

# **Contractors' Bidding Behavior and Winning Mechanisms in Roadway Projects**

**Kyeong Rok Ryu, Ph.D. Student, and Kunhee Choi, Ph.D.**

Texas A&M University  
College Station, Texas

As the stakes are high and projects are frequent in the highway sector, it is likely that contractors employ bidding strategies based on information learned from previous bidding "auctions." In such a process, it is possible that major and non-major contractors differentiate their bidding strategies in accordance with their size, specialty, resource constraints, and experience. For instance, top contractors would focus more on huge-scaled projects, while placing appropriate bid amounts. Conversely, non-major, especially small or new, contractors would choose relatively small projects with lower bids, in order to be more competitive. It would be crucial to understand these bidding strategies and bidding equilibrium, in terms of provision of equal opportunity and prevention of drawbacks such as "winner's curse." However, little is known about such dynamics in highway construction projects. In an attempt to fill the gaps in the past studies, the proposed research aims to investigate contractors' bidding behavior in highway projects and, consequently, to develop a quantitative model for their winning bidding mechanisms. More specifically, bidding equilibrium between major and non-major contractors will be the key focal point in the study. The research frameworks will be developed based on the auction or game theory. As behavior should be examined over time, time series or other equivalent modeling will be employed for the research methods. Project size, types, and contracting methods are likely to have influence on the bids. Therefore, the research will analyze the impacts of bidding behavior by each categorized project. Besides those internal factors, the quantitative model will also include external factors such as GDP, interest rates, unemployment rates, and so on. The developed quantitative models are expected to represent contractors' bidding behavior and their winning strategies by categorized project size, type, and contracting methods. Moreover, comparison between major and non-major contractors will provide a theoretical basis for the bidding equilibrium between them in a quantitative way. The findings and developed model in the study will assist agencies as well as contractors in the highway sector to make better-informed decisions when budgeting and bidding.

**Key Words:** Bidding, Auction Theory, Time Series, Contractors, Roadway