

# Health Risk and Exposure Assessment for Ozone

**Final Report** 

**Chapters 7-9 Appendices** 

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# Health Risk and Exposure Assessment for Ozone Final Report Chapters 7-9 Appendices

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This final document has been prepared by staff from the Risk and Benefits Group, Health and Environmental Impacts Division, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency. Any findings and conclusions are those of the authors and do not necessarily reflect the views of the Agency.

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# **APPENDIX 7A**

# Detailed Information on Effect Estimates, Baseline Incidence and Demographic Data Used in the Epidemiological-Based Risk Assessment

This Appendix contains one table (Table 7A-1) summarizing the effect estimates, baseline incidence, and population data used for the epidemiological-based risk assessment. References are included immediately following the table.

						Stu	ıdy informatio	n (C-R functio			Baseline in	cidence <sup>b</sup>	Popul	lation	
Endpoint	Study	Urban study area	Study area template	Air metric	Risk assessment modeling period	Age range	Lag	Additional study details	Statistical Model	Effect estimate (Beta)	SE (effect estimate) <sup>a</sup>	2007	2009	2007	2009
Core Risk - short-term	exposure-relation	ted all-cause mo	ortality	<u>.</u>							, ,				
Mortality, Non- Accidental	Smith et al., 2009	Atlanta, GA	CBSA	D8HourMax	March- October	0-99	distributed lag 0-6 d	-	log-linear	0.0002411	0.0002919	19,995	20,442	5,033,453	5,205,933
Mortality, Non- Accidental	Smith et al., 2009	Baltimore, MD	CBSA	D8HourMax	April- October	0-99	distributed lag 0-6 d	-	log-linear	0.0004192	0.00033	11,703	11,598	2,664,335	2,692,803
Mortality, Non- Accidental	Smith et al., 2009	Boston, MA	CBSA	D8HourMax	April- September	0-99	distributed lag 0-6 d	-	log-linear	0.0002807	0.0003429	16,688	16,436	4,439,453	4,519,143
Mortality, Non- Accidental	Smith et al., 2009	Cleveland, OH	CBSA	D8HourMax	April- October	0-99	distributed lag 0-6 d	-	log-linear	0.0005654	0.0003149	10,964	10,692	2,093,376	2,082,741
Mortality, Non- Accidental	Smith et al., 2009	Denver, CO	CBSA	D8HourMax	March- September	0-99	distributed lag 0-6 d	-	log-linear	0.0001657	0.0003565	6,750	6,856	2,408,986	2,498,144
Mortality, Non- Accidental	Smith et al., 2009	Detroit, MI	CBSA	D8HourMax	April- September	0-99	distributed lag 0-6 d	-	log-linear	0.0006432	0.0003117	17,169	16,815	4,381,785	4,316,185
Mortality, Non- Accidental	Smith et al., 2009	Houston, TX	CBSA	D8HourMax	January- December	0-99	distributed lag 0-6 d	-	log-linear	0.0004999	0.0002075	30,191	30,927	5,539,894	5,823,529
Mortality, Non- Accidental	Smith et al., 2009	Los Angeles, CA	CBSA	D8HourMax	January- December	0-99	distributed lag 0-6 d	-	log-linear	0.0002179	0.0001571	72,824	72,935	12,615,165	12,756,237
Mortality, Non- Accidental	Smith et al., 2009	New York, NY	CBSA	D8HourMax	April- October	0-99	distributed lag 0-6 d	-	log-linear	0.0010114	0.0002074	78,036	76,645	18,554,574	18,779,754
Mortality, Non- Accidental	Smith et al., 2009	Philadelphia, PA	CBSA	D8HourMax	April- October	0-99	distributed lag 0-6 d	-	log-linear	0.000714	0.0002846	28,177	27,658	5,876,683	5,936,034
Mortality, Non- Accidental	Smith et al., 2009	Sacramento, CA	CBSA	D8HourMax	January- December	0-99	distributed lag 0-6 d	-	log-linear	0.0003016	0.0003145	13,198	13,361	2,077,487	2,127,784
Mortality, Non- Accidental	Smith et al., 2009	St. Louis, MO	CBSA	D8HourMax	April- October	0-99	distributed lag 0-6 d	-	log-linear	0.0005401	0.0003428	13,944	13,686	2,779,558	2,803,333
Core Risk - long-term	exposure-relate	ed respiratory m	ortality												
Mortality, Respiratory	Jerrett et al., 2009	Atlanta, GA	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	-	log-linear	0.0039221	0.0013249	3,133	3,216	2,833,399	2,954,650
Mortality, Respiratory	Jerrett et al., 2009	Baltimore, MD	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	-	log-linear	0.0039221	0.0013249	2,056	2,034	1,587,538	1,609,957
Mortality, Respiratory	Jerrett et al., 2009	Boston, MA	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	-	log-linear	0.0039221	0.0013249	3,685	3,622	2,690,981	2,747,634

# Table 7A-1. Detailed Information on Effect Estimates, Baseline Incidence and Demographic Data Used in the Epidemiological-Based Risk Assessment.

						Stu	ıdy informatio			Baseline in	cidence <sup>b</sup>	Popul	lation		
Endpoint	Study	Urban study area	Study area template	Air metric	Risk assessment modeling period	Age range	Lag	Additional study details	Statistical Model	Effect estimate (Beta)	SE (effect estimate) <sup>a</sup>	2007	2009	2007	2009
Mortality, Respiratory	Jerrett et al., 2009	Cleveland, OH	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	-	log-linear	0.0039221	0.0013249	1,833	1,783	1,294,458	1,294,845
Mortality, Respiratory	Jerrett et al., 2009	Denver, CO	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	-	log-linear	0.0039221	0.0013249	1,549	1,574	1,396,514	1,454,586
Mortality, Respiratory	Jerrett et al., 2009	Detroit, MI	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	-	log-linear	0.0039221	0.0013249	3,230	3,153	2,636,935	2,628,339
Mortality, Respiratory	Jerrett et al., 2009	Houston, TX	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	-	log-linear	0.0039221	0.0013249	2,790	2,859	3,001,537	3,165,283
Mortality, Respiratory	Jerrett et al., 2009	Los Angeles, CA	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	-	log-linear	0.0039221	0.0013249	7,480	7,512	7,072,418	7,236,439
Mortality, Respiratory	Jerrett et al., 2009	New York, NY	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	-	log-linear	0.0039221	0.0013249	12,304	12,067	11,118,315	11,303,888
Mortality, Respiratory	Jerrett et al., 2009	Philadelphia, PA	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	-	log-linear	0.0039221	0.0013249	4,993	4,891	3,488,101	3,545,106
Mortality, Respiratory	Jerrett et al., 2009	Sacramento, CA	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	-	log-linear	0.0039221	0.0013249	1,669	1,690	1,185,990	1,221,735
Mortality, Respiratory	Jerrett et al., 2009	St. Louis, MO	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	-	log-linear	0.0039221	0.0013249	2,535	2,485	1,649,209	1,676,509
Core Risk - short-tern	n exposure-rela	ted morbidity	•						•						
HA, All Respiratory	Katsouyanni et al., 2009	Detroit, MI	CBSA	D1HourMax	June- August	65-99	average of lag 0 and lag 1	penalized splines	log-linear	0.00056	0.000352	6,538	6,694	539,077	557,511
HA, All Respiratory	Katsouyanni et al., 2009	Detroit, MI	CBSA	D1HourMax	June- August	65-99	average of lag 0 and lag 1	natural splines	log-linear	0.00054	0.0003571	6,538	6,694	539,077	557,511
HA, Asthma	Silverman and Ito, 2010	New York, NY	CBSA	D8HourMax	April- October	6-18	average of lag 0 and lag 1	-	log-linear	0.007907	0.0037862	1,697	1,683	3,197,360	3,173,355
HA, Asthma	Silverman and Ito, 2010	New York, NY	CBSA	D8HourMax	April- October	6-18	average of lag 0 and lag 1	PM2.5	log-linear	0.0055553	0.0036926	1,697	1,683	3,197,360	3,173,355
HA, Chronic Lung Disease	Lin et al. (a), 2008	New York, NY	CBSA	D1HourMax	April- October	0-17	Lag 2 d	-	log-linear	0.0007609	0.000163	4,340	4,300	4,388,434	4,344,448
HA, All Respiratory	Linn et al., 2000	Los Angeles, CA	CBSA	D24HourMean	June- August	30-99	Lag Od	-	log-linear	0.0006	0.0007	19,320	20,259	7,072,418	7,236,439

						Stu	ıdy informatio		Baseline in	cidence⁵	Popul	lation			
Endpoint	Study	Urban study	Study area template	Air metric	Risk assessment modeling period	Age	lag	Additional study details	Statistical Model	Effect estimate (Beta)	SE (effect	2007	2009	2007	2009
HA, Chronic Lung Disease (less Asthma)	Medina- Ramon et al, 2006	Atlanta, GA	CBSA	D8HourMean	June- August	65-99	distributed lag 0-1 d	-	logistic	0.00054	0.000199	2,160	2,358	412,999	453,851
HA, Chronic Lung Disease (less Asthma)	Medina- Ramon et al, 2006	Baltimore, MD	CBSA	D8HourMean	June- August	65-99	distributed lag 0-1 d	-	logistic	0.00054	0.000199	1,540	1,593	320,763	334,599
HA, Chronic Lung Disease (less Asthma)	Medina- Ramon et al, 2006	Boston, MA	CBSA	D8HourMean	June- August	65-99	distributed lag 0-1 d	-	logistic	0.00054	0.000199	2,577	2,657	559,310	581,219
HA, Chronic Lung Disease (less Asthma)	Medina- Ramon et al, 2006	Cleveland, OH	CBSA	D8HourMean	June- August	65-99	distributed lag 0-1 d	-	logistic	0.00054	0.000199	1,587	1,612	305,763	312,042
HA, Chronic Lung Disease (less Asthma)	Medina- Ramon et al, 2006	Denver, CO	CBSA	D8HourMean	June- August	65-99	distributed lag 0-1 d	-	logistic	0.00054	0.000199	623	665	227,092	245,643
HA, Chronic Lung Disease (less Asthma)	Medina- Ramon et al, 2006	Detroit, MI	CBSA	D8HourMean	June- August	65-99	distributed lag 0-1 d	-	logistic	0.00054	0.000199	2,870	2,935	539,077	557,511
HA, Chronic Lung Disease (less Asthma)	Medina- Ramon et al, 2006	Houston, TX	CBSA	D8HourMean	June- August	65-99	distributed lag 0-1 d	-	logistic	0.00054	0.000199	2,716	2,922	451,335	489,474
HA, Chronic Lung Disease (less Asthma)	Medina- Ramon et al, 2006	Los Angeles, CA	CBSA	D8HourMean	June- August	65-99	distributed lag 0-1 d	-	logistic	0.00054	0.000199	4,059	4,302	1,309,329	1,372,256
HA, Chronic Lung Disease (less Asthma)	Medina- Ramon et al, 2006	New York, NY	CBSA	D8HourMean	June- August	65-99	distributed lag 0-1 d	-	logistic	0.00054	0.000199	9,026	9,235	2,359,351	2,427,316
HA, Chronic Lung Disease (less Asthma)	Medina- Ramon et al, 2006	Philadelphia, PA	CBSA	D8HourMean	June- August	65-99	distributed lag 0-1 d	-	logistic	0.00054	0.000199	3,825	3,920	755,595	780,220
HA, Chronic Lung Disease (less Asthma)	Medina- Ramon et al, 2006	Sacramento, CA	CBSA	D8HourMean	June- August	65-99	distributed lag 0-1 d	-	logistic	0.00054	0.000199	606	649	235,921	250,905

						Stu	udy informatio	n (C-R functio			Baseline in	cidence <sup>b</sup>	Popul	lation	
Endpoint	Study	Urban study area	Study area template	Air metric	Risk assessment modeling period	Age range	Lag	Additional study details	Statistical Model	Effect estimate (Beta)	SE (effect estimate) <sup>a</sup>	2007	2009	2007	2009
HA, Chronic Lung Disease (less Asthma)	Medina- Ramon et al, 2006	St. Louis, MO	CBSA	D8HourMean	June- August	65-99	distributed lag 0-1 d	-	logistic	0.00054	0.000199	1,653	1,697	357,309	368,743
Emergency Room Visits, Respiratory	Strickland et al., 2010	Atlanta, GA	Atlanta, GA	D8HourMax	March- October (8)	5-17	distributed lag 0-7 d	-	log-linear	0.0047864	0.0007602	33,322	34,432	963,574	995,654
Emergency Room Visits, Respiratory	Strickland et al., 2010	Atlanta, GA	Atlanta, GA	D8HourMax	March- October (8)	5-17	average of lags 0-2	-	log-linear	0.002699	0.0006456	33,322	34,432	963,574	995,654
Emergency Room Visits, Respiratory	Tolbert et al., 2007	Atlanta, GA	Atlanta, GA	D8HourMax	March- October (8)	0-99	average of lags 0-2	-	log-linear	0.001286	0.0002062	122,122	126,013	5,033,453	5,205,934
Emergency Room Visits, Respiratory	Tolbert et al., 2007	Atlanta, GA	Atlanta, GA	D8HourMax	March- October (8)	0-99	average of lags 0-2	СО	log-linear	0.0011408	0.0002283	122,122	126,013	5,033,453	5,205,934
Emergency Room Visits, Respiratory	Tolbert et al., 2007	Atlanta, GA	Atlanta, GA	D8HourMax	March- October (8)	0-99	average of lags 0-2	NO2	log-linear	0.0010287	0.0002506	122,122	126,013	5,033,453	5,205,934
Emergency Room Visits, Respiratory	Tolbert et al., 2007	Atlanta, GA	Atlanta, GA	D8HourMax	March- October (8)	0-99	average of lags 0-2	PM10	log-linear	0.0008032	0.000267	122,122	126,013	5,033,453	5,205,934
Emergency Room Visits, Respiratory	Tolbert et al., 2007	Atlanta, GA	Atlanta, GA	D8HourMax	March- October (8)	0-99	average of lags 0-2	PM10, NO2	log-linear	0.0007749	0.0002672	122,122	126,013	5,033,453	5,205,934
Emergency Room Visits, Respiratory	Darrow et al., 2011	Atlanta, GA	Atlanta, GA	D8HourMax	March- October (8)	0-99	Lag 1d	-	log-linear	0.0006852	0.0001385	122,122	126,013	5,033,453	5,205,934
Emergency Room Visits, Asthma	Ito et al., 2007	New York, NY	New York, NY	D8HourMax	April- October (7)	0-99	average of lag 0 and lag 1	-	log-linear	0.0052134	0.0009087	52,867	53,243	18,554,574	18,779,754
Emergency Room Visits, Asthma	lto et al., 2007	New York, NY	New York, NY	D8HourMax	April- October (7)	0-99	average of lag 0 and lag 1	PM2.5	log-linear	0.0039757	0.0009789	52,867	53,243	18,554,574	18,779,754
Emergency Room Visits, Asthma	lto et al., 2007	New York, NY	New York, NY	D8HourMax	April- October (7)	0-99	average of lag 0 and lag 1	NO2	log-linear	0.0032337	0.0009359	52,867	53,243	18,554,574	18,779,754
Emergency Room Visits, Asthma	lto et al., 2007	New York, NY	New York, NY	D8HourMax	April- October (7)	0-99	average of lag 0 and lag 1	со	log-linear	0.0055437	0.0008939	52,867	53,243	18,554,574	18,779,754
Emergency Room Visits, Asthma	lto et al., 2007	New York, NY	New York, NY	D8HourMax	April- October (7)	0-99	average of lag 0 and lag 1	SO2	log-linear	0.004115	0.0009226	52,867	53,243	18,554,574	18,779,754
Asthma Exacerbation, Chest Tightness	Gent et al., 2003	Boston, MA	Boston, MA	D1HourMax	April- September (6)	0-12	Lag 1d	-	logistic	0.0007609	0.0020002	138,691	138,494	702,975	700,631

						<b>C1</b> -			Deceline in	cidonaab	Domu	lation			
					Risk	Sti	idy informatio	n (C-R functio	n)			Baseline in	cidence	Рори	lation
			Study		assessment	• • •		Additional	Charles I.	Effect	65 (affect				
Endpoint	Study	orban study area	area template	Air metric	period	Age range	Lag	details	Model	estimate (Beta)	SE (effect estimate) <sup>a</sup>	2007	2009	2007	2009
Asthma Exacerbation, Chest Tightness	Gent et al., 2003	Boston, MA	Boston, MA	D8HourMax	April- September (6)	0-12	Lag 1d	-	logistic	0.0057036	0.0020217	138,691	138,494	702,975	700,631
Asthma Exacerbation, Chest Tightness	Gent et al., 2003	Boston, MA	Boston, MA	D1HourMax	April- September (6)	0-12	Lag 1d	PM2.5	logistic	0.0077052	0.0022666	138,691	138,494	702,975	700,631
Asthma Exacerbation, Chest Tightness	Gent et al., 2003	Boston, MA	Boston, MA	D1HourMax	April- September (6)	0-12	Lag 1d	PM2.5	logistic	0.0070131	0.0022734	138,691	138,494	702,975	700,631
Asthma Exacerbation, Shortness of Breath	Gent et al., 2003	Boston, MA	Boston, MA	D1HourMax	April- September (6)	0-12	Lag 1d	-	logistic	0.003977	0.0017947	173,364	173,117	702,975	700,631
Asthma Exacerbation, Shortness of Breath	Gent et al., 2003	Boston, MA	Boston, MA	D8HourMax	April- September (6)	0-12	Lag 1d	-	logistic	0.0052473	0.0021808	173,364	173,117	702,975	700,631
Asthma Exacerbation, Wheeze	Gent et al., 2003	Boston, MA	Boston, MA	D1HourMax	April- September (6)	0-12	Lag Od	PM2.5	logistic	0.0060021	0.0020225	323,613	323,152	702,975	700,631
Sensitivity Analysis - s	short-term expo	sure-related all	-cause morta	lity	T		Γ	I	ſ	T	ſ	ſ			1
Mortality, Non- Accidental	Smith et al., 2009	Atlanta, GA	Epi study based	D8HourMax	March- October	0-99	distributed lag 0-6 d	-	log-linear	0.0002411	0.0002919		6,267		1,589,914
Mortality, Non- Accidental	Smith et al., 2009	Baltimore, MD	Epi study based	D8HourMax	April- October	0-99	distributed lag 0-6 d	-	log-linear	0.0004192	0.00033		3,287		621,421
Mortality, Non- Accidental	Smith et al., 2009	Boston, MA	Epi study based	D8HourMax	April- September	0-99	distributed lag 0-6 d	-	log-linear	0.0002807	0.0003429		2,252		715,296
Mortality, Non- Accidental	Smith et al., 2009	Cleveland, OH	Epi study based	D8HourMax	April- October	0-99	distributed lag 0-6 d	-	log-linear	0.0005654	0.0003149	SA	7,541	SA	1,287,137
Mortality, Non- Accidental	Smith et al., 2009	Denver, CO	Epi study based	D8HourMax	March- September	0-99	distributed lag 0-6 d	-	log-linear	0.0001657	0.0003565	for 2009	5,140	for 2009	1,578,451
Mortality, Non- Accidental	Smith et al., 2009	Detroit, MI	Epi study based	D8HourMax	April- September	0-99	distributed lag 0-6 d	-	log-linear	0.0006432	0.0003117		8,174		1,842,465
Mortality, Non- Accidental	Smith et al., 2009	Houston, TX	Epi study based	D8HourMax	January- December	0-99	distributed lag 0-6 d	-	log-linear	0.0004999	0.0002075		19,642		4,017,371
Mortality, Non- Accidental	Smith et al., 2009	Los Angeles, CA	Epi study based	D8HourMax	January- December	0-99	distributed lag 0-6 d	-	log-linear	0.0002179	0.0001571		55,949		9,776,644

						Stu	udy informatio	n (C-R functio	n)			Baseline in	cidence <sup>b</sup>	Popu	lation
Endpoint	Study	Urban study area	Study area template	Air metric	Risk assessment modeling period	Age range	Lag	Additional study details	Statistical Model	Effect estimate (Beta)	SE (effect estimate) <sup>a</sup>	2007	2009	2007	2009
Mortality, Non- Accidental	Smith et al., 2009	New York, NY	Epi study based	D8HourMax	April- October	0-99	distributed lag 0-6 d	-	log-linear	0.0010114	0.0002074		33,006		9,066,479
Mortality, Non- Accidental	Smith et al., 2009	Philadelphia, PA	Epi study based	D8HourMax	April- October	0-99	distributed lag 0-6 d	-	log-linear	0.000714	0.0002846		7,835		1,513,040
Mortality, Non- Accidental	Smith et al., 2009	Sacramento, CA	Epi study based	D8HourMax	January- December	0-99	distributed lag 0-6 d	-	log-linear	0.0003016	0.0003145		9,225		1,405,572
Mortality, Non- Accidental	Smith et al., 2009	St. Louis, MO	Epi study based	D8HourMax	April- October	0-99	distributed lag 0-6 d	-	log-linear	0.0005401	0.0003428		1,688		319,302
Mortality, Non- Accidental	Smith et al., 2009	Atlanta, GA	CBSA	D8HourMax	March- October	0-99	distributed lag 0-6 d	Regional Bayes- based	log-linear	0.0002603	0.0002359		20,442		5,205,933
Mortality, Non- Accidental	Smith et al., 2009	Baltimore, MD	CBSA	D8HourMax	April- October	0-99	distributed lag 0-6 d	Regional Bayes- based	log-linear	0.0009399	0.0002829		11,598		2,692,803
Mortality, Non- Accidental	Smith et al., 2009	Boston, MA	CBSA	D8HourMax	April- September	0-99	distributed lag 0-6 d	Regional Bayes- based	log-linear	0.0008827	0.0003004		16,436		4,519,143
Mortality, Non- Accidental	Smith et al., 2009	Cleveland, OH	CBSA	D8HourMax	April- October	0-99	distributed lag 0-6 d	Regional Bayes- based	log-linear	0.0006789	0.0002637		10,692		2,082,741
Mortality, Non- Accidental	Smith et al., 2009	Denver, CO	CBSA	D8HourMax	March- September	0-99	distributed lag 0-6 d	Regional Bayes- based	log-linear	0.0000293	0.0003502	SA completed for 2009	6,856	SA completed for 2009	2,498,144
Mortality, Non- Accidental	Smith et al., 2009	Detroit, MI	CBSA	D8HourMax	April- September	0-99	distributed lag 0-6 d	Regional Bayes- based	log-linear	0.0007159	0.0002622		16,815		4,316,185
Mortality, Non- Accidental	Smith et al., 2009	Houston, TX	CBSA	D8HourMax	January- December	0-99	distributed lag 0-6 d	Regional Bayes- based	log-linear	0.000423	0.0001825		30,927		5,823,529
Mortality, Non- Accidental	Smith et al., 2009	Los Angeles, CA	CBSA	D8HourMax	January- December	0-99	distributed lag 0-6 d	Regional Bayes- based	log-linear	0.0001988	0.000151		72,935		12,756,237
Mortality, Non- Accidental	Smith et al., 2009	New York, NY	CBSA	D8HourMax	April- October	0-99	distributed lag 0-6 d	Regional Bayes- based	log-linear	0.0011223	0.0001808		76,645		18,779,754

						Stu	ıdy informatio		Baseline in	cidence <sup>b</sup>	Popul	ation			
Endpoint	Study	Urban study area	Study area template	Air metric	Risk assessment modeling period	Age range	Lag	Additional study details	Statistical Model	Effect estimate (Beta)	SE (effect estimate) <sup>a</sup>	2007	2009	2007	2009
Mortality, Non- Accidental	Smith et al. <i>,</i> 2009	Philadelphia, PA	CBSA	D8HourMax	April- October	0-99	distributed lag 0-6 d	Regional Bayes- based	log-linear	0.001026	0.0002395		27,658		5,936,034
Mortality, Non- Accidental	Smith et al., 2009	Sacramento, CA	CBSA	D8HourMax	January- December	0-99	distributed lag 0-6 d	Regional Bayes- based	log-linear	0.000107	0.000323		13,361		2,127,784
Mortality, Non- Accidental	Smith et al., 2009	St. Louis, MO	CBSA	D8HourMax	April- October	0-99	distributed lag 0-6 d	Regional Bayes- based	log-linear	0.0006754	0.00028		13,686		2,803,333
Mortality, Non- Accidental	Smith et al., 2009	Atlanta, GA	CBSA	D8HourMax	March- October	0-99	distributed lag 0-6 d	PM10	log-linear	0.0001183	0.0005456		20,442		5,205,933
Mortality, Non- Accidental	Smith et al., 2009	Baltimore, MD	CBSA	D8HourMax	April- October	0-99	distributed lag 0-6 d	PM10	log-linear	0.0004727	0.000531		11,598		2,692,803
Mortality, Non- Accidental	Smith et al., 2009	Boston, MA	CBSA	D8HourMax	April- September	0-99	distributed lag 0-6 d	PM10	log-linear	0.0001591	0.0005752		16,436		4,519,143
Mortality, Non- Accidental	Smith et al., 2009	Cleveland, OH	CBSA	D8HourMax	April- October	0-99	distributed lag 0-6 d	PM10	log-linear	0.0004626	0.0004335		10,692		2,082,741
Mortality, Non- Accidental	Smith et al., 2009	Denver, CO	CBSA	D8HourMax	March- September	0-99	distributed lag 0-6 d	PM10	log-linear	- 0.0000383	0.0005263		6,856		2,498,144
Mortality, Non- Accidental	Smith et al., 2009	Detroit, MI	CBSA	D8HourMax	April- September	0-99	distributed lag 0-6 d	PM10	log-linear	0.000286	0.0004066	SA	16,815	SA	4,316,185
Mortality, Non- Accidental	Smith et al., 2009	Houston, TX	CBSA	D8HourMax	January- December	0-99	distributed lag 0-6 d	PM10	log-linear	0.000631	0.0003623	for 2009	30,927	for 2009	5,823,529
Mortality, Non- Accidental	Smith et al., 2009	Los Angeles, CA	CBSA	D8HourMax	January- December	0-99	distributed lag 0-6 d	PM10	log-linear	0.0000524	0.0003473		72,935		12,756,237
Mortality, Non- Accidental	Smith et al., 2009	New York, NY	CBSA	D8HourMax	April- October	0-99	distributed lag 0-6 d	PM10	log-linear	0.0004407	0.0003904		76,645		18,779,754
Mortality, Non- Accidental	Smith et al., 2009	Philadelphia, PA	CBSA	D8HourMax	April- October	0-99	distributed lag 0-6 d	PM10	log-linear	0.0005445	0.0005186		27,658		5,936,034
Mortality, Non- Accidental	Smith et al., 2009	Sacramento, CA	CBSA	D8HourMax	January- December	0-99	distributed lag 0-6 d	PM10	log-linear	0.0002805	0.0005434		13,361		2,127,784
Mortality, Non- Accidental	Smith et al., 2009	St. Louis, MO	CBSA	D8HourMax	April- October	0-99	distributed lag 0-6 d	PM10	log-linear	0.0003602	0.0005813		13,686		2,803,333

				Study information (C-R function)								Baseline in	cidence <sup>b</sup>	Popul	ation
Endpoint	Study	Urban study area	Study area template	Air metric	Risk assessment modeling period	Age	Lag	Additional study details	Statistical Model	Effect estimate (Beta)	SE (effect estimate) <sup>a</sup>	2007	2009	2007	2009
Mortality, All Cause	Zanobetti & Schwartz (b), 2008	Atlanta, GA	CBSA	D8HourMean	June- August	0-99	distributed lag 0-3 d	-	log-linear	0.0002954	0.0002886		8,448		5,205,933
Mortality, All Cause	Zanobetti & Schwartz (b), 2008	Baltimore, MD	CBSA	D8HourMean	June- August	0-99	distributed lag 0-3 d	-	log-linear	0.000515	0.000314		5,327		2,692,803
Mortality, All Cause	Zanobetti & Schwartz (b), 2008	Boston, MA	CBSA	D8Hour Mean	June- August	0-99	distributed lag 0-3 d	-	log-linear	0.0006816	0.0003284		8,726		4,519,143
Mortality, All Cause	Zanobetti & Schwartz (b), 2008	Cleveland, OH	CBSA	D8Hour Mean	June- August	0-99	distributed lag 0-3 d	-	log-linear	0.0005962	0.0003546		4,838		2,082,741
Mortality, All Cause	Zanobetti & Schwartz (b), 2008	Denver, CO	CBSA	D8Hour Mean	June- August	0-99	distributed lag 0-3 d	-	log-linear	0.0003518	0.0004088		3,351		2,498,144
Mortality, All Cause	Zanobetti & Schwartz (b), 2008	Detroit, MI	CBSA	D8Hour Mean	June- August	0-99	distributed lag 0-3 d	-	log-linear	0.0010459	0.0003441	SA	8,977	SA	4,316,185
Mortality, All Cause	Zanobetti & Schwartz (b), 2008	Houston, TX	CBSA	D8HourMean	June- August	0-99	distributed lag 0-3 d	-	log-linear	0.0001629	0.0002628	for 2009	8,712	for 2009	5,823,529
Mortality, All Cause	Zanobetti & Schwartz (b), 2008	Los Angeles, CA	CBSA	D8HourMean	June- August	0-99	distributed lag 0-3 d	-	log-linear	0.0002737	0.0002134		19,665		12,756,237
Mortality, All Cause	Zanobetti & Schwartz (b), 2008	New York, NY	CBSA	D8Hour Mean	June- August	0-99	distributed lag 0-3 d	-	log-linear	0.0010925	0.0002357		34,611		18,779,754
Mortality, All Cause	Zanobetti & Schwartz (b), 2008	Philadelphia, PA	CBSA	D8Hour Mean	June- August	0-99	distributed lag 0-3 d	-	log-linear	0.0006246	0.0003146		12,678		5,936,034
Mortality, All Cause	Zanobetti & Schwartz (b), 2008	Sacramento, CA	CBSA	D8Hour Mean	June- August	0-99	distributed lag 0-3 d	-	log-linear	0.0005691	0.0003885		3,657		2,127,784
Mortality, All Cause	Zanobetti & Schwartz (b), 2008	St. Louis, MO	CBSA	D8Hour Mean	June- August	0-99	distributed lag 0-3 d	-	log-linear	0.0005444	0.0003334		6,359		2,803,333
Sensitivity Analysis - I	ong-term expos	sure-related res	piratory mor	tality <sup>c</sup>											
Mortality, Respiratory	Jerrett et al., 2009	Atlanta, GA	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	Regional	log-linear	0.0113329	0.0031929		3,216		2,954,650

						Stu	ıdy informatio		Baseline in	cidence <sup>b</sup>	Popu	lation			
Endpoint	Study	Urban study area	Study area template	Air metric	Risk assessment modeling period	Age range	Lag	Additional study details	Statistical Model	Effect estimate (Beta)	SE (effect estimate) <sup>a</sup>	2007	2009	2007	2009
Mortality, Respiratory	Jerrett et al., 2009	Baltimore, MD	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	Regional	log-linear	-0.001005	0.0038531		2,034		1,609,957
Mortality, Respiratory	Jerrett et al., 2009	Boston, MA	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	Regional	log-linear	-0.001005	0.0038531		3,622		2,747,634
Mortality, Respiratory	Jerrett et al., 2009	Cleveland, OH	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	Regional	log-linear	0	0.0046043		1,783		1,294,845
Mortality, Respiratory	Jerrett et al., 2009	Denver, CO	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	Regional	log-linear	0.0058269	0.0031178		1,574		1,454,586
Mortality, Respiratory	Jerrett et al., 2009	Detroit, MI	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	Regional	log-linear	0	0.0046043		3,153		2,628,339
Mortality, Respiratory	Jerrett et al., 2009	Houston, TX	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	Regional	log-linear	0.0113329	0.0031929	SA completed for 2009	2,859	SA completed for 2009	3,165,283
Mortality, Respiratory	Jerrett et al., 2009	Los Angeles, CA	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	Regional	log-linear	0.000995	0.0027674	101 2003	7,512	101 2003	7,236,439
Mortality, Respiratory	Jerrett et al., 2009	New York, NY	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	Regional	log-linear	-0.001005	0.0038531		12,067		11,303,888
Mortality, Respiratory	Jerrett et al., 2009	Philadelphia, PA	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	Regional	log-linear	-0.001005	0.0038531		4,891		3,545,106
Mortality, Respiratory	Jerrett et al., 2009	Sacramento, CA	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	Regional	log-linear	0.0058269	0.0031178		1,690		1,221,735
Mortality, Respiratory	Jerrett et al., 2009	St. Louis, MO	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	Regional	log-linear	0	0.0046043		2,485		1,676,509
Mortality, Respiratory	Jerrett et al., 2009	Atlanta, GA	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	ozone- only	log-linear	0.0026642	0.0009693		3,216		2,954,650
Mortality, Respiratory	Jerrett et al., 2009	Baltimore, MD	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	ozone- only	log-linear	0.0026642	0.0009693		2,034		1,609,957
Mortality, Respiratory	Jerrett et al., 2009	Boston, MA	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	ozone- only	log-linear	0.0026642	0.0009693	SA	3,622	SA	2,747,634
Mortality, Respiratory	Jerrett et al., 2009	Cleveland, OH	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	ozone- only	log-linear	0.0026642	0.0009693	for 2009	1,783	for 2009	1,294,845
Mortality, Respiratory	Jerrett et al., 2009	Denver, CO	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	ozone- only	log-linear	0.0026642	0.0009693		1,574		1,454,586
Mortality, Respiratory	Jerrett et al., 2009	Detroit, MI	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	ozone- only	log-linear	0.0026642	0.0009693		3,153		2,628,339

						Stu	ıdy informatio	on (C-R functio	n)			Baseline in	cidence⁵	Рори	lation
Endpoint	Study	Urban study area	Study area template	Air metric	Risk assessment modeling period	Age range	Lag	Additional study details	Statistical Model	Effect estimate (Beta)	SE (effect estimate) <sup>a</sup>	2007	2009	2007	2009
Mortality, Respiratory	Jerrett et al., 2009	Houston, TX	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	ozone- only	log-linear	0.0026642	0.0009693		2,859		3,165,283
Mortality, Respiratory	Jerrett et al., 2009	Los Angeles, CA	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	ozone- only	log-linear	0.0026642	0.0009693		7,512		7,236,439
Mortality, Respiratory	Jerrett et al., 2009	New York, NY	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	ozone- only	log-linear	0.0026642	0.0009693		12,067		11,303,888
Mortality, Respiratory	Jerrett et al., 2009	Philadelphia, PA	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	ozone- only	log-linear	0.0026642	0.0009693		4,891		3,545,106
Mortality, Respiratory	Jerrett et al., 2009	Sacramento, CA	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	ozone- only	log-linear	0.0026642	0.0009693		1,690		1,221,735
Mortality, Respiratory	Jerrett et al., 2009	St. Louis, MO	CBSA	Seasonal-avg D1hrMax	April- September	30-99	NA	ozone- only	log-linear	0.0026642	0.0009693		2,485		1,676,509

<sup>a</sup> all Beta distributions assumed to be normal.

<sup>b</sup> Gent et al., 2003 also uses the following prevalence rates: 0.028 (wheeze), 0.015 (shortness of breath), 0.012 (chest tightness) (from study).

<sup>c</sup> Threshold models were considered as sensitivity analyses for long-term exposure-related respiratory mortality (see section HREA 7.3.2). Given that the same threshold-specific effect estimate was used for all 12 study areas, they are not presented here to avoid repetition (see Sasser, 2014 for a listing of the coefficients and standard errors). Other model inputs used in modeling thresholds for this effect endpoint are the same as for other applications of Jerrett et al., 2009 (see table entries).

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# **APPENDIX 7B**

# **Detailed Summary Tables and Figures of Core Risk Estimates**

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	values are risk increases, positive values are risk reductions

				Ai	r Quality Scena	rio			
		Absolute Oz	zone-Attributab	le Incidence		Chan	nge in Ozone-A	tributable Incid	ence
Study Area	Base	75ppb	70ppb	65ppb	60ppb	Base-75	75-70	75-65	75-60
Atlanta GA	250	220	210	200	190	31	10	18	28
	(-350 - 840)	(-310 - 740)	(-300 - 710)	(-280 - 680)	(-270 - 650)	(-42 - 100)	(-13 - 32)	(-24 - 60)	(-39 - 95)
Baltimore MD	240	230	220	210	210	12	7	14	23
bartiniore, wib	(-130 - 600)	(-130 - 570)	(-120 - 560)	(-120 - 540)	(-110 - 520)	(-6 - 30)	(-4 - 17)	(-8 - 35)	(-13 - 59)
Boston MA	210	200	200	190	180	3	4	11	18
Boston, IVIA	(-290 - 680)	(-290 - 670)	(-280 - 660)	(-270 - 640)	(-260 - 620)	(-5 - 11)	(-6 - 14)	(-16 - 39)	(-25 - 62)
Cloveland OH	270	270	260	250	230	0	8	20	40
cievelaliu, OH	(-25 - 550)	(-25 - 550)	(-24 - 540)	(-23 - 510)	(-21 - 470)	(01)	(-1 - 18)	(-2 - 41)	(-4 - 83)
Donvor CO	59	58	57	55	53	1	1	3	5
Deliver, CO	(-190 - 300)	(-190 - 300)	(-190 - 290)	(-180 - 280)	(-170 - 270)	(-2 - 3)	(-4 - 7)	(-10 - 15)	(-17 - 27)
Dotroit MI	520	520	500	480	460	2	18	33	54
Detroit, Mi	(26 - 990)	(26 - 990)	(25 - 960)	(25 - 930)	(24 - 890)	(0 - 4)	(1 - 35)	(2 - 64)	(3 - 110)
Houston TV	540	580	580	570	560	-39	4	9	20
Houston, IX	(100 - 970)	(110 - 1000)	(110 - 1000)	(110 - 1000)	(110 - 1000)	(-771)	(1-8)	(2 - 17)	(4 - 37)
	640	750	730	700	660	-110	26	52	96
Los Angeles, CA	(-270 - 1500)	(-310 - 1800)	(-300 - 1700)	(-290 - 1700)	(-270 - 1600)	(46270)	(-11 - 62)	(-22 - 130)	(-40 - 230)
Now York NY	3400	3200	3100	2500	NA	170	150	740	NA
New TOIK, NY	(2000 - 4700)	(1900 - 4500)	(1900 - 4300)	(1500 - 3500)	NA	(100 - 240)	(92 - 220)	(440 - 1000)	NA
Dhiladalahia DA	960	920	890	860	830	47	26	56	86
Philadelphia, PA	(210 - 1700)	(200 - 1600)	(200 - 1600)	(190 - 1500)	(180 - 1500)	(10 - 84)	(6 - 46)	(12 - 100)	(19 - 150)
Community CA	170	160	160	160	150	5	3	6	10
Sacramento, CA	(-180 - 500)	(-170 - 480)	(-170 - 470)	(-160 - 470)	(-160 - 450)	(-5 - 15)	(-3 - 9)	(-6 - 17)	(-11 - 31)
	370	350	330	320	300	22	15	31	49
St. Louis, IVIO	(-92 - 810)	(-86 - 770)	(-83 - 740)	(-79 - 700)	(-74 - 660)	(-6 - 50)	(-4 - 33)	(-8 - 70)	(-12 - 110)
				Ai	r Quality Scena	rio			
	Pe	rcent of Baselin	e Incidence Att	ributable to Ozo	ne		Change in O <sub>3</sub> -A	ttributable Risk	
Study Area	Base	75ppb	70ppb	65ppb	60ppb	Base-75	75-70	75-65	75-60
Atlanta, GA	1.2	1.1	1.1	1.0	1.0	12	4	8	13
Baltimore, MD	2.0	1.9	1.9	1.8	1.7	5	3	6	10
Boston, MA	1.2	1.2	1.2	1.1	1.1	2	2	5	9
Cleveland, OH	2.4	2.4	2.4	2.3	2.1	-0.1	3	7	14
Denver, CO	0.9	0.8	0.8	0.8	0.8	1	2	5	9
Detroit, MI	3.0	3.0	2.9	2.8	2.7	0.3	3	6	10
Houston, TX	1.8	1.9	1.9	1.9	1.9	-7	1	2	3
Los Angeles, CA	0.9	1.0	1.0	1.0	0.9	-17	3	7	13
New York, NY	4.3	4.1	3.9	3.2	NA	5	5	22	NA
Philadelphia, PA	3.4	3.2	3.2	3.1	3.0	5	3	6	9
Sacramento, CA	1.2	1.2	1.2	1.2	1.1	3	2	3	6
St. Louis, MO	2.6	2.5	2.4	2.3	2.1	6	4	9	14
				Ai	r Ouality Scena	rio			
		Ozone-Attr	ibutable Deaths	per 100.000		Change i	n Ozone-Attrib	utable Deaths pe	er 100.000
Study Area	Base	75nnb	70nnb	65ppb	60ppb	Base-75	75-70	75-65	75-60
Atlanta, GA	5.0	4.4	4.2	41	3.8	0.61	0.19	0.35	0.56
Baltimore, MD	9.0	8.6	83	81	77	0.44	0.25	0.52	0.87
Boston, MA	4.6	4.5	4.5	4.3	4.1	0.074	0.092	0.26	0.41
Cleveland, OH	13	13	12	12	11	-0.011	0.40	0.95	19
Denver, CO	24	24	24	23	22	0.073	0.40	0.55	0.22
Detroit MI	17	17	11	11	11	0.025	0.41	0.75	1.22
Houston TY	0.0	10	10	10	10	-0.70	0.41	0.75	0.36
	5.0	60	5.8	56	5.2	-0.70	0.075	0.17	0.30
New York NV	5.1	17	J.0 17	J.0 14	J.Z	-0.00	0.20	40	0.70
Philadolphia DA	10	16	1/	14	14	0.95	0.65	4.0	1 5
rinidueipilla, PA	10	10	15	C1	14	10.01	0.44	0.90	1.5
Correments CA	0.0	77	7.0	7 -	7.2	0.33	0.14	0.27	0.40
Sacramento, CA	8.0	7.7	7.6	7.5	7.3	0.23	0.14	0.27	0.49

Table 7B-1. Core Short-Term Ozone-Attributable Mortality (2007) (incidence, percent of baseline mortality, incidence per 100,000) (Smith et al., 2009).

