# 상수도 관리를 위한 의사결정시스템 개발

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There are two kinds of approaches for prediction of water main condition: first-principle and statistical approaches. The first-principle approach constructs a mechanistic model to describe the physical mechanism leading to pipe breakage. It evalautes pipe failure due to the stesse applied on pipe under various conditions. Failure prediction of water main using this model is limited due the model complexity and expensive data requirement for reliable parameter estimation. On the other hand, statistical methods utilize historical data including recorded historical failure and enviromental factors and relates these to estimate pipe condition. While these models are easy to apply, obtaining such data sets is time-consuming for constructing reliable model. Hence, it is necessary to select a relevant set of variables before collecting data and determining a model structure. Towards this, this study first proposes a scoring scheme to rank the ease of data acquisition for each variable. Furthermore, robustness of existing statistical models for pipe condition assessment is examined using global sensitivity analysis and Monte-Carlo simulations. Incorporating these two schemes will aid in selecting the most sensitive factors in constructing statistical empirical model.