

PREDICTION OF URBAN AIR QUALITY BY USING VISIBILITY AS AN INDICATOR IN SOUTHERN TAIWAN

H.Y. Yang¹, C.S. Yuan²

¹*Department of Civil Engineering, China Institute of Technology, Taipei, Taiwan*

²*Institute of Environmental Engineering, National Sun Yet-Sen University, Kaohsiung, Taiwan*

This paper focused on the description and improvement of urban air quality using visibility as an indicator. Field observation of visibility were consecutively conducted to investigate the influence of pollution sources and meteorological factors on urban air quality, which can be applied to determine the control strategies for the improvement of urban air quality in Kaohsiung city. The results from regular observation of visibility from November 1998 to April 2000 indicated that most frequently observed visibility range from 2 to 8 kilometers. Approximately 79.3% of these days are with visibility less than 8 kilometers, which observed mainly during in the wintertime. However, intensive observation of visibility and measurement of scattering coefficient from January 8-16 to March 24-30 2000 indicated that atmospheric visibility had an opposite correlation with scattering coefficient for relative humidity less than 70%. The field measured scattering coefficients during two separate intensive sampling periods were 0.0928-0.5744/km and 0.0852-0.6727/km, respectively. Visibility predicted by climate-persistence (CLIPER), analog, and multiple regression models. The results from models prediction indicated that the percentage for the difference between predicted and observed visibility within 1.5 kilometers was higher than 60%. Moreover, daily observation data indicated that the worst visibility occurred in early morning at 6:00am and the best visibility occurred in the late afternoon at 1:00pm. In addition, seasonal variation of visibility indicated that the best and the worst visibility seasons were summertime and wintertime in Kaohsiung city. This study concluded that visibility might be used as indicator of ambient quality.