"0" incidence values denote non-zero estimates that round to zero.

Absolute Coone-Attributable Incidence         Contage in Coone-Attributable Incidence           Study Area         Base         75 pp         70 po         65 pp         60 pp         Base-75         77:00         77:00         77:00           Atlanta, GA         200         200         190         190         180         4         7         13:1           Baltimore, MD         210         210         200         200         200         190         3         4         9           Gatom, MA         120         520         120         210         200         200         100         130         140         180         1-1         3           Boston, MA         1280         180         180         180         180         180         1-1         3           Cleveland, OH         2250         2240         220         2-37         18           T/200         (180-290)         (180-290)         (280-502)         (280-502)         (280-502)         (2-37         0         1         -2         -2         10         1         2         2         10         1         2         2         10         1         2         2         10	dence 75-60 19			io	ir Quality Scena	Ai					
Study Area         Base         75ppb         70ppb         65ppb         60ppb         Bar-75         75-70         75-70           Atlanta, GA         (-280 - 680)         (-280 - 670)         (-270 - 650)         (-250 - 610)         (-5 - 13)         (-10 - 24)         (18 - 45)           Baltimore, MD         (10 - 500)         (110 - 500)         (110 - 500)         (110 - 600)         (120 - 610)         (-5 - 13)         (-2 - 7)         (-1 - 7)         (-2 - 7)         (-1 - 7)         (-2 - 7)         (-2 - 7)         (-2 - 7)         (-2 - 7)         (-2 - 7)         (-2 - 7)         (-2 - 7)         (-2 - 7)         (-2 - 7)	<b>75-60</b> 19	ributable Incide	ge in Ozone-Att	Chan		le Incidence	one-Attributab	Absolute Oz			
Atlanta, GA         200         200         190         180         4         7         133           Baltimore, MD         210         220         200         200         190         3         4         9           Baltimore, MD         210         220         200         200         190         3         4         9           Boston, MA         180         180         180         180         180         180         180         17         13         4         9           Cleveland, OH         (220-50)         (210-510)         (220-600)         (220-539)         (2 - 4)         (1 - 2)         (4 - 1)         3           Cleveland, OH         (23-510)         (22-50)         2240         230         220         -3         7         18           Cleveland, OH         (23-510)         (22-50)         (21-40)         (20-450)         (1 - 1)         (1 - 1)         (2 - 37)           Derver, CO         55         55         51         0         0         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1 </th <th>19</th> <th>75-65</th> <th>75-70</th> <th>Base-75</th> <th>60ppb</th> <th>65ppb</th> <th>70ppb</th> <th>75ppb</th> <th>Base</th> <th>Study Area</th>	19	75-65	75-70	Base-75	60ppb	65ppb	70ppb	75ppb	Base	Study Area	
Classical Structure         (-280 - 670)         (-290 - 620)         (-290 - 610)         (-5 - 13)         (-10 - 24)         (-18 - 24)           Baltimore, MD         (-10 - 530)         (-110 - 520)         (-110 - 510)         (-110 - 500)         (-110 - 480)         (-2 - 7)         (-2 - 10)         (-5 - 23)           Boston, MA         180         180         180         180         180         180         -1         -1         3           Colo - 610         (-26 - 610)         (-26 - 620)         (-20 - 60)         (-27 - 590)         (-21 - 44)         (1 - 25)           Cleveland, OH         (-23 - 510)         (-23 - 510)         (-23 - 510)         (-23 - 500)         (-21 - 480)         (-20 - 450)         (-11 - 13)         (-11 - 13)         (-11 - 13)         (-11 - 13)         (-11 - 13)         (-11 - 13)         (-13 - 23)         (-10 - 23)         (-10 - 23)         (-10 - 23)         (-10 - 23)         (-10 - 23)         (-10 - 23)         (-11 - 13)         (-11 - 13)         (-11 - 13)         (-11 - 13)         (-11 - 13)         (-11 - 13)         (-11 - 13)         (-11 - 13)         (-11 - 13)         (-11 - 13)         (-11 - 13)         (-11 - 13)         (-11 - 13)         (-11 - 13)         (-11 - 13)         (-11 - 13)         (-11 - 13)         (-12 - 13)	(-26 61)	13	7	4	180	190	190	200	200	Atlanta GA	
Baltimore, MD         210         210         200         200         190         3         4         9           Boston, MA         180         180         180         180         110-500         (-110-480)         (24)         (12)         (-53-50)           Cleveland, OH         250         250         240         230         220         -3         7         180           Cleveland, OH         250         250         240         230         220         -3         7         180           Cleveland, OH         250         55         55         51         0         0         1         (-(-1.1)         (-(+.1.1))         (-(+.1.1)         (-(+.1.2)         (-(1.1.5)         (-(-1.1)	(-20 - 04)	(-18 - 45)	(-10 - 24)	(-5 - 13)	(-250 - 610)	(-260 - 620)	(-270 - 650)	(-280 - 670)	(-280 - 680)		
Instrument         (120 - 530)         (-110 - 520)         (-110 - 500)         (-110 - 480)         (-2 - 7)         (-2 - 10)         (-5 - 23)           Boston, MA         120         130         140         130 <th>14</th> <th>9</th> <th>4</th> <th>3</th> <th>190</th> <th>200</th> <th>200</th> <th>210</th> <th>210</th> <th>Baltimore, MD</th>	14	9	4	3	190	200	200	210	210	Baltimore, MD	
Boston, MA         120 <th< th=""><th>(-8 - 37)</th><th>(-5 - 23)</th><th>(-2 - 10)</th><th>(-2 - 7)</th><th>(-110 - 480)</th><th>(-110 - 500)</th><th>(-110 - 510)</th><th>(-110 - 520)</th><th>(-120 - 530)</th><th></th></th<>	(-8 - 37)	(-5 - 23)	(-2 - 10)	(-2 - 7)	(-110 - 480)	(-110 - 500)	(-110 - 510)	(-110 - 520)	(-120 - 530)		
(260 - 610)         (-260 - 620)         (-260 - 620)         (-270 - 520)         (011)         (120)         (120)         (120)         (120)         (120)         (133)         (011)         (120)         (130)         (111)         (2 - 27 - 27)         (2 - 27 - 27)         (2 - 27 - 27)         (2 - 27 - 27)         (2 - 27 - 27)         (2 - 27 - 27)         (2 - 27 - 2	8	3	-1	-1	180	180	180	180	180	Boston, MA	
Cleveland, OH         250         250         240         230         220         -3         7         18           Denver, CO         56         56         55         51         0         0         1           Denver, CO         66         460         470         460         440         170         (1-1)         (1-1)         (1-1)         (4-7)           Detroit, MI         460         460         470         460         440         NA         -17         -53           Houston, TX         550         600         600         590         580         -47         -1         3         (1-10)         (10)	(-11 - 27)	(-4 - 10)	(12)	(24)	(-250 - 590)	(-260 - 600)	(-260 - 620)	(-260 - 610)	(-260 - 610)	,	
(-23 - 510)         (-23 - 510)         (-23 - 500)         (-21 - 480)         (-20 - 200)         (-11 - 15)         (-2 - 75)           Denver, CO         76         56         56         55         51         0         0         1           Detroit, MI         26         460         470         460         440         NA         -17         -5           Detroit, MI         23 - 880)         (23 - 880)         (23 - 880)         (23 - 880)         (23 - 880)         (3 - 13)         (1 - 13)         (-1 - 3)         (-2 - 1 - 3)         (-2 - 1 - 3)         (-2 - 1 - 3)         (-2 - 1 - 3)         (-2 - 1 - 3)         (-2 - 1 - 3)         (-2 - 1 - 3)         (-2 - 1 - 3)         (-2 - 1 - 3)         (-2 - 1 - 3)         (-2 - 1 -	31	18	7	-3	220	230	240	250	250	Cleveland, OH	
Denver, CO         56         56         55         51         0         0         1           Detroit, MI         (180 - 290)         (-180 - 280)         (-180 - 280)         (-180 - 280)         (1-1)         (-1 - 1)         (-1	(-3 - 64)	(-2 - 37)	(-1 - 15)	(06)	(-20 - 450)	(-21 - 480)	(-22 - 500)	(-23 - 510)	(-23 - 510)	,	
Image: constraint of the system of	5	1	0	0	51	55	56	56	56	Denver, CO	
Detroit, MI         460         470         460         440         NA         -17         -5           Houston, TX         550         600         600         590         580         -47         -1         3           Houston, TX         550         600         600         590         580         -47         -1         3           (100 -990)         (110 -1100)         (110 -1100)         (110 -1000)         (10 -000)         (-9         92         53           (280 -1600)         (-320 -1800)         (-310 -1800)         (-300 -1700)         (-280 - 1600)         (41 - 240)         (-10 - 60)         (-22 - 13)           New York, NY         2900         3000         2900         2500         NA         -88         96         500           (1800 - 4100)         (180 - 4400)         (180 - 4400)         (180 - 4400)         (170 - 1400)         (170 - 1400)         (-1 - 8)         (3 - 25)         (7 - 58)           Sacramento, CA         170         160         160         150         5         3         5           St. Louis, MO         310         310         300         290         280         1         7         17           St. Louis, MO	(-15 - 25)	(-4 - 7)	(-1 - 1)	(11)	(-170 - 260)	(-180 - 280)	(-180 - 290)	(-180 - 290)	(-180 - 290)		
Houston, TX         (23 - 880)         (24 - 880)         (24 - 880)         (24 - 880)         (24 - 880)         (24 - 880)         (24 - 880)         (24 - 880)         (27 - 33)         (0 - 10)           Houston, TX         550         600         600         590         580         -47         -1         3           Los Angeles, CA         670         770         750         720         670         -99         25         53           New York, NY         2900         3000         2900         2500         NA         -89         96         500           (1800 - 4100)         (180 - 4200)         (180 - 4200)         (180 - 4400)         (180 - 4400)         (180 - 4400)         (170 - 1400)         (170 - 1400)         (1 - 240)         (-1 - 240)         (-1 - 240)         (-1 - 240)         (-22 - 13)           Philadelphia, PA         820         820         810         790         770         -4         14         33         5           Sacramento, CA         170         160         160         160         150         5         3         5           Sacramento, CA         310         310         300         290         17         7         17           St. L	12	-5	-17	NA	440	460	470	460	460	Detroit, MI	
Houston, TX         550         600         600         590         580         -47         -1         3           (100 - 990)         (110 - 1100)         (110 - 1100)         (110 - 1000)         (10 - 1000)         (9 - 85)         (0 - 1)         (1 - 6)           Los Angeles, CA         670         770         750         720         670         -99         25         53           New York, NY         2000         3000         2900         2500         NA         -89         96         500           1800 - 41000         (1800 - 4200)         (1800 - 4100)         (170 - 1400)         (77 - 44         14         33           (180 - 1400)         (180 - 1400)         (170 - 1400)         (710 - 460)         (-53 - 120)         (3 - 25)         (7 - 58)           Sacramento, CA         170         160         160         150         5         3         5           St. Louis, MO         310         300         290         280         1         7         17           St. Louis, MO         1.8         1.8         1.7         1.7         1.7         1.7         1.7           St. Louis, MO         1.8         1.8         1.7         1.7         1.7	(1 - 23)	(010)	(-133)		(23 - 850)	(23 - 890)	(24 - 910)	(23 - 880)	(23 - 880)		
International (100-1100)         (110-1100)         (110-1100)         (110-100)         (1-985)         (01)         (1-6)           Los Angeles, CA         670         770         750         720         670         -99         25         53           New York, NY         2900         33000         2900         2500         NA         -89         96         500           Philadelphia, PA         820         820         810         790         770         -4         14         33           Station (1800-4100)         (180-1400)         (180-1400)         (180-1400)         (170-1400)         (170-1400)         (-18)         (3 - 25)         (7 - 58)           Satramento, CA         170         160         160         150         5         3         5           St. Louis, MO         310         310         300         290         280         1         7         17           St. Louis, MO         1.8         1.8         1.7         1.7         4.60p         6.5pb         60ppb         83ee-75         75.70         75.6           Batimore, MD         1.8         1.8         1.7         1.7         1.7         1         2         4	12	3	-1	-47	580	590	600	600	550	Houston, TX	
Los Angeles, CA         670         770         750         720         670         -99         25         53           New York, NY         2900         3000         2900         2500         NA         -89         96         500           Philadelphia, PA         820         820         1800         (1500 - 4100)         (1500 - 4100)         (1500 - 3500)         NA         -89         96         500           Philadelphia, PA         820         820         810         790         770         -4         144         33           Sacramento, CA         170         160         160         150         5         3         5           (-180 - 500)         (-170 - 490)         (-170 - 470)         (-160 - 460)         (-5 - 14)         (-3 - 8)         (-6 - 17)           St. Louis, MO         310         310         300         290         280         1         7         17           C+77 - 690         (-77 - 690)         (-77 - 690)         (-77 - 670)         (-73 - 650)         (-69 - 620)         (0 - 3)         (-2 - 15)         (-4 - 37)           Study Area         Base         75 ppb         70ppb         65ppb         60ppb         Base-75         75 70	(2 - 22)	(1 - 6)	(01)	(-985)	(110 - 1000)	(110 - 1100)	(110 - 1100)	(110 - 1100)	(100 - 990)		
Image: Control (-220-1800)         (-310-1800)         (-310-1800)         (-300-1700)         (-280-1800)         (-10-60)         (-22-13)           New York, NY         2900         3000         2900         2500         NA         -89         96         500           Philadelphia, PA         820         820         810         790         770         -4         14         33           Sacramento, CA         170         160         160         160         150         5         3         5           Sacramento, CA         170         160         160         160         150         5         3         5           St. Louis, MO         310         310         300         290         280         1         7         17           St. Louis, MO         1.0         1.0         0.9         0.9         0.9         2.0         (-2.15)         (-437)           Study Area         Base         75ppb         70ppb         65ppb         60ppb         Base-75         75-70         75-65           Atlanta, GA         1.0         1.0         0.9         0.9         0.9         2         3         7           Baltimore, MD         1.8	98	53	25	-99	670	720	750	770	670	Los Angeles, CA	
New York, NY         2900         3000         2900         2500         NA        89         96         500           Philadelphia, PA         820         820         810         790         770         -4         14         33           Sacramento, CA         170         160         160         160         150         5         3         5           Sacramento, CA         170         160         160         160         150         5         3         5           (-180 - 500)         (-170 - 490)         (-170 - 470)         (-160 - 460)         (-5 - 14)         (-3 - 8)         (-6 - 17)           St. Louis, MO         310         310         300         290         280         1         7         17           (-77 - 690)         (-77 - 690)         (-75 - 670)         (-73 - 650)         (-69 - 620)         (0 - 3)         (-2 - 15)         (-4 - 37)           Study Area         Base         75ppb         70ppb         65ppb         60ppb         Base-75         75-70         75-65           Atlanta, GA         1.0         1.0         0.9         0.9         2         3         7           Batimore, MD         1.8         1.8	(-41 - 240)	(-22 - 130)	(-10-60)	(41240)	(-280 - 1600)	(-300 - 1700)	(-310 - 1800)	(-320 - 1800)	(-280 - 1600)	-	
Study Area         Air Quality Scenario         Change in O <sub>3</sub> -Attributable           Study Area         Base         750pb         770         -4         14         33           Atlanta, GA         170         160         160         160         150         5         3         5           Sacramento, CA         170         160         160         160         150         5         3         5           St. Louis, MO         310         310         300         290         280         1         7         17           St. Louis, MO         310         310         300         290         280         1         7         7           V         (-77 - 690)<	NA	500	96	-89	NA	2500	2900	3000	2900	New York, NY	
Biladelphia, PA         820         820         810         790         770         -4         14         33           Sacramento, CA         (180 - 1400)         (180 - 1400)         (170 - 1400)         (150 - 1400)         (130 - 1400)         (170 - 1400)         (170 - 1400)         (170 - 1400)         (170 - 1400)         (170 - 1400)         (170 - 1400)         (170 - 1400)         (170 - 1400)         (170 - 1400)         (170 - 1400)         (170 - 1400)         (170 - 1400)         (170 - 1400)         (170 - 1400)         (170 - 1400)         (170 - 1400)         (170 - 170 - 170)         (170 - 170 - 170)         170         17         17         17         17         17         17         17         17		(300 - 700)	(57 - 130)	(-53120)	770	(1500 - 3500)	(1800 - 4100)	(1800 - 4200)	(1800 - 4100)		
(180 - 1400)         (180 - 1400)         (170 - 1400)         (171 - 1400)         (171 - 1400)         (171 - 1400)         (171 - 1400)         (171 - 1400)         (171 - 1400)         (171 - 1400)         (171 - 1400)         (171 - 1400)         (171 - 1400)         (171 - 1400)         (171 - 1400)         (171 - 1400)         (171 - 1400)         (170 - 170 - 170)         (170 - 170 - 170)         (170 - 170 - 170)         (170 - 170 - 170)         (170 - 170 - 170)         (170 - 170 - 170)         (170 - 170 - 170)         (170 - 170 - 170 - 170)         (170 - 170 - 170)         (170 - 170 - 170)         (170 - 170 - 170)         (170 - 170 - 170)         (170 - 170 - 170)         (170 - 170 - 170)         (170 - 170 - 170)         (170 - 170 - 170)         (170 - 170 - 170)         (170 - 170 - 170)         (170 - 170 - 170)	(11 00)	33	(2, 25)	-4	//0	/90	810	820	820	Philadelphia, PA	
Sarramento, CA         170         160         160         150         150         150         150         5         3         5           St. Louis, MO         (-180 - 500)         (-170 - 490)         (-170 - 480)         (-170 - 470)         (-160 - 460)         (-5 - 14)         (-3 - 8)         (-6 - 17)           St. Louis, MO         310         310         300         290         280         1         7         17           (-77 - 690)         (-77 - 690)         (-75 - 670)         (-73 - 650)         (-69 - 620)         (0 - 3)         (-2 - 15)         (-4 - 37)           Air Quality Scenario           Percent of Baseline Incidence Attributable to Ozone         Change in O <sub>3</sub> -Attributable           Study Area         Base         75ppb         70ppb         65ppb         60ppb         Base-75         75-70         75-65           Atlanta, GA         1.0         1.0         0.9         0.9         0.9         2         3         7           Batimore, MD         1.8         1.8         1.7         1.7         1.7         1         2         4           Boston, MA         1.1         1.1         1.1         1.1         1.1         1.1         1.1	(11-90)	(7 - 58)	(3 - 25)	(-18)	(170 - 1400)	(170-1400)	(180 - 1400)	(180 - 1400)	(180 - 1400)		
Image: Control (-17) - 430)         (-17) - 470)         (-17) - 470)         (-2 - 15)         (-4 - 37)           Air Quality Scenario           Air Quality Scenario           Study Area         Base         75 ppb         70 ppb         65ppb         60ppb         Base -75         75 70         75-65           Atlanta, GA         1.0         1.0         1.0           Base         75 ppb         70 ppb         65ppb         60ppb         8ase -75         75 70         <	9	5	3	5	150	160	160	160	1/0	Sacramento, CA	
St. Louis, MO         310         300         290         280         1         7         17           (-77 - 690)         (-77 - 690)         (-75 - 670)         (-73 - 650)         (-69 - 620)         (0 - 3)         (-2 - 15)         (-4 - 37           Air Quality Scenario           Percent of Baseline Incidence Attributable to Ozone         Change in 0 <sub>3</sub> -Attributable           Study Area         Base         75ppb         70ppb         65ppb         60ppb         Base-75         75-70         75-65           Atlanta, GA         1.0         1.0         0.9         0.9         2         3         7           Batimore, MD         1.8         1.1         1.1         1.1         1.1         1.1         1.1         1.1         1.1         1.1         1.1         1.1         1.1           Study Area         Air model and the first colspan="6">Air model and the first colspan="6">1.1         1.1         1.1 <th colsp<="" th=""><td>(-10 - 28)</td><td>(-0-17)</td><td>(-3-8)</td><td>(-5 - 14)</td><td>(-160 - 460)</td><td>(-1/0-4/0)</td><td>(-170 - 480)</td><td>(-170 - 490)</td><td>(-180 - 500)</td><td></td></th>	<td>(-10 - 28)</td> <td>(-0-17)</td> <td>(-3-8)</td> <td>(-5 - 14)</td> <td>(-160 - 460)</td> <td>(-1/0-4/0)</td> <td>(-170 - 480)</td> <td>(-170 - 490)</td> <td>(-180 - 500)</td> <td></td>	(-10 - 28)	(-0-17)	(-3-8)	(-5 - 14)	(-160 - 460)	(-1/0-4/0)	(-170 - 480)	(-170 - 490)	(-180 - 500)	
Air Quality Scenario           Percent of Baseline Incidence Attributable to Ozone         Change in O <sub>3</sub> -Attributable           Study Area         Base         75ppb         70ppb         65ppb         60ppb         Base-75         75-70         75-65           Atlanta, GA         1.0         1.0         0.9         0.9         0.9         2         3         7           Baltimore, MD         1.8         1.8         1.7         1.7         1.7         1         2         4           Boston, MA         1.1         1.1         1.1         1.1         1.1         1.1         1.1         1.1         1.1         1.1         1.1         3         7           Denver, CO         0.8         0.8         0.8         0.8         0.7         -0.4         0.3         2           Detroit, MI         2.7         2.7         2.8         2.7         2.6         NA         -4         -1           Houston, TX         1.8         1.9         1.9         1.9         3         3         16           Philadelphia, PA         2.9         3.0         2.9         2.8         -1         2         4           Sacramento, CA         1.2 <t< th=""><td>30</td><td>1/</td><td>/ /</td><td>1</td><td>280</td><td>(72,650)</td><td>300</td><td>310</td><td>310</td><td>St. Louis, MO</td></t<>	30	1/	/ /	1	280	(72,650)	300	310	310	St. Louis, MO	
Air Quality Scenario           Percent of Baseline Incidence Attributable to Ozone         Change in O <sub>3</sub> -Attributable           Study Area         Base         75ppb         70ppb         65ppb         60ppb         Base-75         75-70         75-65           Atlanta, GA         1.0         1.0         0.9         0.9         0.9         2         3         7           Baltimore, MD         1.8         1.8         1.7         1.7         1.7         1         2         4           Boston, MA         1.1         1.1         1.1         1.1         1.1         1.1         1.1         1.1         3         7           Denver, CO         0.8         0.8         0.8         0.8         0.7         -0.4         0.3         2           Detroit, MI         2.7         2.7         2.8         2.7         2.6         NA         -4         -1           Houston, TX         1.8         1.9         1.9         1.9         1.9         -8         -0.1         0.5           Los Angeles, CA         0.9         1.1         1.0         1.0         0.9         -15         3         7           New York, NY         3	(-7-67)	(-4 - 57)	(-2 - 15)	(0-5)	(-69 - 620)	(-73-050)	(-73-070)	(-77-690)	(-77-090)		
Air Quality Scenario           Percent of Baseline Incidence Attributable to Ozone         Change in O <sub>3</sub> -Attributable           Study Area         Base         75ppb         70ppb         65ppb         60ppb         Base-75         75-70         75-65           Atlanta, GA         1.0         1.0         0.9         0.9         0.9         2         3         7           Baltimore, MD         1.8         1.8         1.7         1.7         1.7         1         2         4           Boston, MA         1.1         1.											
Percent of Baseline Incidence Attributable to Ozone         Change in O <sub>3</sub> -Attributable           Study Area         Base         75ppb         70ppb         65ppb         60ppb         Base-75         75-70         75-65           Atlanta, GA         1.0         1.0         0.9         0.9         0.9         2         3         7           Baltimore, MD         1.8         1.8         1.7         1.7         1.7         1         2         4           Boston, MA         1.1         1.1         1.1         1.1         1.1         1.1         1.1         1.1         2.3         2.3         2.2         2.0         -1         3         7           Denver, CO         0.8         0.8         0.8         0.8         0.7         -0.4         0.3         2           Detroit, MI         2.7         2.7         2.8         2.7         2.6         NA         -4         -1           Houston, TX         1.8         1.9         1.9         1.9         1.9         -8         -0.1         0.5           Los Angeles, CA         0.9         1.1         1.0         1.0         0.9         -15         3         7				io	ir Quality Scena	Ai					
Study Area         Base         75ppb         70ppb         65ppb         60ppb         Base-75         75-70         75-65           Atlanta, GA         1.0         1.0         0.9         0.9         0.9         2         3         7           Baltimore, MD         1.8         1.8         1.7         1.7         1.7         1         2         4           Boston, MA         1.1         1.1         1.1         1.1         1.1         2         4           Boston, MA         1.1         1.1         1.1         1.1         1.1         2         4           Boston, MA         1.1         1.1         1.1         1.1         1.1         1.1         2         4           Boston, MA         1.1         1.1         1.1         1.1         1.1         1.1         1.1         1.1         1.1         1.1         1.1         1.1         1.1         1.0	;k	ttributable Risk	Change in O <sub>3</sub> -A		one	ributable to Ozo	e Incidence Att	rcent of Baselin	Pe		
Atlanta, GA         1.0         1.0         0.9         0.9         0.9         2         3         7           Baltimore, MD         1.8         1.8         1.7         1.7         1.7         1         2         4           Boston, MA         1.1         1.1         1.1         1.1         1.1         2         4           Boston, MA         1.1         1.1         1.1         1.1         1.1         2         4           Boston, MA         1.1         1.1         1.1         1.1         1.1         2         4           Boston, MA         1.1         1.1         1.1         1.1         1.1         1.1         2         4           Boston, MA         1.1	75-60	75-65	75-70	Base-75	60ppb	65ppb	70ppb	75ppb	Base	Study Area	
Baltimore, MD         1.8         1.8         1.7         1.7         1.7         1         2         4           Boston, MA         1.1 <t< th=""><th>9</th><th>7</th><th>3</th><th>2</th><th>0.9</th><th>0.9</th><th>0.9</th><th>1.0</th><th>1.0</th><th>Atlanta, GA</th></t<>	9	7	3	2	0.9	0.9	0.9	1.0	1.0	Atlanta, GA	
Boston, MA         1.1	7	4	2	1	1.7	1.7	1.7	1.8	1.8	Baltimore, MD	
Cleveland, OH         2.3         2.3         2.3         2.2         2.0         -1         3         7           Denver, CO         0.8         0.8         0.8         0.8         0.7         -0.4         0.3         2           Detroit, MI         2.7         2.7         2.8         2.7         2.6         NA         -4         -1           Houston, TX         1.8         1.9         1.9         1.9         1.9         -8         -0.1         0.5           Los Angeles, CA         0.9         1.1         1.0         1.0         0.9         -15         3         7           New York, NY         3.8         4.0         3.8         3.3         NA         -3         3         16           Philadelphia, PA         2.9         3.0         2.9         2.8         -1         2         4           Sacramento, CA         1.2         1.2         1.2         1.1         3         2         3           St. Louis, MO         2.3         2.3         2.2         2.1         2.0         0.4         2         5 <th>4</th> <th>2</th> <th>-0.3</th> <th>-1</th> <th>1.1</th> <th>1.1</th> <th>1.1</th> <th>1.1</th> <th>1.1</th> <th>Boston, MA</th>	4	2	-0.3	-1	1.1	1.1	1.1	1.1	1.1	Boston, MA	
Denver, CO         0.8         0.8         0.8         0.8         0.7         -0.4         0.3         2           Detroit, MI         2.7         2.7         2.8         2.7         2.6         NA         -4         -1           Houston, TX         1.8         1.9         1.9         1.9         1.9         8         -0.1         0.5           Los Angeles, CA         0.9         1.1         1.0         0.9         -15         3         7           New York, NY         3.8         4.0         3.8         3.3         NA         -3         3         16           Philadelphia, PA         2.9         3.0         2.9         2.9         2.8         -1         2         4           Sacramento, CA         1.2         1.2         1.2         1.2         1.1         3         2         3           St. Louis, MO         2.3         2.3         2.2         2.1         2.0         0.4         2         5 <th>12</th> <th>7</th> <th>3</th> <th>-1</th> <th>2.0</th> <th>2.2</th> <th>2.3</th> <th>2.3</th> <th>2.3</th> <th>Cleveland, OH</th>	12	7	3	-1	2.0	2.2	2.3	2.3	2.3	Cleveland, OH	
Detroit, MI         2.7         2.7         2.8         2.7         2.6         NA        4         -1           Houston, TX         1.8         1.9         1.9         1.9         1.9         3.8         -0.1         0.5           Los Angeles, CA         0.9         1.1         1.0         1.0         0.9         -15         3         7           New York, NY         3.8         4.0         3.8         3.3         NA         -3         3         16           Philadelphia, PA         2.9         3.0         2.9         2.9         2.8         -1         2         4           Sacramento, CA         1.2         1.2         1.2         1.2         1.1         3         2         3           St. Louis, MO         2.3         2.3         2.2         2.1         2.0         0.4         2         5	8	2	0.3	-0.4	0.7	0.8	0.8	0.8	0.8	Denver, CO	
Houston, TX         1.8         1.9         1.9         1.9         1.9         1.9         0.5           Los Angeles, CA         0.9         1.1         1.0         1.0         0.9         -15         3         7           New York, NY         3.8         4.0         3.8         3.3         NA         -3         3         16           Philadelphia, PA         2.9         3.0         2.9         2.9         2.8         -1         2         4           Sacramento, CA         1.2         1.2         1.2         1.1         3         2         3           St. Louis, MO         2.3         2.3         2.2         2.1         2.0         0.4         2         5	3	-1	-4	NA	2.6	2.7	2.8	2.7	2.7	Detroit, MI	
Los Angeles, CA         0.9         1.1         1.0         1.0         0.9         -15         3         7           New York, NY         3.8         4.0         3.8         3.3         NA         -3         3         16           Philadelphia, PA         2.9         3.0         2.9         2.9         2.8         -1         2         4           Sacramento, CA         1.2         1.2         1.2         1.2         1.1         3         2         3           St. Louis, MO         2.3         2.3         2.2         2.1         2.0         0.4         2         5 <th>2</th> <th>0.5</th> <th>-0.1</th> <th>-8</th> <th>1.9</th> <th>1.9</th> <th>1.9</th> <th>1.9</th> <th>1.8</th> <th>Houston, TX</th>	2	0.5	-0.1	-8	1.9	1.9	1.9	1.9	1.8	Houston, TX	
New York, NY         3.8         4.0         3.8         3.3         NA         -3         3         16           Philadelphia, PA         2.9         3.0         2.9         2.9         2.8         -1         2         4           Sacramento, CA         1.2         1.2         1.2         1.2         1.2         3         2         3           St. Louis, MO         2.3         2.3         2.2         2.1         2.0         0.4         2         5	13	7	3	-15	0.9	1.0	1.0	1.1	0.9	Los Angeles, CA	
Philadelphia, PA         2.9         3.0         2.9         2.9         2.8         -1         2         4           Sacramento, CA         1.2         1.2         1.2         1.2         1.2         3         2         3           St. Louis, MO         2.3         2.3         2.2         2.1         2.0         0.4         2         5	NA	16	3	-3	NA	3.3	3.8	4.0	3.8	New York, NY	
Sacramento, CA         1.2         1.2         1.2         1.2         1.1         3         2         3           St. Louis, MO         2.3         2.3         2.2         2.1         2.0         0.4         2         5	6	4	2	-1	2.8	2.9	2.9	3.0	2.9	Philadelphia, PA	
St. Louis, MO         2.3         2.3         2.2         2.1         2.0         0.4         2         5	6	3	2	3	1.1	1.2	1.2	1.2	1.2	Sacramento, CA	
	9	5	2	0.4	2.0	2.1	2.2	2.3	2.3	St. Louis, MO	
Air Quality Scenario				io	ir Ouality Scena	Ai					
Ozone-Attributable Deaths per 100.000 Change in Ozone-Attributable Death		table Deaths pe	n Ozone-Attribu	Change i	a quanty occurs	per 100.000	ibutable Deaths	Ozone-Attr			
Study Area Base 75ppb 70ppb 65ppb 60ppb Base-75 75-70 75-65	per 100.000	75-65	75-70	Base-75	60ppb	65ppb	70ppb	75ppb	Base	Study Area	
Atlanta, GA 3.9 3.9 3.7 3.6 3.5 0.071 0.14 0.26	per 100,000	0.26	0.14	0.071	3.5	3.6	3.7	3.9	3.9	Atlanta, GA	
Baltimore MD 7.8 7.7 7.6 7.4 7.2 0.11 0.14 0.33	per 100,000 75-60 0.37	0.33	0.14	0.11	7.2	7.4	7.6	7.7	7.8	Baltimore. MD	
Boston, MA 4.0 4.1 4.1 4.0 3.9 -0.028 -0.013 0.064	per 100,000 75-60 0.37 0.54		0.012	-0.028	3.9	4.0	4.1	4.1	4.0	Boston. MA	
Cleveland OH 12 12 12 11 11 -0.14 0.35 0.86	<b>75-60</b> 0.37 0.54 0.18	0.064	-0.015	-0.14	11	11	12	12	12	Cleveland, OH	
Denver, CO 2.2 2.2 2.2 2.2 2.1 -0.0098 0.0081 0.054	per 100,000 75-60 0.37 0.54 0.18 1.5	0.064	-0.015	-0,14						Demune CO	
Detroit MI 11 11 11 11 11 10 NA -0.39 -0.11	Der 100,000 75-60 0.37 0.54 0.18 1.5 0.19	0.064 0.86 0.054	0.35	-0.0098	2.1	2.2	2.2	2.2	2.2	Denver. CO	
Houston TX 9.4 10 10 10 10 -0.80 -0.010 0.054	Der 100,000 75-60 0.37 0.54 0.18 1.5 0.19 0.28	0.064 0.86 0.054 -0.11	-0.015 0.35 0.0081 -0.39	-0.0098 NA	2.1	2.2	2.2	2.2	2.2	Denver, CO Detroit. MI	
Los Angeles, CA 5.3 6.0 5.8 5.6 5.3 -0.77 0.19 0.42	0000           75-60           0.37           0.54           0.18           1.5           0.19           0.28           0.21	0.064 0.86 0.054 -0.11 0.054	-0.013 0.35 0.0081 -0.39 -0.010	-0.14 -0.0098 NA -0.80	2.1 10 10	2.2 11 10	2.2 11 10	2.2 11 10	2.2 11 9.4	Detroit, MI Houston, TX	
New York, NY 16 16 16 16 14 NA -047 0.51 2.7	Der 100,000           75-60           0.37           0.54           0.18           1.5           0.19           0.28           0.21	0.064 0.86 0.054 -0.11 0.054 0.42	-0.013 0.35 0.0081 -0.39 -0.010 0.19	-0.14 -0.0098 NA -0.80 -0.77	2.1 10 10 5.3	2.2 11 10 5.6	2.2 11 10 5.8	2.2 11 10 6.0	2.2 11 9.4 5.3	Detroit, MI Houston, TX Los Angeles, CA	
Philadelphia PA 14 14 14 13 13 0.07 0.24 0.57	Per 100,000 75-60 0.37 0.54 0.18 1.5 0.19 0.28 0.21 0.77 NA	0.064 0.86 0.054 -0.11 0.054 0.42 2.7	-0.013 0.35 0.0081 -0.39 -0.010 0.19 0.51	-0.14 -0.0098 NA -0.80 -0.77 -0.47	2.1 10 10 5.3 NA	2.2 11 10 5.6 14	2.2 11 10 5.8 16	2.2 11 10 6.0 16	2.2 11 9.4 5.3 16	Deriver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY	
Sacramento, CA 7.8 7.6 7.5 7.4 7.2 0.21 0.13 0.24 0.35	Per 100,000 75-60 0.37 0.54 0.18 1.5 0.19 0.28 0.21 0.77 NA 0.85	0.064 0.86 0.054 -0.11 0.054 0.42 2.7 0.55	-0.013 0.35 0.0081 -0.39 -0.010 0.19 0.51 0.24	-0.0098 NA -0.80 -0.77 -0.47 -0.070	2.1 10 5.3 NA 13	2.2 11 10 5.6 14 13	2.2 11 10 5.8 16 14	2.2 11 10 6.0 16 14	2.2 11 9.4 5.3 16 14	Deriver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia PA	
	Per 100,000 75-60 0.37 0.54 0.18 1.5 0.19 0.28 0.21 0.77 NA 0.85 0.44	0.064 0.86 0.054 -0.11 0.054 0.42 2.7 0.55 0.26	-0.015 0.35 0.0081 -0.39 -0.010 0.19 0.51 0.24 0.13	-0.14 -0.0098 NA -0.80 -0.77 -0.47 -0.070 0.21	2.1 10 5.3 NA 13 7.2	2.2 11 10 5.6 14 13 7.4	2.2 11 10 5.8 16 14 7.5	2.2 11 10 6.0 16 14 7.6	2.2 11 9.4 5.3 16 14 7.8	Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA	
St. Louis. MO 11 11 11 10 10 0.041 0.24 0.60	Per 100,000 75-60 0.37 0.54 0.18 1.5 0.19 0.28 0.21 0.77 NA 0.85 0.85 0.44 1.1	0.064 0.86 0.054 -0.11 0.054 0.42 2.7 0.55 0.26 0.60	-0.015 0.35 0.0081 -0.39 -0.010 0.19 0.51 0.24 0.13 0.24	-0.14 -0.0098 NA -0.80 -0.77 -0.47 -0.070 0.21 0.041	2.1 10 5.3 NA 13 7.2 10	2.2 11 10 5.6 14 13 7.4 10	2.2 11 10 5.8 16 14 7.5 11	2.2 11 10 6.0 16 14 7.6 11	2.2 11 9.4 5.3 16 14 7.8 11	Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO	

# Table 7B-2. Core Short-Term Ozone-Attributable Mortality (2009) (incidence, percent of baseline mortality, incidence per 100,000) (Smith et al., 2009).

NA: for NYC, the model-based adjustment methodology was unable to estimate ozone distributions which would meet the alternative standard level of 60 ppb. For Detroit, already meeting existing standard "0" incidence values denote non-zero estimates that round to zero.

# Figure 7B-1. Core Short-Term Ozone-Attributable Mortality (2007) (heat map tables – absolute ozone-attributable incidence) (Smith et al., 2009).

