

**Session Detail Information**[Add this session to your itinerary](#)

---

**Cluster : Transportation Science & Logistics**

---

**Session Information : Tuesday Nov 15, 10:00 - 11:30**

---

**Title: Transportation Infrastructure Management II****Chair: Jasenka Rakas**, University of California at Berkeley, NEXTOR, 107D McLaughlin Hall, Berkeley CA 94720, United States, jrakas@berkeley.edu

---

**Abstract Details**

---

**Title: Simulation of Imperfect Information in Vulnerability Modeling for Infrastructure Facilities****Presenting Author: Mark Turnquist**, Cornell University, Ithaca NY 14853, United States, mat14@cornell.edu**Co-Author: Dean Jones**, Sandia National Laboratory, Albuquerque NM, United States, dajones@sandia.gov**Linda Nozick**, Cornell University, Ithaca NY 14853, United States, lkn3@cornell.edu

**Abstract:** A Markov model of malicious intrusions in infrastructure facilities is combined with simulation to analyze varying levels of imperfect intruder information in planning for attacks. This provides an explicit mechanism to estimate the probability of successful breaches of physical security, and to evaluate potential means to reduce that probability.

**Title: Optimal Sequencing of Un-staffed Facility Inspection Sites in the National Airspace System****Presenting Author: Juaida Norrell**, Federal Aviation Administration, 800 Independence Ave, SW, ATIS Technical Operations, Washington, DC 20591, juaida.norrell@faa.gov**Co-Author: Gautam Gupta**, University of California at Berkeley, 107 McLaughlin Hall, University of California at Berkeley, Berkeley CA 94720, United States, ggupta@berkeley.edu**Jasenka Rakas**, University of California at Berkeley, NEXTOR, 107D McLaughlin Hall, Berkeley CA 94720, United States, jrakas@berkeley.edu

**Abstract:** The evaluation of the Facility Condition Index (FCI) for 9,000 structural towers at un-staffed facilities in the National Airspace System requires proper sampling methodology. This research focuses on developing an appropriate sequence of inspection sites with the objective to minimize sample variance. The proposed sequencing technique is supported by data analysis, including comparisons to highlight the relative benefits of such a technique.

**Title: Balancing Service Components of the National Airspace System: Quality, Value, and Cost****Presenting Author: Jady Handal**, Federal Aviation Administration, 800 Independence Ave, SW, NAS Operations, AOP-200, Washington, DC 20591, United States, jady.handal@faa.gov**Co-Author: Jasenka Rakas**, University of California at Berkeley, NEXTOR, 107D McLaughlin Hall, Berkeley CA 94720, United States, jrakas@berkeley.edu

**Abstract:** This research explores questions of balance among three components of service in the National Airspace System (NAS): quality, value and cost. We also explore how willingness to pay, either consciously or unconsciously, ultimately drives quality of service. Service Level Agreements are discussed identifying how risk tolerance, a quality measure, influences cost. Deterministic and stochastic models are presented to illustrate the decision process.

**Title: Infrastructure Maintenance Decisions Optimization using a History-dependent Markov Decision Process****Presenting Author: Charles-Antoine Robelin**, Graduate Student Researcher, UC Berkeley, robelin@ce.berkeley.edu

**Co-Author: Samer Madanat**, Professor of Civ. and Env. Eng., UC Berkeley,  
madanat@newton.berkeley.edu

**Abstract:** A reliability-based model of deterioration is developed and used in a facility level optimization model of bridge maintenance decisions, using A Markov chain whos includes part of the history of deterioration and maintenance. This formulation all use of standard optimization techniques, while using realistic, history-dependent deterioration models. The framework to formulate a continuous deterioration mod Markov model with limited loss of information is presented.

---