Every few years, the city of Edmonton, Canada must review and evaluate changes to its electoral district boundaries. The review process that was completed in 2009 resulted in modifying the district plan from a six-ward system with two council members in each to a single-member 12-ward system. The authors of this paper designed the redistricting plan. This paper describes the algorithm we applied to solve the problem and the decision support system we used. The algorithm is based on a multicriteria mathematical model, which is solved by a tabu search heuristic embedded within a geographic information system (GIS)-based decision support system. The resulting district plan meets districting criteria, including population balance, contiguity, compactness, respect for natural boundaries, growth areas, and integrity of communities of interest. This plan was formally approved as a city bylaw and used in the municipal elections in 2010. The resulting work was also acknowledged with CORS 2010 Practice Prize Winner award.

Joint work with E. Erkut, D. Haight, and G. Laporte

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