Study area	Daily 8hr I	Max Ozone	e Level (pp	b)													Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	>75	
Atlanta, GA	0	0	0	1	2	4	10	13	17	24	34	47	29	30	20	19	252
Baltimore, MD	0	0	0	1	4	10	10	25	20	28	30	29	18	33	20	13	240
Boston, MA	0	0	0	0	5	10	27	24	36	22	17	18	14	10	5	17	205
Cleveland, OH	0	0	0	2	5	14	28	30	45	34	33	25	23	15	6	7	268
Denver, CO	0	0	0	0	0	0	2	3	4	6	9	12	12	6	3	1	59
Detroit, MI	0	0	1	0	5	23	31	48	76	96	50	30	41	20	29	68	518
Houston, TX	0	1	6	20	41	58	74	71	61	49	51	28	25	27	26	3	542
Los Angeles, CA	0	0	3	14	33	38	69	58	96	84	81	79	35	20	15	17	643
New York, NY	0	0	0	47	93	169	339	549	326	446	306	228	222	266	205	197	3,391
Philadelphia, PA	0	0	1	5	15	39	63	70	118	97	112	117	69	93	86	76	961
Sacramento, CA	0	0	0	2	7	10	17	25	19	21	20	19	10	7	5	3	165
St. Louis, MO	0	0	1	1	2	9	17	34	49	33	58	48	32	25	23	36	369

Current Standard (75)

Recent conditions

Study area	Daily 8hr	Max Ozone	e Level (pp	b)													Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	>75	
Atlanta, GA	0	0	0	0	2	4	15	20	34	43	52	31	12	5	3	0	222
Baltimore, MD	0	0	0	0	1	6	11	22	43	37	36	38	23	6	5	2	228
Boston, MA	0	0	0	0	2	11	26	29	33	33	20	12	17	5	7	6	202
Cleveland, OH	0	0	0	1	3	9	25	41	55	50	27	25	19	8	6	0	268
Denver, CO	0	0	0	0	0	0	1	3	4	9	12	15	10	3	1	0	58
Detroit, MI	0	0	0	0	1	5	33	56	97	116	59	41	44	16	34	14	516
Houston, TX	0	0	0	0	14	42	107	124	126	81	42	42	2	0	0	0	580
Los Angeles, CA	0	0	0	0	0	0	0	10	204	268	233	27	8	3	0	0	753
New York, NY	0	0	0	0	24	113	341	625	851	545	418	268	45	0	0	0	3,230
Philadelphia, PA	0	0	0	2	0	25	46	115	157	175	155	122	75	31	7	7	916
Sacramento, CA	0	0	0	0	1	8	23	43	29	29	17	9	2	1	0	0	161
St Louis MO	0	0	0	1	2	6	15	52	53	61	60	38	24	23	10	3	348

## Alternative Standard 70

Study area	Daily 8hr	Max Ozone	e Level (pp	b)													Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	>75	
Atlanta, GA	0	0	0	0	2	7	16	23	43	53	43	17	6	3	0	0	212
Baltimore, MD	0	0	0	0	1	6	7	28	49	44	43	26	11	5	2	0	222
Boston, MA	0	0	0	0	2	11	27	35	31	31	21	16	8	7	4	4	198
Cleveland, OH	0	0	0	1	2	10	26	45	67	47	24	21	14	4	0	0	260
Denver, CO	0	0	0	0	0	0	0	3	5	11	17	15	4	2	0	0	57
Detroit, MI	0	0	0	0	0	5	33	65	119	113	50	55	23	24	13	0	499
Houston, TX	0	0	0	0	8	41	108	141	139	81	45	11	0	0	0	0	576
Los Angeles, CA	0	0	0	0	0	0	0	17	240	362	98	5	5	0	0	0	727
New York, NY	0	0	0	0	15	156	392	749	930	597	224	20	0	0	0	0	3,083
Philadelphia, PA	0	0	0	0	2	23	45	133	202	167	160	89	57	6	7	0	891
Sacramento, CA	0	0	0	0	0	7	24	47	35	30	9	6	0	1	0	0	158
St Louis MO	0	0	0	1	2	7	20	61	61	68	47	34	24	9	0	0	333

### Alternative Standard 65

Study area	Daily 8hr I	Max Ozone	e Level (pp	b)													Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	>75	
Atlanta, GA	0	0	0	0	1	8	20	24	54	55	31	8	4	0	0	0	204
Baltimore, MD	0	0	0	0	1	5	11	34	51	44	43	19	6	2	0	0	215
Boston, MA	0	0	0	0	1	11	31	36	37	31	21	12	6	3	2	0	191
Cleveland, OH	0	0	0	0	2	11	34	57	65	42	22	11	4	0	0	0	249
Denver, CO	0	0	0	0	0	0	0	2	7	14	21	10	2	0	0	0	55
Detroit, MI	0	0	0	0	0	3	33	74	144	96	56	37	29	12	0	0	484
Houston, TX	0	0	0	0	4	36	119	155	149	69	38	0	0	0	0	0	571
Los Angeles, CA	0	0	0	0	0	0	0	63	312	288	29	7	3	0	0	0	701
New York, NY	0	0	0	0	43	694	710	1,057	15	0	0	0	0	0	0	0	2,519
Philadelphia, PA	0	0	0	0	2	23	45	143	228	197	148	63	6	6	0	0	862
Sacramento, CA	0	0	0	0	0	5	28	50	41	22	7	2	1	0	0	0	155
St. Louis, MO	0	0	0	0	2	7	29	62	69	75	38	28	6	0	0	0	317

## Alternative Standard 60

Study area	Daily 8hr I	Max Ozone	Level (pp	b)													Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	>75	
Atlanta, GA	0	0	0	0	2	10	21	41	53	48	16	2	0	0	0	0	194
Baltimore, MD	0	0	0	0	1	5	12	45	56	56	25	7	0	0	0	0	206
Boston, MA	0	0	0	0	1	12	39	29	53	26	12	7	3	2	0	0	184
Cleveland, OH	0	0	0	0	3	15	51	66	70	15	10	0	0	0	0	0	229
Denver, CO	0	0	0	0	0	0	0	2	9	21	18	3	0	0	0	0	53
Detroit, MI	0	0	0	0	0	2	39	106	139	101	47	31	0	0	0	0	463
Houston, TX	0	0	0	0	0	28	136	192	152	48	4	0	0	0	0	0	560
Los Angeles, CA	0	0	0	0	0	0	7	225	264	151	11	0	0	0	0	0	658
New York, NY									NA								
Philadelphia, PA	0	0	0	0	2	21	61	161	263	218	97	5	6	0	0	0	834
Sacramento, CA	0	0	0	0	0	4	33	59	38	13	4	1	0	0	0	0	151
St. Louis, MO	0	0	0	0	2	8	45	73	92	46	29	4	0	0	0	0	300

# Figure 7B-2. Core Short-Term Ozone-Attributable Mortality (2007) (heat map tables – change in absolute ozone-attributable incidence) (Smith et al., 2009). Note: negative values are risk increases, positive values are risk reductions.

Decrease recent conditions to 75

Study area	Daily 8hr	Max Ozone	e Level (pp	b)													Total	Change	e in risk
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	>75		Inc.	Dec.
Atlanta, GA	0	0	0	0	0	0	0	0	1	2	4	6	5	5	4	4	31	0	31
Baltimore, MD	0	0	0	0	-1	-1	-1	-1	0	1	2	2	2	4	3	2	12	-6	18
Boston, MA	0	0	0	0	-1	0	-1	0	0	0	1	1	1	1	0	1	3	-4	6
Cleveland, OH	0	0	0	-1	-1	-2	-2	-1	-1	1	1	1	1	1	1	0	0	-8	7
Denver, CO	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1
Detroit, MI	0	0	-1	0	-2	-4	-4	-4	-3	1	1	2	3	2	3	9	2	-19	22
Houston, TX	0	-2	-6	-11	-14	-15	-10	-6	0	3	5	3	4	4	5	1	-39	-65	26
Los Angeles, CA	0	0	-7	-18	-28	-22	-26	-14	-14	-5	1	7	5	4	3	4	-111	-134	25
New York, NY	0	0	0	-18	-30	-31	-43	-25	7	44	39	38	38	56	48	49	172	-169	341
Philadelphia, PA	0	0	-1	-3	-3	-9	-9	-5	0	3	10	12	9	14	14	15	47	-36	82
Sacramento, CA	0	0	0	-1	-2	-2	-1	0	1	2	2	3	2	1	1	1	5	-7	13
St. Louis. MO	0	0	0	0	0	-1	-1	0	2	2	4	4	3	3	3	5	22	-3	27

## Decrease 75 to 70

Study area	Daily 8hr	Max Ozone	e Level (pp	b)													Total	Change	e in risk
				ľ															
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	>75		Inc.	Dec.
Atlanta, GA	0	0	0	0	0	0	0	0	1	2	3	2	1	0	0	0	10	0	10
Baltimore, MD	0	0	0	0	0	0	0	0	1	1	1	2	1	0	0	0	7	0	6
Boston, MA	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	4	0	3
Cleveland, OH	0	0	0	0	0	0	0	0	1	2	1	2	1	1	0	0	8	0	10
Denver, CO	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
Detroit, MI	0	0	0	0	0	0	0	0	2	4	3	2	3	1	3	1	18	0	19
Houston, TX	0	0	0	0	-1	-1	-1	0	2	2	2	2	0	0	0	0	4	-3	8
Los Angeles, CA	0	0	0	0	0	0	0	0	4	10	10	1	0	0	0	0	26	0	25
New York, NY	0	0	0	0	-1	-2	0	14	31	37	41	29	6	0	0	0	154	-13	167
Philadelphia, PA	0	0	0	0	0	-1	0	0	2	5	6	6	4	2	0	1	26	-2	27
Sacramento, CA	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	3	0	4
St Louis MO	0	0	0	0	0	0	0	1	2	2	2	2	2	2	1	0	15	0	16

## Decrease 75 to 65

Study area	Daily 8hr	Max Ozone	e Level (pp	b)													Total	Change	e in risk
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	>75		Inc.	Dec.
Atlanta, GA	0	0	0	0	0	0	1	1	2	4	5	3	1	1	0	0	18	0	18
Baltimore, MD	0	0	0	0	0	0	0	0	2	2	3	4	2	1	1	0	14	0	15
Boston, MA	0	0	0	0	0	0	0	1	1	2	2	1	2	1	1	1	11	0	12
Cleveland, OH	0	0	0	0	0	0	0	1	4	4	3	3	3	1	1	0	20	-1	20
Denver, CO	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	3	0	3
Detroit, MI	0	0	0	0	0	0	-1	0	3	7	5	4	5	2	5	2	33	-2	35
Houston, TX	0	0	0	0	-2	-2	-3	0	4	4	3	4	0	0	0	0	9	-8	16
Los Angeles, CA	0	0	0	0	0	0	0	0	8	20	21	2	1	0	0	0	52	0	52
New York, NY	0	0	0	0	-1	2	27	98	172	156	156	103	22	0	0	0	735	-7	742
Philadelphia, PA	0	0	0	0	0	-1	-1	0	5	11	13	14	9	4	1	1	56	-4	60
Sacramento, CA	0	0	0	0	0	0	-1	1	1	2	1	1	0	0	0	0	6	-1	6
St. Louis, MO	0	0	0	0	0	0	0	2	4	6	6	5	3	3	2	0	31	0	31

### Decrease 75 to 60

Study area	Daily 8hr	Max Ozone	e Level (pp	b)													Total	Change	e in risk
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	>75		Inc.	Dec.
Atlanta, GA	0	0	0	0	0	0	1	2	4	6	7	5	2	1	1	0	28	0	29
Baltimore, MD	0	0	0	0	0	0	0	0	3	4	5	6	4	1	1	0	23	0	25
Boston, MA	0	0	0	0	0	0	0	1	2	3	3	2	3	1	2	1	18	0	19
Cleveland, OH	0	0	0	0	0	0	0	3	7	9	6	6	5	2	2	0	40	-2	41
Denver, CO	0	0	0	0	0	0	0	0	0	0	1	2	2	1	0	0	5	0	6
Detroit, MI	0	0	0	0	0	0	-1	1	6	11	8	7	8	4	7	3	54	-2	57
Houston, TX	0	0	0	0	-2	-4	-4	1	7	8	6	7	1	0	0	0	20	-11	31
Los Angeles, CA	0	0	0	0	0	0	0	1	24	35	29	4	1	1	0	0	96	0	95
New York, NY										NA									
Philadelphia, PA	0	0	0	0	0	-1	-1	1	8	17	19	20	13	6	1	2	86	-4	89
Sacramento, CA	0	0	0	0	0	-1	-1	2	3	3	2	1	0	0	0	0	10	-2	11
St. Louis, MO	0	0	0	0	0	0	0	4	6	9	10	7	5	5	2	1	49	0	49

# Figure 7B-3. Core Short-Term Ozone-Attributable Mortality (2009) (heat map tables – absolute ozone-attributable incidence) (Smith et al., 2009).

### Recent conditions Study area aily 8hr Max Ozone Level (ppb) Total 5-10 10-15 0-5 15-20 20-25 25-30 30-35 35-40 40-45 45-50 50-55 55-60 60-65 65-70 70-75 Atlanta, GA Baltimore, MD 204 210 36 20 29 13 20 32 29 20 20 10 Boston, MA 19 182 Cleveland, OH Denver, CO Detroit, MI 7 11 7 5 21 36 89 116 40 36 0 456 68 6 Houston, TX 80 60 41 21 14 549 18 55 Los Angeles, CA New York, NY 23 41 672 12 116 2,944 Philadelphia, PA 30 817 ramento, CA St. Louis, MO

## Current Standard (75)

Study area	Daily 8hr I	Max Ozone	e Level (pp	b)													Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	>75	
Atlanta, GA	0	0	1	2	7	13	15	28	41	37	24	25	8	1	0	0	201
Baltimore, MD	0	0	0	0	2	7	21	36	33	47	33	23	6	0	0	0	207
Boston, MA	0	0	0	0	7	14	26	33	29	31	27	4	2	3	5	2	183
Cleveland, OH	0	0	0	0	3	16	28	42	46	50	35	17	7	4	0	0	249
Denver, CO	0	0	0		0	1	2	3	6	12	15	13	4	1	0	0	56
Detroit, MI	0	0	1	7	5	21	36	53	89	116	30	40	36	0	17	5	456
Houston, TX	0	0	0	5	24	43	105	107	96	77	72	31	23	6	3	3	595
Los Angeles, CA	0	0	0	0	0	0	1	10	168	196	297	91	5	0	0	0	770
New York, NY	0	0	0	7	41	246	489	407	724	538	314	201	64	0	0	0	3,031
Philadelphia, PA	0	0	0	2	12	38	118	93	162	130	151	67	50	0	0	0	822
Sacramento, CA	0	0	0	0	1	10	28	30	32	24	18	14	3	0	0	0	162
St Louis MO	0	0	1	5	5	14	22	44	42	62	52	/12	11	7	0	0	210

## Alternative Standard 70

Study area	Daily 8hr f	Max Ozone	Level (pp	b)													Total
		F 10	10.15	15.20	20.25	25.20	20.25	25.40	40.45	45 50	50.55	FF (0	(0 (T	cr. 70	70 75	4	
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	>/5	
Atlanta, GA	0	0	0	1	8	14	18	38	48	27	24	16	1	0	0	0	194
Baltimore, MD	0	0	0	0	2	7	20	40	42	46	37	10	0	0	0	0	203
Boston, MA	0	0	0	0	1	17	23	37	34	33	25	3	0	5	5	0	184
Cleveland, OH	0	0	0	0	1	16	35	47	53	49	31	5	5	0	0	0	242
Denver, CO	0	0	0	0	0	0	2	2	7	11	20	11	2	1	0	0	56
Detroit, MI	0	0	0	0	9	10	33	58	82	137	66	50	7	15	4	0	472
Houston, TX	0	0	0	2	21	41	104	124	99	97	70	22	10	3	3	0	596
Los Angeles, CA	0	0	0	0	0	0	1	24	198	301	185	36	0	0	0	0	745
New York, NY	0	0	0	0	42	203	548	609	847	434	256	0	0	0	0	0	2,940
Philadelphia, PA	0	0	0	0	13	33	109	127	152	180	127	62	5	0	0	0	808
Sacramento, CA	0	0	0	0	1	7	34	35	35	21	22	6	0	0	0	0	159
St. Louis, MO	0	0	0	3	8	12	28	51	58	58	52	25	8	0	0	0	304

### Alternative Standard 65

Study area	Daily 8hr f	Max Ozone	Level (pp	b)													Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	>75	
Atlanta, GA	0	0	0	1	7	10	27	44	53	21	23	1	0	0	0	0	187
Baltimore, MD	0	0	0	0	1	6	22	44	56	38	29	2	0	0	0	0	198
Boston, MA	0	0	0	0	1	17	27	37	40	33	14	1	5	5	0	0	181
Cleveland, OH	0	0	0	0	1	15	50	51	57	43	10	5	0	0	0	0	231
Denver, CO	0	0	0	0	0	0	1	3	7	16	21	5	1	0	0	0	55
Detroit, MI	0	0	0	0	8	8	31	68	115	135	52	26	14	4	0	0	461
Houston, TX	0	0	0	0	10	38	118	142	115	109	41	12	5	3	0	0	592
Los Angeles, CA	0	0	0	0	0	0	1	55	241	319	96	5	0	0	0	0	717
New York, NY	0	0	0	0	43	540	827	1,080	58	0	0	0	0	0	0	0	2,547
Philadelphia, PA	0	0	0	0	11	31	102	171	193	172	85	25	0	0	0	0	791
Sacramento, CA	0	0	0	0	0	6	36	43	34	19	18	1	0	0	0	0	156
St. Louis, MO	0	0	0	1	10	10	33	61	70	52	46	12	0	0	0	0	294

## Alternative Standard 60

Study area	Daily 8hr I	Max Ozone	e Level (pp	b)													Total
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	>75	
Atlanta, GA	0	0	0	0	7	12	35	47	47	25	8	0	0	0	0	0	182
Baltimore, MD	0	0	0	0	1	5	27	54	55	37	14	0	0	0	0	0	193
Boston, MA	0	0	0	0	1	19	34	37	45	26	5	4	5	0	0	0	176
Cleveland, OH	0	0	0	0	1	17	68	50	58	21	4	0	0	0	0	0	219
Denver, CO	0	0	0	0	0	0	0	5	12	29	5	0	0	0	0	0	51
Detroit, MI	0	0	0	0	4	13	31	95	129	123	36	10	3	0	0	0	444
Houston, TX	0	0	0	0	4	32	117	177	155	79	17	2	0	0	0	0	583
Los Angeles, CA	0	0	0	0	0	0	4	199	216	242	11	0	0	0	0	0	673
New York, NY									NA								
Philadelphia, PA	0	0	0	0	5	23	109	214	220	142	61	0	0	0	0	0	773
Sacramento, CA	0	0	0	0	0	4	38	52	31	25	2	0	0	0	0	0	153
St. Louis, MO	0	0	0	0	10	11	47	76	64	58	16	0	0	0	0	0	281

# Figure 7B-4. Core Short-Term Ozone-Attributable Mortality (2009) (heat map tables – change in absolute ozone-attributable incidence) (Smith et al., 2009) Note: negative values are risk increases, positive values are risk reductions.

Decrease recent conditinos to 75

	-	Daily 8hr Max Ozone Level (ppb)																	
Study area	Daily 8hr	Max Ozone	e Level (pp	b)													Total	Change	e in risk
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	>75		Inc.	Dec.
Atlanta, GA	0	0	0	0	0	-1	0	0	1	1	1	1	1	1	0	0	4	-1	6
Baltimore, MD	0	0	-1	0	-2	-2	-2	-1	0	2	3	3	2	1	1	0	3	-9	13
Boston, MA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	0
Cleveland, OH	0	0	0	-2	-2	-2	-2	-1	0	1	2	1	1	1	0	0	-3	-10	7
Denver, CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Detroit, MI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Houston, TX	0	-1	-4	-7	-9	-12	-10	-8	-3	-1	1	2	1	1	1	1	-47	-55	7
Los Angeles, CA	0	-2	-9	-15	-19	-23	-26	-13	-10	-8	1	5	7	7	2	3	-99	-126	26
New York, NY	0	0	-3	-34	-47	-42	-27	-18	-4	10	23	20	16	13	3	0	-89	-198	109
Philadelphia, PA	0	0	-2	-4	-6	-9	-7	-4	1	3	5	9	5	3	1	0	-4	-36	32
Sacramento, CA	0	0	-1	-1	-2	-2	-1	0	1	2	2	2	2	3	2	1	5	-7	15
St. Louis, MO	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	2

## Decrease 75 to 70

Study area	Daily 8hr	Max Ozone	e Level (pp	b)													Total	Change	e in risk
																	1		
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	>75		Inc.	Dec.
Atlanta, GA	0	0	0	0	0	0	0	1	1	2	2	2	1	0	0	0	7	0	9
Baltimore, MD	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	4	0	4
Boston, MA	0	0	0	0	-1	0	-1	0	0	0	0	0	0	0	0	0	-1	-3	2
Cleveland, OH	0	0	0	0	0	0	0	1	1	2	2	1	0	0	0	0	7	0	7
Denver, CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Detroit, MI	0	0	-1	-2	-1	-4	-4	-4	-4	-1	0	1	2	0	1	0	-17	-22	5
Houston, TX	0	0	0	-1	-2	-2	-3	-1	1	1	2	1	1	0	0	0	-1	-9	6
Los Angeles, CA	0	0	0	0	0	0	0	0	3	6	12	4	0	0	0	0	25	0	25
New York, NY	0	0	0	-1	-4	-16	-9	9	26	36	26	21	7	0	0	0	96	-44	139
Philadelphia, PA	0	0	0	0	-1	-2	-2	-1	3	4	6	3	3	0	0	0	14	-6	21
Sacramento, CA	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	3	0	4
St. Louis. MO	0	0	0	-1	0	-1	0	0	1	2	2	2	1	0	0	0	7	-2	9

## Decrease 75 to 65

Study area	Daily 8hr	Max Ozone	e Level (pp	b)													Total	Change	e in risk
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	>75		Inc.	Dec.
Atlanta, GA	0	0	0	0	-1	-1	0	1	3	4	3	3	1	0	0	0	13	-2	15
Baltimore, MD	0	0	0	0	0	0	0	0	1	3	2	2	1	0	0	0	9	-1	11
Boston, MA	0	0	0	0	-1	-1	-1	0	1	1	2	0	0	0	1	0	3	-4	6
Cleveland, OH	0	0	0	0	0	-1	0	2	3	5	4	3	1	1	0	0	18	-1	21
Denver, CO	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
Detroit, MI	0	0	-1	-3	-1	-5	-4	-3	-2	3	1	4	4	0	2	1	-5	-21	16
Houston, TX	0	0	0	-1	-4	-4	-5	-1	2	3	5	3	3	1	1	0	3	-15	19
Los Angeles, CA	0	0	0	0	0	0	0	0	6	14	25	8	0	0	0	0	53	0	53
New York, NY	0	0	0	-1	-5	-19	18	60	122	138	93	72	24	0	0	0	500	-48	550
Philadelphia, PA	0	0	0	0	-2	-3	-3	-1	8	8	13	7	6	0	0	0	33	-11	44
Sacramento, CA	0	0	0	0	0	-1	0	1	2	2	1	1	0	0	0	0	5	-2	7
St. Louis, MO	0	0	0	-1	-1	-1	0	1	2	5	5	5	1	1	0	0	17	-4	22

## Decrease 75 to 60

Study area	Daily 8hr I	Max Ozone	e Level (pp	b)													Total	Change	e in risk
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	>75		Inc.	Dec.
Atlanta, GA	0	0	0	0	-1	-1	0	2	4	5	4	4	2	0	0	0	19	-2	21
Baltimore, MD	0	0	0	0	0	-1	0	1	2	5	4	3	1	0	0	0	14	-2	16
Boston, MA	0	0	0	0	-1	-1	-1	1	1	3	3	1	0	0	1	0	8	-4	11
Cleveland, OH	0	0	0	0	0	0	1	4	5	8	7	4	2	1	0	0	31	-1	33
Denver, CO	0	0	0	0	0	0	0	0	0	0	1	2	1	0	0	0	5	0	5
Detroit, MI	0	0	-1	-4	-2	-6	-4	-2	1	8	3	6	6	0	4	1	12	-22	32
Houston, TX	0	0	0	-2	-6	-6	-6	0	4	7	9	5	5	1	1	1	12	-22	35
Los Angeles, CA	0	0	0	0	0	0	0	1	19	26	37	13	1	0	0	0	98	0	97
New York, NY										NA									
Philadelphia, PA	0	0	0	-1	-2	-4	-3	0	12	12	19	10	8	0	0	0	51	-14	65
Sacramento, CA	0	0	0	0	0	-1	-1	1	3	3	2	2	0	0	0	0	9	-2	11
St. Louis, MO	0	0	-1	-2	-1	-1	0	3	4	8	8	7	2	1	0	0	30	-6	34

					Ai	r Quality Scena	rio			
			Absolute Oz	one-Attributal	ole Incidence		Chang	e in Ozone-At	tributable Inci	dence
E	ndpoint/Study Area/Descriptor	Base	75ppb	70ppb	65ppb	60ppb	Base-75	75-70	75-65	75-60
				2007 Si	mulation Year					
HA	(respiratory); Detroit (Katsouyan	ni et al., 2009	)							
	1hr may penalized splines	200	190	180	170	160	14	10	18	29
		(-47 - 430)	(-44 - 410)	(-41 - 380)	(-40 - 370)	(-37 - 340)	(-3.2 - 31)	(-2.4 - 23)	(-4.3 - 41)	(-6.8 - 65)
	1hr max_natural solines	190	180	170	160	150	13	9.8	18	28
	in max, natural spinies	(-58 - 430)	(-54 - 400)	(-51 - 380)	(-49 - 360)	(-45 - 340)	(-4.0 - 31)	(-2.9 - 22)	(-5.3 - 40)	(-8.4 - 65)
HA	(respiratory); NYC (Silverman an	d Ito, 2010; Lir	n et al., 2008)							
	HA Chronic Lung Disease (Lin)	160	140	140	110		14	7.9	34	
		(92 - 220)	(84 - 200)	(80 - 190)	(65 - 160)		(8.0 - 19)	(4.6 - 11)	(20 - 48)	
	HA Asthma (Silverman)	520	490	460	380	NA	58	33	140	NA
		(39 - 860)	(35 - 810)	(33 - 780)	(26 - 660)		(3.8 - 110)	(2.1 - 63)	(8.9 - 250)	
	HA Asthma, PM2.5 (Silverman)	390	360	340	280		42	23	98	
		(-140 - 760)	(-130 - 710)	(-120 - 680)	(-94 - 570)		(-13 - 91)	(-7.2 - 53)	(-31 - 210)	
HA	(respiratory); LA (Linn et al., 2000	)	1	r	1	r		r	1	r
	1hr max penalized splines	370	480	460	450	440	-110	11	23	36
_		(-480 - 1,200)	(-630 - 1,500)	(-610 - 1,500)	(-600 - 1,500)	(-580 - 1,400)	(140 370)	(-15 - 37)	(-29 - 74)	(-47 - 120)
HA	(COPD less asthma); all 12 study	<b>areas</b> (Medina	-Ramon, et al.,	, 2006)	1	1		1	1	1
	Atlanta. GA	64	55	52	50	47	10	3	5	8
		(18 - 110)	(15 - 93)	(15 - 89)	(14 - 85)	(13 - 80)	(3 - 17)	(1 - 5)	(1 - 9)	(2 - 14)
	Baltimore. MD	43	40	38	37	35	3	1	3	5
	· · ·	(12 - 73)	(11 - 68)	(11 - 66)	(10 - 63)	(10 - 60)	(1 - 6)	(0 - 3)	(1 - 5)	(1 - 8)
	Boston, MA	59	58	57	54	52	2	1	3	6
	·	(17 - 100)	(16 - 99)	(16 - 97)	(15 - 93)	(15 - 90)	(0 - 3)	(0 - 2)	(1 - 6)	(2 - 9)
	Cleveland, OH	38	37	36	34	31	1	1	3	6
		(11 - 65)	(11 - 64)	(10 - 62)	(10 - 59)	(9 - 53)	(0 - 1)	(0 - 2)	(1 - 6)	(2 - 11)
	Denver, CO	18	18	18	17	16	0	1	1	2
		(5 - 32)	(5 - 31)	(5 - 30)	(5 - 29)	(5 - 27)	(0 - 1)	(0 - 1)	(0 - 2)	(1 - 4)
	Detroit, MI	72	71	69	67	64	0	2	4	7
		(20 - 120)	(20 - 120)	(19 - 120)	(19 - 110)	(18 - 110)	(0 - 1)	(1 - 4)	(1 - 8)	(2 - 13)
	Houston, TX	55	5/	56	55	54	-2	1	2	3
		(15 - 94)	(16 - 97)	(16 - 96)	(15 - 94)	(15 - 92)	(-14)	(0 - 1)	(0 - 3)	(1-6)
	Los Angeles, CA	110	110	110	100	96	2	5	10	15
		(31 - 190)	(31 - 190)	(30 - 180)	(28-170)	(27 - 160)	(0 - 3)	(1-9)	(3-1/)	(4 - 26)
	New York, NY	220	200	190	150	NA	21	13	5/	NA
		(63 - 380)	(57 - 350)	(53 - 330)	(41 - 250)	06	(6-37)	(4 - 22)	(16 - 98)	
	Philadelphia, PA	110	97	93	90	86	9	3	/	11
		(30 - 180)	(27 - 160)	(26 - 160)	(25 - 150)	(24 - 150)	(2 - 15)	(1-6)	(2 - 12)	(3 - 18)
	Sacramento, CA	1/	15	14	14	13	2	1	1	2
		(5 - 29)	(4 - 25)	(4 - 25)	(4 - 24)	(4 - 23)	(1-3)	(0 - 1)	(0 - 2)	(0 - 3)
	St. Louis, MO	46	43	41	38	36	4	2	4	/
		(13 - 79)	(12 - 73)	(11 - 69)	(11 - 66)	(10 - 62)	(1 - 6)	(1 - 4)	(1 - 8)	(2 - 12)

 Table 7B-3a. Core Short-Term Ozone-Attributable Morbidity – Hospital Admissions (2007).

"0" incidence values denote non-zero estimates that round to zero.

					Ai	r Quality Scena	ario			
			Absolute Oz	one-Attributal	ble Incidence		Chang	e in Ozone-At	tributable Inci	dence
E	ndpoint/Study Area/Descriptor	Base	75ppb	70ppb	65ppb	60ppb	Base-75	75-70	75-65	75-60
				2009 Si	mulation Year					
HA	(respiratory); Detroit (Katsouyan	ni et al., 2009)	)	-					-	-
	1hr may penalized splines	170	170	170	160	150		2.8	10	20
		(-40 - 380)	(-40 - 380)	(-40 - 370)	(-38 - 350)	(-36 - 330)	NΔ	(-0.65 - 6.2)	(-2.4 - 23)	(-4.6 - 44)
	1hr max_natural splines	160	160	160	160	150		2.7	9.8	19
	in max, natural spinles	(-50 - 370)	(-50 - 370)	(-49 - 370)	(-47 - 350)	(-44 - 330)		(-0.80 - 6.2)	(-2.9 - 22)	(-5.6 - 43)
HA	(respiratory); NYC (Silverman ar	d Ito, 2010; Lir	n et al., 2008)							
	HA Chronic Lung Disease (Lin)	140	140	130	110		0.053	5.9	25	
		(80 - 190)	(80 - 190)	(77 - 190)	(66 - 160)		(0.038 - 0.056)	(3.4 - 8.4)	(14 - 35)	
	HA Asthma (Silverman)	480	470	450	390	NA	9.4	28	110	NA
		(35 - 800)	(34 - 790)	(32 - 770)	(27 - 670)		(0.62 - 17)	(1.8 - 54)	(7.2 - 200)	
	HA Asthma, PM2.5 (Silverman)	350	350	330	280		6.8	20	79	
		(-130 - 700)	(-120 - 700)	(-120 - 670)	(-97 - 580)		(-2.2 - 14)	(-6.2 - 45)	(-25 - 170)	
HA	(respiratory); LA (Linn et al., 2000	))	1	1	1	1	1		1	1
	1hr max penalized splines	390	500	490	480	460	-120	11	23	37
		(-510 - 1,200)	(-660 - 1,600)	(-650 - 1,600)	(-630 - 1,500)	(-610 - 1,500)	(150 390)	(-14 - 35)	(-30 - 76)	(-48 - 120)
HA	(COPD less asthma); all 12 study	<b>areas</b> (Medina	-Ramon, et al.,	, 2006)	1	1	1			
	Atlanta, GA	53	52	50	48	46	2	3	4	6
		(15 - 91)	(15 - 89)	(14 - 85)	(13 - 82)	(13 - 79)	(0 - 3)	(1 - 4)	(1 - 8)	(2 - 11)
	Baltimore, MD	38	37	36	35	34	1	1	2	3
		(11 - 65)	(10 - 62)	(10 - 61)	(10 - 59)	(9 - 57)	(0 - 3)	(0 - 1)	(1 - 3)	(1 - 5)
	Boston, MA	53	53	53	52	51	0	0	1	2
		(15 - 90)	(15 - 91)	(15 - 91)	(15 - 89)	(14 - 87)	(01)	(0 - 0)	(0 - 1)	(1 - 4)
	Cleveland, OH	36	36	35	33	31	0	1	3	5
		(10-61)	(10-61)	(10 - 59)	(9 - 56)	(9 - 53)	(0 - 0)	(0 - 2)	(1-5)	(1-9)
	Denver, CO	18	18	18	1/	16	0	0	1	2
		(5-30)	(5-30)	(5 - 30)	(5 - 29)	(4 - 27)	(0 - 0)	(0-0)	(0-1)	(1-4)
	Detroit, MI	(19, 110)	(18, 110)	(10, 110)	(19, 110)	(19, 110)	NA	-3	-1	1
		(18-110)	(18-110)	(19-110)	(18-110)	(18-110)	2	(-14)	(02)	(0-2)
	Houston, TX	(17, 100)	(18, 110)	(18, 110)	(17, 110)	(17, 100)	-3	(0, 1)	1 (0, 2)	3
		(17-100)	(18-110)	(18-110)	(17 - 110)	(17 - 100)	(-15)	(0-1)	(0-2)	(1-6)
	Los Angeles, CA	(22 - 200)	(22 - 200)	(21 - 190)	(20 - 180)	(28 - 170)	5 (1 - 5)	(1 - 9)	(2 - 17)	(4 - 27)
		100	190	190	(30-180)	(28-170)	-1	(1-8)	(3-17)	(4-27)
	New York, NY	(54, 220)	190	(52, 220)	(42, 270)	NA	-1	0	40	NA
		(54 - 550)	(55-550)	(32 - 320)	(43-270)	82	1	(2 - 14)	(11-09)	6
	Philadelphia, PA	(25 150)	(25 150)	(24 150)	(24 140)	(22 140)	(0, 2)	(0, 2)	(1 7)	(2 11)
1		18	16	15	15	1/	2	1	1	2
1	Sacramento, CA	(5 - 31)	(5 - 27)	(4 - 26)	(1 - 25)	(1 - 24)	(1-4)	(0 - 1)	(0-2)	(1-3)
1		41	41	39	38	36	(1-4)	2	3	5
1	St. Louis, MO	(12 - 70)	(11 - 69)	(11 - 67)	(11 - 64)	(10-61)	(0 - 1)	(0 - 3)	(1-5)	(1 - 9)
		(12 - 70)	(11-09)	(11-0/)	(11-04)	(10-01)	(U - 1)	(U-3)	(1-5)	(1 - 9)

Table 7B-3b. Core Short-Term Ozone-Attributable Morbidity – Hospital Admissions(2009).

NA: for NYC, the model-based adjustment methodology was unable to estimate ozone distributions which would meet the alternative standard level of 60 ppb. For Detroit, already meeting existing standard.

"0" incidence values denote non-zero estimates that round to zero.

				A	ir Quality Scenar	io			
		Absolute O	zone-Attributab	le Incidence		Char	ige in Ozone-At	tributable Incide	ence
Endpoint/Study Area/Descriptor	Base	75ppb	70ppb	65ppb	60ppb	Base-75	75-70	75-65	75-60
			2007	Simulation Yea	r				
ER Visits (repiratory); Atlanta (Stric	kland et al., 2007	7)							
Distributed lag 0.7 days	7,400	6,600	6,300	6,000	5,700	1,100	350	650	1,000
Distributed lag 0-7 days	(5,300 - 9,400)	(4,700 - 8,300)	(4,500 - 8,000)	(4,300 - 7,700)	(4,100 - 7,300)	(790 - 1,500)	(240 - 460)	(450 - 850)	(710 - 1,300)
Average day lag 0.2	4,400	3,900	3,700	3,600	3,400	650	200	370	580
Average day lag 0-2	(2,400 - 6,300)	(2,100 - 5,500)	(2,000 - 5,300)	(1,900 - 5,100)	(1,800 - 4,800)	(350 - 950)	(110 - 290)	(200 - 540)	(310 - 850)
ER-visits (respiratory); Atlanta (Toll	oert et al., 2007,	Darrow et al., 20	)11)						
Tolbort	8,000	7,000	6,700	6,500	6,200	1,000	310	580	920
Torbert	(5,500 - 10,000)	(4,900 - 9,200)	(4,700 - 8,800)	(4,500 - 8,500)	(4,300 - 8,000)	(680 - 1,300)	(220 - 410)	(400 - 760)	(630 - 1,200)
Talbart CO	7,100	6,300	6,000	5,800	5,500	880	280	510	810
Torbert-CO	(4,400 - 9,800)	(3,800 - 8,600)	(3,700 - 8,300)	(3,500 - 8,000)	(3,400 - 7,600)	(540 - 1,200)	(170 - 390)	(310 - 710)	(490 - 1,100)
Tolbort NO2	6,400	5,700	5,400	5,200	5,000	800	250	460	730
Tolbert-NO2	(3,400 - 9,400)	(3,000 - 8,300)	(2,900 - 7,900)	(2,800 - 7,600)	(2,600 - 7,300)	(420 - 1,200)	(130 - 370)	(240 - 680)	(380 - 1,100)
Tolbort DM10	5,000	4,400	4,300	4,100	3,900	620	200	360	570
Torbert-Pivito	(1,800 - 8,200)	(1,600 - 7,300)	(1,500 - 7,000)	(1,400 - 6,700)	(1,400 - 6,400)	(220 - 1,000)	(68 - 320)	(130 - 600)	(200 - 940)
Talbart DM10 NO2	4,900	4,300	4,100	4,000	3,800	600	190	350	550
Tolbert-Pivito, NO2	(1,600 - 8,000)	(1,400 - 7,100)	(1,300 - 6,800)	(1,300 - 6,600)	(1,200 - 6,200)	(200 - 1,000)	(61 - 320)	(110 - 580)	(180 - 920)
Darrow	4,300	3,800	3,600	3,500	3,300	530	170	310	490
Darrow	(2,600 - 6,000)	(2,300 - 5,300)	(2,200 - 5,100)	(2,100 - 4,900)	(2,000 - 4,600)	(320 - 740)	(100 - 230)	(190 - 430)	(300 - 680)
ER-visits (asthma); NYC (Ito et al, 2	007)								
single pollutant model	11,000	11,000	10,000	8,200		920	620	2,700	
single pollutant model	(7,700 - 14,000)	(7,200 - 14,000)	(6,900 - 13,000)	(5,600 - 11,000)		(610 - 1,200)	(410 - 830)	(1,800 - 3,600)	
DM2 5	8,800	8,300	7,900	6,400		710	480	2,100	
FIVIZ.5	(4,800 - 12,000)	(4,500 - 12,000)	(4,200 - 11,000)	(3,400 - 9,200)		(370 - 1,000)	(250 - 700)	(1,100 - 3,100)	
NO3	7,300	6,800	6,500	5,300	NIA	580	390	1,700	NA
NOZ	(3,300 - 11,000)	(3,100 - 10,000)	(2,900 - 9,800)	(2,400 - 8,000)	NA	(260 - 890)	(170 - 610)	(760 - 2,700)	NA
69	12,000	11,000	11,000	8,700		970	660	2,900	
	(8,500 - 15,000)	(7,900 - 14,000)	(7,500 - 13,000)	(6,100 - 11,000)		(680 - 1,300)	(460 - 870)	(2,000 - 3,800)	
so2	9,100	8,500	8,100	6,600		730	490	2,200	
302	(5,300 - 13,000)	(5,000 - 12,000)	(4,700 - 11,000)	(3,800 - 9,200)	]	(420 - 1,000)	(280 - 710)	(1,200 - 3,100)	

Table 7B-4a. Core Short-Term Ozone-Attributable Morbidity – Emergency Room Visits(2007).

				A	ir Quality Scenar	io			
		Absolute O	zone-Attributab	le Incidence		Char	nge in Ozone-At	tributable Incide	ence
Endpoint/Study Area/Descriptor	Base	75ppb	70ppb	65ppb	60ppb	Base-75	75-70	75-65	75-60
			2009	Simulation Yea	r				
ER Visits (repiratory); Atlanta (Stric	kland et al., 2007	7)							
Distributed lag 0.7 days	6,100	5,900	5,700	5,500	5,400	150	270	490	700
Distributed lag 0-7 days	(4,300 - 7,700)	(4,200 - 7,600)	(4,100 - 7,300)	(3,900 - 7,100)	(3,800 - 6,900)	(100 - 200)	(190 - 350)	(340 - 640)	(480 - 910)
Average day lag 0.2	3,600	3,500	3,400	3,300	3,100	86	150	280	400
Average day lag 0-2	(2,000 - 5,100)	(1,900 - 5,000)	(1,800 - 4,800)	(1,800 - 4,700)	(1,700 - 4,500)	(46 - 130)	(81 - 220)	(150 - 410)	(210 - 580)
ER-visits (respiratory); Atlanta (Toll	bert et al., 2007,	Darrow et al., 20	)11)						
Tolbort	6,600	6,400	6,200	6,000	5,900	120	230	440	620
Torbert	(4,500 - 8,500)	(4,500 - 8,400)	(4,300 - 8,100)	(4,200 - 7,900)	(4,000 - 7,600)	(84 - 160)	(160 - 300)	(300 - 570)	(430 - 820)
Tolbart CO	5,800	5,700	5,500	5,400	5,200	110	200	390	550
Torbert-CO	(3,600 - 8,000)	(3,500 - 7,900)	(3,400 - 7,600)	(3,300 - 7,400)	(3,200 - 7,200)	(66 - 150)	(120 - 290)	(240 - 540)	(340 - 770)
Tolbort NO2	5,300	5,200	5,000	4,900	4,700	97	180	350	500
TOBELENOZ	(2,800 - 7,700)	(2,700 - 7,600)	(2,600 - 7,300)	(2,600 - 7,100)	(2,500 - 6,900)	(51 - 140)	(97 - 270)	(180 - 520)	(260 - 740)
Tolbort BM10	4,100	4,100	3,900	3,800	3,700	76	140	270	390
Torbert-Pivito	(1,500 - 6,800)	(1,400 - 6,600)	(1,400 - 6,400)	(1,300 - 6,200)	(1,300 - 6,000)	(27 - 130)	(50 - 240)	(95 - 450)	(140 - 640)
Tolbort BM10 NO2	4,000	3,900	3,800	3,700	3,600	73	140	260	380
Tolbert-FINID, NO2	(1,300 - 6,600)	(1,300 - 6,500)	(1,200 - 6,300)	(1,200 - 6,100)	(1,200 - 5,900)	(24 - 120)	(45 - 230)	(86 - 440)	(120 - 630)
Darrow	3,500	3,500	3,400	3,300	3,200	65	120	230	330
Darlow	(2,200 - 4,900)	(2,100 - 4,800)	(2,000 - 4,700)	(2,000 - 4,500)	(1,900 - 4,400)	(39 - 91)	(74 - 170)	(140 - 320)	(200 - 470)
ER-visits (asthma); NYC (Ito et al, 2	.007)								
single pollutant model	10,000	10,000	9,900	8,500		-84	470	2,100	
single pollutant model	(7,000 - 13,000)	(7,000 - 13,000)	(6,800 - 13,000)	(5,800 - 11,000)		(-52120)	(310 - 630)	(1,400 - 2,800)	
DM2 5	8,000	8,100	7,800	6,700		-62	360	1,600	
F 1012.3	(4,300 - 11,000)	(4,300 - 11,000)	(4,200 - 11,000)	(3,600 - 9,600)		(-3097)	(190 - 530)	(840 - 2,300)	
NO2	6,600	6,700	6,400	5,500	NIA	-49	290	1,300	NIA
NOZ	(3,000 - 9,900)	(3,000 - 10,000)	(2,900 - 9,700)	(2,400 - 8,300)	NA	(-2081)	(130 - 460)	(570 - 2,000)	NA
69	11,000	11,000	10,000	9,000		-90	500	2,200	
60	(7,600 - 14,000)	(7,700 - 14,000)	(7,400 - 13,000)	(6,400 - 12,000)		(-59130)	(340 - 660)	(1,500 - 2,900)	
\$03	8,200	8,300	8,000	6,900		-64	370	1,700	
502	(4,800 - 11,000)	(4,800 - 12,000)	(4,700 - 11,000)	(4,000 - 9,600)		(-3498)	(210 - 530)	(940 - 2,400)	

 Table 7B-4b. Core Short-Term Ozone-Attributable Morbidity – Emergency Room Visits (2009).

