

BIBLIOGRAPHY

- L. Aboueljinane, E. Sahin, and Z. Jemai. A Review on Simulation Models applied to Emergency Medical Service Operations. *Computers & Industrial Engineering*, 66(4):734–750, 2013.
- R. Alanis, A. Ingolfsson, and B. Kolfal. A Markov Chain Model for an EMS System with Repositioning. *Production and Operations Management*, 22(1):216–231, 2013.
- Ambulancezorg Nederland. Ambulances in-zicht 2014. Technical report, 2014.
- T. Andersson and P. Värbrand. Decision Support Tools for Ambulance Dispatch and Relocation. *Journal of the Operational Research Society*, 58(2):195–201, 2007.
- S. Ansari, L. A. McLay, and M. E. Mayorga. A Maximum Expected Covering Problem for District Design. *Transportation Science*, 2015.
- A. Başar, B. Çatay, and T. Ünlüyurt. A Multi-Period Double Coverage Approach for Locating the Emergency Medical Service Stations in Istanbul. *Journal of the Operational Research Society*, 62(4):627–637, 2011.
- A. Başar, B. Çatay, and T. Ünlüyurt. A Taxonomy for Emergency Service Station Location Problem. *Optimization Letters*, 6:1147–1160, 2012.
- D. Bandara, M. E. Mayorga, and L. A. McLay. Optimal Dispatching Strategies for Emergency Vehicles to Increase Patient Survivability. *International Journal of Operational Research*, 15(2):195–214, 2012.
- D. Bandara, M. E. Mayorga, and L. A. McLay. Priority Dispatching Strategies for EMS Systems. *Journal of the Operational Research Society*, 65:572–587, 2014.
- R. Batta, J. M. Dolan, and N. N. Krishnamurthy. The Maximal Expected Covering Problem: Revisited. *Transportation Science*, 23(4):277–287, 1989.
- V. Bélanger, A. Ruiz, and P. Soriano. *Recent Advances in Emergency Medical Services Management*. Tech. Rep. CIRRELT-2015-28, CIRRELT, 2015.
- O. Berman. Repositioning of Distinguishable Urban Service Units on Networks. *Computers & Operations Research*, 8(2):105–118, 1981a.

- O. Berman. Dynamic Repositioning of Indistinguishable Service Units on Transportation Networks. *Transportation Science*, 15(2):115–136, 1981b.
- O. Berman. Repositioning of Two Distinguishable Service Vehicles on Networks. *IEEE Transactions on Systems, Man and Cybernetics*, 11(3):187–193, 1981c.
- L. Brotcorne, G. Laporte, and F. Semet. Ambulance Location and Relocation Models. *European Journal of Operational Research*, 147(3):451–463, 2003.
- S. Budge, A. Ingolfsson, and E. Erkut. Approximating Vehicle Dispatch Probabilities for Emergency Service Systems with Location-Specific Service Times and Multiple Units per Location. *Operations Research*, 57(1):251–255, 2009.
- S. Budge, A. Ingolfsson, and D. Zerom. Empirical Analysis of Ambulance Travel Times: The Case of Calgary Emergency Medical Services. *Management Science*, 56(4):716–723, 2010.
- R. E. Burkhard, M. Dell’Amico, and S. Martello. *Assignment Problems*, chapter 6. SIAM, Philadelphia, 2009.
- A. Carter, J. Gould, P. Vanberkel, J. Jensen, J. Cook, S. Carrigan, M. Wheatley, and A. Travers. Offload Zones to Mitigate Emergency Medical Services Offload Delay in the Emergency Department: a Process Map and Hazard Analysis. *Canadian Journal of Emergency Medicine*, pages 1–9, 2015.
- N. Channouf, P. L’Ecuyer, A. Ingolfsson, and A. N. Avramidis. The Application of Forecasting Techniques to Modeling Emergency Medical System Calls in Calgary, Alberta. *Health Care Management Science*, 10(1):25–45, 2007.
