With respect to average NO_2, the Bureau of Mines study indicates that hydrocarbon reductions would tend to increase NO_2 dosage. This result is consistent with the theoretical argument of Stephens (1973) who hypothesized that hydrocarbon reduction would increase average NO_2 because these reductions would delay and suppress the chemical reactions that consume NO_2 after it reaches a peak. However, the General Motors chamber study and the two HEW studies indicate that hydrocarbons produce no consistent effects on average NO_2 concentrations. The UNC experiments imply that a 50% reduction in hydrocarbons produces about a 20% decrease in average NO_2. There is some question about the UNC conclusion, however, because the UNC chamber runs were of a 10-hour duration and the NO_2 levels at the end of the experiments were greater when hydrocarbons were reduced. The extra NO_2 remaining after the 10-hour period could cause an increase in 24-hour average NO_2, even though average NO_2 was reduced during the first 10 hours.

Considering the results of all the chamber studies, Trijonis suggested a consensus based on existing chamber results which would appear to be as follows: 50% hydrocarbon reduction would have little effect on average NO_2 concentrations (a change of $\pm$ 10%) but would yield moderate decreases in maximal NO_2 (a reduction of about 10 to 20%). It should be noted that these conclusions are meant to apply to one basic type of ambient situation--the situation of well-mixed urban air.

Some additional support for these conclusions was provided recently by studies of actual ambient data on NO_x and hydrocarbon levels from a number of cities in the U.S. Using empirical modeling and historical trend analysis, Trijonis (1978a, 1978b) concluded that the ambient data were generally consistent with the consensus of chamber results. The exact form of the NO_2/precursor relationship, however, was found to vary somewhat from one location to another, presumably depending on local hydrocarbon/NO_x ratios, on the details of the hydrocarbon mix, and on specific meteorological conditions.

Reference is made also to another body of data due to Pitts et al. (1977) (collected for a different purpose) which also contains potential information on the relationship between NO_x and its precursors. However, the data have not been analyzed to date for its pertinence to the NO_x/precursor question.