Table 7B-5a. Core Short-Term Ozone-Attributable Morbidity – Asthma Exacerbations(2007).

					A	ir Quality Scenario	D					
			Absolute C	zone-Attributabl	e Incidence		Ch	ange in Ozone-At	tributable Incider	ice		
	Endpoint/Study Area/Descriptor	Base	75ppb	70ppb	65ppb	60ppb	Base-75	75-70	75-65	75-60		
				2007	Simulation Year							
A	Asthma exacerbation (wheeze); Boston (Gent et al., 2003, 2004)											
	Chest Tightness (1hr max)	41,000	40,000	40,000	38,000	37,000	1,500	1,200	3,300	5,100		
		(22,000 - 57,000)	(21,000 - 56,000)	(21,000 - 55,000)	(20,000 - 53,000)	(19,000 - 52,000)	(720 - 2,200)	(600 - 1,800)	(1,600 - 4,900)	(2,500 - 7,500)		
	Chast Tightness (8hr max)	30,000	30,000	29,000	28,000	28,000	530	680	1,900	3,000		
	cliest rightness (on max)	(10,000 - 47,000)	(9,900 - 47,000)	(9,800 - 46,000)	(9,400 - 45,000)	(9,100 - 43,000)	(170 - 870)	(210 - 1,100)	(580 - 3,100)	(920 - 4,900)		
		42,000	41,000	40,000	39,000	37,000	1,500	1,200	3,300	5,100		
	Chest Tightness (Inr max, PM2.5)	(20,000 - 59,000)	(19,000 - 58,000)	(19,000 - 57,000)	(18,000 - 56,000)	(17,000 - 54,000)	(640 - 2,300)	(530 - 1,900)	(1,400 - 5,100)	(2,200 - 7,900)		
	Chart Tinkton (4km DM2) 5) <sup>b</sup>	39,000	38,000	37,000	36,000	34,000	1,400	1,100	3,000	4,700		
	Chest Tightness (Inr max, PM2.5)	(16,000 - 57,000)	(15,000 - 56,000)	(15,000 - 55,000)	(14,000 - 53,000)	(14,000 - 52,000)	(500 - 2,200)	(420 - 1,800)	(1,100 - 4,900)	(1,800 - 7,500)		
	Shortness of Breath (1hr may)	29,000	29,000	28,000	27,000	26,000	970	800	2,200	3,400		
	Shortness of Breath (IIII max)	(3,700 - 51,000)	(3,600 - 50,000)	(3,500 - 49,000)	(3,400 - 47,000)	(3,200 - 45,000)	(110 - 1,800)	(93 - 1,500)	(250 - 4,000)	(400 - 6,200)		
	Shortness of Breath (8hr may)	35,000	35,000	34,000	33,000	32,000	610	780	2,100	3,400		
	Shortness of Breath (on max)	(7,200 - 58,000)	(7,000 - 57,000)	(6,900 - 56,000)	(6,700 - 55,000)	(6,400 - 53,000)	(120 - 1,100)	(150 - 1,400)	(400 - 3,800)	(640 - 6,000)		
	W(boozo (BM2 E)	78,000	76,000	75,000	72,000	69,000	2,700	2,200	6,000	9,300		
	Wheeze (PM2.5)	(29,000 - 120,000)	(28,000 - 120,000)	(28,000 - 110,000)	(26,000 - 110,000)	(25,000 - 110,000)	(930 - 4,400)	(760 - 3,700)	(2,100 - 9,800)	(3,200 - 15,000)		

<sup>a</sup> previous day; <sup>b</sup> same day.

# Table 7B-5b. Core Short-Term Ozone-Attributable Morbidity – Asthma Exacerbations(2009).

					4	ir Quality Scenari	0				
			Absolute C	zone-Attributable	e Incidence		Ch	ange in Ozone-At	tributable Incider	ice	
	Endpoint/Study Area/Descriptor	Base	75ppb	70ppb	65ppb	60ppb	Base-75	75-70	75-65	75-60	
				2009	Simulation Year						
A	Asthma exacerbation (wheeze); Boston (Gent et al., 2003, 2004)										
	Chest Tightness (1hr max)	38,000	38,000	38,000	37,000	36,000	-92	290	1,400	2,800	
		(20,000 - 53,000)	(20,000 - 53,000)	(20,000 - 53,000)	(19,000 - 52,000)	(19,000 - 50,000)	(-44140)	(140 - 430)	(690 - 2,100)	(1,400 - 4,200)	
	Chest Tightness (Shamou)	28,000	28,000	28,000	27,000	27,000	-220	-110	470	1,300	
	chest fightness (anr max)	(9,100 - 43,000)	(9,200 - 44,000)	(9,200 - 44,000)	(9,100 - 43,000)	(8,800 - 42,000)	(-66370)	(-32190)	(150 - 780)	(410 - 2,200)	
		38,000	38,000	38,000	37,000	36,000	-93	300	1,400	2,900	
	Chest Tightness (Inr max, PM2.5)	(18,000 - 55,000)	(18,000 - 55,000)	(18,000 - 55,000)	(17,000 - 54,000)	(17,000 - 52,000)	(-39150)	(130 - 460)	(610 - 2,200)	(1,200 - 4,400)	
	Chart Tinkton (4km Ph 42 F) <sup>b</sup>	35,000	35,000	35,000	34,000	33,000	-84	270	1,300	2,600	
	Chest Tightness (Inr max, PM2.5)	(14,000 - 52,000)	(14,000 - 53,000)	(14,000 - 52,000)	(14,000 - 51,000)	(13,000 - 50,000)	(-30140)	(100 - 430)	(480 - 2,100)	(980 - 4,200)	
	Shortness of Breath (1hr may)	26,000	27,000	26,000	26,000	25,000	-59	190	930	1,900	
	Shortness of Breath (Ini max)	(3,300 - 46,000)	(3,300 - 46,000)	(3,300 - 46,000)	(3,200 - 45,000)	(3,100 - 44,000)	(-6.8110)	(23 - 360)	(110 - 1,700)	(220 - 3,500)	
	Shortness of Breath (8hr may)	32,000	32,000	32,000	32,000	31,000	-250	-120	540	1,500	
	Shortness of Breath (on max)	(6,500 - 53,000)	(6,500 - 54,000)	(6,500 - 54,000)	(6,400 - 53,000)	(6,200 - 52,000)	(-46450)	(-22230)	(100 - 960)	(280 - 2,600)	
	Wheeze (BM2 5)	71,000	71,000	71,000	69,000	67,000	-170	530	2,600	5,200	
	WIICE2E (F WI2.5)	(26,000 - 110,000)	(26,000 - 110,000)	(26,000 - 110,000)	(25,000 - 110,000)	(25,000 - 100,000)	(-56280)	(190 - 870)	(880 - 4,200)	(1,800 - 8,500)	

<sup>a</sup> previous day; <sup>b</sup> same day.

		Air Quality Scenario								
		Ab	solute Incide	nce			Change in	Incidence		
Study Area	Base	75ppb	70ppb	65ppb	60ppb	base-75	75-70	75-65	75-60	
Atlanta GA	690	590	560	530	500	120	35	64	100	
Atlanta, GA	(250 - 1100)	(210 - 920)	(200 - 870)	(190 - 840)	(180 - 790)	(42 - 200)	(12 - 59)	(22 - 110)	(34 - 160)	
Paltimora MD	420	390	380	360	340	41	17	35	57	
Baltimore, MD	(150 - 650)	(140 - 610)	(140 - 590)	(130 - 560)	(120 - 540)	(14 - 67)	(6 - 29)	(12 - 57)	(19 - 93)	
Boston MA	660	640	620	590	570	24	20	53	82	
Boston, WA	(240 - 1000)	(230 - 1000)	(220 - 980)	(210 - 930)	(200 - 900)	(8 - 39)	(7 - 33)	(18 - 88)	(28 - 140)	
Claveland OH	340	330	310	300	270	13	16	35	64	
cievelaliu, off	(120 - 530)	(120 - 510)	(110 - 490)	(110 - 470)	(97 - 430)	(4 - 21)	(6 - 27)	(12 - 58)	(22 - 100)	
Denver CO	340	330	320	300	290	16	13	26	43	
beilver, co	(120 - 520)	(120 - 500)	(110 - 490)	(110 - 470)	(100 - 450)	(5 - 26)	(4 - 21)	(9 - 44)	(15 - 71)	
Detroit, MI	620	600	580	560	540	24	28	50	78	
Detroit, Mi	(220 - 960)	(220 - 940)	(210 - 900)	(200 - 880)	(190 - 840)	(8 - 40)	(10 - 46)	(17 - 82)	(27 - 130)	
Houston TV	470	460	450	450	440	18	8.0	16	27	
	(170 - 740)	(160 - 720)	(160 - 710)	(160 - 700)	(160 - 690)	(6 - 30)	(3 - 13)	(5 - 26)	(9 - 44)	
Los Angeles CA	1,600	1,500	1,500	1,400	1,300	57	82	160	240	
Los Angeles, CA	(580 - 2500)	(560 - 2400)	(540 - 2300)	(510 - 2200)	(490 - 2100)	(19 - 95)	(28 - 140)	(54 - 260)	(83 - 400)	
New York NY	2,400	2,100	2,000	1,600	NΔ	320	140	550	ΝΔ	
New TOIK, NT	(860 - 3700)	(750 - 3300)	(710 - 3100)	(570 - 2600)	114	(110 - 530)	(47 - 230)	(190 - 900)	114	
Philadelphia PA	1,000	930	890	850	820	120	42	87	130	
Tiniadelpina, TA	(370 - 1600)	(330 - 1400)	(320 - 1400)	(310 - 1300)	(290 - 1300)	(42 - 200)	(14 - 69)	(30 - 140)	(44 - 210)	
Sacramento CA	350	300	290	280	260	56	14	26	44	
Sacramento, CA	(130 - 530)	(110 - 470)	(100 - 450)	(100 - 440)	(94 - 410)	(19 - 92)	(5 - 22)	(9 - 43)	(15 - 73)	
St Louis MO	520	480	460	430	410	48	27	56	84	
	(190 - 800)	(170 - 750)	(170 - 710)	(160 - 680)	(150 - 640)	(16 - 80)	(9 - 45)	(19 - 92)	(29 - 140)	

Table 7B-6. Core Long-Term Ozone-Attributable Respiratory Mortality (2007) (incidence, percent of baseline mortality, incidence per 100,000) (Jerrett et al., 2009).

				Air	Quality Scen	ario					
		Percent	of Baseline I	ncidence		Change in O₃-Attributable Risk					
Study Area	Base	75ppb	70ppb	65ppb	60ppb	Base-75	75-70	75-65	75-60		
Atlanta, GA	21.7	18.6	17.7	16.9	16.0	14	5	9	14		
Baltimore, MD	20.3	18.8	18.1	17.4	16.5	8	4	7	12		
Boston, MA	17.7	17.2	16.7	16.0	15.3	3	3	7	11		
Cleveland, OH	18.2	17.7	16.9	16.1	14.8	3	4	9	16		
Denver, CO	21.6	20.8	20.1	19.4	18.6	4	3	6	11		
Detroit, MI	19.0	18.4	17.7	17.2	16.4	3	4	7	11		
Houston, TX	16.9	16.3	16.1	15.9	15.5	3	1	3	5		
Los Angeles, CA	21.0	20.4	19.6	18.8	17.8	3	4	8	13		
New York, NY	19.0	16.9	15.9	13.1	NA	11	6	23	NA		
Philadelphia, PA	20.4	18.4	17.7	17.0	16.3	10	4	8	12		
Sacramento, CA	20.5	17.8	17.1	16.5	15.6	13	4	7	12		
St. Louis. MO	20.3	18.8	17.9	17.0	16.0	7	5	10	15		

		Air Quality Scenario										
		Ozone-Attributable Deaths per 100,000 Change in Ozone-Attributable Deaths per 100,000										
Study Area	Base	75ppb	70ppb	65ppb	60ppb	Base-75	75-70	75-65	75-60			
Atlanta, GA	24	21	20	19	18	4.4	1.3	2.3	3.5			
Baltimore, MD	27	25	24	23	22	2.6	1.1	2.2	3.6			
Boston, MA	24	24	23	22	21	0.88	0.74	2.0	3.1			
Cleveland, OH	26	25	24	23	21	1.00	1.2	2.7	4.9			
Denver, CO	24	23	23	22	21	1.1	0.91	1.9	3.1			
Detroit, MI	24	23	22	21	20	0.91	1.1	1.9	3.0			
Houston, TX	16	15	15	15	15	0.61	0.27	0.52	0.89			
Los Angeles, CA	23	22	21	20	19	0.81	1.2	2.2	3.4			
New York, NY	21	19	18	15	NA	2.9	1.3	4.9	NA			
Philadelphia, PA	29	27	26	24	23	3.5	1.2	2.5	3.7			
Sacramento, CA	29	25	24	23	22	4.7	1.1	2.2	3.7			
St. Louis, MO	32	29	28	26	25	2.9	1.6	3.4	5.1			

				Air	Quality Scen	ario			
		Ab	solute Incide	nce			Change in	Incidence	
Study Area	Base	75ppb	70ppb	65ppb	60ppb	base-75	75-70	75-65	75-60
Atlanta CA	570	550	520	500	480	26	32	59	82
Atlanta, GA	(210 - 890)	(200 - 860)	(190 - 820)	(180 - 790)	(170 - 760)	(9 - 43)	(11 - 53)	(20 - 98)	(28 - 140)
Paltimora MD	380	360	350	340	320	25	12	27	41
Baltimore, wib	(140 - 590)	(130 - 560)	(120 - 540)	(120 - 530)	(120 - 510)	(8 - 41)	(4 - 20)	(9 - 44)	(14 - 68)
Poston MA	580	580	580	560	540	-1.1	3.7	23	47
BOSTON, IVIA	(210 - 910)	(210 - 920)	(210 - 910)	(200 - 890)	(190 - 860)	(02)	(1-6)	(8 - 38)	(16 - 77)
Clausiand, OU	310	300	290	280	260	9.4	14	32	50
Cleveland, OH	(110 - 490)	(110 - 470)	(100 - 460)	(98 - 430)	(92 - 410)	(3 - 16)	(5 - 24)	(11 - 53)	(17 - 82)
Demuer CO	320	320	310	300	280	0.49	5.8	18	45
Denver, CO	(120 - 490)	(120 - 490)	(110 - 490)	(110 - 470)	(100 - 440)	(0 - 1)	(2 - 10)	(6 - 30)	(16 - 75)
Detroit, MI	540	540	550	530	510	NA	-6.7	14	38
	(190 - 850)	(190 - 850)	(200 - 850)	(190 - 830)	(180 - 800)		(-211)	(5 - 23)	(13 - 64)
Houston TV	490	490	480	470	460	-3.9	11	24	40
Houston, 1X	(170 - 760)	(180 - 770)	(170 - 750)	(170 - 740)	(160 - 720)	(-17)	(4 - 18)	(8 - 40)	(14 - 66)
Los Angolos CA	1,600	1,600	1,500	1,400	1,400	63	77	160	250
LOS Aligeles, CA	(590 - 2500)	(570 - 2400)	(550 - 2300)	(520 - 2200)	(500 - 2100)	(21 - 100)	(26 - 130)	(54 - 260)	(84 - 400)
Now York NV	2,100	2,000	1,900	1,700	NIA	61	120	420	NA
New TOR, NT	(750 - 3300)	(730 - 3200)	(690 - 3000)	(590 - 2700)	NA	(21 - 100)	(40 - 200)	(140 - 690)	NA
Dhiladalahia DA	880	850	820	790	770	40	31	66	97
Philadelphia, PA	(320 - 1400)	(310 - 1300)	(300 - 1300)	(280 - 1200)	(270 - 1200)	(13 - 66)	(11 - 52)	(23 - 110)	(33 - 160)
Socramonto CA	360	310	300	280	270	61	14	28	44
Sacramento, CA	(130 - 550)	(110 - 480)	(110 - 460)	(100 - 450)	(96 - 420)	(21 - 100)	(5 - 24)	(9 - 46)	(15 - 73)
St. Louis MO	450	440	430	410	390	5.6	19	41	66
St. LOUIS, MO	(160 - 700)	(160 - 690)	(150 - 670)	(150 - 650)	(140 - 610)	(2 - 9)	(6 - 31)	(14 - 67)	(23 - 110)

# Table 7B-7. Core Long-Term Ozone-Attributable Respiratory Mortality (2009) (incidence, percent of baseline mortality, incidence per 100,000) (Jerrett et al., 2009).

				Air	Quality Scen	ario					
		Percent	of Baseline I	ncidence		Change in O <sub>3</sub> -Attributable Risk					
Study Area	Base	75ppb	70ppb	65ppb	60ppb	Base-75	75-70	75-65	75-60		
Atlanta, GA	17.6	17.0	16.2	15.4	14.8	4	5	9	13		
Baltimore, MD	18.4	17.4	16.9	16.3	15.7	5	3	6	10		
Boston, MA	15.9	16.0	15.9	15.4	14.9	-0.2	1	3	7		
Cleveland, OH	17.2	16.8	16.1	15.3	14.5	2	4	9	14		
Denver, CO	20.1	20.0	19.8	19.1	17.7	0.1	1	5	12		
Detroit, MI	17.0	17.0	17.2	16.6	16.0	NA	-1	2	6		
Houston, TX	16.8	16.9	16.6	16.3	15.8	-1	2	4	7		
Los Angeles, CA	21.4	20.7	19.9	19.1	18.1	3	4	8	13		
New York, NY	17.1	16.7	15.9	13.8	NA	2	5	18	NA		
Philadelphia, PA	17.9	17.2	16.7	16.1	15.5	4	3	6	10		
Sacramento, CA	20.9	18.0	17.3	16.7	15.8	14	4	7	12		
St. Louis, MO	17.9	17.7	17.1	16.4	15.5	1	3	8	12		

		Air Quality Scenario										
		Ozone-Attributable Deaths per 100,000 Change in Ozone-Attributable Deaths per 100,000										
Study Area	Base	75ppb	70ppb	65ppb	60ppb	Base-75	75-70	75-65	75-60			
Atlanta, GA	19	19	18	17	16	0.88	1.1	2.0	2.8			
Baltimore, MD	23	22	22	21	20	1.5	0.75	1.7	2.6			
Boston, MA	21	21	21	21	20	-0.041	0.13	0.82	1.7			
Cleveland, OH	24	23	22	21	20	0.73	1.1	2.5	3.8			
Denver, CO	22	22	22	21	19	0.034	0.40	1.3	3.1			
Detroit, MI	21	21	21	20	19	NA	-0.25	0.52	1.5			
Houston, TX	15	15	15	15	14	-0.12	0.35	0.76	1.3			
Los Angeles, CA	22	22	21	20	19	0.87	1.1	2.2	3.4			
New York, NY	18	18	17	15	NA	0.54	1.0	3.7	NA			
Philadelphia, PA	25	24	23	22	22	1.1	0.88	1.9	2.7			
Sacramento, CA	29	25	24	23	22	5.0	1.2	2.3	3.6			
St. Louis, MO	27	27	26	25	23	0.34	1.1	2.4	3.9			

NA: for NYC, the model-based adjustment methodology was unable to estimate ozone distributions which would meet the alternative standard level of 60 ppb. For Detroit, already meeting existing standard.

"0" counts denote non-zero estimates that round to zero.

# **APPENDIX 7C**

# Detailed Summary Tables and Figures of Sensitivity Analysis Results

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Table 7C-1.	Sensitivity Analysis – ST Mortality: Smaller Smith et al., 2009-based study area
	(2009) (incidence, percent of baseline mortality, incidence per 100,000 - compare
T-1-1-70 0	with Core Results in Appendix B, Table /B-2)
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	with Core Results in Table 7B-2)
Table /C-3.	Sensitivity Analysis – ST Mortality: Regional Bayes Adjustment (2009)
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	Core Results in Table 7B-2)
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	Schwartz, 2008) (2009) (incidence, percent of baseline mortality, incidence per
	100,000 - compare with Core Results in Table 7B-2)
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	- compare with Core Results in Table 7B-7)
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Table 7C-8.	Sensitivity Analysis – LT Mortality: Threshold models (ozone-only effect
	estimate) (2009 Baseline) (ozone-attributable deaths, percent of baseline
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	estimate) (2009 Current Standard 75ppb) (ozone-attributable deaths, percent of
	baseline mortality, incidence per 100,000 - compare with Core Results in Table
	7B-7)
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	estimate) (2009 Current Standard 70ppb) (ozone-attributable deaths, percent of
	baseline mortality, incidence per 100,000 - compare with Core Results in Table
	7B-7)
Table 7C-11.	Sensitivity Analysis – LT Mortality: Threshold models (ozone-only effect
	estimate) (2009 Current Standard 65ppb) (ozone-attributable deaths, percent of

baseline mortality, incidence per 100,000 - compare with Core Results in Table
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Sensitivity Analysis – LT Mortality: Threshold models (ozone-only effect
estimate) (2009 Current Standard 60ppb) (ozone-attributable deaths, percent of
baseline mortality, incidence per 100,000 - compare with Core Results in Table
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Table 7C-1. Sensitivity Analysis – ST Mortality: Smaller Smith et al., 2009-based study area (2009) (incidence, percent of baseline mortality, incidence per 100,000 - compare with Core Results in Appendix B, Table 7B-2).

