northwest, also contribute to the problems in Hartford, Providence and Boston. Connecticut, Rhode Island, western Massachusetts, Vermont, and central and southern New Hampshire also contribute to the Boston problem, by virtue of lying to the southwest, west or northwest of Boston. By virtue of lying to the southwest of Portsmouth, New Hampshire, the states of Connecticut, Rhode Island, and Massachusetts contribute to Portsmouth's nonattainment problem. Western and northern New York State, Vermont, and central and southern New Hampshire lie to the west and northwest of the Portsmouth nonattainment area, and thus also contribute to the Portsmouth problem. The Boston area, as well as New Hampshire, Vermont, and New York State, lie to the southwest or west of Maine. and thus contribute to nonattainment and maintenance problems in Maine.

Recently, and too late for inclusion in the rationale of the SNPRM, three additional studies have become available, described below. These new studies confirm the conclusions indicated by the previous studies.

EPA has completed a modeling analysis for the OTC to examine the potential impacts of region-wide NO_Xoriented control strategies in portions of the eastern United States.12 The pertinent purposes of this analysis were (1) to identify whether a set of alternative regional controls would reduce ozone transport into and along the Northeast "Urban Corridor" to below 120 ppb, and (2) to examine the incremental benefits, in term of ozone reductions in the Corridor, from the application of control strategies within the Corridor only and within the entire OTR. For this analysis, the "Urban Corridor" is defined as the contiguous serious and severe ozone nonattainment areas extending from Washington, DC, through Baltimore, Philadelphia, New York City, and New England to southern New Hampshire.

For the analysis EPA used ROM (see 59 FR at 48674), a photochemical grid model covering the eastern half of the United States and southeastern Canada. Model simulations were performed for two meteorological episodes: July 1–15, 1988 and July 13–21, 1991. The July 1988 period was a severe and widespread ozone episode in most sections of the modeling domain. During the July 1991 period, high ozone concentrations were limited to the Midwest and Northeast. Meteorological weather patterns were quite favorable for large-scale ozone and precursor transport into and along the Urban Corridor during both episodes.

EPA modelled several scenarios simulating very significant emission reductions (on the order of 35-40% for NO_X and VOC) in the OTR. These scenarios included, among others, reductions from combinations of measures, including the Clean Air Actmandated control programs, a 0.15 lb/ MMBtu NO_X limit, an additional "corridor control package," and LEV. None of these emission reduction combinations was sufficient to reduce ozone levels to below 0.12 ppm throughout the region. Specifically, even with the most effective combination of measures, several areas, including the New York City area and parts of New England, were not in attainment by the year 2005. Specifically in New England, even the most effective combination of these measures did not result in attainment in the Boston area and parts of Connecticut and Rhode Island by the year 2005. Because emissions are lower in 2005 than in 1999 (the attainment year for serious areas in the OTR), it is a reasonable extrapolation from this data that an even greater nonattainment problem remained in 1999, and that a maintenance problem in these areas is to be expected. This provides additional support to EPA's conclusions from the SNPRM that very large emission reductions will be required throughout the OTR to bring all areas into attainment.

EPA also used ROM to examine the impact on air quality of a region-wide OTC LEV program applied in addition to a Clean Air Act 2005 base case scenario and a 0.15 lb/MMBtu NO_X program in the OTR. Given that, due to fleet turnover, reductions from the OTC LEV program would be only partially achieved by 2005, EPA's ROM analysis found the incremental improvements in ozone levels due to application of the OTC LEV program (reductions of 3-6 ppb in daily maximum ozone levels) to be relatively large. EPA found this incremental improvement from OTC LEV most evident when the LEV results are compared with the results of simulating the impact of a "corridor control strategy" that would result in similar emission reductions.

A further discussion of this recent model analysis is included in the response-to-comments documents.

New York State reached conclusions that support the studies described above, after applying the Urban Airshed Model (UAMIV) to the modeling domain being used in the New York and

Connecticut ozone attainment demonstrations.13 These studies utilized the CALMET procedure for generating meteorological inputs to UAM. Consequently, resulting wind fields and mixing heights differed from those used in the ROM analyses and in earlier UAM studies conducted by the same investigators. New York State's most recent UAM study shows that it would be impossible to demonstrate attainment unless large reductions in regional ozone transported into the domain were realized. In this UAM study, it is shown that a local strategy reflecting 75% reduction in VOC and 25% reduction in NO_x combined with an upwind regional strategy reflecting 75% reduction in NO_x and 25% reduction in VOC would be necessary to attain the NAAQS throughout the New York UAM domain. These results add credence to the ROM matrix findings and results from ROM simulations performed for the OTC, which came to similar conclusions.

In the New York UAM analysis, both large VOC and large NO_X reductions were effective in reducing peak ozone concentrations, with the VOC controls being somewhat more so. However, predicted reductions in ozone were more extensive over a larger area when NO_X was reduced by large amounts. This latter finding with the UAM is consistent with ROM analyses that suggest that large NO_x reductions will be needed to reduce regional transport to at or below 120 ppb of ozone. As noted above, the New York UAM analyses to date are consistent in predicting that large reductions to incoming regional ozone (through control of ozone precursors) will be needed to demonstrate attainment further downwind with the UAM.

The New York UAM analysis uses more refined, localized meteorological estimates (CALMET), instead of coarser ROM meteorology, as well as the updated interim regional inventory, rather than 1985 National Acid Precipitation Assessment Program emissions. This study is close to what New York is expected to use for its attainment demonstration and rate-ofprogress SIPs; thus, the study is particularly helpful.

Finally, EPA performed studies designed to determine the extent to which improved air quality in recent years is due to meteorological fluctuations compared to reduced VOC

¹² See "Summary of EPA Regional Oxidant Model Analyses of Various Regional Ozone Control Strategies", November 28, 1994.

¹³ See Kuruvilla, John et. al., "Modeling Analyses of the Ozone Problem in the Northeast", prepared for U.S. EPA, CA No. X819328–01–0, EPA document no. EPA–230–R–94–108, 1994.