p.m. — Graduate Seminar
Room 1130 ME

ABSTRACT — Ambulance service providers all over the world are struggling to maintain service levels, as measured by response times to calls, in the face of increasing traffic congestion, increasing call volumes, and budget pressure. As a consequence, they are looking, more than ever, to provide a good match between supply and demand of ambulances. The ambulance location problem is that of determining how many ambulances to operate from each of a predefined set of bases. We first review a simple model that sheds light on this question: One should not allocate ambulances to bases in proportion to demand. The optimal (static) allocation of ambulances to bases is important, but it ignores the option of dynamically moving ambulances in real time to attempt to "fill holes," which is also known as relocation. We discuss some existing methods for relocation, as well as a new method based on approximate dynamic programming (ADP). Computational results for Edmonton (Canada), and Melbourne (Australia) show that ADP can work well, but a successful implementation requires a mix of queueing-systems knowledge and intuition.

* *Joint work with Mateo Restrepo and Huseyin Topaloglu*

BIO — Shane G. Henderson is an associate professor in the School of Operations Research and Information Engineering at Cornell University. His research interests include stochastic simulation and simulation optimization, and he has worked for some time with emergency services. He is the simulation area editor at Operations Research, and is an associate editor for the ACM Transactions on Modeling and Computer Simulation and Operations Research Letters. His web page can be found via http://www.orie.cornell.edu

Informal Faculty Luncheon: Wednesday, March 12, 2008, 12:00 noon. Meet in 1100 ME and walk to lunch with other faculty. Prof. Shane Henderson will be able to attend.