		Abaaluta O		A	r Quality Scena	rio Chau			
Study Area	Para	Absolute O	Zone-Attributab	le Incidence	60nnh	Raco 75	ige in Ozone-At	Tributable Incid	ence
Study Area	Ed Se	73000	70ppb	es es	60ppb 61	Dase-75	1	75-05	75-60
Atlanta, GA	( 90, 210)	( 00 210)	( 90, 210)	( 96 210)	( 84, 200)	-1	(1.2)	(2.9)	4
	(-83-210)	58	58	57	(-84 - 200)	-3	(-1-3)	(-3-8)	2
Baltimore, MD	(-30 - 140)	(-32 - 150)	(-32 - 140)	(-31 - 140)	(-31 - 140)	(28)	(0 - 1)	(-1 - 3)	(-1 - 6)
	24	25	26	26	26	-1	-1	-1	-1
Boston, MA	(-34 - 82)	(-35 - 84)	(-37 - 87)	(-37 - 87)	(-36 - 86)	(12)	(24)	(13)	(12)
Clausiand, Old	170	180	170	170	160	-8	4	10	18
Cleveland, OH	(-16 - 350)	(-16 - 360)	(-16 - 360)	(-15 - 340)	(-15 - 330)	(1 17)	(0 - 8)	(-1 - 21)	(-2 - 38)
Denver, CO	41	42	42	42	40	0	-1	0	2
	(-130 - 210)	(-140 - 210)	(-140 - 220)	(-140 - 210)	(-130 - 200)	(23)	(23)	(0 - 0)	(-7 - 11)
Detroit, MI	220	220	230	220	220	NA	-11	-7	0
	(11 - 420)	(11 - 420)	(12 - 440)	(11 - 430)	(11 - 420)		(-122)	(0 14)	(0 - 0)
Houston, TX	350	380	380	380	380	-36	-2	-1	3
	(65 - 620)	(72 - 690)	(72 - 690)	(72 - 690)	(71 - 680)	(-766)	(03)	(02)	(1-6)
Los Angeles, CA	520	600	580	( 220, 1200)	520	-83	21	44	81 ( 22, 100)
	(-220 - 1200)	(-250-1400)	(-240 - 1400)	(-230 - 1300)	(-220 - 1200)	(34200)	(-9-50)	(-18 - 110)	(-55 - 190)
New York, NY	(730 - 1700)	(830 - 1900)	(830 - 1900)	(750 - 1700)	NA	(-100240)	(3 - 6)	(84 - 200)	NA
	210	220	220	220	220	-15	1	3	5
Philadelphia, PA	(46 - 370)	(49 - 390)	(49 - 390)	(49 - 390)	(48 - 380)	(-327)	(0 - 1)	(1 - 5)	(1 - 9)
	110	110	110	110	110	1	2	4	7
Sacramento, CA	(-120 - 340)	(-120 - 340)	(-120 - 340)	(-120 - 330)	(-110 - 320)	(-1 - 2)	(-2 - 6)	(-4 - 11)	(-7 - 20)
Sh Louis MO	36	37	39	39	39	-1	-2	-3	-2
St. Louis, IVIO	(-9 - 80)	(-9 - 81)	(-10 - 86)	(-10 - 87)	(-10 - 86)	(02)	(15)	(16)	(15)
				Ai	r Quality Scena	rio			
	Pe	rcent of Baselin	e Incidence Att	ributable to Ozo	ne		Change in O <sub>3</sub> -A	Attributable Risk	
								1	1
Study Area	Base	75ppb	70ppb	65ppb	60ppb	Base-75	75-70	75-65	75-60
Study Area Atlanta, GA	Base 1.0	75ppb 1.0	70ppb 1.0	65ppb 1.0	60ppb 1.0	Base-75 -1	<b>75-70</b>	<b>75-65</b>	<b>75-60</b> 6
Study Area Atlanta, GA Baltimore, MD	Base 1.0 1.7	75ppb 1.0 1.8	70ppb 1.0 1.7	65ppb 1.0 1.7	60ppb 1.0 1.7	Base-75 -1 -6	75-70 1 1	<b>75-65</b> 4 2	75-60 6 4
Study Area Atlanta, GA Baltimore, MD Boston, MA	Base           1.0           1.7           1.1	75ppb 1.0 1.8 1.1	70ppb 1.0 1.7 1.1	65ppb 1.0 1.7 1.1	60ppb 1.0 1.7 1.1	Base-75 -1 -6 -2	75-70 1 1 -4	75-65 4 2 -4	75-60 6 4 -2
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH	Base           1.0           1.7           1.1           2.2           0.8	75ppb 1.0 1.8 1.1 2.3 0.8	70ppb 1.0 1.7 1.1 2.3 0.8	65ppb 1.0 1.7 1.1 2.2 0.8	60ppb 1.0 1.7 1.1 2.1 0.8	Base-75 -1 -6 -2 -5 -1	75-70 1 1 -4 2	75-65 4 2 -4 5 -0.2	75-60 6 4 -2 10
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO	Base           1.0           1.7           1.1           2.2           0.8           2.6	75ppb 1.0 1.8 1.1 2.3 0.8 2.6	70ppb 1.0 1.7 1.1 2.3 0.8 2.8	65ppb 1.0 1.7 1.1 2.2 0.8 2.7	60ppb 1.0 1.7 1.1 2.1 0.8 2.6	Base-75 -1 -6 -2 -5 -1 NA	75-70 1 1 -4 2 -1 -5	75-65 4 2 -4 5 -0.2	75-60 6 4 -2 10 5
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX	Base           1.0           1.7           1.1           2.2           0.8           2.6           1.8	75ppb 1.0 1.8 1.1 2.3 0.8 2.6 1.9	70ppb 1.0 1.7 1.1 2.3 0.8 2.8 2.0	65ppb 1.0 1.7 1.1 2.2 0.8 2.7 1.9	60ppb 1.0 1.7 1.1 2.1 0.8 2.6 1.9	Base-75 -1 -6 -2 -5 -1 NA -10	75-70 1 1 -4 2 -1 -5 -1	75-65 4 2 -4 5 -0.2 -3 -0.3	75-60 6 4 -2 10 5 0.03 1
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA	Base           1.0           1.7           1.1           2.2           0.8           2.6           1.8           0.9	75ppb 1.0 1.8 1.1 2.3 0.8 2.6 1.9 1.1	70ppb 1.0 1.7 1.1 2.3 0.8 2.8 2.0 1.0	65ppb 1.0 1.7 1.1 2.2 0.8 2.7 1.9 1.0	60ppb 1.0 1.7 1.1 2.1 0.8 2.6 1.9 0.9	Base-75 -1 -6 -2 -5 -1 NA -10 -16	75-70 1 1 -4 2 -1 -5 -1 3	75-65 4 2 -4 5 -0.2 -3 -0.3 7	75-60 6 4 -2 10 5 0.03 1 13
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY	Base           1.0           1.7           1.1           2.2           0.8           2.6           1.8           0.9           3.7	75ppb 1.0 1.8 1.1 2.3 0.8 2.6 1.9 1.1 4.2	70ppb 1.0 1.7 1.1 2.3 0.8 2.8 2.0 1.0 4.1	65ppb 1.0 1.7 1.1 2.2 0.8 2.7 1.9 1.0 3.8	60ppb 1.0 1.7 1.1 2.1 0.8 2.6 1.9 0.9 NA	Base-75 -1 -6 -2 -5 -1 NA -10 -16 -14	75-70 1 1 -4 2 -1 -5 -1 3 0.3	<b>75-65</b> 4 2 -4 5 -0.2 -3 -0.3 7 10	75-60 6 4 -2 10 5 0.03 1 13 NA
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY	Base           1.0           1.7           1.1           2.2           0.8           2.6           1.8           0.9           3.7           2.6	75ppb 1.0 1.8 1.1 2.3 0.8 2.6 1.9 1.1 4.2 2.8	70ppb           1.0           1.7           1.1           2.3           0.8           2.8           2.0           1.0           4.1           2.8	65ppb 1.0 1.7 1.1 2.2 0.8 2.7 1.9 1.0 3.8 2.8	60ppb 1.0 1.7 1.1 2.1 0.8 2.6 1.9 0.9 NA 2.8	Base-75 -1 -6 -2 -5 -1 NA -10 -16 -14 -7	<b>75-70</b> 1 1 -4 2 -1 -5 -1 3 0.3 0.2	<b>75-65</b> 4 2 -4 5 -0.2 -3 -0.3 7 10 1	75-60 6 4 2 10 5 0.03 1 13 NA 2
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA	Base           1.0           1.7           1.1           2.2           0.8           2.6           1.8           0.9           3.7           2.6           1.2	75ppb           1.0           1.8           1.1           2.3           0.8           2.6           1.9           1.1           4.2           2.8           1.2	70ppb           1.0           1.7           1.1           2.3           0.8           2.8           2.0           1.0           4.1           2.8           1.2	65ppb 1.0 1.7 1.1 2.2 0.8 2.7 1.9 1.0 3.8 2.8 1.2	60ppb 1.0 1.7 1.1 2.1 0.8 2.6 1.9 0.9 NA 2.8 1.2	Base-75 -1 -6 -2 -5 -1 NA -10 -16 -14 -7 1	<b>75-70</b> 1 1 -4 2 -1 -5 -1 3 0.3 0.2 2	75-65           4           2           -4           5           -0.2           -3           -0.3           7           10           1           3	<b>75-60</b> 6 4 -2 10 5 0.03 1 13 NA 2 6
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO	Base           1.0           1.7           1.1           2.2           0.8           2.6           1.8           0.9           3.7           2.6           1.2           2.1	75ppb           1.0           1.8           1.1           2.3           0.8           2.6           1.9           1.1           4.2           2.8           1.2           2.2	70ppb           1.0           1.7           1.1           2.3           0.8           2.8           2.0           1.0           4.1           2.8           1.2           2.3	65ppb 1.0 1.7 1.1 2.2 0.8 2.7 1.9 1.0 3.8 2.8 1.2 2.3	60ppb 1.0 1.7 1.1 2.1 0.8 2.6 1.9 0.9 NA 2.8 1.2 2.3	Base-75 -1 -6 -2 -5 -1 NA -10 -16 -14 -7 1 -2	<b>75-70</b> 1 1 -4 2 -1 -5 -1 3 0.3 0.2 2 -6	75-65           4           2           -4           5           -0.2           -3           -0.3           7           10           1           3           -7	<b>75-60</b> 6 4 -2 10 5 0.03 1 13 NA 2 6 -6
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO	Base           1.0           1.7           1.1           2.2           0.8           2.6           1.8           0.9           3.7           2.6           1.2           2.1	75ppb 1.0 1.8 1.1 2.3 0.8 2.6 1.9 1.1 4.2 2.8 1.2 2.2	70ppb           1.0           1.7           1.1           2.3           0.8           2.8           2.0           1.0           4.1           2.8           1.2           2.3	65ppb           1.0           1.7           1.1           2.2           0.8           2.7           1.9           1.0           3.8           2.8           1.2           2.3	60ppb 1.0 1.7 1.1 2.1 0.8 2.6 1.9 0.9 NA 2.8 1.2 2.3	Base-75 -1 -6 -2 -5 -1 NA -10 -16 -14 -7 1 -2 -2 -2 -2 -2 -5 -1 -5 -5 -5 -1 -5 -5 -5 -5 -1 -1 -5 -5 -1 -1 -5 -5 -1 -1 -5 -1 -1 -1 -5 -1 -1 -1 -1 -5 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1	<b>75-70</b> 1 1 -4 2 -1 -5 -1 3 0.3 0.2 2 -6	75-65           4           2           -4           5           -0.2           -3           -0.3           7           10           1           3           -7	<b>75-60</b> 6 4 -2 10 5 0.03 1 13 NA 2 6 -6
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO	Base           1.0           1.7           1.1           2.2           0.8           2.6           1.8           0.9           3.7           2.6           1.2           2.1	75ppb 1.0 1.8 1.1 2.3 0.8 2.6 1.9 1.1 4.2 2.8 1.2 2.2	70ppb           1.0           1.7           1.1           2.3           0.8           2.8           2.0           1.0           4.1           2.8           1.2           2.3	65ppb 1.0 1.7 1.1 2.2 0.8 2.7 1.9 1.0 3.8 2.8 1.2 2.3 Å	60ppb 1.0 1.7 1.1 2.1 0.8 2.6 1.9 0.9 NA 2.8 1.2 2.3 r Quality Scenar	Base-75 -1 -6 -2 -5 -1 NA -10 -16 -14 -7 1 -7 1 -2 -2 -7 -7 -1 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7	<b>75-70</b> 1 1 -4 2 -1 -5 -1 3 0.3 0.2 2 -6	<b>75-65</b> 4 2 -4 5 -0.2 -3 -0.3 7 10 1 3 -7	<b>75-60</b> 6 4 -2 10 5 0.03 1 13 NA 2 6 -6
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO	Base           1.0           1.7           1.1           2.2           0.8           2.6           1.8           0.9           3.7           2.6           1.2           2.1	75ppb 1.0 1.8 1.1 2.3 0.8 2.6 1.9 1.1 4.2 2.8 1.2 2.2 Ozone-Attr	70ppb           1.0           1.7           1.1           2.3           0.8           2.8           2.0           1.0           4.1           2.8           1.2           2.3	65ppb 1.0 1.7 1.1 2.2 0.8 2.7 1.9 1.0 3.8 2.8 1.2 2.3 Per 100,000	60ppb 1.0 1.7 1.1 2.1 0.8 2.6 1.9 0.9 NA 2.8 1.2 2.3 r Quality Scenar	Base-75 -1 -6 -2 -5 -1 NA -10 -16 -14 -7 1 -2 -7 1 -2 -7 Change i	<b>75-70</b> 1 1 -4 2 -1 -5 -1 3 0.3 0.2 2 -6 n Ozone-Attribu	75-65 4 - - - - - - - - - - - - -	75-60 6 4 -2 10 5 0.03 1 13 NA 2 6 -6 -6
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO	Base           1.0           1.7           1.1           2.2           0.8           2.6           1.8           0.9           3.7           2.6           1.2           2.1	75ppb 1.0 1.8 1.1 2.3 0.8 2.6 1.9 1.1 4.2 2.8 1.2 2.2 Ozone-Attr 75ppb	70ppb 1.0 1.7 1.1 2.3 0.8 2.8 2.0 1.0 4.1 2.8 1.2 2.3 ibutable Deaths 70ppb	65ppb 1.0 1.7 1.1 2.2 0.8 2.7 1.9 1.0 3.8 2.8 1.2 2.3 ki sper 100,000 65ppb	60ppb 1.0 1.7 1.1 2.1 0.8 2.6 1.9 0.9 NA 2.8 1.2 2.3 r Quality Scenar 60ppb	Base-75 -1 -6 -2 -5 -1 NA -10 -16 -14 -7 1 -2 rio Change i Base-75	<b>75-70</b> 1 1 -4 2 -1 -5 -1 3 0.3 0.2 2 -6 <b>n Ozone-Attribu</b> <b>75-70</b>	75-65 4 -4 5 -0.2 -3 -0.3 7 10 1 3 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7	<b>75-60</b> 6 4 -2 10 5 0.03 1 13 NA 2 6 -6 <b>er 100,000</b> <b>75-60</b>
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Study Area Atlanta, GA	Base           1.0           1.7           1.1           2.2           0.8           2.6           1.8           0.9           3.7           2.6           1.2           2.1	75ppb 1.0 1.8 1.1 2.3 0.8 2.6 1.9 1.1 4.2 2.8 1.2 2.2 0zone-Attr 75ppb 4.1	70ppb           1.0           1.7           1.1           2.3           0.8           2.8           2.0           1.0           4.1           2.8           1.2           2.3           butable Deaths           70ppb           4.0	65ppb 1.0 1.7 1.1 2.2 0.8 2.7 1.9 1.0 3.8 2.8 1.2 2.3 Per 100,000 65ppb 3.9	60ppb 1.0 1.7 1.1 2.1 0.8 2.6 1.9 0.9 NA 2.8 1.2 2.3 r Quality Scenar 60ppb 3.8	Base-75 -1 -6 -2 -5 -1 NA -10 -16 -14 -7 1 -2 rio Change i Base-75 -0.041	<b>75-70</b> 1 1 -4 2 -1 -5 -1 3 0.3 0.2 2 -6 <b>n Ozone-Attribu</b> <b>75-70</b> 0.050	<b>75-65</b> 4 2 -4 5 -0.2 -3 -0.3 7 10 1 3 -7 <b>table Deaths per 75-65</b> 0.15	<b>75-60</b> 6 4 -2 10 5 0.03 1 13 NA 2 6 -6 <b>er 100,000</b> <b>75-60</b> 0.25
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Study Area Atlanta, GA Baltimore, MD	Base           1.0           1.7           1.1           2.2           0.8           2.6           1.8           0.9           3.7           2.6           1.2           2.1	75ppb 1.0 1.8 1.1 2.3 0.8 2.6 1.9 1.1 4.2 2.8 1.2 2.2 0zone-Attr 75ppb 4.1 9.3	70ppb           1.0           1.7           1.1           2.3           0.8           2.8           2.0           1.0           4.1           2.8           1.2           2.3           ibutable Deaths           70ppb           4.0           9.3	65ppb 1.0 1.7 1.1 2.2 0.8 2.7 1.9 1.0 3.8 2.8 1.2 2.3 A per 100,000 65ppb 3.9 9.1	60ppb 1.0 1.7 1.1 2.1 0.8 2.6 1.9 0.9 NA 2.8 1.2 2.3 r Quality Scenar 60ppb 3.8 9.0	Base-75 -1 -6 -2 -5 -1 NA -10 -16 -14 -7 1 -2 rio Change i Base-75 -0.041 -0.52	<b>75-70</b> 1 1 -4 2 -1 -5 -1 3 0.3 0.2 2 -6 <b>75-70</b> 0.050 0.073	75-65 4 -4 -5 -0.2 -3 -0.3 7 10 1 3 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7	<b>75-60</b> 6 4 -2 10 5 0.03 1 13 NA 2 6 -6 <b>75-60</b> 0.25 0.38
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Study Area Atlanta, GA Baltimore, MD Boston, MA	Base           1.0           1.7           1.1           2.2           0.8           2.6           1.8           0.9           3.7           2.6           1.2           2.1	75ppb 1.0 1.8 1.1 2.3 0.8 2.6 1.9 1.1 4.2 2.8 1.2 2.2 Ozone-Attr 75ppb 4.1 9.3 3.5	70ppb           1.0           1.7           1.1           2.3           0.8           2.0           1.0           4.1           2.8           1.2           2.3           ibutable Deaths           70ppb           4.0           9.3           3.6	65ppb 1.0 1.7 1.1 2.2 0.8 2.7 1.9 1.0 3.8 2.8 1.2 2.3 Ai sper 100,000 65ppb 3.9 9.1 3.6	60ppb 1.0 1.7 1.1 2.1 0.8 2.6 1.9 0.9 NA 2.8 1.2 2.3 r Quality Scenar 60ppb 3.8 9.0 3.6	Base-75 -1 -6 -2 -5 -1 NA -10 -16 -14 -7 1 -2 rio Change i Base-75 -0.041 -0.52 -0.084	<b>75-70</b> 1 1 -4 2 -1 -5 -1 3 0.3 0.2 2 -6 <b>n Ozone-Attrib</b> <b>75-70</b> 0.050 0.073 -0.16	75-65 4 -4 5 -0.2 -3 -0.3 7 10 1 3 -7 7 7 5 0.15 0.21 -0.14	<b>75-60</b> 6 4 -2 10 5 0.03 1 13 NA 2 6 -6 <b>er 100,000</b> <b>75-60</b> 0.25 0.38 -0.087
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH	Base           1.0           1.7           1.1           2.2           0.8           2.6           1.8           0.9           3.7           2.6           1.2           2.1           Base           4.0           8.8           3.4           13	75ppb 1.0 1.8 1.1 2.3 0.8 2.6 1.9 1.1 4.2 2.8 1.2 2.2 75ppb 4.1 9.3 3.5 14	70ppb           1.0           1.7           1.1           2.3           0.8           2.8           2.0           1.0           4.1           2.8           1.2           2.3           ibutable Deaths           70ppb           4.0           9.3           3.6           13	65ppb 1.0 1.7 1.1 2.2 0.8 2.7 1.9 1.0 3.8 2.8 1.2 2.3 A per 100,000 65ppb 3.9 9.1 3.6 13	60ppb 1.0 1.7 1.1 2.1 0.8 2.6 1.9 0.9 NA 2.8 1.2 2.3 r Quality Scenar 60ppb 3.8 9.0 3.6 12	Base-75 -1 -6 -2 -5 -1 NA -10 -16 -14 -7 1 -2 -0.041 -0.52 -0.084 -0.63	<b>75-70</b> 1 1 -4 2 -1 -5 -1 3 0.3 0.2 2 -6 <b>n Ozone-Attribu</b> <b>75-70</b> 0.050 0.073 -0.16 0.28	75-65           4           2           -4           5           -0.2           -3           -0.3           7           10           1           3           -7           utable Deaths pc           75-65           0.15           0.21           -0.14           0.77	75-60 6 4 -2 10 5 0.03 1 13 NA 2 6 -6 er 100,000 75-60 0.25 0.38 -0.087 1.4
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO	Base           1.0           1.7           1.1           2.2           0.8           2.6           1.8           0.9           3.7           2.6           1.2           2.1           Base           4.0           8.8           3.4           13           2.6	75ppb 1.0 1.8 1.1 2.3 0.8 2.6 1.9 1.1 4.2 2.8 1.2 2.2 75ppb 4.1 9.3 3.5 14 2.6	70ppb           1.0           1.7           1.1           2.3           0.8           2.8           2.0           1.0           4.1           2.8           1.2           2.3           ibutable Deaths           70ppb           4.0           9.3           3.6           13           2.7	65ppb 1.0 1.7 1.1 2.2 0.8 2.7 1.9 1.0 3.8 2.8 1.2 2.3 Per 100,000 65ppb 3.9 9.1 3.6 13 2.6	60ppb 1.0 1.7 1.1 2.1 0.8 2.6 1.9 0.9 NA 2.8 1.2 2.3 r Quality Scenar 60ppb 3.8 9.0 3.6 12 2.5	Base-75 -1 -6 -2 -5 -1 NA -10 -16 -14 -7 1 -2 -7 1 -2 -7 5 -0.041 -0.52 -0.084 -0.63 -0.030	<b>75-70</b> 1 1 -4 2 -1 -5 -1 3 0.3 0.2 2 -6 <b>n Ozone-Attribu</b> <b>75-70</b> 0.050 0.073 -0.16 0.28 -0.036	75-65           4           2           -4           5           -0.2           -3           -0.3           7           10           1           3           -7           utable Deaths pe           75-65           0.15           0.21           -0.14           0.77	75-60 6 4 -2 10 5 0.03 1 13 NA 2 6 -6 er 100,000 75-60 0.25 0.38 -0.087 1.4 0.13
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI	Base           1.0           1.7           1.1           2.2           0.8           2.6           1.8           0.9           3.7           2.6           1.2           2.1           Base           4.0           8.8           3.4           13           2.6           12	75ppb 1.0 1.8 1.1 2.3 0.8 2.6 1.9 1.1 4.2 2.8 1.2 2.2 75ppb 4.1 9.3 3.5 14 2.6 12 0.5	70ppb           1.0           1.7           1.1           2.3           0.8           2.8           2.0           1.0           4.1           2.8           1.2           2.3           ibutable Deaths           70ppb           4.0           9.3           3.6           13           2.7           12           0.5	65ppb 1.0 1.7 1.1 2.2 0.8 2.7 1.9 1.0 3.8 2.8 1.2 2.3 Per 100,000 65ppb 3.9 9.1 3.6 13 2.6 12 0.5	60ppb 1.0 1.7 1.1 2.1 0.8 2.6 1.9 0.9 NA 2.8 1.2 2.3 r Quality Scenar 60ppb 3.8 9.0 3.6 12 2.5 12 0.5 12 12 0.5 12 0.5 15 15 15 15 15 15 15 15 15 1	Base-75 -1 -6 -2 -5 -1 NA -10 -16 -14 -7 1 -2 -7 1 -2 -7 5 -0.041 -0.52 -0.084 -0.63 -0.030 NA -0.52 -0.030 NA	75-70 1 1 -4 2 -1 -5 -1 3 0.3 0.2 2 -6 n Ozone-Attribu 75-70 0.050 0.073 -0.16 0.28 -0.036 -0.62 -0.62 -0.62 -0.62	75-65 4 2 -4 5 -0.2 -3 -0.3 7 10 1 1 3 -7 -0.3 -7 -0.3 -0.5 -0.14 -0.77 -0.38 -0.34 -0.14 -0.377 -0.38 -0.38 -0.34 -0.34 -0.377 -0.34 -0.38 -0.377 -0.34 -0.38 -0.377 -0.38 -0.34 -0.38 -0.377 -0.38 -0.34 -0.38 -0.38 -0.34 -0.38 -0.38 -0.38 -0.377 -0.040 -0.38 -0.38 -0.357 -0.38	<b>75-60</b> 6 4 -2 10 5 0.03 1 13 NA 2 6 -6 -6 <b>er 100,000</b> <b>75-60</b> 0.25 0.38 -0.087 1.4 0.13 0.011 0.5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX	Base           1.0           1.7           1.1           2.2           0.8           2.6           1.2           2.1           Base           4.0           8.8           3.4           13           2.6           12           8.6           1.2	75ppb 1.0 1.8 1.1 2.3 0.8 2.6 1.9 1.1 4.2 2.8 1.2 2.2 75ppb 4.1 9.3 3.5 14 2.6 12 9.5 6.1 9.5 14	70ppb           1.0           1.7           1.1           2.3           0.8           2.8           2.0           1.0           4.1           2.8           1.2           2.3           ibutable Deaths           70ppb           4.0           9.3           3.6           13           2.7           12           9.6           5.0	65ppb 1.0 1.7 1.1 2.2 0.8 2.7 1.9 1.0 3.8 2.8 1.2 2.3 65ppb 3.9 9.1 3.6 13 2.6 12 9.5 5.7 5.7 5.7 5.7 5.7 5.7 5.7 5	60ppb 1.0 1.7 1.1 2.1 0.8 2.6 1.9 0.9 NA 2.8 1.2 2.3 r Quality Scenar 60ppb 3.8 9.0 3.6 12 2.5 12 9.4 5.2 12 9.4	Base-75 -1 -6 -2 -5 -1 NA -10 -16 -14 -7 1 -2 rio Change i Base-75 -0.041 -0.52 -0.084 -0.63 -0.63 NA -0.91 -0.91 -0.91 -0.91	<b>75-70</b> 1 1 -4 2 -1 -5 -1 3 0.3 0.2 2 -6 <b>n Ozone-Attribu</b> <b>75-70</b> 0.050 0.073 -0.16 0.28 -0.036 -0.62 -0.047	75-65 4 2 -4 5 -0.2 -3 -0.3 7 10 1 1 3 -7 -0.10 -0.15 0.21 -0.14 0.77 -0.024 -0.38 -0.022 -0.44 -0.77 -0.024 -0.34 -0.14 -0.77 -0.024 -0.34 -0.14 -0.77 -0.024 -0.34 -0.15 -0.14 -0.14 -0.14 -0.14 -0.14 -0.14 -0.14 -0.14 -0.14 -0.14 -0.14 -0.14 -0.14 -0.14 -0.15 -0.14 -0.14 -0.15 -0.15 -0.14 -0.14 -0.14 -0.15 -0.15 -0.14 -0.14 -0.15 -0.15 -0.15 -0.15 -0.15 -0.15 -0.15 -0.15 -0.14 -0.14 -0.14 -0.14 -0.14 -0.15 -0.15 -0.15 -0.15 -0.15 -0.15 -0.14 -0.15 -0.15 -0.15 -0.15 -0.15 -0.15 -0.15 -0.15 -0.15 -0.15 -0.15 -0.15 -0.15 -0.14	75-60 6 4 -2 10 5 0.03 1 13 NA 2 6 -6 75-60 0.25 0.38 -0.087 1.4 0.13 0.011 0.081 2.6 -6
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA	Base           1.0           1.7           1.1           2.2           0.8           2.6           1.8           0.9           3.7           2.6           1.2           2.1           Base           4.0           8.8           3.4           13           2.6           12           8.6           5.3           12	75ppb 1.0 1.8 1.1 2.3 0.8 2.6 1.9 1.1 4.2 2.8 1.2 2.2 75ppb 4.1 9.3 3.5 14 2.6 12 9.5 6.1 75	70ppb 1.0 1.7 1.1 2.3 0.8 2.8 2.0 1.0 4.1 2.8 1.2 2.3 1.2 2.3 1.2 1.2 3.6 1.3 2.7 12 9.6 5.9 4.5	65ppb 1.0 1.7 1.1 2.2 0.8 2.7 1.9 1.0 3.8 2.8 1.2 2.3 4 5 per 100,000 65ppb 3.9 9.1 3.6 13 2.6 12 9.5 5.7 4	60ppb 1.0 1.7 1.1 2.1 0.8 2.6 1.9 0.9 NA 2.8 1.2 2.3 r Quality Scenar 60ppb 3.8 9.0 3.6 12 2.5 12 9.4 5.3 NA	Base-75 -1 -6 -2 -5 -1 NA -10 -16 -14 -7 1 -2 rio Change i Base-75 -0.041 -0.52 -0.084 -0.63 -0.030 NA -0.91 -0.85 -0.85	<b>75-70</b> 1 1 -4 2 -1 -5 -1 3 0.3 0.2 2 -6 <b>n Ozone-Attribu</b> <b>75-70</b> 0.050 0.073 -0.16 0.28 -0.036 -0.62 -0.047 0.21 0.250	75-65 4 -4 5 -0.2 -3 -0.3 7 10 1 3 -7 7 -0.04 75-65 0.15 0.21 -0.14 0.77 -0.0040 -0.38 -0.022 0.45 5 -0.2 -3 -0.2 -3 -0.2 -3 -0.2 -3 -0.2 -3 -0.2 -3 -0.2 -3 -0.2 -3 -0.2 -3 -0.2 -3 -0.2 -3 -0.2 -3 -0.2 -3 -0.2 -3 -0.2 -3 -0.2 -3 -0.2 -3 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7	<b>75-60</b> 6 4 -2 10 5 0.03 1 13 NA 2 6 -6 <b>75-60</b> 0.25 0.38 -0.087 1.4 0.13 0.011 0.081 0.83 14 0.03 14 0.03 14 0.03 14 0.03 14 0.03 14 0.03 15 0.03 10 0.03 0.03 0.03 0.03 0.03 0.03 0.25 0.38 0.03 0.0
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY	Base           1.0           1.7           1.1           2.2           0.8           2.6           1.8           0.9           3.7           2.6           1.2           2.1           Base           4.0           8.8           3.4           13           2.6           12           8.6           5.3           13	75ppb 1.0 1.8 1.1 2.3 0.8 2.6 1.9 1.1 4.2 2.8 1.2 2.2 0zone-Attr 75ppb 4.1 9.3 3.5 14 2.6 12 9.5 6.1 15 	70ppb 1.0 1.7 1.1 2.3 0.8 2.8 2.0 1.0 4.1 2.8 1.2 2.3 10 4.1 2.8 1.2 2.3 10 4.1 2.8 1.2 2.3 10 4.1 2.8 1.2 2.3 10 4.1 2.8 1.2 2.3 10 1.1 2.8 1.0 4.1 2.8 1.2 2.3 1.0 1.1 2.5 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	65ppb 1.0 1.7 1.1 2.2 0.8 2.7 1.9 1.0 3.8 2.8 1.2 2.3 4 5 per 100,000 65ppb 3.9 9.1 3.6 13 2.6 12 9.5 5.7 14 4	60ppb 1.0 1.7 1.1 2.1 0.8 2.6 1.9 0.9 NA 2.8 1.2 2.3 r Quality Scenar 60ppb 3.8 9.0 3.6 12 2.5 12 9.4 5.3 NA	Base-75 -1 -6 -2 -5 -1 NA -10 -16 -14 -7 1 -2 rio Change i Base-75 -0.041 -0.52 -0.084 -0.63 -0.030 NA -0.91 -0.85 -1.9 -1.9 -1.9 -1.9 -1.9 -1.9 -1.9 -1.9	<b>75-70</b> 1 1 -4 2 -1 -5 -1 3 0.3 0.2 2 -6 <b>n Ozone-Attribu</b> <b>75-70</b> 0.050 0.073 -0.16 0.28 -0.036 -0.62 -0.047 0.21 0.050 0.050 0.050	<b>75-65</b> 4 2 -4 5 -0.2 -3 -0.3 7 10 1 1 3 -7 <b>10</b> <b>1</b> 3 -7 <b>7</b> -0.3 7 10 <b>1</b> 3 -7 <b>7</b> -0.3 <b>7</b> 10 <b>1</b> 3 -7 <b>7</b> -0.3 <b>7</b> -0.3 <b>7</b> -0.3 <b>7</b> -0.3 <b>7</b> -0.3 <b>7</b> -0.3 <b>7</b> -0.3 <b>7</b> -0.3 <b>7</b> -0.3 <b>7</b> -0.3 <b>7</b> -0.3 <b>7</b> -0.3 <b>7</b> -0.3 <b>7</b> -0.3 <b>7</b> -7 <b>10</b> <b>11</b> <b>3</b> <b>-7</b> <b>5</b> <b>5</b> <b>0</b> .15 <b>0</b> .21 <b>-0</b> .14 <b>0</b> .77 <b>-0</b> .040 <b>0</b> <b>1</b> <b>0</b> <b>1</b> <b>0</b> <b>1</b> <b>1</b> <b>1</b> <b>1</b> <b>1</b> <b>1</b> <b>1</b> <b>1</b>	75-60 6 4 -2 10 5 0.03 1 13 NA 2 6 -6 -6 -6 -6 -75-60 0.25 0.38 -0.087 1.4 0.13 0.011 0.081 0.83 NA
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sites CA New York, NY Philadelphia, PA	Base           1.0           1.7           1.1           2.2           0.8           2.6           1.8           0.9           3.7           2.6           1.2           2.1           Base           4.0           8.8           3.4           13           2.6           12           8.6           5.3           13           14           0.2	75ppb 1.0 1.8 1.1 2.3 0.8 2.6 1.9 1.1 4.2 2.8 1.2 2.2 75ppb 4.1 9.3 3.5 14 2.6 12 9.5 6.1 15 15 2.4	70ppb           1.0           1.7           1.1           2.3           0.8           2.8           2.0           1.0           4.1           2.8           1.2           2.3           ibutable Deaths           70ppb           4.0           9.3           3.6           13           2.7           9.6           5.9           15           15           0.0	65ppb 1.0 1.7 1.1 2.2 0.8 2.7 1.9 1.0 3.8 2.8 1.2 2.3 2.3 4 65ppb 3.9 9.1 3.6 13 2.6 12 9.5 5.7 14 15 7.0	60ppb 1.0 1.7 1.1 2.1 0.8 2.6 1.9 0.9 NA 2.8 1.2 2.3 r Quality Scenar 60ppb 3.8 9.0 3.6 12 2.5 12 9.4 5.3 NA 14 7.6 12 12 12 12 12 12 12 12 12 12	Base-75 -1 -6 -2 -5 -1 NA -10 -16 -14 -7 1 -2 -0.041 -0.52 -0.030 NA -0.63 -0.030 NA -0.91 -0.91 -0.85 -1.9 -1.0 -1.0 -0.63 -0.91 -0.91 -0.920	<b>75-70</b> 1 1 -4 2 -1 -5 -1 3 0.3 0.2 2 -6 <b>n Ozone-Attribu</b> <b>75-70</b> 0.050 0.073 -0.16 0.28 -0.036 -0.62 -0.047 0.021 0.050 0.039 0.12	75-65 4 -4 -5 -0.2 -3 -0.3 7 10 1 1 3 -7 -7 -7 -0.2 -3 -0.3 7 10 1 1 3 -7 -7 -0.3 -0.5 -0.14 -0.022 -0.38 -0.022 -0.45 -0.3 -0.38 -0.022 -0.45 -0.15 -0.38 -0.022 -0.38 -0.022 -0.15 -0.15 -0.38 -0.022 -0.15 -0.38 -0.022 -0.15 -0.15 -0.38 -0.022 -0.15 -0.38 -0.022 -0.15 -0.15 -0.38 -0.022 -0.15 -0.15 -0.22 -0.38 -0.22 -0.38 -0.22 -0.38 -0.38 -0.38 -0.38 -0.38 -0.38 -0.38 -0.38 -0.38 -0.38 -0.38 -0.38 -0.38 -0.38 -0.38 -0.38 -0.38 -0.35 -0.38 -0.35 -0.38 -0.35 -0.38 -0.35 -0.38 -0.35 -0.38 -0.35 -0.38 -0.35 -0.38 -0.35 -0.38 -0.35 -0.38 -0.35 -0.38 -0.35 -0.35 -0.38 -0.35 -0.55 -0.55 -0.55 -0.55 -0.55 -0.55 -0.55 -0.55 -0.55 -0.55 -	75-60 6 4 -2 10 5 0.03 1 13 NA 2 6 -6 -6 -6 -6 -75-60 0.25 0.38 -0.087 1.4 0.13 0.011 0.081 0.081 0.083 NA 0.34 0.4 fr 0.34 0.4 fr 0.34 0.54 0.54 0.55
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Lowis, MC	Base           1.0           1.7           1.1           2.2           0.8           2.6           1.8           0.9           3.7           2.6           1.2           2.1           Base           4.0           8.8           3.4           13           2.6           12           8.6           5.3           13           14           8.2           11	75ppb 1.0 1.8 1.1 2.3 0.8 2.6 1.9 1.1 4.2 2.8 1.2 2.2 75ppb 4.1 9.3 3.5 14 2.6 12 9.5 6.1 15 15 8.1 12 12	70ppb           1.0           1.7           1.1           2.3           0.8           2.8           2.0           1.0           4.1           2.8           1.2           2.3           ibutable Deaths           70ppb           4.0           9.3           3.6           13           2.7           12           9.6           5.9           15           15           8.0	65ppb 1.0 1.7 1.1 2.2 0.8 2.7 1.9 1.0 3.8 2.8 1.2 2.3 2.3 Per 100,000 65ppb 3.9 9.1 3.6 13 2.6 12 9.5 5.7 14 15 7.8 12	60ppb 1.0 1.7 1.1 2.1 0.8 2.6 1.9 0.9 NA 2.8 1.2 2.3 r Quality Scenar 60ppb 3.8 9.0 3.6 12 2.5 12 9.4 5.3 NA 14 7.6 12	Base-75 -1 -6 -2 -5 -1 NA -10 -16 -14 -7 1 -2 -7 1 -2 -7 -1 -6 -10 -14 -7 -7 -1 -7 -1 -10 -10 -10 -10 -10 -10 -10	<b>75-70</b> 1 1 -4 2 -1 -5 -1 3 0.3 0.2 2 -6 <b>n Ozone-Attrib</b> <b>75-70</b> 0.050 0.073 -0.16 0.28 -0.036 -0.62 -0.047 0.21 0.050 0.039 0.13 0.55	75-65 4 -4 -5 -0.2 -3 -0.3 7 10 1 1 3 -7 -7 -7 -0.044 0.77 -0.040 -0.38 -0.21 -0.14 0.77 -0.0040 -0.38 -0.22 0.45 1.5 0.18 0.26 0.92	75-60 6 4 -2 10 5 0.03 1 13 NA 2 6 -6 -6 -6 -6 -6 -6 -6 -6 -6

"0" incidence values denote non-zero estimates that round to zero.

# Figure 7C-1. Sensitivity Analysis – ST Mortality: Smaller Smith et al., 2009-based study area (2009) (heat maps for just meeting existing standard and risk reductions from just meeting alternative standards) (see Key at bottom of figure).

Study area	Daily 8hr Max Ozone Level (ppb)															Total	
	0.5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	>75	
Atlanta, GA	0	0	0	0	20-25	23-30 4	5	8	12	43-30	7	8	2	0	0	0	61
Baltimore, MD	0	0	0	0	0	2	6	11	10	14	10	7	2	0	0	0	63
Boston, MA	0	0	0	0	1	2	4	5	4	4	4	1	0	0	1	0	25
Cleveland, OH	0	0	0	0	2	11	20	30	33	35	25	12	5	3	0	0	176
Denver, CO	0	0	0	0	0	0	1	2	5	9	11	10	3	1	0	0	42
Detroit, MI	0	0	0	3	3	10	18	26	43	56	15	19	18	0	8	2	221
Houston, TX	0	0	0	3	15	28	66	68	61	49	46	19	15	4	2	2	378
Los Angeles, CA	0	0	0	0	0	0	1	8	129	151	228	70	4	0	0	0	590
New York, NY	0	0	0	3	18	106	211	175	312	232	135	86	28	0	0	0	1,305
Philadelphia, PA	0	0	0	1	3	11	33	26	46	37	43	19	14	0	0	0	234
Sacramento, CA	0	0	0	0	1	7	19	21	22	17	13	10	2	0	0	0	112
St. Louis. MO	0	0	0	1	1	2	3	5	5	8	7	5	1	1	0	0	38

## Decrease 75 to 70

Study area	Daily 8hr	Daily 8hr Max Ozone Level (ppb)															Total	Change	e in risk
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	>75		Inc.	Dec.
Atlanta, GA	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	2	0	2
Baltimore, MD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Boston, MA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cleveland, OH	0	0	0	0	0	0	0	1	1	2	1	1	0	0	0	0	5	0	6
Denver, CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Detroit, MI	0	0	0	-1	-1	-2	-2	-2	-2	-1	0	1	1	0	1	0	-8	-11	3
Houston, TX	0	0	0	0	-1	-1	-2	-1	0	1	2	1	1	0	0	0	0	-5	5
Los Angeles, CA	0	0	0	0	0	0	0	0	2	5	9	3	0	0	0	0	19	0	19
New York, NY	0	0	0	0	-2	-7	-4	4	11	15	11	9	3	0	0	0	41	-19	59
Philadelphia, PA	0	0	0	0	0	-1	-1	0	1	1	2	1	1	0	0	0	4	-2	6
Sacramento, CA	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	2	0	3
St. Louis, MO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0

### Decrease 75 to 65

Study area	Daily 8hr	Daily 8hr Max Ozone Level (ppb)															Total	Change	e in risk
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	>75		Inc.	Dec.
Atlanta, GA	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	4	0	4
Baltimore, MD	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	3	0	3
Boston, MA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cleveland, OH	0	0	0	0	0	0	0	2	2	4	3	2	1	0	0	0	13	-1	14
Denver, CO	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
Detroit, MI	0	0	0	-1	-1	-2	-2	-2	-1	1	1	2	2	0	1	0	-2	-9	9
Houston, TX	0	0	0	-1	-2	-3	-3	0	1	2	3	2	2	0	0	0	2	-10	10
Los Angeles, CA	0	0	0	0	0	0	0	0	4	10	19	6	0	0	0	0	41	0	39
New York, NY	0	0	0	-1	-2	-8	8	26	53	59	40	31	10	0	0	0	215	-21	236
Philadelphia, PA	0	0	0	0	0	-1	-1	0	2	2	4	2	2	0	0	0	9	-3	12
Sacramento, CA	0	0	0	0	0	-1	0	1	1	1	1	1	0	0	0	0	4	-1	5
Ch Louis MO	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	2	0	2

## Decrease 75 to 60

Study area	Daily 8hr I	Daily 8hr Max Ozone Level (ppb)															Total	Change	e in risk
																			_
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	>75		Inc.	Dec.
Atlanta, GA	0	0	0	0	0	0	0	1	1	2	1	1	1	0	0	0	6	0	7
Baltimore, MD	0	0	0	0	0	0	0	0	1	2	1	1	0	0	0	0	4	0	5
Boston, MA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Cleveland, OH	0	0	0	0	0	0	0	3	4	6	5	3	1	1	0	0	22	-1	24
Denver, CO	0	0	0	0	0	0	0	0	0	0	1	2	1	0	0	0	4	0	4
Detroit, MI	0	0	0	-2	-1	-3	-2	-1	1	4	2	3	3	0	2	1	6	-10	17
Houston, TX	0	0	0	-1	-4	-4	-4	0	3	4	6	3	3	1	1	0	8	-14	22
Los Angeles, CA	0	0	0	0	0	0	0	1	15	20	29	10	1	0	0	0	75	0	76
New York, NY										NA									
Philadelphia, PA	0	0	0	0	-1	-1	-1	0	3	4	5	3	2	0	0	0	14	-4	18
Sacramento, CA	0	0	0	0	0	-1	0	1	2	2	2	2	0	0	0	0	6	-2	9
St. Louis, MO	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	4	0	4

NA: for NYC, the model-based adjustment methodology was unable to estimate ozone distributions which would meet the alternative standard level of 60 ppb.

**Key**: For *current standard* (75) which is an absolute risk metric, color gradient ranges from blue (smallest ozone-related mortality count) to red (highest ozone-related mortality count). For *Decrease results*, color gradient ranges from red (increase in risk – negative cell values) to blue (reduction in risk – positive cell values).
Table 7C-2. Sensitivity Analysis – ST Mortality: Alternate method for simulating standards (2009) (incidence, percent of baseline mortality, incidence per 100,000 - compare with Core Results in Table 7B-2).

		Air Quality Scenario										
		Absolute Oz	one-Attributab	le Incidence		Char	ige in Ozone-At	tributable Incid	ence			
Study Area	Base	75ppb	70ppb	65ppb	60ppb	Base-75	75-70	75-65	75-60			
Donvor CO	56	57	57	56	52	-1	0	1	5			
Deriver, CO	(-180 - 290)	(-190 - 290)	(-190 - 290)	(-180 - 290)	(-170 - 270)	(35)	(01)	(-3 - 6)	(-16 - 25)			
Detroit MI	460	460	460	450	430	NA	-9	4	24			
Detroit, ivi	(23 - 880)	(23 - 880)	(24 - 890)	(23 - 870)	(22 - 830)	NA	(018)	(0 - 7)	(1 - 46)			
Houston TV	550	580	580	580	560	-31	-2	2	18			
	(100 - 990)	(110 - 1000)	(110 - 1000)	(110 - 1000)	(110 - 1000)	(-657)	(03)	(0 - 3)	(3 - 32)			
Los Angeles CA	670	690	680	660	640	-19	15	32	48			
LOS Aligeles, CA	(-280 - 1600)	(-290 - 1700)	(-280 - 1600)	(-270 - 1600)	(-270 - 1500)	(846)	(-6 - 36)	(-13 - 77)	(-20 - 120)			
New York NY	2900	2900	2900	2700	NA	-3	24	290	NA			
New Tork, NT	(1800 - 4100)	(1800 - 4100)	(1800 - 4100)	(1600 - 3700)	114	(-24)	(14 - 33)	(170 - 400)	NA.			
Philadelphia PA	820	810	790	780	750	9	16	35	58			
r madeipma, r A	(180 - 1400)	(180 - 1400)	(180 - 1400)	(170 - 1400)	(170 - 1300)	(2 - 16)	(4 - 28)	(8 - 61)	(13 - 100)			
Sacramento CA	170	160	160	150	150	7	3	6	10			
Sacramento, CA	(-180 - 500)	(-170 - 480)	(-170 - 470)	(-160 - 460)	(-160 - 450)	(-7 - 20)	(-3 - 10)	(-6 - 18)	(-10 - 30)			
				Ai	ir Quality Scena	rio						
	Pe	rcent of Baselin	e Incidence Att	ributable to Ozo	one		Change in O <sub>3</sub> -A	Attributable Risk	:			
Study Area	Base	75ppb	70ppb	65ppb	60ppb	Base-75	75-70	75-65	75-60			
Denver, CO	0.8	0.8	0.8	0.8	0.7	-2	-0.2	2	8			
Detroit, MI	2.7	2.7	2.8	2.7	2.6	NA	-2	1	5			
Houston, TX	1.8	1.9	1.9	1.9	1.8	-6	-0.3	0.2	3			
Los Angeles, CA	0.9	0.9	0.9	0.9	0.9	-3	2	5	7			
New York, NY	3.8	3.8	3.8	3.5	NA	-0.1	1	9	NA			
Philadelphia, PA	2.9	2.9	2.9	2.8	2.7	1	2	4	7			
Sacramento, CA	1.2	1.2	1.2	1.1	1.1	4	2	4	6			
				Ai	ir Quality Scena	rio						
		Ozone-Attr	ibutable Deaths	per 100,000		Change i	n Ozone-Attrib	utable Deaths pe	er 100,000			
Study Area	Base	75ppb	70ppb	65ppb	60ppb	Base-75	75-70	75-65	75-60			
Denver, CO	2.2	2.3	2.3	2.2	2.1	-0.039	-0.0044	0.042	0.19			
Detroit, MI	11	11	11	10	10	NA	-0.21	0.086	0.54			
Houston, TX	9.4	10.0	10.0	9.9	9.7	-0.54	-0.026	0.028	0.30			
Los Angeles, CA	5.3	5.4	5.3	5.2	5.0	-0.15	0.12	0.25	0.38			
New York, NY	16	16	16	14	NA	-0.014	0.13	1.5	NA			
Philadelphia, PA	14	14	13	13	13	0.15	0.27	0.58	0.99			

NA: for NYC, the model-based adjustment methodology was unable to estimate ozone distributions which would meet the alternative standard level of 60 ppb.

# Table 7C-3. Sensitivity Analysis – ST Mortality: Regional Bayes Adjustment (2009) (incidence, percent of baseline mortality, incidence per 100,000 - compare with Core Results in Table 7B-2).

				A	ir Quality Scena	rio			
		Absolute O	zone-Attributab	le Incidence		Char	nge in Ozone-At	tributable Incid	ence
Study Area	Base	75ppb	70ppb	65ppb	60ppb	Base-75	75-70	75-65	75-60
Atlanta GA	220	220	210	200	200	4	8	14	21
Atlanta, GA	(-170 - 610)	(-170 - 590)	(-160 - 570)	(-160 - 560)	(-150 - 540)	(-3 - 11)	(-6 - 21)	(-11 - 40)	(-16 - 57)
Baltimore MD	460	460	450	440	430	7	9	20	32
	(190 - 730)	(190 - 720)	(190 - 710)	(180 - 690)	(180 - 670)	(3 - 10)	(4 - 13)	(8 - 32)	(13 - 51)
Boston, MA	570	570	570	560	550	-4	-2	9	25
	(190 - 930)	(190 - 940)	(190 - 940)	(190 - 920)	(180 - 900)	(-17)	(-13)	(3 - 15)	(8 - 41)
Cleveland, OH	290	300	290	280	260	-4	9	21	37
	(71 - 510)	(72 - 520)	(70 - 500)	(67 - 480)	(63 - 460)	(-16)	(2 - 15)	(5 - 38)	(9 - 65)
Denver. CO	10	10	10	10	9	0	0	0	1
,	(-230 - 240)	(-230 - 240)	(-230 - 240)	(-220 - 230)	(-210 - 220)	(11)	(-1 - 1)	(-5 - 6)	(-19 - 21)
Detroit. MI	510	510	520	510	490	NA	-19	-5	13
	(140 - 860)	(140 - 860)	(150 - 890)	(150 - 870)	(140 - 840)		(-532)	(-29)	(4 - 23)
Houston. TX	470	500	500	500	490	-40	-1	3	10
	(72 - 850)	(78 - 920)	(79 - 930)	(78 - 920)	(77 - 910)	(-673)	(01)	(0 - 5)	(2 - 19)
Los Angeles. CA	610	700	680	650	610	-90	23	49	90
	(-300 - 1500)	(-350 - 1700)	(-330 - 1700)	(-320 - 1600)	(-300 - 1500)	(44220)	(-11 - 56)	(-24 - 120)	(-44 - 220)
New York, NY	3300	3400	3300	2800	NA	-98	110	550	NA
	(2200 - 4300)	(2300 - 4400)	(2200 - 4300)	(1900 - 3700)		(-67130)	(73 - 140)	(380 - 730)	
Philadelphia, PA	1200	1200	1200	1100	1100	-6	20	47	73
• •	(640 - 1700)	(640 - 1700)	(630 - 1700)	(620 - 1600)	(600 - 1600)	(-39)	(11 - 29)	(25 - 68)	(40 - 110)
Sacramento, CA	59	58	57	56	54	2	1	2	3
	(-300 - 400)	(-290 - 390)	(-280 - 390)	(-280 - 380)	(-270 - 370)	(-8 - 11)	(-5 - 7)	(-10 - 13)	(-16 - 23)
St. Louis, MO	390	390	380	370	350	1	8	21	37
	(74 - 690)	(73 - 690)	(72 - 680)	(69 - 660)	(66 - 630)	(0 - 3)	(2 - 15)	(4 - 38)	(7 - 68)
				-					
				A	ir Quality Scena	rio I			
	Pe	ercent of Baselir	e Incidence Att	ributable to Ozo	one		Change in O <sub>3</sub> -A	Attributable Risk	: 
Study Area	Base	75ppb	70ppb	65ppb	60ppb	Base-75	75-70	75-65	75-60
Atlanta, GA	1.1	1.1	1.0	1.0	1.0	2	3	7	9
Baltimore, MD	4.0	3.9	3.9	3.8	3.7	1	2	4	7
Boston, MA	3.4	3.5	3.5	3.4	3.3	-1	-0.3	1	4
Cleveland, OH	2.7	2.8	2.7	2.6	2.4	-1	3	7	12
Denver, CO	0.1	0.1	0.1	0.1	0.1	-0.4	0.2	2	7
Detroit, MI	3.0	3.0	3.1	3.0	2.9	NA	-4	-1	3
Houston, TX	1.5	1.6	1.6	1.6	1.6	-8	-0.1	0.5	2
Los Angeles, CA	0.8	1.0	0.9	0.9	0.8	-15	3	7	13
New York, NY	4.2	4.4	4.2	3.7	NA	-3	3	16	NA
Philadelphia, PA	4.2	4.2	4.2	4.1	4.0	-1	2	4	6
Sacramento, CA	0.4	0.4	0.4	0.4	0.4	2	2	3	6
St. Louis, IVIO	2.8	2.8	2.8	2.7	2.6	0.4	2	5	9
				A	ir Quality Scena	rio			
		Ozone-Attr	ibutable Deaths	s per 100,000		Change i	n Ozone-Attrib	utable Deaths pe	er 100,000
Study Area	Base	75ppb	70ppb	65ppb	60ppb	Base-75	75-70	75-65	75-60
Atlanta, GA	4.2	4.2	4.0	3.9	3.8	0.077	0.15	0.28	0.40
Baltimore, MD	17	17	17	16	16	0.24	0.32	0.74	1.2
Boston, MA	13	13	13	12	12	-0.088	-0.043	0.20	0.55
Cleveland, OH	14	14	14	13	13	-0.17	0.42	1.0	1.8
Denver, CO	0.40	0.40	0.40	0.39	0.36	-0.0017	0.0014	0.0095	0.034
Detroit, MI	12	12	12	12	11	NA	-0.43	-0.12	0.31
Houston, TX	8.0	8.7	8.7	8.6	8.5	-0.68	-0.0085	0.045	0.18
Los Angeles, CA	4.8	5.5	5.3	5.1	4.8	-0.70	0.18	0.38	0.70
New York, NY	17	18	17	15	NA	-0.52	0.57	3.0	NA
Philadelphia, PA	20	20	19	19	19	-0.10	0.34	0.79	1.2
Sacramento, CA	2.8	2.7	2.7	2.6	2.6	0.076	0.046	0.091	0.16
St. Louis, MO	14	14	13	13	12	0.052	0.30	0.74	13

NA: for NYC, the model-based adjustment methodology was unable to estimate ozone distributions which would meet the alternative standard level of 60 ppb.

Table 7C-4. Sensitivity Analysis – ST Mortality: Copollutant model (PM10) (2009) (incidence, percent of baseline mortality, incidence per 100,000 - compare with Core Results in Table 7B-2).