- A. Charnes and J. Storbeck. A Goal Programming Model for the Siting of Multi-level EMS Systems. *Socio-Economic Planning Sciences*, 14(4):155–161, 1980.
- K. C. Chong, S. G. Henderson, and M. E. Lewis. The Vehicle Mix Decision in Emergency Medical Service Systems. *Manufacturing & Service Operations Management*, 2015.
- R. Church and C. S. ReVelle. The Maximal Covering Location Problem. *Papers Regional Science Association*, 32(1):101–118, 1974.
- M. S. Daskin. Application of an Expected Covering Model To Emergency Medical Service System Design. *Decision Sciences*, 13:416–439, 1982.
- M. S. Daskin. A Maximum Expected Covering Location Model: Formulation, Properties and Heuristic Solution. *Transportation Science*, 17(1):48–70, 1983.
- M. S. Daskin and E. H. Stern. A Hierarchical Objective Set Covering Model for Emergency Medical Service Vehicle Deployment. *Transportation Science*, 15: 137–152, 1981.
- V. De Maio, I. Stiell, G. Wells, and D. Spaitte. Optimal Defibrillation for Maximum Out-of-Hospital Cardiac Arrest Survival Rates. *Annals of Emergency Medicine*, 42(2):242–250, 2003.

- D. Degel, L. Wiesche, S. Rachuba, and B. Werners. Time-dependent Ambulance Allocation Considering Data-driven Empirically Required Coverage. *Health Care Management Science*, 18(4):444–458, 2015.
- K. F. Doerner, W. J. Gutjahr, R. F. Hartl, M. Karall, and M. Reimann. Heuristic Solution of an Extended Double-Coverage Ambulance Location Problem for Austria. *Central European Journal of Operations Research*, 13:325–340, 2005.
- G. Erdoğan, E. Erkut, A. Ingolfsson, and G. Laporte. Scheduling Ambulance Crews for Maximum Coverage. *Journal of the Operational Research Society*, 61(4):543–550, 2009.
- E. Erkut, A. Ingolfsson, and G. Erdoğan. Ambulance Location for Maximum Survival. *Naval Research Logistics*, 55(1):42–58, 2008.
- E. Erkut, A. Ingolfsson, T. Sim, and G. Erdoğan. Computational Comparison of Five Maximal Covering Models for Locating Ambulances. *Geographical Analysis*, 41(1):43–65, 2009.
- R. D. Galvão and C. S. ReVelle. A Lagrangean Heuristic for the Maximal Covering Location Problem. *European Journal of Operational Research*, 88(1):114–123, 1996.
- R. D. Galvão, F. Y. Chiyoshi, and R. Morabito. Towards Unified Formulations and Extensions of Two Classical Probabilistic Location Models. *Computers & Operations Research*, 32:15–33, 2005.
- M. Gendreau, G. Laporte, and F. Semet. Solving an Ambulance Location Model by Tabu Search. *Location Science*, 5(2):75–88, 1997.
- M. Gendreau, G. Laporte, and F. Semet. A Dynamic Model and Parallel Tabu Search Heuristic for Real-time Ambulance Relocation. *Parallel Computing*, 27(12):1641–1653, 2001.
- M. Gendreau, G. Laporte, and F. Semet. The Maximal Expected Coverage Relocation Problem for Emergency Vehicles. *Journal of the Operational Research Society*, 57:22–28, 2006.
- J. B. Goldberg. Operations Research Models for the Deployment of Emergency Services Vehicles. *EMS Management Journal*, 1:20–39, 2004.
- J. B. Goldberg, R. Dietrich, J. Ming Chen, M. G. Mitwasi, T. Valenzuela, and E. Criss. Validating and Applying a Model for Locating Emergency Medical Vehicles in Tucson, AZ. *European Journal of Operational Research*, 49(3):308–324, 1990.
