Ahmed E. Al-Juaidi, 2017, Decision support system with multi-criteria, stability, and uncertainty analysis for resolving the municipal infrastructure conflict in the city of Jeddah, *Journal of King Saud University — Engineering Sciences,* to appear,
doi: https://doi.org/10.1016/j.jksues.2017.11.004.

Abstract The goal of this paper is resolve a dispute for North Jeddah Airport municipal infrastructure expansion using the Graph Model for conflict resolution. The study identifies the preferences and concerns of the main stakeholders by addressing the economical, environmental, social and public welfare. In this study, an informative Decision Support System (DSS) has been employed. This DSS incorporates multiple-criteria decision , stability , and uncertainty analyses. It provides decision through three stages (A, B and C). Stage A focuses on eliminating infeasible solution using multi-criteria method. Stage B identifies the most robust and stable solution while considering stakeholders preferences with possible actions and counteractions using stability analysis. Stage C is concerned with evaluating the strength of the solutions for an array of uncertainty using info-gap technique. Based on its simple modeling and powerful analytical features, the DSS proved to be useful in modeling and resolving municipal infrastructure disputes, determining most robust solution, and examining the effect of uncertainty.

Keywords graph model; conflict resolution; decision support systems; municipal infrastructure, multiple criteria decision analysis; Jeddah.