				A	r Quality Scenar	no			
		Absolute Oz	one-Attributab	le Incidence		Char	ige in Ozone-At	tributable Incid	ence
Study Area	Base	75ppb	70ppb	65ppb	60ppb	Base-75	75-70	75-65	75-60
Atlanta, GA	100	99	95	92	89	2	4	7	9
	(-830 - 980)	(-810 - 970)	(-780 - 940)	(-760 - 910)	(-730 - 880)	(-15 - 18)	(-28 - 35)	(-53 - 65)	(-76 - 94)
Baltimore, MD	240	230	230	220	220	3	4	10	16
	(-290 - 740)	(-290 - 730)	(-280 - 720)	(-270 - 700)	(-270 - 680)	(-4 - 10)	(-5 - 14)	(-12 - 32)	(-20 - 52)
Boston, MA	100	100	100	100	100	-1	0	2	5
	(-650 - 820)	(-650 - 820)	(-650 - 830)	(-640 - 810)	(-620 - 790)	(46)	(23)	(-10 - 13)	(-28 - 36)
Cleveland, OH	200	200	200	190	180	-3	6	15	25
	(-1/0 - 560)	(-1/0 - 5/0)	(-1/0 - 550)	(-160 - 530)	(-150 - 500)	(2/)	(-5 - 17)	(-12 - 41)	(-21 - 71)
Denver, CO	-13	-13	-13	-13	-12	(2 2)	0	0	-1
	(-370-330)	(-370-330)	(-370 - 330)	(-300 - 320)	(-340 - 300)	(22)	(-1-1)	(-9-8)	(-31 - 28)
Detroit, MI	( 270, 760)	( 270 760)	( 280 700)	( 280, 770)	( 260 740)	NA	-/	-2	5
	(-370-700)	(-370-760)	(-360 - 790)	(-360-770)	(-300-740)	-50	(1526)	(40)	(-10-20)
Houston, TX	(-99-1400)	/ 95 - 1600)	/-95 - 1600)	/ 95 - 1600)	/50	-59	-1	4	(_2_22)
	(-66 - 1400)	(-93-1000)	(-93 - 1600)	(-93 - 1600)	(-95 - 1500)	-24	(02)	(-1-0)	(-2 - 55)
Los Angeles, CA	(-2000 - 2200)	190	100	(-2100 - 2400)	(-2000 - 2200)	-24	(_72_92)	15	24 (-280 - 220)
	1200	(-2300-2000)	(-2200 - 2500)	(-2100-2400)	(-2000 - 2200)	(200550)	(-72-85)	220	(-280 - 550)
New York, NY	( 070 2500)	( 1000 3600)	( 070, 2500)	( 840, 2000)	NA	(29 110)	42	( 160 600)	NA
	(-970-3300)	(-1000-3000)	(-970-3300)	(-840 - 3000)	500	(20110)	(-51-110)	(-100-000)	20
Philadelphia, PA	030	030	620 ( EE0 1700)	610	590	-3	(0.21)	( 22 71)	39
	(-500 - 1600)	(-500 - 1800)	(-550-1700)	(-540 - 1700)	(-520-1700)	(39)	(-9-51)	(-22-71)	(-34 - 110)
Sacramento, CA	(-440 - 720)	150	(-420 - 690)	(-420 - 680)	(-410 - 670)	4	5 (-7 - 12)	5	9
	210	(-450-710)	(-420 - 690)	(-420-080)	(-410-670)	(-12-20)	(-/-12)	(-14 - 24)	(-24 - 41)
St. Louis, MO	(-460 - 840)	(-460 - 840)	(-450 - 820)	200	(-420 - 760)	(-2-2)	4	(-24 - 46)	(-12 - 92)
	(-400 - 840)	(-400 - 840)	(-430 - 830)	(-440 - 800)	(-420 - 760)	(-2 - 3)	(-10 - 18)	(-24 - 40)	(-45 - 65)
				Δ	r Quality Scenar	rio			
	Bo	rcont of Bosolin	o Incidonco Att	ributable to Oze			Change in O	ttributable Bick	
Study Area	Paca	7Ennh	70nnh	6Ennh	60mmh	Baco 75	75 70		75.60
Study Area	Dase	vahhn	Vohhn	oshhp	00000	Dase-75	73-70	73-03	73-00
Atlanta GA	0.5	0.5	0.4	0.4	0.4	2	2	6	٥
Atlanta, GA Baltimore, MD	0.5	0.5	0.4	0.4	0.4	2	3	6	9
Atlanta, GA Baltimore, MD Boston, MA	0.5	0.5	0.4 2.0 0.6	0.4	0.4	2 1	3 2	6 4 1	9 7 4
Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH	0.5 2.0 0.6	0.5 2.0 0.6	0.4 2.0 0.6	0.4 1.9 0.6	0.4 1.9 0.6	2 1 -1 -1	3 2 -0.4 3	6 4 1 7	9 7 4 12
Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH	0.5 2.0 0.6 1.9	0.5 2.0 0.6 1.9	0.4 2.0 0.6 1.8	0.4 1.9 0.6 1.8	0.4 1.9 0.6 1.7	2 1 -1 -1 -05	3 2 -0.4 3	6 4 1 7 3	9 7 4 12 10
Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit. MI	0.5 2.0 0.6 1.9 -0.2 1.2	0.5 2.0 0.6 1.9 -0.2 1.2	0.4 2.0 0.6 1.8 -0.2 1.2	0.4 1.9 0.6 1.8 -0.2 1.2	0.4 1.9 0.6 1.7 -0.2 1.2	2 1 -1 -0.5 NA	3 2 -0.4 3 1 -4	6 4 1 7 3 -1	9 7 4 12 10 3
Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX	0.5 2.0 0.6 1.9 -0.2 1.2 2.2	0.5 2.0 0.6 1.9 -0.2 1.2 2.4	0.4 2.0 0.6 1.8 -0.2 1.2 2.4	0.4 1.9 0.6 1.8 -0.2 1.2 2.4	0.4 1.9 0.6 1.7 -0.2 1.2 2.4	2 1 -1 -0.5 NA -8	3 2 -0.4 3 1 -4 -0.1	6 4 1 7 3 -1	9 7 4 12 10 3 2
Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA	0.5 2.0 0.6 1.9 -0.2 1.2 2.2 0.2	0.5 2.0 0.6 1.9 -0.2 1.2 2.4 0.2	0.4 2.0 0.6 1.8 -0.2 1.2 2.4 0.2	0.4 1.9 0.6 1.8 -0.2 1.2 2.4 0.2	0.4 1.9 0.6 1.7 -0.2 1.2 2.4 0.2	2 1 -1 -0.5 NA -8 -14	3 2 -0.4 3 1 -4 -0.1 3	6 4 7 3 -1 0.5 7	9 7 4 12 10 3 2 12
Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY	0.5 2.0 0.6 1.9 -0.2 1.2 2.2 0.2 1.7	0.5 2.0 0.6 1.9 -0.2 1.2 2.4 0.2 1.7	0.4 2.0 0.6 1.8 -0.2 1.2 2.4 0.2 1.7	0.4 1.9 0.6 1.8 -0.2 1.2 2.4 0.2 1.5	0.4 1.9 0.6 1.7 -0.2 1.2 2.4 0.2 NA	2 1 -1 -0.5 NA -8 -14 -3	3 2 -0.4 3 1 -4 -0.1 3 3	6 4 7 3 -1 0.5 7 16	9 7 4 12 10 3 2 12 NA
Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia. PA	0.5 2.0 0.6 1.9 -0.2 1.2 2.2 0.2 1.7 2.2	0.5 2.0 0.6 1.9 -0.2 1.2 2.4 0.2 1.7 2.3	0.4 2.0 0.6 1.8 -0.2 1.2 2.4 0.2 1.7 2.2	0.4 1.9 0.6 1.8 -0.2 1.2 2.4 0.2 1.5 2.2	0.4 1.9 0.6 1.7 -0.2 1.2 2.4 0.2 NA 2.1	2 1 -1 -0.5 NA -8 -14 -3 -1	3 -0.4 3 1 -4 -0.1 3 3 2	6 4 7 3 -1 0.5 7 16 4	9 7 4 10 3 2 12 NA 6
Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA	0.5 2.0 0.6 1.9 -0.2 1.2 2.2 0.2 1.7 2.2 1.7 2.2 1.1	0.5 2.0 0.6 1.9 -0.2 1.2 2.4 0.2 1.7 2.3 1.1	0.4 2.0 0.6 1.8 -0.2 1.2 2.4 0.2 1.7 2.2 1.1	0.4 1.9 0.6 1.8 -0.2 1.2 2.4 0.2 1.5 2.2 1.1	0.4 1.9 0.6 1.7 -0.2 1.2 2.4 0.2 NA 2.1 1.0	2 1 -1 -0.5 NA -8 -14 -3 -1 2	3 2 -0.4 3 1 -4 -0.1 3 3 2 2 2	6 4 1 7 3 -1 0.5 7 16 4 3	9 7 4 12 10 3 2 12 NA 6 6
Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO	0.5           2.0           0.6           1.9           -0.2           1.2           2.2           0.2           1.7           2.2           1.1           1.5	0.5 2.0 0.6 1.9 -0.2 1.2 2.4 0.2 1.7 2.3 1.1 1.5	0.4 2.0 0.6 1.8 -0.2 1.2 2.4 0.2 1.7 2.2 1.1 1.5	0.4 1.9 0.6 1.8 -0.2 1.2 2.4 0.2 1.5 2.2 1.1 1.4	0.4 1.9 0.6 1.7 -0.2 1.2 2.4 0.2 NA 2.1 1.0 1.3	2 1 -1 -0.5 NA -8 -14 -3 -1 2 0.3	3 2 -0.4 3 1 -4 -0.1 3 3 2 2 2 2	6 4 1 7 3 -1 0.5 7 16 4 3 5	9 7 4 12 10 3 2 12 NA 6 6 9
Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO	0.5           2.0           0.6           1.9           -0.2           1.2           2.2           0.2           1.7           2.2           1.1           1.5	0.5 2.0 0.6 1.9 -0.2 2.4 0.2 1.7 2.3 1.1 1.5	0.4 2.0 0.6 1.8 -0.2 1.2 2.4 0.2 1.7 2.2 1.1 1.5	0.4 1.9 0.6 1.8 -0.2 1.2 2.4 0.2 1.5 2.2 1.1 1.4	0.4 1.9 0.6 1.7 -0.2 1.2 2.4 0.2 NA 2.1 1.0 1.3	2 1 -1 -0.5 NA -8 -14 -3 -1 2 0.3	3 -0.4 3 1 -4 -0.1 3 3 2 2 2 2	6 4 1 7 3 -1 0.5 7 16 4 3 5	9 7 4 12 10 3 2 12 NA 6 6 6 9
Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO	0.5 2.0 0.6 1.9 -0.2 1.2 2.2 0.2 1.7 2.2 1.7 2.2 1.1 1.5	0.5 2.0 0.6 1.9 -0.2 1.2 2.4 0.2 1.7 2.3 1.1 1.5	0.4 2.0 0.6 1.8 -0.2 1.2 2.4 0.2 1.7 2.2 1.1 1.5	0.4 1.9 0.6 1.8 -0.2 1.2 2.4 0.2 1.5 2.2 1.1 1.4	0.4 1.9 0.6 1.7 -0.2 1.2 2.4 0.2 NA 2.1 1.0 1.3 r Ouelity Scenario	2 1 -1 -0.5 NA -8 -14 -3 -1 2 0.3	3 2 -0.4 3 1 -4 -0.1 3 3 2 2 2 2	6 4 7 3 -1 0.5 7 16 4 3 5	9 7 4 12 10 3 2 12 NA 6 6 9
Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO	0.5           2.0           0.6           1.9           -0.2           1.2           2.2           0.2           1.7           2.2           1.7           2.2           1.7           2.2	0.5 2.0 0.6 1.9 -0.2 1.2 2.4 0.2 1.7 2.3 1.1 1.5	0.4 2.0 0.6 1.8 -0.2 1.2 2.4 0.2 1.7 2.2 1.1 1.5 but able Deaths	0.4 1.9 0.6 1.8 -0.2 1.2 2.4 0.2 1.5 2.2 1.1 1.4 A	0.4 1.9 0.6 1.7 -0.2 1.2 2.4 0.2 NA 2.1 1.0 1.3 r Quality Scenar	2 1 -1 -0.5 NA -8 -14 -3 -1 2 0.3 rio	3 2 -0.4 3 1 -4 -0.1 3 3 2 2 2 2	6 4 7 3 -1 0.5 7 16 4 3 5	9 7 4 12 10 3 2 12 NA 6 6 6 9
Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO	0.5 2.0 0.6 1.9 -0.2 1.2 2.2 0.2 1.7 2.2 1.7 2.2 1.1 1.5	0.5 2.0 0.6 1.9 -0.2 1.2 2.4 0.2 1.7 2.3 1.1 1.5 <b>Ozone-Attr</b> <b>75aph</b>	0.4 2.0 0.6 1.8 -0.2 1.2 2.4 0.2 1.7 2.2 1.1 1.5 (butable Deaths	0.4 1.9 0.6 1.8 -0.2 1.2 2.4 0.2 1.5 2.2 1.1 1.4 Per 100,000 65 apb	0.4 1.9 0.6 1.7 -0.2 1.2 2.4 0.2 NA 2.1 1.0 1.3 r Quality Scenar	2 1 -1 -0.5 NA -8 -14 -3 -1 2 0.3 rio Change i Baco 75	3 2 -0.4 3 1 -4 -0.1 3 3 2 2 2 2 2 7 7 70	6 4 1 7 3 -1 0.5 7 16 4 3 5	9 7 4 12 10 3 2 12 NA 6 6 6 9 9
Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Study Area Atlanta, GA	0.5 2.0 0.6 1.9 -0.2 1.2 2.2 0.2 1.7 2.2 1.7 2.2 1.1 1.5 Base 19	0.5 2.0 0.6 1.9 -0.2 1.2 2.4 0.2 1.7 2.3 1.1 1.5 <b>Ozone-Attr</b> <b>75ppb</b>	0.4 2.0 0.6 1.8 -0.2 1.2 2.4 0.2 1.7 2.2 1.1 1.5 ibutable Deaths 70ppb	0.4 1.9 0.6 1.8 -0.2 1.2 2.4 0.2 1.5 2.2 1.1 1.4 Per 100,000 65ppb 1.8	0.4 1.9 0.6 1.7 -0.2 1.2 2.4 0.2 NA 2.1 1.0 1.3 r Quality Scenar 60ppb	2 1 -1 -0.5 NA -8 -14 -3 -1 2 0.3 rio Change i Base-75 0.025	3 2 -0.4 3 1 -4 -0.1 3 3 2 2 2 2 2 2 0 0066	6 4 1 7 3 -1 0.5 7 16 4 3 5 5 table Deaths pe 75-65 0 13	9 7 4 12 10 3 2 12 NA 6 6 6 9 9 <b>2</b> 12 NA 6 7 5-60 75-60
Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Study Area Atlanta, GA	0.5 2.0 0.6 1.9 -0.2 1.2 2.2 0.2 1.7 2.2 1.1 1.5 Base 1.9 8.8	0.5 2.0 0.6 1.9 -0.2 1.2 2.4 0.2 1.7 2.3 1.1 1.5 <b>Ozone-Attr</b> <b>75ppb</b> 1.9 8.7	0.4 2.0 0.6 1.8 -0.2 1.2 2.4 0.2 1.7 2.2 1.1 1.5 ibutable Deaths 70ppb 1.8 85	0.4 1.9 0.6 1.8 -0.2 1.2 2.4 0.2 1.5 2.2 1.1 1.4 Per 100,000 65ppb 1.8 8 3	0.4 1.9 0.6 1.7 -0.2 1.2 2.4 0.2 NA 2.1 1.0 1.3 r Quality Scenar 60ppb 1.7 8.1	2 1 -1 -0.5 NA -8 -14 -3 -1 2 0.3 rio Change i Base-75 0.035 0.12	3 2 -0.4 3 1 -4 -0.1 3 3 2 2 2 2 2 n Ozone-Attribu 75-70 0.066 0.16	6 4 1 7 3 -1 0.5 7 16 4 3 5 <b>table Deaths pe</b> <b>75-65</b> 0.13 0.37	9 7 4 12 10 3 2 12 NA 6 6 6 9 9 <b>:r 100,000</b> <b>75-60</b> 0.18 0.61
Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO St. Louis, MO Study Area Atlanta, GA Baltimore, MD	0.5 2.0 0.6 1.9 -0.2 1.2 2.2 0.2 1.7 2.2 1.1 1.5 Base 1.9 Base 1.9	0.5 2.0 0.6 1.9 -0.2 1.2 2.4 0.2 1.7 2.3 1.1 1.5 <b>Ozone-Attr</b> <b>75ppb</b> 1.9 8.7 2.2	0.4 2.0 0.6 1.8 -0.2 1.2 2.4 0.2 1.7 2.2 1.1 1.5 ibutable Deaths 70ppb 1.8 8.5 2.2	0.4 1.9 0.6 1.8 -0.2 1.2 2.4 0.2 1.5 2.2 1.1 1.4 Per 100,000 65ppb 1.8 8.3 2.2	0.4 1.9 0.6 1.7 -0.2 1.2 2.4 0.2 NA 2.1 1.0 1.3 r Quality Scenar 60ppb 1.7 8.1 2.2	2 1 -1 -0.5 NA -8 -14 -3 -1 2 0.3 Change i Base-75 0.035 0.12	3 2 -0.4 3 1 -4 -0.1 3 3 2 2 2 2 n Ozone-Attribut 75-70 0.066 0.16 0.0076	6 4 1 7 0.5 7 16 4 3 5 <b>xtable Deaths pe</b> <b>75-65</b> 0.13 0.37	9 7 4 12 10 3 2 12 NA 6 6 6 9 9 <b>r 100,000</b> <b>75-60</b> 0.18 0.61
Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO St. Louis, MO Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH	0.5 2.0 0.6 1.9 -0.2 1.2 2.2 0.2 1.7 2.2 1.1 1.5 Base 1.9 8.8 2.3 9.7	0.5 2.0 0.6 1.9 -0.2 1.2 2.4 0.2 1.7 2.3 1.1 1.5 <b>Ozone-Attr</b> <b>75ppb</b> 1.9 8.7 2.3 9.8	0.4 2.0 0.6 1.8 -0.2 1.2 2.4 0.2 1.7 2.2 1.1 1.5 ibutable Deaths 70ppb 1.8 8.5 2.3 9.5	0.4 1.9 0.6 1.8 -0.2 1.2 2.4 0.2 1.5 2.2 1.1 1.4 Per 100,000 65ppb 1.8 8.3 2.3 9.1	0.4 1.9 0.6 1.7 -0.2 1.2 2.4 0.2 NA 2.1 1.0 1.3 r Quality Scenar 60ppb 1.7 8.1 2.2 8.6	2 1 -1 -0.5 NA -8 -14 -3 -1 2 0.3 Change i Base-75 0.035 0.12 -0.016 -0 12	3 2 -0.4 3 1 -4 -0.1 3 3 2 2 2 2 <b>n Ozone-Attribu</b> <b>75-70</b> 0.066 0.16 -0.0076 0.28	6 4 1 7 0.5 7 16 4 3 5 <b>table Deaths pe</b> <b>75-65</b> 0.13 0.37 0.036	9 7 4 12 10 3 2 12 NA 6 6 6 9 9 <b>r 100,000</b> <b>75-60</b> 0.18 0.61 0.100
Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO St. Louis, MO Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH	0.5 2.0 0.6 1.9 -0.2 1.2 2.2 0.2 1.7 2.2 1.1 1.5 Base Base 1.9 8.8 2.3 9.7 -0.2	0.5 2.0 0.6 1.9 -0.2 1.2 2.4 0.2 1.7 2.3 1.1 1.5 <b>Ozone-Attr</b> <b>75ppb</b> 1.9 8.7 2.3 9.8 9.8	0.4 2.0 0.6 1.8 -0.2 1.2 2.4 0.2 1.7 2.2 1.1 1.5 <b>ibutable Deaths</b> <b>70ppb</b> 1.8 8.5 2.3 9.5 -0.52	0.4 1.9 0.6 1.8 -0.2 1.2 2.4 0.2 1.5 2.2 1.1 1.4 Per 100,000 65ppb 1.8 8.3 2.3 9.1 -0.5 1.2 -0.0 -0.0 -0.2 -0	0.4 1.9 0.6 1.7 -0.2 1.2 2.4 0.2 NA 2.1 1.0 1.3 r Quality Scenar 60ppb 1.7 8.1 2.2 8.6 -0.48	2 1 -1 -0.5 NA -8 -14 -3 -1 2 0.3 Change i Base-75 0.035 0.12 -0.016 -0.12 0.0023	3 2 -0.4 3 1 -4 -0.1 3 3 2 2 2 2 2 75-70 0.066 0.16 -0.0076 0.28 -0.0019	6 4 1 7 3 -1 0.5 7 16 4 3 5 5 <b>table Deaths pe</b> <b>75-65</b> 0.13 0.37 0.036 0.70	9 7 4 12 10 3 2 12 NA 6 6 6 9 9 *r 100,000 75-60 0.18 0.61 0.100 1.2
Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO	0.5 2.0 0.6 1.9 -0.2 1.2 2.2 0.2 1.7 2.2 1.1 1.5 Base Base 1.9 8.8 2.3 9.7 -0.52 4.7	0.5 2.0 0.6 1.9 -0.2 1.2 2.4 0.2 1.7 2.3 1.1 1.5 <b>Ozone-Attr</b> <b>75ppb</b> 1.9 8.7 2.3 9.8 -0.52 4.7	0.4 2.0 0.6 1.8 -0.2 1.2 2.4 0.2 1.7 2.2 1.1 1.5 ibutable Deaths 70ppb 1.8 8.5 2.3 9.5 -0.52 4.9	0.4 1.9 0.6 1.8 -0.2 1.2 2.4 0.2 1.5 2.2 1.1 1.4 Per 100,000 65ppb 1.8 8.3 2.3 9.1 -0.51 4.9	0.4 1.9 0.6 1.7 -0.2 1.2 2.4 0.2 NA 2.1 1.0 1.3 r Quality Scenar 60ppb 1.7 8.1 2.2 8.6 -0.48 4.5	2 1 -1 -0.5 NA -8 -14 -3 -1 2 0.3 rio Change i Base-75 0.035 0.12 -0.016 -0.12 0.0023 NA	3 2 -0.4 3 1 -4 -0.1 3 3 2 2 2 2 2 7 0.066 0.16 -0.0076 0.28 -0.0019 -0.17	6 4 1 7 3 -1 0.5 7 16 4 3 5 <b>xtable Deaths pe</b> <b>75-65</b> 0.13 0.37 0.036 0.70 -0.012	9 7 4 12 10 3 2 12 NA 6 6 6 9 9 <b>r 100,000</b> <b>75-60</b> 0.18 0.61 0.100 1.2 -0.044 0.12
Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO St. Louis, MO St. Louis, MO Cleveland, OH Denver, CO Detroit, MI	0.5 2.0 0.6 1.9 -0.2 1.2 2.2 0.2 1.7 2.2 1.1 1.5 Base 1.9 Base 1.9 8.8 2.3 9.7 -0.52 4.7 12	0.5 2.0 0.6 1.9 -0.2 1.2 2.4 0.2 1.7 2.3 1.1 1.5 <b>Ozone-Attr</b> <b>75ppb</b> 1.9 8.7 2.3 9.8 -0.52 4.7	0.4 2.0 0.6 1.8 -0.2 1.2 2.4 0.2 1.7 2.2 1.1 1.5 <b>ibutable Deaths</b> <b>70ppb</b> 1.8 8.5 2.3 9.5 -0.52 4.9 12	0.4 1.9 0.6 1.8 -0.2 1.2 2.4 0.2 1.5 2.2 1.1 1.4 Per 100,000 65ppb 1.8 8.3 2.3 9.1 -0.51 4.8 12	0.4 1.9 0.6 1.7 -0.2 1.2 2.4 0.2 NA 2.1 1.0 1.3 r Quality Scenar 60ppb 1.7 8.1 2.2 8.6 -0.48 4.6 12	2 1 -1 -0.5 NA -8 -14 -3 -1 2 0.3 rio Change i Base-75 0.035 0.12 -0.016 -0.12 0.0023 NA 1.0	3 2 -0.4 3 1 -4 -0.1 3 3 2 2 2 2 2 2 2 0.066 0.16 -0.0076 0.28 -0.0019 -0.17 0.012	6 4 1 7 3 -1 0.5 7 16 4 3 5 <b>7</b> 16 4 3 5 <b>7</b> 5 <b>7</b> 16 0.13 0.37 0.036 0.70 -0.012 -0.049 0.069	9 7 4 12 10 3 2 12 NA 6 6 6 9 9 <b>75-60</b> 0.18 0.61 0.100 1.2 -0.044 0.12
Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO St. Louis, MO St. Louis, MO Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX	0.5 2.0 0.6 1.9 -0.2 1.2 2.2 0.2 1.7 2.2 1.1 1.5 Base 1.9 8.8 2.3 9.7 -0.52 4.7 12 12	0.5 2.0 0.6 1.9 -0.2 1.2 2.4 0.2 1.7 2.3 1.1 1.5 <b>Ozone-Attr</b> <b>75ppb</b> 1.9 8.7 2.3 9.8 -0.52 4.7 13	0.4 2.0 0.6 1.8 -0.2 1.2 2.4 0.2 1.7 2.2 1.1 1.5 ibutable Deaths 70ppb 1.8 8.5 2.3 9.5 -0.52 4.9 13 1.4	0.4 1.9 0.6 1.8 -0.2 1.2 2.4 0.2 1.5 2.2 1.1 1.4 Per 100,000 65ppb 1.8 8.3 2.3 9.1 -0.51 4.8 13 1.4	0.4 1.9 0.6 1.7 -0.2 1.2 2.4 0.2 NA 2.1 1.0 1.3 r Quality Scenar 60ppb 1.7 8.1 2.2 8.6 -0.48 4.6 13 1.2	2 1 -1 -0.5 NA -8 -14 -3 -1 2 0.3 rio Change i Base-75 0.035 0.12 -0.016 -0.12 0.0023 NA	3 2 -0.4 3 1 -4 -0.1 3 3 2 2 2 2 2 0.066 0.16 -0.0076 0.28 -0.0019 -0.17 -0.013 0.067	6 4 1 7 3 -1 0.5 7 16 4 3 5 <b>7</b> 16 4 3 5 <b>7</b> <b>16</b> <b>4</b> 3 5 <b>7</b> <b>16</b> <b>0.5</b> <b>7</b> <b>16</b> <b>0.5</b> <b>7</b> <b>16</b> <b>0.5</b> <b>7</b> <b>16</b> <b>0.5</b> <b>7</b> <b>16</b> <b>0.5</b> <b>7</b> <b>16</b> <b>0.5</b> <b>7</b> <b>16</b> <b>0.5</b> <b>7</b> <b>16</b> <b>0.5</b> <b>7</b> <b>16</b> <b>0.5</b> <b>7</b> <b>16</b> <b>0.5</b> <b>7</b> <b>16</b> <b>0.5</b> <b>7</b> <b>16</b> <b>0.5</b> <b>7</b> <b>16</b> <b>0.5</b> <b>7</b> <b>16</b> <b>0.5</b> <b>7</b> <b>16</b> <b>0.13</b> <b>0.37</b> <b>0.036</b> <b>0.13</b> <b>0.037</b> <b>0.036</b> <b>0.70</b> <b>0.036</b> <b>0.70</b> <b>0.036</b> <b>0.70</b> <b>0.036</b> <b>0.70</b> <b>0.049</b> <b>0.049</b> <b>0.049</b> <b>0.049</b> <b>0.049</b> <b>0.049</b> <b>0.049</b> <b>0.049</b> <b>0.049</b> <b>0.049</b> <b>0.049</b> <b>0.049</b> <b>0.049</b> <b>0.049</b> <b>0.049</b> <b>0.049</b> <b>0.049</b> <b>0.05</b> <b>0.13</b> <b>0.037</b> <b>0.036</b> <b>0.070</b> <b>0.002</b> <b>0.0012</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.003</b> <b>0.003</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.003</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.002</b> <b>0.0020.0020.0020000000000000</b>	9 7 4 12 10 3 2 12 NA 6 6 6 9 9 <b>75-60</b> 0.18 0.61 0.100 1.2 -0.044 0.12 0.27 0.10
Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA	0.5 2.0 0.6 1.9 -0.2 1.2 2.2 0.2 1.7 2.2 1.1 1.5 Base 1.9 8.8 2.3 9.7 -0.52 4.7 1.2 1.3 5.3	0.5 2.0 0.6 1.9 -0.2 1.2 2.4 0.2 1.7 2.3 1.1 1.5 <b>Ozone-Attr</b> <b>75ppb</b> 1.9 8.7 2.3 9.8 -0.52 4.7 13 1.5	0.4 2.0 0.6 1.8 -0.2 1.2 2.4 0.2 1.7 2.2 1.1 1.5 <b>ibutable Deaths</b> <b>70ppb</b> 1.8 8.5 2.3 9.5 -0.52 4.9 1.3 1.4 6.2	0.4 1.9 0.6 1.8 -0.2 1.2 2.4 0.2 1.5 2.2 1.1 1.4 Per 100,000 65ppb 1.8 8.3 2.3 9.1 -0.51 4.8 13 1.4 6.2	0.4 1.9 0.6 1.7 -0.2 1.2 2.4 0.2 NA 2.1 1.0 1.3 r Quality Scenar 60ppb 1.7 8.1 2.2 8.6 -0.48 4.6 1.3 NA	2 1 -1 -0.5 NA -8 -14 -3 -1 2 0.3 <b>Change i</b> <b>Base-75</b> 0.035 0.12 -0.016 -0.12 0.0023 NA -1.0 -0.5 NA	3 2 -0.4 3 1 -4 -0.1 3 3 2 2 2 2 2 2 2 2 2 2 2 2 2	6 4 1 7 3 -1 0.5 7 16 4 3 5 <b>5</b> <b>7</b> 16 4 3 5 <b>5</b> <b>7</b> 16 0.13 0.13 0.13 0.37 0.036 0.70 -0.012 -0.049 0.068 0.10	9 7 4 12 10 3 2 12 NA 6 6 6 9 9 <b>75-60</b> 0.18 0.61 0.100 1.2 -0.044 0.12 0.27 0.19 NA
Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO St. Louis, MO St. Louis, MO Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY	0.5 2.0 0.6 1.9 -0.2 1.2 2.2 0.2 1.7 2.2 1.1 1.5 Base 1.9 8.8 2.3 9.7 -0.52 4.7 12 1.3 6.9	0.5 2.0 0.6 1.9 -0.2 1.2 2.4 0.2 1.7 2.3 1.1 1.5 <b>Ozone-Attr</b> <b>75ppb</b> 1.9 8.7 2.3 9.8 -0.52 4.7 13 1.5 -7.1	0.4 2.0 0.6 1.8 -0.2 1.2 2.4 0.2 1.7 2.2 1.1 1.5 5 5 5 5 5 5 5 5 5 5 5 5 5	0.4 1.9 0.6 1.8 -0.2 1.2 2.4 0.2 1.5 2.2 1.1 1.4 Per 100,000 65ppb 1.8 8.3 2.3 9.1 -0.51 4.8 13 1.4 6.0 40	0.4 1.9 0.6 1.7 -0.2 1.2 2.4 0.2 NA 2.1 1.0 1.3 r Quality Scenar 60ppb 1.7 8.1 2.2 8.6 -0.48 4.6 13 1.3 NA 1.0 1.0 1.7 1.0 1.7 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2	2 1 -1 -0.5 NA -8 -14 -3 -1 2 0.3 <b>Change i</b> <b>Base-75</b> 0.035 0.12 -0.016 -0.12 0.0023 NA -1.0 -0.20 0.20	3 2 -0.4 3 1 -4 -0.1 3 3 2 2 2 2 2 2 2 2 2 2 2 2 2	6 4 1 7 3 -1 0.5 7 16 4 3 5 <b>xtable Deaths per</b> <b>75-65</b> 0.13 0.37 0.036 0.70 -0.012 -0.049 0.068 0.10 1.2	9 7 4 12 10 3 2 12 NA 6 6 6 9 9 <b>75-60</b> 0.18 0.61 0.100 1.2 -0.044 0.12 0.27 0.19 NA
Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO St. Louis, MO St. Louis, MO Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA	0.5 2.0 0.6 1.9 -0.2 1.2 2.2 0.2 1.7 2.2 1.1 1.5 Base Base 1.9 8.8 2.3 9.7 -0.52 4.7 12 1.3 6.9 11	0.5 2.0 0.6 1.9 -0.2 1.2 2.4 0.2 1.7 2.3 1.1 1.5 <b>Ozone-Attr</b> <b>75ppb</b> 1.9 8.7 2.3 9.8 -0.52 4.7 13 1.5 7.1 11	0.4 2.0 0.6 1.8 -0.2 1.2 2.4 0.2 1.7 2.2 1.1 1.5 (butable Deaths 70ppb 1.8 8.5 2.3 9.5 -0.52 4.9 13 1.4 6.9 10 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.	0.4 1.9 0.6 1.8 -0.2 1.2 2.4 0.2 1.5 2.2 1.1 1.4 <b>Per 100,000</b> <b>65ppb</b> 1.8 8.3 2.3 9.1 -0.51 4.8 13 1.4 6.0 10 6.2	0.4 1.9 0.6 1.7 -0.2 1.2 2.4 0.2 NA 2.1 1.0 1.3 r Quality Scenar 60ppb 1.7 8.1 2.2 8.6 -0.48 4.6 13 1.3 NA 1.3 NA	2 1 -1 -0.5 NA -8 -14 -3 -1 2 0.3 Change i Base-75 0.035 0.12 -0.016 -0.12 0.0023 NA -1.0 -0.19 -0.20 -0.053 0.22 -0.053	3 2 -0.4 3 1 -4 -0.1 3 2 2 2 2 2 2 0.066 0.16 -0.0076 0.28 -0.0019 -0.17 -0.013 0.047 0.22 0.18 0.12	6 4 1 7 3 -1 0.5 7 16 4 3 5 5 <b>xtable Deaths pe</b> <b>75-65</b> 0.13 0.37 0.036 0.70 -0.012 -0.049 0.068 0.10 1.2 0.42	9 7 4 12 10 3 2 12 NA 6 6 6 9 9 <b>27</b> 0.18 0.61 0.100 1.2 -0.044 0.12 0.27 0.19 NA 0.65 0.41
Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO St. Louis, MO St. Louis, MO Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA	0.5         2.0         0.6         1.9         -0.2         1.2         2.2         0.2         1.7         2.2         1.7         2.2         1.7         2.2         1.7         2.2         1.7         2.2         1.7         2.2         1.7         2.2         1.1         1.5         Base         1.9         8.8         2.3         9.7         -0.52         4.7         12         1.3         6.9         11         7.3	0.5 2.0 0.6 1.9 -0.2 1.2 2.4 0.2 1.7 2.3 1.1 1.5 <b>Ozone-Attr</b> <b>75ppb</b> 1.9 8.7 2.3 9.8 -0.52 4.7 1.3 1.5 7.1 1.5 7.1	0.4 2.0 0.6 1.8 -0.2 1.2 2.4 0.2 1.7 2.2 1.1 1.5 <b>ibutable Deaths</b> <b>70ppb</b> 1.8 8.5 2.3 9.5 -0.52 4.9 13 1.4 6.9 10 7.0 7.0 7.0 7.0	0.4 1.9 0.6 1.8 -0.2 1.2 2.4 0.2 1.5 2.2 1.1 1.4 <b>A</b> i <b>per 100,000</b> <b>65ppb</b> 1.8 8.3 2.3 9.1 -0.51 4.8 13 1.4 6.0 10 6.8	0.4 1.9 0.6 1.7 -0.2 1.2 2.4 0.2 NA 2.1 1.0 1.3 r Quality Scenar 60ppb 1.7 8.1 2.2 8.6 -0.48 4.6 13 1.3 NA 1.0 6.7	2 1 -1 -0.5 NA -8 -14 -3 -1 2 0.3 Change i Base-75 0.035 0.12 -0.016 -0.12 0.0023 NA -1.0 -0.19 -0.20 -0.053 0.20 0.20	3 2 -0.4 3 1 -4 -0.1 3 3 2 2 2 2 2 2 2 2 2 2 2 2 2	6 4 1 7 3 -1 0.5 7 16 4 3 5 <b>xtable Deaths pe</b> <b>75-65</b> 0.13 0.37 0.036 0.70 -0.012 -0.049 0.068 0.10 1.2 0.42 0.24	9 7 4 12 10 3 2 12 NA 6 6 6 9 9 <b>27</b> <b>75-60</b> 0.18 0.61 0.100 1.2 -0.044 0.12 0.27 0.19 NA 0.65 0.41

NA: for NYC, the model-based adjustment methodology was unable to estimate ozone distributions which would meet the alternative standard level of 60 ppb.

Table 7C-5. Sensitivity Analysis – ST Mortality: Alternate risk model (Zanobetti and Schwartz, 2008) (2009) (incidence, percent of baseline mortality, incidence per 100,000 - compare with Core Results in Table 7B-2).