- L. V. Green and P. J. Kolesar. Improving Emergency Responsiveness with Management Science. *Management Science*, 50(8):1001–1014, 2004.
- K. Hogan and C. S. ReVelle. Concepts and Application of Backup Coverage. *Management Science*, 34:1434–1444, 1986.

- A. Ingolfsson, S. Budge, and E. Erkut. Optimal Ambulance Location with Random Delays and Travel Times. *Health Care Management Science*, 11(3):262–274, 2008.
- C. J. Jagtenberg, S. Bhulai, and R. D. van der Mei. An Efficient Heuristic for Real-time Ambulance Redeployment. *Operations Research for Health Care*, 4: 27–35, 2015.
- C. J. Jagtenberg, S. Bhulai, and R. D. van der Mei. Optimality of the Closest-idle Policy in Advanced Ambulance Dispatching. *Health Care Management Science (to appear)*, 2016.
- J. P. Jarvis. Approximating the Equilibrium Behavior of Multi-Server Loss Systems. *Management Science*, 31(2):235–239, 1985.
- V. Jayaraman and R. Srivastava. A Service Logistics Model for Simultaneous Siting of Facilities and Multiple Levels of Equipment. *Computers & Operations Research*, 22(2):191–204, 1995.
- O. Karasakal and E. K. Karasakal. A Maximal Covering Location Model in the Presence of Partial Coverage. *Computers & Operations Research*, 31(9):1515–1526, 2004.
- R. B. O. Kerckamp and K. I. Aardal. A Constructive Proof of Swap Local Search Worst-case Instances for the Maximum Coverage Problem. *Operations Research Letters*, 44(3):329–335, 2016.
- V. A. Knight, P. R. Harper, and L. Smith. Ambulance Allocation for Maximal Survival with Heterogeneous Outcome Measures. *Omega*, 40(6):918–926, 2012.
- P. J. Kolesar and W. E. Walker. An Algorithm for the Dynamic Relocation of Fire Companies. *Operations Research*, 22(2):249–274, 1974.
- G. J. Kommer and S. Zwakhals. Referentiekader spreading en beschikbaarheid ambulancezorg, 2008.
- G. Laporte, F. V. Louveaux, F. Semet, and A. Thirion. Application of the double standard model for ambulance location. In *Innovations in Distribution Logistics*, pages 235–249. Springer, 2009.
- M. Larsen, M. Eisenberg, R. Cummins, and A. Hallstrom. Predicting Survival from Out-of-Hospital Cardiac Arrest - a Graphic Model. *Annals of Emergency Medicine*, 22:1652–1658, 1993.
- R. C. Larson. A Hypercube Queuing Model for Facility Location and Redistricting in Urban Emergency Services. *Computers & Operations Research*, 1(1):67–95, 1974.
- R. C. Larson. Approximating the Performance of Urban Emergency Service Systems. *Operations Research*, 23(5):845–868, 1975.

- S. Lee. The Role of Preparedness in Ambulance Dispatching. *Journal of the Operational Research Society*, 62:1888–1897, 2011.
- X. Li, Z. Zhao, X. Zhu, and T. Wyatt. Covering Models and Optimization Techniques for Emergency Response Facility Location and Planning: a Review. *Mathematical Methods of Operations Research*, (74):281–310, 2011.
- C. S. Lim, R. Mamat, and T. Bräunl. Impact of Ambulance Dispatch Policies on Performance of Emergency Medical Services. *IEEE Transactions on Intelligent Transportation Systems*, 12:624–632, 2011.
- M. Maleki, N. Majlesinasab, and M. Mehdi Sepehri. Two New Models for Redeployment of Ambulances. *Computers & Industrial Engineering*, 78:271–284, 2014.
- M. B. Mandell. Covering Models for Two-Tiered Emergency Medical Service Systems. *Location Science*, 6:355–368, 1998.
