

APPENDIX D
AIR QUALITY

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Air Quality Additional Information – Within the Study Area

The air quality analysis performed for assessing effects from alternatives 1 and 2 examined the local (project level) vehicle emissions of carbon monoxide (CO). Other pollutants, such as particulate matter and oxides of nitrogen are also components of vehicular emissions; however, carbon monoxide is the primary pollutant of the vehicular emissions and is the only pollutant for which the Environmental Protection Agency (EPA) has developed guidelines for evaluating effects. Ozone, nitrogen oxides, and hydrocarbons are pollutants that are regional in nature, and as such, meaningful evaluation at the project level is not possible. The EPA is currently developing procedures for analyzing micro-scale particulate pollution effects, but guidance is not available at this time. Until the EPA provides guidelines for the analysis for particulate matter, the analysis will concentrate on the local impact of carbon monoxide emissions.

CONFORMITY

Since 1977 Federal agencies and Metropolitan Planning Organizations have been required by Section 176c of the Clean Air Act to ensure that all transportation projects conform with the approved air quality State Implementation Plan (SIP). The Clean Air Act Amendments enacted in 1990 defined conformity to a SIP as meaning “conformity to a SIP’s purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards (NAAQS)” (Federal Register, November 30, 1993). The conformity determinations for Federal actions related to transportation projects must meet the requirements of 40 CFR Parts 51 and 93. The portion of this project between Dysart Road and SR303 is included within the MAG FY2007-2011 Transportation Improvement Program approved August 2006, which conforms to the SIP and is therefore in conformity. The remaining portion is not yet included the TIP.

STANDARDS

National Ambient Air Quality Standards (NAAQS) were first established in 1970 under the Federal Clean Air Act (CAA). Six pollutants, referred to as the “Criteria Pollutants,” were placed under regulation and limits placed on acceptable ambient concentrations. Two Federal Standards exist for most of the Criteria Pollutants. The primary standard defines levels deemed “... necessary, with an adequate margin of safety, to protect the public health.” The secondary standard defines levels “... necessary to protect the public welfare ...” (40 CFR Part 50). The promulgation of these standards, however, does not prohibit any State from establishing air quality standards that are more stringent. The Federal Standards are also subject to periodic review and revision as deemed necessary by the Administrator of the EPA. Since the NAAQS

were first established, revisions have been made to the NAAQS that modify which pollutants are regulated, the allowable ambient concentrations and the time interval over which the pollutant is measured. Recently the EPA revised the NAAQS for particulate matter by revoking the annual PM_{10} standard and lowering the 24-hour $PM_{2.5}$ standard. The revisions to the NAAQS for PM_{10} and $PM_{2.5}$ became effective December 18, 2006 (FR October 17, 2006). Currently the Criteria Pollutants include CO, nitrogen dioxide, ozone, particulate matter (PM_{10} and $PM_{2.5}$), sulfur dioxide, and lead. The NAAQS for the criteria pollutants are presented in the table below.

CO is a colorless, odorless gas that primarily affects the cardiovascular system; vehicular emissions are a source. nitrogen dioxide is a gas with a yellowish-orange to reddish-brown appearance, depending upon its concentration, which impairs the respiratory system; sources are power plants and vehicular emissions. ozone is created through a complex reaction of hydrocarbons and oxides of nitrogen with sunlight as the primary catalyst; ozone affects the respiratory system. Sources of the ozone precursors include vehicle emissions, power plants, and service stations. Particulate matter refers to small aerosols that are suspended in the atmosphere and might cause irritation and damage to the respiratory system; vehicular emissions and the resuspension of road dust by vehicular activity are sources. PM_{10} refers to particulate matter with aerodynamic diameters less than 10 micron; $PM_{2.5}$ refers to particles with diameters less than 2.5 micron. Sulfur dioxide is a colorless gas generated by the combustion of sulfur-containing fuels, primarily affecting the respiratory system; sources are power plants and other industrial facilities that burn sulfur-containing fuels Lead and its compounds damage the cardiovascular, renal, and nervous systems. Ambient levels have significantly been reduced since the removal of lead from fuel.

