Trading Ratios: Salt Lake City PM$_{2.5}$ Maintenance Plan

The Utah Division of Air Quality performed an air quality model (CAMx 6.30) analysis to estimate 24-hr PM$_{2.5}$ concentrations given reductions in on-road mobile NOx, VOCs, and direct PM$_{2.5}$ emissions. Reductions in on-road mobile emissions didn't include refueling or re-suspended road dust.

Three different simulations were conducted using the 2035 Salt Lake City nonattainment area (SLC NAA) emissions inventory (EI). Each modeled simulation involved taking a 1 ton/day reduction in one of three on-road mobile EI pollutants: NOx, VOC, and direct PM$_{2.5}$. Resultant reductions in modeled PM$_{2.5}$ were evaluated at the Rose Park FRM monitor, which is the monitor that consistently measures the highest value in the SLC NAA. Reductions were evaluated for the modeled episode day with the largest 24-hour PM$_{2.5}$ concentrations at the Rose Park monitor. The reduction in modeled 24-hour PM$_{2.5}$, given a 1 ton/day reduction in a specific on-road mobile EI pollutant, is shown in Table 1:

EI Pollutant	Modeled PM$_{2.5}$ Reduction (μg/m^3)*
NOx	0.152
VOC	0.046
Direct PM$_{2.5}$	0.955

Table 1: Relative contributions of NOx, VOC, and direct PM$_{2.5}$ emission (1 ton/day) reductions to modeled PM2.5 concentrations at SLC NAA monitors.
*These numbers have been rounded. The ratios were calculated using number that were not rounded

To establish the MVEB ratios, simple division was applied between the model sensitivity results.

NOx : PM2.5 trading ratio = 0.955 / 0.152 = 6.3

VOC : PM2.5 trading ratio = 0.955 / 0.046 = 20.9

Future increases in on-road direct PM$_{2.5}$ emissions may be offset with future decreases in NO$_x$ emissions from on-road mobile sources at a NO$_x$ to PM$_{2.5}$ ratio of 6.3 to 1 and/or future decreases in VOC emissions from on-road mobile sources at a VOC to PM$_{2.5}$ ratio of 20.9 to 1.