- V. Marianov and C. S. ReVelle. The Capacitated Standard Response Fire Protection Siting Problem: Deterministic and Probabilistic Models. *Annals of Operations Research*, 40(1):303–322, 1992.
- V. Marianov and C. S. ReVelle. The Queueing Maximal Availability Location Problem: a Model for the Siting of Emergency Vehicles. *European Journal of Operational Research*, 93(1):110–120, 1996.
- V. Marianov and D. Serra. Hierarchical Location-allocation Models for Congested Systems. *European Journal of Operational Research*, 135(1):195–208, 2001.
- A. J. Mason. Simulation and Real-Time Optimised Relocation for Improving Ambulance Operations. In B. Denton, editor, *Handbook of Healthcare Operations: Methods and Applications*, pages 289–317. Springer, New York, 2013.
- D. S. Matteson, M. W. McLean, D. B. Woodard, and S. G. Henderson. Forecasting Emergency Medical Service Call Arrival Rates. *Annals of Applied Statistics*, 5(2B):1379–1406, 2011.
- M. S. Maxwell, M. Restrepo, S. G. Henderson, and H. Topaloglu. Approximate Dynamic Programming for Ambulance Redeployment. *INFORMS Journal on Computing*, 22(2):266–281, 2010.
- M. S. Maxwell, S. G. Henderson, and H. Topaloglu. Tuning Approximate Dynamic Programming Policies for Ambulance Redeployment via Direct Search. *Stochastic Systems*, 3(2):322–361, 2013.
- M. S. Maxwell, E. C. Ni, C. Tong, S. G. Henderson, H. Topaloglu, and S. R. Hunter. A Bound on the Performance of an Optimal Ambulance Redeployment Policy. *Operations Research*, 62(5):1014–1027, 2014.
- M. E. Mayorga, D. Bandara, and L. A. McLay. Districting and Dispatching Policies for Emergency Medical Service Systems to Improve Patient Survival. *IIE Transactions on Healthcare Systems Engineering*, 3(1):39–56, 2013.

- L. A. McLay. A Maximum Expected Covering Location Model with Two Types of Servers. *IIE Transactions*, 41(8):730–741, 2009.
- L. A. McLay and M. E. Mayorga. Evaluating Emergency Medical Service Performance Measures. *Health Care Management Science*, 13(2):124–136, 2010.
- L. A. McLay and M. E. Mayorga. A Dispatching Model for Server-to-Customer Systems that Balances Efficiency and Equity. *Manufacturing & Service Operations Management*, 15(2):205–220, 2013a.
- L. A. McLay and M. E. Mayorga. A Model for Optimally Dispatching Ambulances to Emergency Calls with Classification Errors in Patient Priorities. *IIE Transactions*, 45(1):1–24, 2013b.
- M. Moeini, Z. Jemai, and E. Sahin. Location and Relocation Problems in the Context of the Emergency Medical Service Systems: a Case Study. *Central European Journal of Operations Research*, 23:641–658, 2014.
- R. Nair and E. Miller-Hooks. Evaluation of Relocation Strategies for Emergency Medical Service Vehicles. *Transportation Research Record*, 2137:63–73, 2009.
- J. Naoum-Sawaya and S. Elhedhli. A Stochastic Optimization Model for Real-Time Ambulance Redeployment. *Computers & Operations Research*, 40:1972–1978, 2013.
- S. H. Owen and M. S. Daskin. Strategic Facility Location: A Review. *European Journal of Operational Research*, 111:423–447, 1998.
- M. A. Pereira, E. L. F. Senne, and L. A. N. Lorena. A Decomposition Heuristic for the Maximal Covering Location Problem. *Advances in Operations Research*, 2010.
- M. Puterman. *Markov Decision Processes: Discrete Stochastic Dynamic Programming*. John Wiley & Sons, Inc., New York, NY, USA, 1st edition, 1994.
- H. K. Rajagopalan and C. Saydam. A Minimum Expected Response Model: Formulation, Heuristic Solution, and Application. *Socio-Economic Planning Sciences*, 43(4):253–262, 2009.