National Ambient Air Quality Standards

Pollutant	Averaging Time	Primary ug/m ³ (ppm)	Secondary ug/m ³ (ppm)
Carbon Monoxide	1-hour	40 (35) ^a	* ^b
	8-hour	10 (9)	*
Nitrogen Dioxide	Annual	100 (0.05)	100 (0.05)
Ozone	1-hour ^c	(0.12)	(0.12)
	7-hour	(0.08)	(0.08)
PM ₁₀	24-hour	150	150
	Annual ^d	50	50
PM _{2.5}	24-hour	65	65
		35 ^e	35 ^e
	Annual	15	15
Sulfur Dioxide	3-hour	*	1,300 (0.5)
	24-hour	365 (0.14)	*
	Annual	80 (0.03)	*
Lead	Calendar Quarter	1.5	1.5

SOURCE: 40 CFR Part 50

NOTES:

^a mg/m³ (ppm)

^b No Standard

^c 1-hour standard revoked in AZ June 15, 2005

^d Annual standard revoked effective December 18, 2006

^e New 24-hour standard effective December 18, 2006

**Table D-1
Travel Characteristics**

	YEAR					
	2006			2030		
	Northern Parkway	Arterials	Total	Northern Parkway	Arterials	Total
Estimated Annual Average Daily Traffic (Vehicles per Day)						
Portion						
SR303L to Sarival Road	6578 <u>NA</u> NA	25966 <u>NA</u> NA	32544 <u>NA</u> NA	13253 <u>74300</u> 81500	31718 <u>42000</u> 40200	44972 <u>116300</u> 121700
Sarival Road to Reems Road	5813 <u>NA</u> NA	9026 <u>NA</u> NA	14839 <u>NA</u> NA	9867 <u>87500</u> 94100	22308 <u>32500</u> 32700	32175 <u>120000</u> 126800
Reems Road to Litchfield Road	9625 <u>NA</u> NA	31918 <u>NA</u> NA	41543 <u>NA</u> NA	14313 <u>97700</u> 103900	60328 <u>57700</u> 60500	74641 <u>155400</u> 164400
Litchfield Road to Dysart Road	7846 <u>NA</u> NA	29750 <u>NA</u> NA	37596 <u>NA</u> NA	12979 <u>100300</u> 113000	95424 <u>81700</u> 78100	108403 <u>182000</u> 191100
Dysart Road to El Mirage Road	10171 <u>NA</u> NA	24732 <u>NA</u> NA	34903 <u>NA</u> NA	12751 <u>96900</u> 121500	67018 <u>62300</u> 64900	79769 <u>159200</u> 186400
El Mirage Road to 111 th Avenue	11089 <u>NA</u> NA	NA <u>NA</u> NA	11089 <u>NA</u> NA	17653 <u>96100</u> 131200	12618 <u>8600</u> 2000	30271 <u>104700</u> 133200
111 th Avenue to 107 th Avenue	12646 <u>NA</u> NA	8286 <u>NA</u> NA	20932 <u>NA</u> NA	24620 <u>89200</u> 130800	16252 <u>30200</u> 10300	40872 <u>119400</u> 141100
107 th Avenue to 103 ^{Road} Avenue	18189 <u>NA</u> NA	6250 <u>NA</u> NA	24439 <u>NA</u> NA	24807 <u>93600</u> 127100	52168 <u>46300</u> 31000	76975 <u>139900</u> 158100
103 ^{Road} Avenue to 99 ^h Avenue	18189 <u>NA</u> NA	5224 <u>NA</u> NA	23413 <u>NA</u> NA	41330 <u>133400</u> 167600	70628 <u>61200</u> 46000	111958 <u>194600</u> 213600
99 th Avenue to SR101L	18818 <u>NA</u> NA	142000 <u>NA</u> NA	160818 <u>NA</u> NA	41162 <u>141100</u> 152400	185838 <u>356800</u> 359700	227000 <u>497900</u> 512100

	YEAR					
	2006			2030		
	Northern Parkway	Arterials	Total	Northern Parkway	Arterials	Total
SR101L to 91 st Avenue	23160 <u>NA</u> NA	19342 <u>NA</u> NA	42502 <u>NA</u> NA	32362 <u>99300</u> 137100	72814 <u>65500</u> 66800	105176 <u>164800</u> 203900
91 st Avenue to 83 ^{Road} Avenue	16252 <u>NA</u> NA	22212 <u>NA</u> NA	38464 <u>NA</u> NA	29527 <u>89400</u> 121600	63806 <u>64500</u> 66400	93333 <u>153900</u> 188000
83 ^{Road} Avenue to 75 th Avenue	12733 <u>NA</u> NA	33394 <u>NA</u> NA	46127 <u>NA</u> NA	30640 <u>73200</u> 110200	63910 <u>69700</u> 69300	94550 <u>142900</u> 179500
75 th Avenue to 67 th Avenue	22100 <u>NA</u> NA	82800 <u>NA</u> NA	104900 <u>NA</u> NA	34473 <u>65600</u> 106600	180258 <u>220600</u> 218000	214731 <u>286200</u> 324600
Estimated Daily Vehicle Miles of Travel (VMT per Day)						
Alternate						
No-Build	148641	213931	362572	253463	497538	751001
Build-OP1	NA	NA	NA	1072563	599800	1672363
Build-OP2	NA	NA	NA	1346428	572950	1919378

SOURCE: URS Corporation 2006

NOTES: No-Build Conditions

Build Conditions – Option 1

Build Conditions – Option 2