APPENDIX D

AIR QUALITY

Appendix D
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/m^3 (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 NA **NA**	25966 NA **NA**	32544 NA **NA**	13253 74300 **81500**	31718 42000 **40200**	44972 116300 **121700**
Sarival Road to Reems Road	5813 NA **NA**	9026 NA **NA**	14839 NA **NA**	9867 87500 **94100**	22308 32500 **32700**	32175 120000 **126800**
Reems Road to Litchfield Road	9625 NA **NA**	31918 NA **NA**	41543 NA **NA**	14313 97700 **103900**	60328 57700 **60500**	74641 155400 **164400**
Litchfield Road to Dysart Road	7846 NA **NA**	29750 NA **NA**	37596 NA **NA**	12979 100300 **113000**	95424 81700 **78100**	108403 182000 **191100**
Dysart Road to El Mirage Road	10171 NA **NA**	24732 NA **NA**	34903 NA **NA**	12751 96900 **121500**	67018 62300 **64900**	79769 159200 **186400**
El Mirage Road to 111th Avenue	11089 NA **NA**	NA NA **NA**	11089 NA **NA**	17653 96100 **131200**	12618 8600 **2000**	30271 104700 **133200**
111th Avenue to 107th Avenue	12646 NA **NA**	8286 NA **NA**	20932 NA **NA**	24620 89200 **130800**	16252 30200 **10300**	40872 119400 **141100**
107th Avenue to 103Road Avenue	18189 NA **NA**	6250 NA **NA**	24439 NA **NA**	24807 93600 **127100**	52168 46300 **31000**	76975 139900 **158100**
103Road Avenue to 99h Avenue	18189 NA **NA**	5224 NA **NA**	23413 NA **NA**	41330 133400 **167600**	70628 61200 **46000**	111958 194600 **213600**
99th Avenue to SR101L	18818 NA **NA**	142000 NA **NA**	160818 NA **NA**	41162 141100 **152400**	185838 356800 **359700**	227000 497900 **512100**

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

SOURCE: URS Corporation 2006

NOTES: No-Build Conditions
Build Conditions – Option 1
Build Conditions – Option 2