

APPENDIX G: AIR QUALITY ANALYSIS

I. Background

In accordance with the 1990 Clean Air Act – Section 176(c)(4), all transportation plans, programs and projects are required to conform to regulatory mobile source emissions budgets for transportation related pollutants in nonattainment and maintenance areas. From the late 1970s, five counties in the Kansas City metropolitan area — Johnson and Wyandotte in Kansas, and Clay, Jackson and Platte in Missouri — were designated nonattainment under the one-hour standard for the ground-level ozone. In 1992, the U.S. Environmental Protection Agency (EPA) redesignated the region a maintenance area, reflecting that the region had met the one-hour standard.

In May 2005, the EPA redesignated the Kansas City metropolitan area an attainment area under a new eight-hour ozone standard, indicating that the region complies with federal clean air standards. The following month, EPA revoked the one-hour ozone standard. As an eight-hour ozone attainment area, the region is required to develop state implementation plans (SIPs), also known as maintenance plans. The SIP is a document that contains legally enforceable strategies the region will employ to stay in compliance with the eight-hour ozone standard. While the region is required to develop and implement SIPs for the eight-hour ozone standard, there is no requirement that the region continue to conform its transportation plans to mobile-source emissions budgets in the SIPs. However, the region hovers close to the standard, and the threat of future violations is high. In light of this, MARC has committed to continuing to produce an air quality analysis.

The metropolitan and statewide planning regulations that govern MARC's long-range transportation plan (*Transportation Outlook 2040*) and Transportation Improvement Program (TIP) require the projects in both documents, for the time periods they cover, to be financially constrained and sufficient in project detail for regionally significant road projects and fixed-guideway transit projects, to permit an air quality analysis. Projects for both *Transportation Outlook 2040* and the TIP are analyzed as a group to determine that their projected air quality impacts are lower than a budgeted amount to ensure that the region's air quality is not adversely affected by mobile-source pollutants.

II. Methodology

MARC uses a process of estimating future year vehicle emissions based on forecast vehicle use, and then comparing these estimates with SIP vehicle emissions budgets to conduct the air quality analysis. Forecast vehicle use is based on the level and distribution of population and employment, income and the anticipated transportation network — primarily roads and transit.

The MARC regional travel-demand model is used to estimate the number and type, distribution, mode and routing of trips on an average work day in the region. Vehicle miles traveled (VMT) are then estimated from this simulated average travel day, as are average daily speeds for all segments of functionally classified roadways comprising the regional network of roads.

The EPA emissions model, MOBILE6, is used to generate factors that estimate grams of volatile organic compounds (VOC) and nitrogen oxides (NOx) — ozone-causing pollutants. These emission "factors" are then applied to the regional network model, and the results aggregated to estimate daily vehicle emissions of VOCs and NOx in kilograms for an average summer day. The analysis assumes 7.0 RVPgasoline as being in place in the region during the ozone season, and also includes implementation

of the national NLEV program and 2004 Heavy-Duty Diesel standard. The emissions factors also account for the Tier 2 Gasoline Sulfur Control requirements.

Figure G-1 reflects the estimated VOC and NOx emissions for the horizon year 2040 using year 2040 forecast land use. The analysis includes all fiscally constrained capacity and regionally significant projects contained in the 2010–2014 TIP and the *Draft Transportation Outlook 2040*, the region’s long-range transportation plan, and compares them with their respective budgets from the SIP.

Figure G-1: Transportation Outlook 2040 Air Quality Analysis using MOBILE6 and Existing Budgets

	2040 Forecast
Seasonally Adjusted VMT (miles)	78,437,168
VOC Budget (kg)	49,623
Estimated mobile VOC emissions (kg)	27,924
VOC Margin (kg)	21,699
NOx Budget (kg)	88,722
Estimated mobile NOx emissions (kg)	26,826
NOx Margin (kg)	61,897

III. Conclusion

The air quality analysis clearly indicates that regional mobile source emissions of VOC and NOx remain below the budgeted level in the regional SIP while accounting for the roadway capacity projects listed in the 2010–2014 TIP and *Transportation Outlook 2040* as being operational by the year 2040.