	Air Quality Scenario								
		Absolute Oz	one-Attributab	le Incidence	·	Char	ige in Ozone-At	tributable Incid	ence
Study Area	Base	75ppb	70ppb	65ppb	60ppb	Base-75	75-70	75-65	75-60
Atlanta, GA	120	110	100	96	91	6	8	14	19
	(-110 - 330)	(-100 - 320)	(-94 - 290)	(-89 - 280)	(-84 - 260)	(-6 - 18)	(-8 - 24)	(-13 - 41)	(-18 - 56)
Baltimore, MD	( 26, 200)	( 24, 260)	( 22, 250)	( 22, 240)	( 21 220)	(2, 20)	4	10	15
	(-20-290)	(-24 - 200)	(-23 - 230)	(-22 - 240)	(-21-250)	(-5-29)	(-1-10)	(-2-21)	(-3-32)
Boston, MA	(12 - 420)	(12 420)	(12 - 410)	(12, 400)	(11, 200)	(0, 2)	(0 - 11)	(1, 22)	(1 27)
	120	110	110	100	95	<u>(0-2)</u>	(0-11)	12	20
Cleveland, OH	(-20 - 260)	(-19 - 240)	(-18-230)	(-17 - 220)	(-16 - 200)	(-1 - 11)	(-1 - 11)	(-2 - 27)	(-3 - 44)
	62	62	60	57	51	0	2	4	10
Denver, CO	(-81 - 200)	(-80 - 200)	(-78 - 190)	(-75 - 180)	(-67 - 170)	(0-1)	(-2 - 6)	(-6 - 14)	(-13 - 33)
	370	370	380	370	350		-6	5	21
Detroit, MI	(130 - 600)	(130 - 600)	(140 - 610)	(130 - 600)	(130 - 570)	NA	(-210)	(2 - 8)	(8 - 35)
Haustan TV	52	56	56	55	54	-4	0	1	3
Houston, 1X	(-110 - 220)	(-120 - 230)	(-120 - 230)	(-120 - 230)	(-120 - 220)	(815)	(0 - 1)	(-2 - 4)	(-6 - 10)
	270	270	260	240	230	6	13	27	40
Los Aligeles, CA	(-150 - 690)	(-140 - 670)	(-140 - 640)	(-130 - 600)	(-120 - 570)	(-3 - 16)	(-7 - 32)	(-14 - 69)	(-21 - 100)
New York, NY	1500	1500	1400	1000	NA	96	110	420	NA
New Tork, NT	(900 - 2200)	(850 - 2100)	(790 - 1900)	(610 - 1500)	110	(56 - 140)	(64 - 160)	(240 - 600)	NA
Philadelphia PA	360	340	320	310	300	24	12	26	38
	(5 - 700)	(4 - 660)	(4 - 640)	(4 - 610)	(4 - 590)	(0 - 47)	(0 - 24)	(0 - 51)	(1 - 76)
Sacramento, CA	110	93	89	86	82	15	4	7	12
	(-37 - 250)	(-32 - 210)	(-31 - 210)	(-30 - 200)	(-28 - 190)	(-5 - 36)	(-1 - 9)	(-2 - 17)	(-4 - 27)
St. Louis, MO	160	150	150	140	130	2	8	15	24
	(-32 - 340)	(-31 - 330)	(-30 - 320)	(-28 - 300)	(-26 - 280)	(0 - 5)	(-2 - 17)	(-3 - 34)	(-5 - 53)
				A3	r Ouality Coope	dia.			
	Po	reant of Bacalin	a Incidanca Att	Ai ributable to Oze	ir Quality Scena	rio	Change in O	ttributable Pick	
Shudu Area	Pe	rcent of Baselin	e Incidence Att	Ai ributable to Ozo	ir Quality Scenar	rio	Change in O <sub>3</sub> -A	Attributable Risk	75.00
Study Area	Pe Base	rcent of Baselin 75ppb	e Incidence Att	Ai ributable to Ozo 65ppb	r Quality Scenar	rio Base-75	Change in O <sub>3</sub> -A 75-70	ttributable Risk	<b>75-60</b>
Study Area Atlanta, GA Baltimore MD	Pe Base 1.4	rcent of Baselin 75ppb 1.3 2.2	e Incidence Att 70ppb 1.2 2.2	Ai ributable to Ozo 65ppb 1.1 2 1	r Quality Scenar	rio Base-75 5	Change in O <sub>3</sub> -A 75-70 7	ttributable Risk	<b>75-60</b> 17
Study Area Atlanta, GA Baltimore, MD Boston, MA	Pe Base 1.4 2.5 2.5	rcent of Baselin 75ppb 1.3 2.2 2.5	e Incidence Att 70ppb 1.2 2.2 2.4	Ai ributable to Ozo 65ppb 1.1 2.1 2.4	r Quality Scenar ne 60ppb 1.1 2.0 2.3	rio Base-75 5 10	Change in O <sub>3</sub> -A 75-70 7 4	ttributable Risk	<b>75-60</b> 17 12 8
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH	Pe Base 1.4 2.5 2.5 2.5 2.5	<b>75ppb</b> 1.3 2.2 2.5 2.4	e Incidence Att 70ppb 1.2 2.2 2.4 2.3	Ai ributable to Ozo 65ppb 1.1 2.1 2.4 2.1	r Quality Scenar ne 60ppb 1.1 2.0 2.3 2.0	rio Base-75 5 10 0.3 4	Change in O <sub>3</sub> -A 75-70 7 4 2 4	ttributable Risk 75-65 13 8 5 10	<b>75-60</b> 17 12 8 17
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO	Pe Base 1.4 2.5 2.5 2.5 2.5 1.8	rcent of Baselin 75ppb 1.3 2.2 2.5 2.4 1.8	e Incidence Att 70ppb 1.2 2.2 2.4 2.3 1.8	Ai ributable to Ozo 65ppb 1.1 2.1 2.4 2.1 1.7	r Quality Scenar ne 60ppb 1.1 2.0 2.3 2.0 1.5	Base-75 5 10 0.3 4 1	Change in O <sub>3</sub> -A 75-70 7 4 2 4 3	ttributable Risk 75-65 13 8 5 10 7	<b>75-60</b> 17 12 8 17 16
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI	Pe Base 1.4 2.5 2.5 2.5 1.8 4.1	rcent of Baselin 75ppb 1.3 2.2 2.5 2.4 1.8 4.1	e Incidence Att 70ppb 1.2 2.2 2.4 2.3 1.8 4.2	Ai ributable to Ozo 65ppb 1.1 2.1 2.4 2.1 1.7 4.1	r Quality Scenar 60ppb 1.1 2.0 2.3 2.0 1.5 3.9	Base-75           5           10           0.3           4           1           NA	Change in O <sub>3</sub> -A 75-70 7 4 2 4 3 -2	Attributable Risk           75-65           13           8           5           10           7           1	<b>75-60</b> 17 12 8 17 16 5
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX	Pe           Base           1.4           2.5           2.5           1.8           4.1           0.6	rcent of Baselin 75ppb 1.3 2.2 2.5 2.4 1.8 4.1 0.6	e Incidence Att 70ppb 1.2 2.2 2.4 2.3 1.8 4.2 0.6	Ai ributable to Ozo 65ppb 1.1 2.1 2.4 2.1 1.7 4.1 0.6	r Quality Scenar ne 60ppb 1.1 2.0 2.3 2.0 1.5 3.9 0.6	rio Base-75 5 10 0.3 4 1 NA -7	Change in O <sub>3</sub> -A 75-70 7 4 2 2 4 3 -2 0.3	Attributable Risk           75-65           13           8           5           10           7           1           2	<b>75-60</b> 17 12 8 17 16 5 4
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA	Pe           Base           1.4           2.5           2.5           1.8           4.1           0.6           1.4	rcent of Baselin 75ppb 1.3 2.2 2.5 2.4 1.8 4.1 0.6 1.4	e Incidence Att 70ppb 1.2 2.2 2.4 2.3 1.8 4.2 0.6 1.3	Ai ributable to Ozo 65ppb 1.1 2.1 2.4 2.1 1.7 4.1 0.6 1.2	r Quality Scenar ne 60ppb 1.1 2.0 2.3 2.0 1.5 3.9 0.6 1.2	rio Base-75 5 10 0.3 4 1 NA -7 2	Change in O <sub>3</sub> -A 75-70 7 4 2 4 3 -2 0.3 5	Attributable Risk           75-65           13           8           5           10           7           1           2           10	<b>75-60</b> 17 12 8 17 16 5 4 4 15
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY	Pe           Base           1.4           2.5           2.5           1.8           4.1           0.6           1.4           4.5	rcent of Baselin 75ppb 1.3 2.2 2.5 2.4 1.8 4.1 0.6 1.4 4.2	e Incidence Att 70ppb 1.2 2.2 2.4 2.3 1.8 4.2 0.6 1.3 3.9	Ai ributable to Ozo 65ppb 1.1 2.1 2.4 2.1 1.7 4.1 0.6 1.2 3.0	r Quality Scenar ne 60ppb 1.1 2.0 2.3 2.0 1.5 3.9 0.6 1.2 NA	rio Base-75 5 10 0.3 4 1 NA -7 2 6	Change in O <sub>3</sub> -A 75-70 7 4 2 4 3 -2 0.3 5 7	Attributable Risk           75-65           13           8           5           10           7           1           2           10           28	<b>75-60</b> 17 12 8 17 16 5 4 15 NA
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA	Pee           Base           1.4           2.5           2.5           1.8           4.1           0.6           1.4           4.5           2.8	rcent of Baselin 75ppb 1.3 2.2 2.5 2.4 1.8 4.1 0.6 1.4 4.2 2.6	e Incidence Att 70ppb 1.2 2.2 2.4 2.3 1.8 4.2 0.6 1.3 3.9 2.6	Ai ributable to Ozo 65ppb 1.1 2.1 2.4 2.1 1.7 4.1 0.6 1.2 3.0 2.4	r Quality Scenar ne 60ppb 1.1 2.0 2.3 2.0 1.5 3.9 0.6 1.2 NA 2.4	rio Base-75 5 10 0.3 4 1 NA -7 2 6 6	Change in O <sub>3</sub> -A 75-70 7 4 2 2 4 3 -2 0.3 5 5 7 3	Attributable Risk           75-65           13           8           5           10           7           1           2           10           28           7	<b>75-60</b> 17 12 8 17 16 5 4 15 NA 11
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA	Pee           Base           1.4           2.5           2.5           1.8           4.1           0.6           1.4           4.5           2.8           2.9	rcent of Baselin 75ppb 1.3 2.2 2.5 2.4 1.8 4.1 0.6 1.4 4.2 2.6 2.5	e Incidence Att 70ppb 1.2 2.2 2.4 2.3 1.8 4.2 0.6 1.3 3.9 2.6 2.4	Ai ributable to Ozo 65ppb 1.1 2.4 2.1 1.7 4.1 0.6 1.2 3.0 2.4 2.3	r Quality Scenar ne 60ppb 1.1 2.0 2.3 2.0 1.5 3.9 0.6 1.2 NA 2.4 2.2	rio Base-75 5 10 0.3 4 1 NA -7 2 6 6 6 14	Change in O <sub>3</sub> -A 75-70 7 4 2 4 3 -2 0.3 5 5 7 7 3 4	Attributable Risk           75-65           13           8           5           10           7           1           2           10           28           7           7           7	<b>75-60</b> 17 12 8 17 16 5 4 15 NA 11 11 12
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO	Pe           Base           1.4           2.5           2.5           2.5           1.8           4.1           0.6           1.4           4.5           2.8           2.9           2.4	rcent of Baselin 75ppb 1.3 2.2 2.5 2.4 1.8 4.1 0.6 1.4 4.2 2.6 2.5 2.4	e Incidence Att 70ppb 1.2 2.2 2.4 2.3 1.8 4.2 0.6 1.3 3.9 2.6 2.4 2.3	Ai ributable to Ozo 65ppb 1.1 2.1 2.4 2.1 1.7 4.1 0.6 1.2 3.0 2.4 2.3 2.2	r Quality Scenar ne 60ppb 1.1 2.0 2.3 2.0 1.5 3.9 0.6 1.2 NA 2.4 2.2 2.0	rio Base-75 5 10 0.3 4 1 NA -7 2 6 6 6 6 14	Change in O <sub>3</sub> -A 75-70 7 4 2 4 3 -2 0.3 5 7 7 3 3 4 5	75-65           13           8           5           10           7           1           2           10           28           7           10           28           7           10	<b>75-60</b> 17 12 8 8 17 16 5 4 15 NA 11 11 12 15
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO	Pe           Base           1.4           2.5           2.5           2.5           1.8           4.1           0.6           1.4           4.5           2.8           2.9           2.4	rcent of Baselin 75ppb 1.3 2.2 2.5 2.4 1.8 4.1 0.6 1.4 4.2 2.6 2.5 2.4	e Incidence Att 70ppb 1.2 2.2 2.4 2.3 1.8 4.2 0.6 1.3 3.9 2.6 2.4 2.3	Ai ributable to Ozo 65ppb 1.1 2.1 2.4 2.1 1.7 4.1 0.6 1.2 3.0 2.4 2.3 2.4 2.3 2.2	r Quality Scenar ne 60ppb 1.1 2.0 2.3 2.0 1.5 3.9 0.6 1.2 NA 2.4 2.2 2.0	rio Base-75 5 10 0.3 4 1 NA -7 2 6 6 6 6 14 1	Change in O <sub>3</sub> -A 7 7 4 2 4 3 -2 0.3 5 7 7 3 4 5 5	75-65           13           8           5           10           7           1           2           10           7           10           7           10           7           10           28           7           10           28           7           10	<b>75-60</b> 17 12 8 8 17 16 5 4 15 15 NA 11 12 15
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO	Pe           Base           1.4           2.5           2.5           2.5           1.8           4.1           0.6           1.4           4.5           2.8           2.9           2.4	rcent of Baselin 75ppb 1.3 2.2 2.5 2.4 1.8 4.1 0.6 1.4 4.2 2.6 2.5 2.4	e Incidence Att 70ppb 1.2 2.2 2.4 2.3 1.8 4.2 0.6 1.3 3.9 2.6 2.4 2.3	Ai ributable to Ozo 65ppb 1.1 2.1 2.4 2.1 1.7 4.1 0.6 1.2 3.0 2.4 2.3 2.3 2.2 Ai	r Quality Scenar ne 60ppb 1.1 2.0 2.3 2.0 1.5 3.9 0.6 1.2 NA 2.4 2.4 2.2 2.0 r Quality Scenar	rio Base-75 5 10 0.3 4 1 NA -7 2 6 6 6 6 14 1 1	Change in O <sub>3</sub> -A 75-70 7 4 2 4 3 -2 0.3 5 7 3 4 5 5	75-65           13           8           5           10           7           1           2           10           7           10           7           10           10           10           10           10           10           10           10           10           10           10           10	<b>75-60</b> 17 12 8 8 17 16 5 4 15 NA 11 11 12 15
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO	Pe           Base           1.4           2.5           2.5           1.8           4.1           0.6           1.4           4.5           2.8           2.9           2.4	rcent of Baselin 75ppb 1.3 2.2 2.5 2.4 1.8 4.1 0.6 1.4 4.2 2.6 2.5 2.4 2.5 2.4 0zone-Attri	e Incidence Att 70ppb 1.2 2.4 2.3 1.8 4.2 0.6 1.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 3.9 2.6 2.4 3.9 3.9 2.6 2.4 3.9 3.9 3.9 3.9 3.9 3.9 3.9 3.9	Ai ributable to Ozo 65ppb 1.1 2.1 2.4 2.1 1.7 4.1 0.6 1.2 3.0 2.4 2.3 2.3 2.2 Ai per 100,000	r Quality Scenar ne 60ppb 1.1 2.0 2.3 2.0 1.5 3.9 0.6 1.2 NA 2.4 2.2 2.0 r Quality Scenar	rio Base-75 5 10 0.3 4 1 NA -7 2 6 6 6 6 14 1 1 1 tio Change i	Change in O <sub>3</sub> -A 75-70 7 4 2 4 3 -2 0.3 5 7 3 4 5 5 7 3 4 5 5	75-65           13           8           5           10           7           1           2           10           7           10           7           10           7           10           28           7           10	75-60 17 12 8 17 16 5 4 15 NA 11 12 15 er 100,000
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO	Pee           Base           1.4           2.5           2.5           1.8           4.1           0.6           1.4           4.5           2.8           2.9           2.4	rcent of Baselin 75ppb 1.3 2.2 2.5 2.4 1.8 4.1 0.6 1.4 4.2 2.6 2.5 2.4 2.5 2.4 0zone-Attri 75ppb	e Incidence Att 70ppb 1.2 2.4 2.3 1.8 4.2 0.6 1.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 3.9 2.6 2.4 3.9 2.6 3.9 2.6 2.4 3.9 2.6 3.9 2.6 3.9 2.6 3.9 2.6 3.9 2.6 3.9 2.6 3.9 2.6 3.9 2.6 3.9 2.6 3.9 2.6 3.9 2.6 3.9 2.6 3.9 3.9 3.9 3.9 3.9 3.9 3.9 3.9	Ai ributable to Ozo 65ppb 1.1 2.1 2.4 2.1 1.7 4.1 0.6 1.2 3.0 2.4 2.3 2.2 2.3 2.2 Ai per 100,000 65ppb	r Quality Scenar ne 60ppb 1.1 2.0 2.3 2.0 1.5 3.9 0.6 1.2 NA 2.4 2.2 2.0 r Quality Scenar 60ppb	rio Base-75 5 10 0.3 4 1 NA -7 2 6 6 6 14 1 1 1 rio Change i Base-75	Change in O <sub>3</sub> -A 75-70 7 4 2 4 3 -2 0.3 5 7 7 3 4 5 5 7 7 0.3 5 7 7 0.3 5 7 7 0.3 5 7 7 0.3 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	T5-65           13           8           5           10           7           1           2           10           7           10           7           10           28           7           10           28           7           10	75-60 17 12 8 17 16 5 4 15 NA 11 12 15 r 100,000 75-60
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Study Area Atlanta, GA	Pee           Base           1.4           2.5           2.5           1.8           4.1           0.6           1.4           4.5           2.8           2.9           2.4           Base           2.2	rcent of Baselin 75ppb 1.3 2.2 2.5 2.4 1.8 4.1 0.6 1.4 4.2 2.6 2.5 2.4 2.5 2.4 2.5 2.4 75ppb 2.1	e Incidence Att 70ppb 1.2 2.4 2.3 1.8 4.2 0.6 1.3 3.9 2.6 2.4 2.3 ibutable Deaths 70ppb 2.0	Ai ributable to Ozo 65ppb 1.1 2.1 2.4 2.1 1.7 4.1 0.6 1.2 3.0 2.4 2.3 2.2 2.3 2.2 Ai per 100,000 65ppb 1.8	r Quality Scenar ne 60ppb 1.1 2.0 2.3 2.0 1.5 3.9 0.6 1.2 NA 2.4 2.2 2.0 r Quality Scenar 60ppb 1.7	rio Base-75 5 10 0.3 4 1 NA -7 2 6 6 6 14 1 1 rio Change i Base-75 0.12	Change in O <sub>3</sub> -A 75-70 7 4 2 4 3 -2 0.3 5 7 7 3 4 5 7 3 4 5 5 7 7 0.3 5 7 7 0.3 5 7 7 0.3 5 7 7 0.3 5 7 7 0.3 5 7 7 0.3 7 7 0.3 7 7 0.3 7 7 0.3 7 7 0.3 7 7 0.3 7 7 0.3 7 7 0.3 7 7 0.3 7 7 0.3 7 7 0.3 7 7 0.3 7 7 0.3 7 7 0.3 7 7 0.3 7 7 0.3 7 7 0.3 7 7 0.3 7 7 0.3 7 0.3 7 7 0.3 7 7 0.3 7 7 0.3 7 7 0.3 7 7 0.3 7 7 0.3 7 7 0.3 7 7 7 0.3 7 7 0.3 7 7 7 0.3 7 7 7 0.3 7 7 7 7 0.3 7 7 7 0.3 7 7 7 0.3 7 7 7 0.3 7 7 7 0.3 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	Attributable Risk           75-65           13           8           5           10           7           1           2           10           7           1           28           7           10           78           7           10	75-60 17 12 8 17 16 5 4 15 NA 11 12 15 er 100,000 75-60 0.37
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Study Area Atlanta, GA Baltimore, MD	Pee           Base           1.4           2.5           2.5           1.8           4.1           0.6           1.4           4.5           2.8           2.9           2.4           Base           2.2           4.9	rcent of Baselin 75ppb 1.3 2.2 2.5 2.4 1.8 4.1 0.6 1.4 4.2 2.6 2.5 2.4 2.5 2.4 2.5 2.4 2.5 2.4 2.5 2.4 2.5 2.4 2.5 2.4 2.5 2.4 4.1 0.6 1.4 4.2 2.5 2.4 1.4 4.1 2.5 2.5 2.4 1.4 4.1 2.5 2.5 2.4 1.4 4.1 2.5 2.5 2.4 1.4 4.1 2.5 2.5 2.4 1.4 4.1 2.5 2.5 2.4 1.4 4.1 2.5 2.5 2.4 1.4 4.1 2.5 2.5 2.4 1.4 4.1 2.5 2.5 2.4 1.4 1.4 2.5 2.5 2.4 1.4 2.5 2.5 2.4 1.4 2.5 2.5 2.4 1.4 2.5 2.5 2.4 2.5 2.4 2.5 2.5 2.4 2.5 2.4 2.5 2.5 2.4 2.5 2.5 2.4 2.5 2.5 2.4 2.5 2.5 2.4 2.5 2.5 2.4 2.5 2.5 2.4 2.5 2.5 2.4 2.5 2.5 2.4 2.5 2.5 2.5 2.4 2.5 2.5 2.5 2.4 2.5 2.5 2.5 2.4 2.5 2.5 2.5 2.4 2.5 2.5 2.5 2.4 2.5 2.5 2.4 2.5 2.5 2.4 2.5 2.5 2.4 2.5 2.5 2.4 2.5 2.5 2.4 2.5 2.4 2.5 2.4 2.5 2.4 2.5 2.4 2.5 2.4 2.5 2.4 2.5 2.4 2.5 2.4 2.5 2.4 2.5 2.4 2.4 2.5 2.4 2.5 2.4 2.4 2.5 2.4 2.5 2.4 2.4 2.5 2.4 2.4 2.5 2.4 2.4 2.5 2.4 2.4 2.5 2.4 2.4 2.5 2.4 2.4 2.5 2.4 2.4 2.5 2.4 2.4 2.5 2.4 2.4 2.5 2.4 2.4 2.5 2.4 2.4 2.4 2.5 2.4 2.4 2.4 2.5 2.4 2.4 2.4 2.4 2.5 2.4 2.4 2.4 2.4 2.4 2.5 2.4 2.4 2.4 2.4 2.4 2.4 2.4 2.4 2.4 2.4	e Incidence Att 70ppb 1.2 2.4 2.3 1.8 4.2 0.6 1.3 3.9 2.6 2.4 2.3 ibutable Deaths 70ppb 2.0 4.3	Ai ributable to Ozo 65ppb 1.1 2.1 2.4 2.1 1.7 4.1 0.6 1.2 3.0 2.4 2.3 2.2 2.3 2.2 Ai per 100,000 65ppb 1.8 4.1	r Quality Scenar ne 60ppb 1.1 2.0 2.3 2.0 1.5 3.9 0.6 1.2 NA 2.4 2.2 2.0 r Quality Scenar 60ppb 1.7 3.9	rio Base-75 5 10 0.3 4 1 NA -7 2 6 6 14 1 1 rio Change i Base-75 0.12 0.49	Change in O <sub>3</sub> -A 75-70 7 4 2 4 3 -2 0.3 5 7 7 3 4 5 7 3 4 5 5 7 7 0.3 5 7 7 0.3 5 7 7 0.3 5 7 7 0.3 6 5 7 7 0.3 5 7 7 0.3 7 0 7 0 1 7 0 1 7 0 1 7 0 1 7 1 7 1 7 7 1 7 1 7 1 7 1 7	Attributable Risk           75-65           13           8           5           10           7           1           2           10           7           10           28           7           10           28           7           10           28           7           0           28           7           0.27           0.35	75-60 17 12 8 17 16 5 4 15 NA 11 12 15 er 100,000 75-60 0.37 0.55
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Study Area Atlanta, GA Baltimore, MD Boston, MA	Pee           Base           1.4           2.5           2.5           1.8           4.1           0.6           1.4           4.5           2.8           2.9           2.4           Base           2.2           4.9	rcent of Baselin 75ppb 1.3 2.2 2.5 2.4 1.8 4.1 0.6 1.4 4.2 2.6 2.5 2.4 2.5 2.4 4.2 2.6 2.5 2.4 75ppb 2.1 4.4 4.8	e Incidence Att 70ppb 1.2 2.2 2.4 2.3 1.8 4.2 0.6 1.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 butable Deaths 70ppb 2.0 4.3 4.7	Ai ributable to Ozo 65ppb 1.1 2.1 2.4 2.1 1.7 4.1 0.6 1.2 3.0 2.4 2.3 2.2 2.3 2.2 Ai per 100,000 65ppb 1.8 4.1 4.6	r Quality Scenar ne 60ppb 1.1 2.0 2.3 2.0 1.5 3.9 0.6 1.2 NA 2.4 2.2 2.0 r Quality Scenar 60ppb 1.7 3.9 4.4	rio Base-75 5 10 0.3 4 1 NA -7 2 6 6 14 1 1 rio Change i Base-75 0.12 0.49 0.017	Change in O <sub>3</sub> -A 75-70 7 4 2 4 3 -2 0.3 5 7 3 4 5 7 3 4 5 7 7 3 0.1 6 7 5 7 0.16 0.16 0.13	Attributable Risk           75-65           13           8           5           10           7           1           2           10           7           10           28           7           10           28           7           0           28           7           0           28           7           0.28           7           0.0           0.27           0.35           0.25	75-60 17 12 8 17 16 5 4 15 NA 11 12 15 15 15 15 15 15 15 15 15 15
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH	Pee           Base           1.4           2.5           2.5           1.8           4.1           0.6           1.4           4.5           2.8           2.9           2.4           Base           2.2           4.9           5.7	rcent of Baselin 75ppb 1.3 2.2 2.5 2.4 1.8 4.1 0.6 1.4 4.2 2.6 2.5 2.4 2.5 2.4 4.2 2.6 2.5 2.4 75ppb 2.1 4.4 4.8 5.5	e Incidence Att 70ppb 1.2 2.2 2.4 2.3 1.8 4.2 0.6 1.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 <b>ibutable Deaths</b> 70ppb 2.0 4.3 4.7 5.3	Ai ributable to Ozo 65ppb 1.1 2.4 2.4 2.1 1.7 4.1 0.6 1.2 3.0 2.4 2.3 2.2 2.3 2.2 Ai per 100,000 65ppb 1.8 4.1 4.6 4.9	r Quality Scenar ne 60ppb 1.1 2.0 2.3 2.0 1.5 3.9 0.6 1.2 NA 2.4 2.2 2.0 ir Quality Scenar 60ppb 1.7 3.9 4.4 4.6	rio Base-75 5 10 0.3 4 1 NA -7 2 6 6 14 1 rio Change i Base-75 0.12 0.49 0.017 0.25	Change in O <sub>3</sub> -A 75-70 7 4 2 4 3 3 2 0.3 5 7 7 3 4 4 5 7 3 4 5 0.16 0.16 0.13 0.25	Attributable Risk           75-65           13           8           5           10           7           10           28           7           10           28           7           0.0           28           7           0.0           28           7           0.0           0.35           0.25           0.59	<b>75-60</b> 17 12 8 17 16 5 4 15 NA 11 12 15 <b>NA</b> 11 12 15 <b>S</b> <b>S</b> <b>S</b> <b>S</b> <b>S</b> <b>S</b> <b>S</b> <b>S</b>
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH	Pee           Base           1.4           2.5           2.5           1.8           4.1           0.6           1.4           4.5           2.8           2.9           2.4           Base           2.2           4.9           5.7           2.5	rcent of Baselin 75ppb 1.3 2.2 2.5 2.4 1.8 4.1 0.6 1.4 4.2 2.6 2.5 2.4 0zone-Attri 75ppb 2.1 4.4 4.8 5.5 2.5	e Incidence Att 70ppb 1.2 2.2 2.4 2.3 1.8 4.2 0.6 1.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 butable Deaths 70ppb 2.0 4.3 4.7 5.3 2.4	Air ributable to Ozo 65ppb 1.1 2.1 2.4 2.1 1.7 4.1 0.6 1.2 3.0 2.4 2.3 2.2 Per 100,000 65ppb 1.8 4.1 4.6 4.9 2.3	r Quality Scenar ne 60ppb 1.1 2.0 2.3 2.0 1.5 3.9 0.6 1.2 NA 2.4 2.2 2.0 r Quality Scenar 60ppb 1.7 3.9 4.4 4.6 2.1	rio Base-75 5 10 0.3 4 1 NA -7 2 6 6 6 6 14 1 1 <b>Change i</b> Base-75 0.12 0.49 0.017 0.25 0.014	Change in O <sub>3</sub> -A 75-70 7 4 2 4 3 -2 0.3 5 7 3 3 4 4 5 5 <b>n Ozone-Attribu</b> <b>75-70</b> 0.16 0.16 0.13 0.25 0.077	Attributable Risk           75-65           13           8           5           10           7           1           2           10           28           7           10           28           7           0.0           28           7           0.0           28           7           0.0           0.25           0.25           0.59           0.17	<b>75-60</b> 17 12 8 17 16 5 4 15 NA 11 12 15 <b>r 100,000</b> <b>75-60</b> 0.37 0.55 0.42 0.97 0.41
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI	Pee           Base           1.4           2.5           2.5           1.8           4.1           0.6           1.4           4.5           2.8           2.9           2.4           2.2           4.9           4.9           5.7           2.5           8.6	rcent of Baselin 75ppb 1.3 2.2 2.5 2.4 1.8 4.1 0.6 1.4 4.2 2.6 2.5 2.4 0zone-Attri 75ppb 2.1 4.4 4.8 5.5 2.5 2.5 8.6	e Incidence Att 70ppb 1.2 2.2 2.4 2.3 1.8 4.2 0.6 1.3 3.9 2.6 2.4 2.3 2.4 2.3 ibutable Deaths 70ppb 2.0 4.3 4.7 5.3 2.4 8.8	Ai ributable to Ozo 65ppb 1.1 2.1 2.4 2.1 1.7 4.1 0.6 1.2 3.0 2.4 2.3 2.2 Ai per 100,000 65ppb 1.8 4.1 4.6 4.9 2.3 8.5	r Quality Scenar ne 60ppb 1.1 2.0 2.3 2.0 1.5 3.9 0.6 1.2 NA 2.4 2.2 2.0 r Quality Scenar 60ppb 1.7 3.9 4.4 4.6 2.1 8.2	rio Base-75 5 10 0.3 4 1 NA -7 2 6 6 6 6 6 14 1 1 1 rio Change i Base-75 0.12 0.49 0.017 0.25 0.014 NA	Change in O <sub>3</sub> -A 75-70 7 4 2 4 3 -2 0.3 5 7 7 3 4 4 5 7 7 3 4 4 5 7 7 0.16 0.16 0.16 0.13 0.25 0.077 -0.14	Attributable Risk           75-65           13           8           5           10           7           1           2           10           28           7           10           28           7           0.0           28           7           0.0           0.27           0.35           0.25           0.59           0.17           0.12	<b>75-60</b> 17 12 8 17 16 5 4 15 NA 11 12 15 <b>r 100,000</b> <b>75-60</b> 0.37 0.55 0.42 0.97 0.41 0.50
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX	Pee           Base           1.4           2.5           2.5           1.8           4.1           0.6           1.4           4.5           2.8           2.9           2.4           Base           2.2           4.9           4.9           5.7           2.5           8.6           0.90	rcent of Baselin 75ppb 1.3 2.2 2.5 2.4 1.8 4.1 0.6 1.4 4.2 2.6 2.5 2.4 0zone-Attri 75ppb 2.1 4.4 4.8 5.5 2.5 2.5 8.6 0.96	e Incidence Att 70ppb 1.2 2.2 2.4 2.3 1.8 4.2 0.6 1.3 3.9 2.6 2.4 2.3 2.6 2.4 2.3 <b>ibutable Deaths</b> 70ppb 2.0 4.3 4.7 5.3 2.4 8.8 0.96	Ai ributable to Ozo 65ppb 1.1 2.1 2.4 2.1 1.7 4.1 0.6 1.2 3.0 2.4 2.3 2.2 Ai per 100,000 65ppb 1.8 4.1 4.6 4.9 2.3 8.5 0.95	r Quality Scenar ne 60ppb 1.1 2.0 2.3 2.0 1.5 3.9 0.6 1.2 NA 2.4 2.2 2.0 r Quality Scenar 60ppb 1.7 3.9 4.4 4.6 2.1 8.2 0.92	rio Base-75 5 10 0.3 4 1 NA -7 2 6 6 6 6 14 1 1 rio Change i Base-75 0.12 0.49 0.017 0.25 0.014 NA -0.062	Change in O <sub>3</sub> -A 75-70 7 4 2 4 3 -2 0.3 5 7 7 3 4 5 7 7 3 4 5 5 7 7 0.16 0.16 0.16 0.13 0.25 0.077 -0.14 0.0029	Attributable Risk           75-65           13           8           5           10           7           1           2           10           28           7           10           28           7           0.010           28           7           0.010           0.25           0.59           0.17           0.12           0.016	<b>75-60</b> 17 12 8 17 16 5 4 15 NA 11 12 15 <b>r 100,000</b> <b>75-60</b> 0.37 0.55 0.42 0.97 0.41 0.50 0.043
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA	Pee           Base           1.4           2.5           2.5           1.8           4.1           0.6           1.4           4.5           2.8           2.9           2.4           Same           2.2           4.9           5.7           2.5           8.6           0.90           2.2	rcent of Baselin 75ppb 1.3 2.2 2.5 2.4 1.8 4.1 0.6 1.4 4.2 2.6 2.5 2.4 <b>Ozone-Attri</b> 75ppb 2.1 4.4 4.8 5.5 2.5 2.5 8.6 0.96 2.1	e Incidence Att 70ppb 1.2 2.2 2.4 2.3 1.8 4.2 0.6 1.3 3.9 2.6 2.4 2.3 butable Deaths 70ppb 2.0 4.3 4.7 5.3 2.4 8.8 0.96 2.0	Ai ributable to Ozo 65ppb 1.1 2.4 2.4 2.1 1.7 4.1 0.6 1.2 3.0 2.4 2.3 2.2 Per 100,000 65ppb 1.8 4.1 4.6 4.9 2.3 8.5 0.95 1.9	r Quality Scenar ne 60ppb 1.1 2.0 2.3 2.0 1.5 3.9 0.6 1.2 NA 2.4 2.2 2.0 r Quality Scenar 60ppb 1.7 3.9 4.4 4.6 2.1 8.2 0.92 1.8	rio Base-75 5 10 0.3 4 1 NA -7 2 6 6 6 6 14 1 1 <b>base-75</b> 0.12 0.49 0.017 0.25 0.014 NA -0.062 0.050	Change in O <sub>3</sub> -A 75-70 7 4 2 4 3 -2 0.3 5 7 7 3 4 4 5 5 <b>n Ozone-Attribu</b> <b>75-70</b> 0.16 0.16 0.16 0.13 0.25 0.077 -0.14 0.0029 0.10	Attributable Risk           75-65           13           8           5           10           7           1           2           10           7           10           28           7           10           28           7           0.0           0.00           0.27           0.35           0.25           0.59           0.17           0.12           0.016           0.21	75-60 17 12 8 17 16 5 4 15 NA 11 12 15 15 15 15 12 15 0.00 75-60 0.37 0.55 0.42 0.97 0.41 0.50 0.043 0.31
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY	Pee           Base           1.4           2.5           2.5           1.8           4.1           0.6           1.4           4.1           0.6           1.4           4.1           0.6           1.4           4.5           2.8           2.9           2.4           Base           2.2           4.9           5.7           2.5           8.6           0.90           2.2           8.2	rcent of Baselin 75ppb 1.3 2.2 2.5 2.4 1.8 4.1 0.6 1.4 4.2 2.6 2.5 2.4 02one-Attri 75ppb 2.1 4.4 4.8 5.5 2.5 2.5 8.6 0.96 2.1 7.8	e Incidence Att 70ppb 1.2 2.4 2.3 1.8 4.2 0.6 1.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 0.6 1.3 3.9 2.6 2.4 2.3 0.6 1.3 3.9 2.6 2.4 2.3 0.6 1.3 3.9 2.6 2.4 2.3 0.6 1.3 3.9 2.6 2.4 2.3 0.6 1.3 3.9 2.6 2.4 2.3 0.6 1.3 3.9 2.6 2.4 2.3 0.6 1.3 3.9 2.6 2.4 2.3 0.6 1.3 3.9 2.6 2.4 2.3 0.6 2.0 4.3 2.4 8.8 0.96 2.0 2.4 2.3 0.7 2.4 2.3 0.7 2.4 2.3 0.7 2.4 2.3 0.7 2.4 8.8 0.96 2.0 7.2	Ai ributable to Ozo 65ppb 1.1 2.4 2.1 1.7 4.1 0.6 1.2 3.0 2.4 2.3 2.2 2.3 2.2 Per 100,000 65ppb 1.8 4.1 4.6 4.9 2.3 8.5 0.95 1.9 5.6	r Quality Scenar ne 60ppb 1.1 2.0 2.3 2.0 1.5 3.9 0.6 1.2 NA 2.4 2.2 2.0 r Quality Scenar 60ppb 1.7 3.9 4.4 4.6 2.1 8.2 0.92 1.8 NA	rio Base-75 5 10 0.3 4 1 NA -7 2 6 6 6 6 6 14 1 1 1 rio Change i Base-75 0.12 0.49 0.017 0.25 0.014 NA -0.062 0.050 0.51	Change in O <sub>3</sub> -A 75-70 7 4 2 4 3 2 0.3 5 7 3 4 4 5 5 7 0.16 0.16 0.16 0.16 0.16 0.13 0.25 0.077 -0.14 0.0029 0.10 0.59	Attributable Risk         75-65         13         8         5         10         7         1         2         10         7         10         28         7         10         28         7         0.0         0.27         0.35         0.27         0.35         0.59         0.17         0.12         0.016         0.21         2.2	75-60 17 12 8 17 16 5 4 15 NA 11 12 15 15 15 15 15 15 15 15 0.42 0.37 0.55 0.42 0.97 0.41 0.50 0.043 0.31 NA
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO St. Louis, MO St. Louis, MO Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA	Pee           Base           1.4           2.5           2.5           1.8           4.1           0.6           1.4           4.5           2.8           2.9           2.4	rcent of Baselin 75ppb 1.3 2.2 2.5 2.4 1.8 4.1 0.6 1.4 4.2 2.6 2.5 2.4 2.5 2.4 0zone-Attri 75ppb 2.1 4.4 4.8 5.5 2.5 2.5 8.6 0.96 2.1 7.8 5.7	e Incidence Att 70ppb 1.2 2.4 2.3 1.8 4.2 0.6 1.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.0 4.3 4.7 5.3 2.4 8.8 0.96 2.0 4.3 2.4 2.5 5.5 5.5 5.5 5.5 5.5 5.5 5.5	Ai ributable to Ozo 65ppb 1.1 2.4 2.1 1.7 4.1 0.6 1.2 3.0 2.4 2.3 2.3 2.2 Per 100,000 65ppb 1.8 4.1 4.6 4.9 2.3 8.5 0.95 1.9 5.6 5.2 0.1 1.9 1.1 1.1 1.1 1.1 1.1 1.1 1	r Quality Scenar ne 60ppb 1.1 2.0 2.3 2.0 1.5 3.9 0.6 1.2 NA 2.4 2.2 2.0 r Quality Scenar 60ppb 1.7 3.9 4.4 4.6 2.1 8.2 0.92 1.8 NA 5.0 0.2 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5	rio Base-75 5 10 0.3 4 1 NA -7 2 6 6 6 6 6 14 1 1 1 <b>tio</b> Change i Base-75 0.12 0.49 0.017 0.25 0.014 NA -0.062 0.050 0.51 0.40	Change in O <sub>3</sub> -A 75-70 7 4 2 4 3 -2 0.3 5 7 3 4 5 5 7 3 4 5 5 7 0.16 0.16 0.16 0.16 0.16 0.16 0.13 0.25 0.077 -0.14 0.0029 0.10 0.59 0.20	Attributable Risk         75-65         13         8         5         10         7         1         2         10         7         10         28         7         10         28         7         10         28         7         0.0         0.27         0.35         0.27         0.35         0.25         0.59         0.17         0.12         0.016         0.21         2.2         0.43	75-60 17 12 8 17 16 5 4 15 NA 11 12 15 NA 11 12 15 15 0.42 0.97 0.42 0.97 0.41 0.50 0.043 0.31 NA 0.64 0.64
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO St. Louis, MO St. Louis, MO Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA	Pee           Base           1.4           2.5           2.5           1.8           4.1           0.6           1.4           4.5           2.8           2.9           2.4           2.2           4.9           5.7           2.5           8.6           0.90           2.2           8.2           6.1           5.1	rcent of Baselin 75ppb 1.3 2.2 2.5 2.4 1.8 4.1 0.6 1.4 4.2 2.6 2.5 2.4 2.5 2.4 <b>Ozone-Attri</b> 75ppb 2.1 4.4 4.8 5.5 2.5 2.5 8.6 0.96 2.1 7.8 5.7 4.4	e Incidence Att 70ppb 1.2 2.4 2.3 1.8 4.2 0.6 1.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.6 2.4 2.3 3.9 2.0 4.3 4.7 5.3 2.4 8.8 0.96 2.0 4.3 4.7 5.3 2.4 8.8 0.96 2.0 7.2 5.5 4.2 7.2 5.5 4.2 7.2 5.5 4.2 7.2 5.5 4.2 7.2 5.5 4.2 7.2 5.5 4.2 7.2 5.5 4.2 7.2 5.5 4.2 7.2 5.5 4.2 7.2 5.5 4.2 7.2 5.5 4.2 7.2 5.5 4.2 7.2 5.5 4.2 7.2 5.5 4.2 7.2 5.5 4.2 7.2 5.5 4.2 7.2 5.5 5.5 4.2 7.2 5.5 5.5 5.5 5.5 5.5 5.5 5.5 5	Ai ributable to Ozo 65ppb 1.1 2.1 2.4 2.1 1.7 4.1 0.6 1.2 3.0 2.4 2.3 2.2 Per 100,000 65ppb 1.8 4.1 4.6 4.9 2.3 8.5 0.95 1.9 5.6 5.2 4.0 1.9	r Quality Scenar ne 60ppb 1.1 2.0 2.3 2.0 1.5 3.9 0.6 1.2 NA 2.4 2.2 2.0 r Quality Scenar 60ppb 1.7 3.9 4.4 4.6 2.1 8.2 0.92 1.8 NA 5.0 3.8 1.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7	rio Base-75 5 10 0.3 4 1 NA -7 2 6 6 6 6 14 1 1 1 <b>tio</b> Change i Base-75 0.12 0.49 0.017 0.25 0.012 0.49 0.017 0.25 0.014 NA -0.062 0.050 0.51 0.40	Change in O <sub>3</sub> -A 75-70 7 4 2 4 3 -2 0.3 5 7 3 4 5 7 3 4 5 5 7 0.16 0.16 0.16 0.16 0.16 0.16 0.16 0.16	Attributable Risk           75-65           13           8           5           10           7           1           2           10           7           10           28           7           10           28           7           0.0           28           7           0.0           0.27           0.35           0.27           0.35           0.25           0.59           0.17           0.12           0.016           0.21           2.2           0.43           0.34	<b>75-60</b> 17 12 8 17 16 5 4 15 NA 11 12 15 15 15 15 15 15 15 15 15 15

NA: for NYC, the model-based adjustment methodology was unable to estimate ozone distributions which would meet the alternative standard level of 60 ppb.

Table 7C-6. Sensitivity Analysis – LT Mortality: Alternate risk model (regional effect estimates) (2009) (incidence, percent of baseline mortality, incidence per 100,000 - compare with Core Results in Table 7B-7).

				Ai	r Quality Scena	rio			
		Absolute Oz	one-Attributat	le Incidence		Chang	ge in Ozone-At	tributable Incid	lence
Study Area	Base	75ppb	70ppb	65ppb	60ppb	Base-75	75-70	75-65	75-60
Atlanta CA	1,400	1,300	1,300	1,200	1,200	75	92	170	230
Atlanta, GA	(720 - 1900)	(690 - 1800)	(660 - 1800)	(630 - 1700)	(610 - 1700)	(34 - 110)	(42 - 140)	(77 - 260)	(110 - 350)
Poltimoro MD	-110	-100	-100	-96	-92	-6.4	-3.1	-6.9	-11
Baltimore, wid	(-1200 - 590)	(-1100 - 560)	(-1000 - 550)	(-980 - 530)	(-930 - 510)	(-55 - 41)	(-27 - 20)	(-59 - 44)	(-93 - 68)
Poston MA		-170	-170	-160	-150	0.29	-0.95	-5.8	-12
BUSION, MA	(-1700 - 920)	(-1700 - 920)	(-1700 - 920)	(-1600 - 890)	(-1500 - 860)	(32)	(-8 - 6)	(-50 - 38)	(-100 - 77)
Clausiand OH	0	0	0	0	0	0	0	0	0
Cleveraliu, OH	(-990 - 630)	(-950 - 620)	(-900 - 600)	(-840 - 570)	(-780 - 540)	(-22 - 22)	(-34 - 33)	(-76 - 73)	(-120 - 110)
Dominar CO	450	450	440	430	400	0.73	8.6	27	67
Denver, CO	(-26 - 780)	(-26 - 780)	(-26 - 770)	(-25 - 760)	(-23 - 710)	(0 - 2)	(0 - 18)	(-1 - 55)	(-3 - 130)
Detroit MI	0	0	0	0	0	NA	0	0	0
Detroit, Mi	(-1700 - 1100)	(-1700 - 1100)	(-1700 - 1100)	(-1700 - 1100)	(-1600 - 1000)	NA	(1515)	(-31 - 31)	(-90 - 88)
Houston TV	1,200	1,200	1,200	1,200	1,100	-11	32	69	110
Houston, TA	(610 - 1600)	(620 - 1600)	(610 - 1600)	(590 - 1600)	(580 - 1500)	(-518)	(14 - 49)	(31 - 110)	(51 - 170)
Los Angolos, CA	450	440	420	400	380	16	19	41	63
LOS Aligeles, CA	(-2400 - 2500)	(-2300 - 2400)	(-2200 - 2300)	(-2100 - 2200)	(-1900 - 2100)	(-72 - 100)	(-87 - 120)	(-180 - 260)	(-290 - 400)
Now York NY	-600	-580	-550	-470	NA	-16	-31	-110	NA
New fork, Nf	(-6200 - 3300)	(-6000 - 3200)	(-5600 - 3100)	(-4600 - 2700)	INA	(-130 - 100)	(-260 - 200)	(-960 - 690)	NA
Dhiladalahia DA	-260	-240	-240	-230	-220	-10	-8.0	-17	-25
Philadelphila, PA	(-2700 - 1400)	(-2500 - 1300)	(-2400 - 1300)	(-2300 - 1300)	(-2200 - 1200)	(-88 - 66)	(-69 - 52)	(-150 - 110)	(-220 - 160)
Sacramanta CA	500	440	420	400	380	90	21	41	65
Sacramento, CA	(-29 - 870)	(-25 - 770)	(-24 - 750)	(-23 - 720)	(-21 - 690)	(-5 - 180)	(-1 - 43)	(-2 - 82)	(-3 - 130)
St Louis MO	0	0	0	0	0	0	0	0	0
St. LOUIS, IVIO	(-1400 - 910)	(-1400 - 910)	(-1400 - 880)	(-1300 - 850)	(-1200 - 810)	(-13 - 13)	(-44 - 43)	(-96 - 92)	(-160 - 150)

		Air Quality Scenario										
	Per	cent of Baselin	e Incidence Att	ributable to O	one		Change in O₃-A	ttributable Ris	k			
Study Area	Base	75ppb	70ppb	65ppb	60ppb	Base-75	75-70	75-65	75-60			
Atlanta, GA	42.6	41.3	39.6	38.1	36.9	3.1	4.0	7.6	10.7			
Baltimore, MD	-7.4	-6.9	-6.6	-6.3	-5.9	7.7	4.0	8.7	13.4			
Boston, MA	-6.1	-6.1	-6.0	-5.8	-5.5	-0.2	0.7	4.5	9.2			
Cleveland, OH	0	0	0	0	0	0	0	0	0			
Denver, CO	27.5	27.5	27.1	26.3	24.5	0.1	1.3	4.2	10.7			
Detroit, MI	0	0	0	0	0	NA	0	0	0			
Houston, TX	41.0	41.2	40.6	39.8	38.9	-0.5	1.5	3.4	5.7			
Los Angeles, CA	4.7	4.6	4.4	4.3	4.1	2.4	3.1	6.7	10.6			
New York, NY	-6.7	-6.5	-6.0	-5.0	NA	3.4	6.8	23.5	NA			
Philadelphia, PA	-7.1	-6.7	-6.5	-6.1	-5.9	5.3	4.3	9.1	13.3			
Sacramento, CA	28.5	24.9	24.0	23.2	22.1	12.8	3.6	6.9	11.2			
St. Louis, MO	0	0	0	0	0	0	0	0	0			

				Ai	r Quality Scena	ario			
		Ozone-Attri	butable Death	s per 100,000		Change in	Ozone-Attrib	utable Deaths p	ver 100,000
Study Area	Base	75ppb	70ppb	65ppb	60ppb	Base-75	75-70	75-65	75-60
Atlanta, GA	47	46	44	42	41	2.5	3.1	5.7	7.9
Baltimore, MD	-6.8	-6.4	-6.2	-6.0	-5.7	-0.40	-0.19	-0.43	-0.66
Boston, MA	-6.1	-6.1	-6.0	-5.8	-5.6	0.011	-0.034	-0.21	-0.44
Cleveland, OH	0	0	0	0	0	0	0	0	0
Denver, CO	31	31	30	30	27	0.050	0.59	1.9	4.6
Detroit, MI	0	0	0	0	0	NA	0	0	0
Houston, TX	38	38	37	37	36	-0.36	1.00	2.2	3.6
Los Angeles, CA	6.2	6.0	5.8	5.5	5.2	0.22	0.27	0.56	0.87
New York, NY	-5.3	-5.2	-4.9	-4.2	NA	-0.14	-0.27	-0.97	NA
Philadelphia, PA	-7.2	-6.9	-6.7	-6.4	-6.2	-0.29	-0.23	-0.48	-0.71
Sacramento, CA	41	36	34	33	32	7.4	1.7	3.3	5.3
St. Louis, MO	0	0	0	0	0	0	0	0	0

NA: for NYC, the model-based adjustment methodology was unable to estimate ozone distributions which would meet the alternative standard level of 60 ppb.