- H. K. Rajagopalan, C. Saydam, and J. Xiao. A Multiperiod Set Covering Location Model for Dynamic Redeployment of Ambulances. *Computers & Operations Research*, 35(3):814–826, 2008.
- J. F. Repede and J. J. Bernardo. Developing and Validating a Decision Support System for Locating Emergency Medical Vehicles in Louisville, Kentucky. *European Journal of Operational Research*, 75(3):567–581, 1994.
- C. S. ReVelle. Review, Extension and Prediction in Emergency Service Siting Models. *European Journal of Operational Research*, 40(1):58–69, 1989.
- C. S. ReVelle and K. Hogan. The Maximum Availability Location Problem. *Transportation Science*, 23:192–200, 1989.

- C. S. ReVelle and R. W. Swain. Central Facilities Location. *Geographical Analysis*, 2(1):30–42, 1970.
- D. P. Richards. *Optimised Ambulance Redeployment Strategies*. Master thesis, University of Auckland, New Zealand, 2007.
- H. Rinne. *The Weibull Distribution: a Handbook*. Taylor & Francis, 2008.
- E. S. Savas. Simulation and Cost-Effectiveness Analysis of New York's Emergency Ambulance Service. *Management Science*, 15(12):B608–B627, 1969.
- C. Saydam and M. McKnew. A Separable Approach to Expected Coverage: an Application to Ambulance Location. *Decision Sciences*, 16:381–389, 1985.
- C. Saydam, H. K. Rajagopalan, E. Sharer, and K. Lawrimore-Belanger. The Dynamic Redeployment Coverage Location Model. *Health Systems*, 2(2):103–119, 2013.
- D. A. Schilling, D. J. Elzinga, J. Cohon, R. L. Church, and C. S. ReVelle. The Team/Fleet Models for Simultaneous Facility and Equipment Siting. *Transportation Science*, 13(2):163–175, 1979.
- E. Schippers. Beantwoording kamervragen over de inzet van rapid responders en brambulances (answers to parliamentary questions regarding rapid responders and brambulances). 2014.
- V. Schmid. Solving the Dynamic Ambulance Relocation and Dispatching Problem using Approximate Dynamic Programming. *European Journal of Operational Research*, 219(3):611–621, 2012.
- V. Schmid and K. F. Doerner. Ambulance Location and Relocation Problems with Time-dependent Travel Times. *European Journal of Operational Research*, 207(3):1293–1303, 2010.
- A. Schrijver. *Combinatorial Optimization - Polyhedra and Efficiency*, volume A, chapter 17. Springer-Verlag Berlin Heidelberg, 2003.
- G. Schwarz. Estimating the Dimension of a Model. *Annals of Statistics*, 6(2):461–464, 1978.
- H. Setzler, C. Saydam, and S. Park. EMS Call Volume Predictions: A Comparative Study. *Computers & Operations Research*, 36(6):1843–1851, 2009.
- V. P. Singh. Generalized Extreme Value Distribution. In *Entropy-Based Parameter Estimation in Hydrology*, chapter 11, pages 169–183. 2010.
- P. N. Skandalakis, P. Lainas, O. Zoras, J. E. Skandalakis, and P. Mirilas. "To Afford the Wounded Speedy Assistance": Dominique Jean Larrey and Napoleon. *World Journal of Surgery*, 30(8):1392–1399, 2006.

- K. Sudtachat, M. E. Mayorga, and L. A. McLay. Recommendations for Dispatching Emergency Vehicles under Multitiered Response via Simulation. *International Transactions in Operational Research*, 21:581–617, 2014.
- K. Sudtachat, M. E. Mayorga, and L. A. McLay. A Nested-Compliance Table Policy for Emergency Medical Service Systems under Relocation. *Omega*, 58:154–168, 2016.
- C. Toregas, R. W. Swain, C. S. ReVelle, and L. Bergman. The Location of Emergency Service Facilities. *Operations Research*, 19:1363–1373, 1971.
- H. Toro-Díaz, M. E. Mayorga, S. Chanta, and L. A. McLay. Joint Location and Dispatching Decisions for Emergency Medical Services. *Computers and Industrial Engineering*, 64(4):917–928, 2013.
- H. Toro-Díaz, M. E. Mayorga, L. A. McLay, H. K. Rajagopalan, and C. Saydam. Reducing Disparities in Large-Scale Emergency Medical Service Systems. *Journal of the Operational Research Society*, 66(7):1169–1181, 2014.
- T. Valenzuela, D. Roe, S. Cretin, D. Spaite, and M. Larsen. Estimating Effectiveness of Cardiac Arrest Intervention - a logistic Regression Survival Model. *Circulation*, 96:3308–3313, 1997.
- T. C. van Barneveld. The Minimum Expected Penalty Relocation Problem for the Computation of Compliance Tables for Ambulance Vehicles. *INFORMS Journal on Computing*, 28(2):370–384, 2016.
- T. C. van Barneveld, S. Bhulai, and R. D. van der Mei. A Dynamic Ambulance Management Model for Rural Areas. *Health Care Management Science (to appear)*, 2015.
- T. C. van Barneveld, S. Bhulai, and R. D. van der Mei. The Effect of Ambulance Relocations on the Performance of Ambulance Service Providers. *European Journal of Operational Research*, 252(1):257–269, 2016a.
- T. C. van Barneveld, C. J. Jagtenberg, S. Bhulai, and R. D. van der Mei. Real-Time Ambulance Relocation: Assessing Real-Time Deployment Strategies for Ambulance Relocation. *Submitted for publication*, 2016b.
- T. C. van Barneveld, R. D. van der Mei, and S. Bhulai. Compliance Tables for an EMS system with Two Types of Medical Response Units. *Computers & Operations Research*, 80:68–81, 2017.
- M. van Buuren, C. J. Jagtenberg, T. C. van Barneveld, R. D. van der Mei, and S. Bhulai. Ambulance Dispatch Center Pilots Proactive Relocation Policies to Enhance Effectiveness. *Submitted for publication*, 2016.
- P. L. van den Berg. *Logistics of Emergency Response Vehicles: Facility Location, Routing, and Shift Scheduling*. PhD thesis, Delft University of Technology, The Netherlands, 2016.

- P. L. van den Berg and K. I. Aardal. Time-dependent MEXCLP with Start-up and Relocation Cost. *European Journal of Operational Research*, 242(2):383–389, 2015.
- P. L. van den Berg, G. J. Kommer, and B. Zuzáková. Linear Formulation for the Maximum Expected Coverage Location Model with Fractional Coverage. *Operations Research for Health Care*, 8:33–41, 2014.
- R. Waaelwijn, R. de Vos, J. Tijssen, and R. Koster. Survival Models for Out-of-Hospital Cardiopulmonary Resuscitation from the Perspectives of the Bystander, the First Responder, and the Paramedic. *Resuscitation*, 51:113–122, 2001.
- Y. H. Wang. On the Number of Successes in Independent Trials. *Statistica Sinica*, 3(2):295–312, 1993.
- B. S. Westgate, D. B. Woodard, D. S. Matteson, and S. G. Henderson. Travel Time Estimation for Ambulances using Bayesian Data Augmentation. *Annals of Applied Statistics*, 7(2):1139–1161, 2013.
- B. S. Westgate, D. B. Woodard, D. S. Matteson, and S. G. Henderson. Large-Network Travel Time Distribution Estimation for Ambulances. *European Journal of Operational Research*, 252(1):322–333, 2016.
- L. Zhang. *Simulation Optimisation and Markov Models for Dynamic Ambulance Redeployment*. PhD thesis, University of Auckland, New Zealand, 2012.