Table 7C-7. Sensitivity Analysis – *LT Mortality: Alternate risk model (ozone-only effect estimate)* (2009) (incidence, percent of baseline mortality, incidence per 100,000) - compare with Core Results in Table 7B-7).

				Air	Quality Scena	ario			
		Ab	solute Incide	nce			Change in	Incidence	
Study Area	Base	75ppb	70ppb	65ppb	60ppb	base-75	75-70	75-65	75-60
Atlanta CA	400	390	370	350	340	18	22	40	56
Atlanta, GA	(120 - 660)	(120 - 630)	(110 - 600)	(100 - 580)	(100 - 550)	(5 - 30)	(6 - 37)	(12 - 69)	(16 - 96)
Paltimore MD	260	250	240	230	230	17	8.2	18	28
Baitimore, ND	(80 - 430)	(75 - 410)	(73 - 400)	(70 - 380)	(67 - 370)	(5 - 29)	(2 - 14)	(5 - 31)	(8 - 48)
Deston MA	410	410	400	390	380	-0.77	2.5	15	32
Boston, IVIA	(120 - 670)	(120 - 670)	(120 - 670)	(120 - 650)	(110 - 620)	(01)	(1-4)	(4 - 26)	(9 - 54)
	220	210	200	190	180	6.4	9.9	22	34
Cleveland, OH	(65 - 360)	(63 - 350)	(61 - 330)	(57 - 320)	(54 - 300)	(2 - 11)	(3 - 17)	(6 - 37)	(10 - 58)
Demuse CO	220	220	220	210	200	0.34	3.9	12	31
Denver, CO	(68 - 370)	(68 - 360)	(67 - 360)	(65 - 350)	(59 - 320)	(0 - 1)	(1 - 7)	(4 - 21)	(9 - 53)
Detroit MI	380	380	380	370	350	NIA	-4.5	9.2	26
Detroit, wil	(110 - 620)	(110 - 620)	(110 - 630)	(110 - 610)	(110 - 580)	NA	(-18)	(3 - 16)	(8 - 45)
Houston TV	340	340	340	330	320	-2.7	7.5	16	27
Houston, IX	(100 - 560)	(100 - 560)	(100 - 550)	(98 - 540)	(95 - 520)	(-15)	(2 - 13)	(5 - 28)	(8 - 46)
	1,100	1,100	1,100	1,000	960	43	52	110	170
Los Angeles, CA	(350 - 1900)	(340 - 1800)	(320 - 1700)	(310 - 1700)	(290 - 1600)	(12 - 73)	(15 - 89)	(31 - 180)	(49 - 290)
New York NV	1,500	1,400	1,300	1,200	NIA	42	81	290	NIA
New York, NY	(440 - 2400)	(430 - 2300)	(400 - 2200)	(350 - 1900)	NA	(12 - 71)	(23 - 140)	(83 - 490)	NA
Dhiladalahia DA	620	590	580	550	530	27	21	45	66
rillaueipilla, rA	(190 - 1000)	(180 - 970)	(170 - 940)	(170 - 910)	(160 - 880)	(8 - 46)	(6 - 36)	(13 - 77)	(19 - 110)
Sacramonto CA	250	220	210	200	190	42	9.8	19	30
Sacramento, CA	(76 - 410)	(65 - 350)	(62 - 340)	(60 - 330)	(56 - 310)	(12 - 71)	(3 - 17)	(5 - 32)	(9 - 51)
	320	310	300	290	270	3.8	13	28	45
St. LOUIS, MO	(95 - 520)	(94 - 510)	(90 - 490)	(86 - 470)	(81 - 450)	(1 - 7)	(4 - 22)	(8 - 47)	(13 - 77)

		Air Quality Scenario										
		Percent	of Baseline I	ncidence		Ch	nange in O₃-A	ttributable R	isk			
Study Area	Base	75ppb	70ppb	65ppb	60ppb	Base-75	75-70	75-65	75-60			
Atlanta, GA	12.4	11.9	11.3	10.8	10.4	4	5	9	13			
Baltimore, MD	12.9	12.2	11.9	11.4	11.0	6	3	6	10			
Boston, MA	11.1	11.2	11.1	10.8	10.4	-0.2	1	3	7			
Cleveland, OH	12.1	11.8	11.3	10.7	10.1	3	4	9	14			
Denver, CO	14.1	14.1	13.9	13.5	12.4	0.1	1	5	12			
Detroit, MI	11.9	11.9	12.0	11.7	11.2	NA	-1	2	6			
Houston, TX	11.8	11.9	11.6	11.4	11.0	-1	2	4	7			
Los Angeles, CA	15.1	14.6	14.1	13.4	12.7	3	4	8	13			
New York, NY	12.0	11.7	11.1	9.6	NA	3	5	18	NA			
Philadelphia, PA	12.5	12.1	11.7	11.2	10.9	4	3	7	10			
Sacramento, CA	14.7	12.6	12.1	11.7	11.1	14	4	8	12			
St. Louis, MO	12.6	12.4	12.0	11.5	10.9	1	4	8	13			

		Air Quality Scenario											
		Ozone-Attrib	utable Death	ns per 100,000	)	Change in C	zone-Attribu	table Deaths	per 100,000				
Study Area	Base	75ppb	70ppb	65ppb	60ppb	Base-75	75-70	75-65	75-60				
Atlanta, GA	14	13	12	12	11	0.60	0.74	1.4	1.9				
Baltimore, MD	16	16	15	15	14	1.0	0.51	1.1	1.7				
Boston, MA	15	15	15	14	14	-0.028	0.091	0.56	1.2				
Cleveland, OH	17	16	16	15	14	0.49	0.76	1.7	2.6				
Denver, CO	15	15	15	15	14	0.023	0.27	0.85	2.1				
Detroit, MI	14	14	15	14	14	NA	-0.17	0.35	1.00				
Houston, TX	11	11	11	10	10	-0.084	0.24	0.51	0.86				
Los Angeles, CA	16	15	15	14	13	0.59	0.72	1.5	2.3				
New York, NY	13	13	12	10	NA	0.37	0.71	2.5	NA				
Philadelphia, PA	17	17	16	16	15	0.76	0.60	1.3	1.9				
Sacramento, CA	21	18	17	16	15	3.4	0.80	1.5	2.5				
St. Louis, MO	19	19	18	17	16	0.23	0.76	1.6	2.7				

NA: for NYC, the model-based adjustment methodology was unable to estimate ozone distributions which would meet the lower alternative standard level of 60 ppb.

### Table 7C-8. Sensitivity Analysis – *LT Mortality: Threshold models (ozone-only effect estimate)* (2009 Baseline) (ozone-attributable deaths, percent of baseline mortality, incidence per 100,000 - compare with Core Results in Table 7B-7).

				Type of Ozone	Model			
	Non-Th	reshold*			Thre	shold		
Study Area	86 city model	96 city model	40ppb	45ppb	50ppb	55ppb	56ppb	60ppb
Atlanta CA	400	430	99	54	-	-	-	-
Atlanta, GA	(120 - 660)	(160 - 670)	(40 - 160)	(22 - 84)	()	()	()	()
Poltimore MD	260	280	77	50	17	-	-	-
baltimore, wib	(80 - 430)	(110 - 440)	(31 - 120)	(21 - 78)	(7 - 27)	()	()	()
Poston MA	410	430	52	-	-	-	-	-
Boston, MA	(120 - 670)	(160 - 690)	(21 - 83)	()	()	()	()	()
Clausiand Oli	220	230	48	22	-	-	-	-
Cleveland, OH	(65 - 360)	(86 - 370)	(19 - 76)	(9 - 35)	()	()	()	()
Damuan 60	220	240	85	66	43	18	12	-
Denver, CO	(68 - 370)	(90 - 370)	(34 - 130)	(28 - 100)	(18 - 68)	(8 - 28)	(6 - 19)	()
Dotroit MI	380	400	77	31	-	-	-	-
Detroit, Mi	(110 - 620)	(150 - 640)	(31 - 120)	(13 - 49)	()	()	()	()
Houston TV	340	360	66	24	-	-	-	-
Houston, IX	(100 - 560)	(130 - 570)	(26 - 100)	(10 - 37)	()	()	()	()
Los Angelos, CA	1100	1200	500	420	320	220	200	65
LOS Angeles, CA	(350 - 1900)	(460 - 1900)	(200 - 790)	(180 - 660)	(130 - 500)	(99 - 340)	(89 - 300)	(22 - 110)
Now York NY	1500	1600	310	140	-	-	-	-
New fork, Nf	(440 - 2400)	(580 - 2500)	(120 - 490)	(56 - 210)	()	()	()	()
Dhiladalahia DA	620	660	160	93	12	-	-	-
Philadelphia, PA	(190 - 1000)	(240 - 1000)	(64 - 250)	(39 - 150)	(5 - 19)	()	()	()
Sacramonto CA	250	270	100	86	62	38	33	3
Sacramento, CA	(76 - 410)	(100 - 420)	(42 - 160)	(36 - 130)	(26 - 97)	(17 - 59)	(15 - 50)	(1-6)
St Louis MO	320	340	83	49	8	-	-	-
St. Louis, MO	(95 - 520)	(120 - 530)	(33 - 130)	(20 - 77)	(3 - 12)	()	()	()

Ozone-Attributable Deaths

Percent of Baseline Incidence Attributable to Ozone

				Type of Ozone	e Model			
	Non-Th	hreshold*			Thre	shold		
Study Area	86 city model	96 city model	40ppb	45ppb	50ppb	55ppb	56ppb	60ppb
Atlanta, GA	12.4	13.2	3.1	1.7	-	-	-	-
Baltimore, MD	12.9	13.8	3.8	2.5	0.8	-	-	-
Boston, MA	11.1	11.9	1.4	-	-	-	-	-
Cleveland, OH	12.1	12.9	2.7	1.3	-	-	-	-
Denver, CO	14.1	15.1	5.4	4.2	2.7	1.2	0.8	-
Detroit, MI	11.9	12.7	2.5	1.0	-	-	-	-
Houston, TX	11.8	12.6	2.3	0.8	-	-	-	-
Los Angeles, CA	15.1	16.2	6.7	5.6	4.2	2.9	2.6	0.9
New York, NY	12.0	12.8	2.6	1.1	-	-	-	-
Philadelphia, PA	12.5	13.4	3.3	1.9	0.2	-	-	-
Sacramento, CA	14.7	15.8	6.2	5.1	3.7	2.3	1.9	0.2
St. Louis, MO	12.6	13 5	33	2.0	03	-	-	-

Ozone-Attributable Deaths per 100,000 Population

		Type of Ozone Model								
	Non-Th	Non-Threshold*		Threshold						
Study Area	86 city model	96 city model	40ppb	45ppb	50ppb	55ppb	56ppb	60ppb		
Atlanta, GA	14	15	3.3	1.8	-	-	-	-		
Baltimore, MD	16	18	4.8	3.1	1.1	-	-	-		
Boston, MA	15	16	1.9	-	-	-	-	-		
Cleveland, OH	17	18	3.7	1.7	-	-	-	-		
Denver, CO	15	16	5.8	4.6	3.0	1.3	0.84	-		
Detroit, MI	14	15	2.9	1.2	-	-	-	-		
Houston, TX	11	11	2.1	0.75	-	-	-	-		
Los Angeles, CA	16	17	6.9	5.8	4.4	3.0	2.7	0.89		
New York, NY	13	14	2.7	1.2	-	-	-	-		
Philadelphia, PA	17	19	4.5	2.6	0.34	-	-	-		
Sacramento, CA	21	22	8.6	7.0	5.1	3.1	2.7	0.28		
St. Louis. MO	19	20	5.0	2.9	0.47	-	-	-		

## Table 7C-9. Sensitivity Analysis – LT Mortality: Threshold models (ozone-only effect estimate) (2009 Current Standard 75ppb) (ozone-attributable deaths, percent of baseline mortality, incidence per 100,000 - compare with Core Results in Table 7B-7).

Ozone-Attributable De	eaths							
			Type of Ozone Model					
	Non-Th	reshold*		r .	Thre	shold	r	
Study Area	86 city model	96 city model	40ppb	45ppb	50ppb	55ppb	56ppb	60ppb
Atlanta. GA	390	410	79	32	-	-	-	-
	(120 - 630)	(150 - 650)	(31 - 130)	(13 - 50)	()	()	()	()
Baltimore, MD	250	270	58	29	-	-	-	-
	(75 - 410)	(99 - 420)	(23 - 92)	(12 - 46)	()	()	()	()
Boston MA	410	440	53	-	-	-	-	-
	(120 - 670)	(160 - 690)	(21 - 85)	()	()	()	()	()
Cleveland OH	210	230	41	14	-	-	-	-
	(63 - 350)	(84 - 360)	(16 - 65)	(6 - 23)	()	()	()	()
Donvor CO	220	240	85	66	43	18	12	-
Deliver, CO	(68 - 360)	(89 - 370)	(34 - 130)	(28 - 100)	(18 - 67)	(8 - 28)	(5 - 18)	()
Detroit MI	380	400	77	31	-	-	-	-
Detroit, wii	(110 - 620)	(150 - 640)	(31 - 120)	(13 - 49)	()	()	()	()
Haustan TV	340	370	69	27	-	-	-	-
Houston, IX	(100 - 560)	(140 - 580)	(28 - 110)	(11 - 43)	()	()	()	()
	1100	1200	450	370	260	160	130	-
Los Angeles, CA	(340 - 1800)	(440 - 1800)	(180 - 720)	(160 - 580)	(110 - 410)	(69 - 240)	(58 - 200)	()
	1400	1500	260	83	-	-	-	-
New York, NY	(430 - 2300)	(560 - 2400)	(100 - 420)	(35 - 130)	()	()	()	()
	590	630	130	59	-	-	-	-
Philadelphia, PA	(180 - 970)	(240 - 1000)	(52 - 210)	(25 - 93)	()	()	()	()
	220	230	58	34	7			
Sacramento, CA	(65 - 350)	(85 - 360)	(23 - 91)	(14 - 54)	(3 - 11)	()	()	()
	210	220	70	(14 - 34)	2	()	()	()
St. Louis, MO	(94 510)	(120 520)	(22 120)	(19 60)	(1 4)	( )	( )	( )
	(94 - 510)	(120 - 520)	(32 - 120)	(10-09)	(1-4)	()	()	()
Demonst of Decelling In		0						
Percent of Baseline In	cidence Attributable to	Ozone		Turne of Orene l	Madal			
	No. Th		1	Type of Ozone		-11-1		
Chudu Anna	Non-Ini		40mmh	4Emaile	Inre 50mmh		- Cranh	Comula
Study Area	11.0	30 city model	40ppb	43ppb	oddoc	Sohhn	oddoc	ooppo
Atlanta, GA	11.9	12.7	2.4	1.0	-	-	-	-
Baltimore, IVID	12.2	13.1	2.8	1.4	-	-	-	-
Boston, IVIA	11.2	11.9	1.5	-	-	-	-	-
Cleveland, OH	11.8	12.6	2.3	0.8	-	-	-	-
Denver, CO	14.1	15.1	5.4	4.2	2.7	1.1	0.7	-
Detroit, MI	11.9	12.7	2.5	1.0	-	-	-	-
Houston, TX	11.9	12.7	2.4	0.9	-	-	-	-
Los Angeles, CA	14.6	15.6	6.0	4.9	3.5	2.1	1.7	-
New York, NY	11.7	12.5	2.2	0.7	-	-	-	-
Philadelphia, PA	12.1	12.9	2.6	1.2	-	-	-	-
Sacramento, CA	12.6	13.5	3.4	2.0	0.4	-	-	-
St. Louis, MO	12.4	13.3	3.2	1.8	0.1	-	-	-
Ozone-Attributable De	eaths per 100,000 Popu	lation						
				Type of Ozone	Model			
	Non-Th	reshold*			Thre	shold		
Study Area	86 city model	96 city model	40ppb	45ppb	50ppb	55ppb	56ppb	60ppb
Atlanta, GA	13	14	2.7	1.1	-	-	-	-
Baltimore, MD	16	17	3.6	1.8	-	-	-	-
Boston, MA	15	16	1.9	-	-	-	-	-
Cleveland, OH	16	17	3.1	1.1	-	-	-	-
Denver. CO	15	16	5.8	4.5	2.9	1.2	0,80	-
Detroit, MI	14	15	2.9	12	-		-	-
Houston, TX	11	12	2.5	0.85	-	-	-	-
Los Angeles CA	15	16	63	5.05	3.6	21	1.8	_
New York NV	13	12	2.3	0.72			1.0	-
	13	10	2.3	17	-	-	-	-
Finiauerpina, PA	1/	10	3.7	1./	0.55	-	-	-
Sacramento, CA	18	19	4.7	2.8	0.55	-	-	-
St. LOUIS, IVIO	19	20	4./	2.6	0.16	-	-	-

## Table 7C-10. Sensitivity Analysis – *LT Mortality: Threshold models (ozone-only effect estimate)* (2009 Current Standard 70ppb) (ozone-attributable deaths, percent of baseline mortality, incidence per 100,000 - compare with Core Results in Table 7B-7).

Ozone-Attributable Dea	aths			- (2 )				
	Non The		1	Type of Ozone M	Viodel	ah al d		
Churches Arrow	Non-Inr	esnoid*	40mmh	4E-math	Inre Comb	snoid	FCareb	Comula
Study Area	35 city model	200	40ppb	45ppb	aqque	oqqee	addag	addoa
Atlanta, GA	(110 - 600)	(140 - 620)	(21 - 85)	(2-6)	()	()	()	()
	240	260	(21-05)	10	()	()	()	()
Baltimore, MD	(73 - 400)	(96 - 410)	(19 - 77)	(8 - 30)	()	()	()	()
	/00	(30 410)	50	(0 50)				
Boston, MA	(120 - 670)	(160 - 680)	(20 - 80)	()	()	()	()	()
	200	220	20-80)	2				
Cleveland, OH	(61 - 330)	(80 - 340)	(12 - 47)	(1 - 3)	()	()	()	()
	220	240	80	61	38	12	5	-
Denver, CO	(67 - 360)	(88 - 370)	(32 - 130)	(26 - 96)	(16 - 59)	(5 - 18)	(2 - 8)	()
	380	410	83	37	-	-	-	-
Detroit, MI	(110 - 630)	(150 - 640)	(33 - 130)	(15 - 58)	()	()	()	()
	340	360	60	18	-	-	-	-
Houston, TX	(100 - 550)	(130 - 570)	(24 - 96)	(7 - 28)	()	()	()	()
	1100	1100	400	310	200	74	45	-
Los Angeles, CA	(320 - 1700)	(420 - 1800)	(160 - 630)	(130 - 480)	(82 - 310)	(33 - 120)	(20 - 70)	()
No. West Pro-	1300	1400	170				-	-
New York, NY	(400 - 2200)	(530 - 2300)	(68 - 270)	()	()	()	()	()
Dhiladalahir DA	580	610	110	32	-	-	-	-
Philadelphia, PA	(170 - 940)	(230 - 970)	(42 - 170)	(14 - 51)	()	()	()	()
C	210	220	46	22	-	-	-	-
Sacramento, CA	(62 - 340)	(82 - 350)	(19 - 74)	(9 - 35)	()	()	()	()
St. Louis MO	300	320	64	28	-	-	-	-
St. Louis, IVIO	(90 - 490)	(120 - 510)	(26 - 100)	(12 - 44)	()	()	()	()
Percent of Baseline Inci	dence Attributable to	Ozone						
				Type of Ozone N	Model			
		1 1 1 4	I					
Charles Arres	Non-Thr	eshold*	40h		Thre	shold	Fruit	<u>court</u>
Study Area	Non-Thr 86 city model	reshold* 96 city model	40ppb	45ppb	Thre 50ppb	shold 55ppb	56ppb	60ppb
Study Area Atlanta, GA	Non-Thr 86 city model 11.3	eshold* 96 city model 12.1	40ppb 1.7	45ppb	Thre 50ppb	shold 55ppb -	56ppb -	60ppb -
Study Area Atlanta, GA Baltimore, MD	Non-Thr 86 city model 11.3 11.9	eshold* 96 city model 12.1 12.7 11.0	40ppb 1.7 2.4	45ppb 0.1 0.9	Thre 50ppb - -	shold 55ppb - -	56ppb - -	60ppb - -
Study Area Atlanta, GA Baltimore, MD Boston, MA Claveland, OH	Non-Thr 86 city model 11.3 11.9 11.1 11.1	reshold* 96 city model 12.1 12.7 11.9 12.1	40ppb 1.7 2.4 1.4	45ppb 0.1 0.9 -	Thre 50ppb - - -	shold 55ppb - - -	56ppb - - -	60ppb - - -
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO	Non-Thr 86 city model 11.3 11.9 11.1 11.3 11.3 13.9	reshold* 96 city model 12.1 12.7 11.9 12.1 14.9	40ppb 1.7 2.4 1.4 1.6 5.1	45ppb 0.1 0.9 - 0.1 3.9	Thre 50ppb 	shold 55ppb - - - - - - - - - - -	56ppb - - - - -	60ppb - - - - -
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit MI	Non-Thr           86 city model           11.3           11.9           11.1           11.3           13.9           12.0	eshold* 96 city model 12.1 12.7 11.9 12.1 14.9 12.9	40ppb 1.7 2.4 1.4 1.6 5.1 2.6	45ppb 0.1 0.9 - 0.1 3.9 1.2	Thre           50ppb           -           -           -           -           2.4	shold 55ppb - - - - 0.7	56ppb - - - 0.3	60ppb 
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX	Non-Thr           86 city model           11.3           11.9           11.1           11.3           13.9           12.0           11.6	eshold* 96 city model 12.1 12.7 11.9 12.1 14.9 12.9 12.5	40ppb 1.7 2.4 1.4 1.6 5.1 2.6 2.1	45ppb 0.1 0.9 - 0.1 3.9 1.2 0.6	Thre 50ppb 	shold 55ppb - - - - 0.7 - 0.7	56ppb - - - - 0.3 - -	60ppb - - - - - - - -
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA	Non-Thr           86 city model           11.3           11.9           11.1           11.3           12.0           11.6           14.1	eshold* 96 city model 12.1 12.7 11.9 12.1 14.9 12.9 12.5 15.0	40ppb 1.7 2.4 1.4 1.6 5.1 2.6 2.1 5.3	45ppb 0.1 0.9 - 0.1 3.9 1.2 0.6 4.1	Three           50ppb           -           -           -           -           -           -           2.4           -           -           2.4           -           2.6	shold 55ppb - - - 0.7 - 1.0	56ppb - - - 0.3 - - 0.6	60ppb - - - - - - - - - - -
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY	Non-Thr           86 city model           11.3           11.9           11.1           11.3           13.9           12.0           11.6           14.1           11.1	eshold* 96 city model 12.1 12.7 11.9 12.1 14.9 12.9 12.5 15.0 11.9	40ppb 1.7 2.4 1.4 1.6 5.1 2.6 2.1 5.3 1.4	45ppb 0.1 0.9 - 0.1 3.9 1.2 0.6 4.1	Thre 50ppb - - - 2.4 - - - - - 2.6	shold 55ppb - - - 0.7 - 1.0 -	56ppb - - - 0.3 - - - - - 0.6	60ppb - - - - - - - - - - - - - -
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY	Non-Thr           86 city model           11.3           11.9           11.1           11.3           12.0           11.6           14.1           11.1	eshold* 96 city model 12.1 12.7 11.9 12.1 14.9 12.9 12.5 15.0 11.9 12.5	40ppb 1.7 2.4 1.4 1.6 5.1 2.6 2.1 5.3 1.4 2.2	45ppb 0.1 0.9 - 0.1 3.9 1.2 0.6 4.1 - 0.7	Thre 50ppb 2.4 2.6	shold 55ppb - - - 0.7 - 1.0 - - 1.0 -	56ppb - - - 0.3 - - - 0.6 - -	60ppb - - - - - - - - - - - - - - - -
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA	Non-Thr           86 city model           11.3           11.9           11.1           11.3           12.0           11.6           14.1           11.7           12.1	eshold* 96 city model 12.1 12.7 11.9 12.1 14.9 12.9 12.5 15.0 11.9 12.5 13.0	40ppb 1.7 2.4 1.4 1.6 5.1 2.6 2.1 5.3 1.4 2.2 2.7	45ppb 0.1 0.9 - 0.1 3.9 1.2 0.6 4.1 - 0.7 1.3	Thre 50ppb 	shold 55ppb - - - 0.7 - - 0.7 - - 1.0 - - - - - -	56ppb 	60ppb - - - - - - - - - - - - - - - - - -
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO	Non-Thr           86 city model           11.3           11.9           11.1           11.3           11.3           11.3           11.3           11.3           11.3           11.1           11.3           11.3           11.1           11.6           14.1           11.1           11.7           12.1           12.0	eshold* 96 city model 12.1 12.7 11.9 12.1 14.9 12.5 15.0 11.9 12.5 15.0 11.9 12.5 13.0 12.8	40ppb 1.7 2.4 1.4 1.6 5.1 2.6 2.1 5.3 1.4 2.2 2.7 2.6	45ppb           0.1           0.9           -           0.1           3.9           1.2           0.6           4.1           -           0.7           1.3           1.1	Thre 50ppb	shold 55ppb - - - - - - - - 1.0 - - - - - - - -	56ppb 	60ppb 
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO	Non-Thr           86 city model           11.3           11.9           11.1           11.3           13.9           12.0           11.6           14.1           11.7           12.1           12.0	eshold*           96 city model           12.1           12.7           11.9           12.1           14.9           12.5           15.0           11.9           12.5           13.0           12.8	40ppb 1.7 2.4 1.4 1.6 5.1 2.6 2.1 5.3 1.4 2.2 2.7 2.6	45ppb           0.1           0.9           -           0.1           3.9           1.2           0.6           4.1           -           0.7           1.3           1.1	Thre 50ppb	shold 55ppb - - - 0.7 - - 0.7 - - 1.0 - - - - - - - - -	56ppb           -           -           -           0.3           -           -           0.6           -           -           -           -           -           -           -           -           -           -           -           -           -           -           -           -           -           -	60ppb - - - - - - - - - - - - - - - - - -
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Ozone-Attributable Dea	Non-Thr           86 city model           11.3           11.9           11.1           11.3           13.9           12.0           11.6           14.1           11.7           12.1           12.0	eshold* 96 city model 12.1 12.7 11.9 12.1 14.9 12.9 12.5 15.0 11.9 12.5 13.0 12.8 ation	40ppb 1.7 2.4 1.4 1.6 5.1 2.6 2.1 5.3 1.4 2.2 2.7 2.6	45ppb           0.1           0.9           -           0.1           3.9           1.2           0.6           4.1           -           0.7           1.3           1.1	Thre 50ppb	shold 55ppb - - - 0.7 - - 0.7 - 1.0 - - - - - - -	56ppb           -           -           -           0.3           -           -           0.6           -           -           -           -           -           -           -           -           -           -           -           -           -           -           -           -           -	60ppb - - - - - - - - - - - - - - - - - -
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Ozone-Attributable Dea	Non-Thr           86 city model           11.3           11.9           11.1           11.3           13.9           12.0           11.6           14.1           11.7           12.0           14.1           11.2           11.7           12.0	eshold*           96 city model           12.1           12.7           11.9           12.1           14.9           12.5           15.0           11.9           12.5           13.0           12.8	40ppb 1.7 2.4 1.4 1.6 5.1 2.6 2.1 5.3 1.4 2.2 2.7 2.6	45ppb 0.1 0.9 - 0.1 3.9 1.2 0.6 4.1 - 0.7 1.3 1.1 Type of Ozone №	Thre 50ppb	shold 55ppb - - - 0.7 - - 0.7 - 1.0 - - - - - - - -	56ppb - - - - - - - - - - - - - - - -	60ppb - - - - - - - - - - - - - - - -
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Ozone-Attributable Dea	Non-Thr           86 city model           11.3           11.9           11.1           11.3           13.9           12.0           11.6           14.1           11.7           12.1           11.7           12.0	eshold* 96 city model 12.1 12.7 11.9 12.1 14.9 12.9 12.5 15.0 11.9 12.5 13.0 12.8 ation eshold*	40ppb 1.7 2.4 1.4 1.6 5.1 2.6 2.1 5.3 1.4 2.2 2.7 2.6	45ppb 0.1 0.9 - 0.1 3.9 1.2 0.6 4.1 - 0.7 1.3 1.1 Type of Ozone N	Thre 50ppb  - - 2.4 - - 2.6 - - - - - - - - - - - - - - - - - - -	shold 55ppb - - - 0.7 - - 1.0 - 1.0 - - - - - - - - - - - - - - - - - - -	56ppb  - - 0.3 - - 0.6 - - - - -	60ppb - - - - - - - - - - - - - - - - - -
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Ozone-Attributable Dea Study Area	Non-Thr           86 city model           11.3           11.9           11.1           11.3           13.9           12.0           11.6           14.1           11.7           12.1           12.0	eshold*           96 city model           12.1           12.7           11.9           12.1           14.9           12.5           15.0           11.9           12.5           13.0           12.8           ation           eshold*           96 city model	40ppb 1.7 2.4 1.4 1.6 5.1 2.6 2.1 5.3 1.4 2.2 2.7 2.6 40ppb	45ppb 0.1 0.9 - 0.1 3.9 1.2 0.6 4.1 - 0.7 1.3 1.1 Type of Ozone № 45ppb	Thre 50ppb 2.4 2.6	shold 5Sppb - - 0.7 - 1.0 - 1.0 - - - - - - - - - - - - -	56ppb 0.3 0.6 56ppb	60ppb
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Ozone-Attributable Dea Study Area Atlanta, GA	Non-Thr           86 city model           11.3           11.9           11.1           11.3           13.9           12.0           11.6           14.1           11.7           12.1           11.7           12.1           12.0	eshold*           96 city model           12.1           12.7           11.9           12.1           14.9           12.5           15.0           11.9           12.5           13.0           12.8           ation           96 city model           13	40ppb 1.7 2.4 1.4 1.6 5.1 2.6 2.1 5.3 1.4 2.2 2.7 2.6 40ppb 1.8	45ppb 0.1 0.9 - 0.1 3.9 1.2 0.6 4.1 - 0.7 1.3 1.1 Type of Ozone N 45ppb 0.14	Thre 50ppb	shold 55ppb - - - 0.7 - 1.0 - 1.0 - 1.0 - - 55ppb - -	56ppb	60ppb
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Ozone-Attributable Dea Study Area Atlanta, GA Baltimore, MD	Non-Thr           86 city model           11.3           11.9           11.1           11.3           13.9           12.0           11.6           14.1           11.7           12.1           12.0	eshold*           96 city model           12.1           12.7           11.9           12.1           14.9           12.5           15.0           11.9           12.5           13.0           12.8           ation           96 city model           13           16	40ppb 1.7 2.4 1.6 5.1 2.6 2.1 5.3 1.4 2.2 2.7 2.6 40ppb 1.8 3.0	45ppb 0.1 0.9 - 0.1 3.9 1.2 0.6 4.1 - 0.7 1.3 1.1 Type of Ozone M 45ppb 0.14 1.2	Three           50ppb           -           -           -           2.4           -           2.4           -           2.6           -           -           2.6           -	shold 55ppb - - - 0.7 - - 1.0 - 1.0 - - 55ppb - - - - - - - - - - - - -	56ppb 	60ppb
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Ozone-Attributable Dea Study Area Atlanta, GA Baltimore, MD Boston, MA	Non-Thr           86 city model           11.3           11.9           11.1           11.3           13.9           12.0           11.6           14.1           11.7           12.1           12.1           12.0	eshold*           96 city model           12.1           12.7           11.9           12.1           14.9           12.5           15.0           11.9           12.5           13.0           12.8           ation           96 city model           13           16           16	40ppb 1.7 2.4 1.4 1.6 5.1 2.6 2.1 5.3 1.4 2.2 2.7 2.6 40ppb 1.8 3.0 1.8	45ppb 0.1 0.9 - 0.1 3.9 1.2 0.6 4.1 - 0.7 1.3 1.1 Type of Ozone N 45ppb 0.14 1.2 -	Three           50ppb           -           -           -           2.4           -           2.4           -           2.6           -           -           2.6           -	shold 55ppb - - 0.7 - 0.7 - 1.0 - 1.0 - -	56ppb 	60ppb 
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Ozone-Attributable Dea Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH	Non-Thr           86 city model           11.3           11.9           11.1           11.3           13.9           12.0           11.6           14.1           11.7           12.1           12.0	eshold*           96 city model           12.1           12.7           11.9           12.1           14.9           12.5           15.0           11.9           12.5           13.0           12.8           ation           eshold*           96 city model           13           16           16           17	40ppb 1.7 2.4 1.4 1.6 5.1 2.6 2.1 5.3 1.4 2.2 2.7 2.6 40ppb 1.8 3.0 1.8 2.3	45ppb 0.1 0.9 - 0.1 3.9 1.2 0.6 4.1 - 0.7 1.3 1.1 Type of Ozone N 45ppb 0.14 1.2 - 0.1 3.9 1.2 0.6 4.1 - 0.7 1.3 1.1 0.7 0.7 1.3 0.1 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7	Three           50ppb           -           -           -           2.4           -           2.4           -           2.6           -	shold 55ppb - - - - - - - - - - - - - - - - - -	56ppb           -           -           -           0.3           -           0.6           -      -           - <td>60ppb </td>	60ppb 
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Ozone-Attributable Dea Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO	Non-Thr           86 city model           11.3           11.9           11.1           11.3           13.9           12.0           11.6           14.1           11.1           11.7           12.0           14.1           11.7           12.1           12.0           ths per 100,000 Popul           86 city model           12           15           16           15	eshold*           96 city model           12.1           12.7           11.9           12.1           14.9           12.5           15.0           11.9           12.5           13.0           12.8           ation           *           96 city model           13           16           17           16	40ppb 1.7 2.4 1.4 1.6 5.1 2.6 2.1 5.3 1.4 2.2 2.7 2.6 40ppb 1.8 3.0 1.8 2.3 5.5	45ppb 0.1 0.9 - 0.1 3.9 1.2 0.6 4.1 - 0.7 1.3 1.1 Type of Ozone № 45ppb 0.14 1.2 - 0.15 4.2	Three           50ppb           -           -           2.4           -           2.4           -           2.6           -      -	shold 55ppb - - - - - - - - - - - - - - - - - -	56ppb           -           -           -           -           -           0.3           -           -           0.6           -      -           - <td>60ppb</td>	60ppb
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Ozone-Attributable Dea Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI	Non-Thr           86 city model           11.3           11.9           11.1           11.3           13.9           12.0           11.6           14.1           11.7           12.1           11.7           12.0           ths per 100,000 Popul           86 city model           12           15           16           15           15           15           15           15           15           15           15           15	eshold*           96 city model           12.1           12.7           11.9           12.1           14.9           12.9           12.5           15.0           11.9           12.5           13.0           12.8           ation           96 city model           13           16           17           16           16           16           16           16           16           16           16           16           16	40ppb 1.7 2.4 1.4 1.6 5.1 2.6 2.1 5.3 1.4 2.2 2.7 2.6 40ppb 1.8 3.0 1.8 3.0 1.8 2.3 5.5 3.1	45ppb           0.1           0.9           -           0.1           3.9           1.2           0.6           4.1           -           0.7           1.3           1.1           Type of Ozone N           45ppb           0.14           1.2           -           0.15           4.2           1.4	Three           50ppb           -           -           -           2.4           -           2.4           -           2.6           -      -	shold 55ppb - - - 0.7 - 0.7 - 1.0 - 1.0 - - 55ppb - shold 55ppb - - - - - - - - - - - - -	56ppb           -           -           -           0.3           -           -           0.6           -      -           - <td>60ppb</td>	60ppb
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Ozone-Attributable Dea Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX	Non-Thr           86 city model           11.3           11.9           11.1           11.3           13.9           12.0           11.6           14.1           11.7           12.1           12.1           12.0           Non-Thr           86 city model           12           15           16           15           15           15           15           15           15           15           11	eshold*           96 city model           12.1           12.7           11.9           12.1           14.9           12.9           12.5           15.0           11.9           12.5           13.0           12.8           eshold*           96 city model           13           16           17           16           16           16           16           16           16           16           11	40ppb 1.7 2.4 1.4 1.6 5.1 2.6 2.1 5.3 1.4 2.2 2.7 2.6 40ppb 1.8 3.0 1.8 3.0 1.8 3.0 1.8 3.1 1.9	45ppb           0.1           0.9           -           0.1           3.9           1.2           0.6           4.1           -           0.7           1.3           1.1           Type of Ozone №           45ppb           0.14           1.2           -           0.15           4.2           1.4           0.56	Three           50ppb           -           -           -           2.4           -           2.4           -           2.6           -	shold 55ppb	56ppb	60ppb
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Ozone-Attributable Dea Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA	Non-Thr           86 city model           11.3           11.9           11.1           11.3           13.9           12.0           11.6           14.1           11.7           12.1           12.1           12.0           Non-Thr           86 city model           12           15           16           15           11           15           11           15           11           15           15           15           15           15           15           15           15           15           15           15           15           15           15           11	eshold*           96 city model           12.1           12.7           11.9           12.1           14.9           12.9           12.5           15.0           11.9           12.5           13.0           12.8           eshold*           96 city model           13           16           17           16           11           16           11           16           11	40ppb 1.7 2.4 1.4 1.6 5.1 2.6 2.1 5.3 1.4 2.2 2.7 2.6 40ppb 1.8 3.0 1.8 3.0 1.8 2.3 5.5 3.1 1.9 5.5	45ppb 0.1 0.9 - 0.1 3.9 1.2 0.6 4.1 - 0.7 1.3 1.1 Type of Ozone N 45ppb 0.14 1.2 - 0.15 4.2 1.4 0.56 4.2	Three           50ppb           -           -           -           2.4           -           2.4           -           2.6           -	shold 55ppb - - - 0.7 - - 1.0 - - 1.0 - - 55ppb - - - - - - - - - - - - -	S6ppb           -           -           0.3           -           0.6           -   -           0.62	60ppb
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Ozone-Attributable Dea Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY	Non-Thr           86 city model           11.3           11.9           11.1           11.3           13.9           12.0           11.6           14.1           11.7           12.1           12.0	eshold*           96 city model           12.1           12.7           11.9           12.1           14.9           12.5           15.0           11.9           12.5           13.0           12.8           eshold*           96 city model           13           16           17           16           11           16           11           16           11           16           11           16           11           16           11	40ppb 1.7 2.4 1.6 5.1 2.6 2.1 5.3 1.4 2.2 2.7 2.6 40ppb 1.8 3.0 1.8 3.0 1.8 2.3 5.5 3.1 1.9 5.5 1.5	45ppb         0.1         0.9         -         0.1         3.9         1.2         0.6         4.1         -         0.7         1.3         1.1         Type of Ozone №         45ppb         0.14         1.2         -         0.15         4.2         1.4         0.56         4.2         -	Three           50ppb           -           -           -           2.4           -           2.4           -           2.6           -           -           -           2.6           -	shold 55ppb - - - 0.7 - - 1.0 - - 1.0 - - 55ppb - 55ppb - - 0.80 - - - - - - - - - - - - -	S6ppb           -           -           0.3           -           0.6           -           -           0.6           -           -           0.6           -           -           0.6           -           -           -           0.3           -           -           -           -           -           -           -           -           -           0.36           -           -           0.62	60ppb
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Ozone-Attributable Dea Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY	Non-Thr           86 city model           11.3           11.9           11.1           11.3           13.9           12.0           11.6           14.1           11.7           12.1           12.1           12.0           Non-Thr           86 city model           12           15           16           15           15           15           15           12           15           16           15           12           15           16           15           11	eshold*           96 city model           12.1           12.7           11.9           12.1           14.9           12.5           15.0           11.9           12.5           13.0           12.8           ation           *           96 city model           16           16           16           11           16           17           16           11           16           17           16           17	40ppb 1.7 2.4 1.4 1.6 5.1 2.6 2.1 5.3 1.4 2.2 2.7 2.6 40ppb 1.8 3.0 1.8 3.0 1.8 2.3 5.5 3.1 1.9 5.5 1.5 3.0	45ppb           0.1           0.9           -           0.1           3.9           1.2           0.6           4.1           -           0.7           1.3           1.1           Type of Ozone N           45ppb           0.14           1.2           -           0.15           4.2           1.4           0.56           4.2           -           0.91	Three           50ppb           -           -           -           2.4           -           2.4           -           2.6           -           -           2.6           -	shold 55ppb - - - 0.7 - - 1.0 - 1.0 - - 55ppb 55ppb - - - - - 0.80 - - 0.80 - - 1.0 - - - - - - - - - - - - -	S6ppb           -           -           -           0.3           -           0.6           -           -           0.6           -           -           0.6           -           -           0.6           -           -           0.3           -           -           -           -           -           -           -           -           -           0.36           -           -           0.62           -           -	60ppb
Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA St. Louis, MO Ozone-Attributable Dea Study Area Atlanta, GA Baltimore, MD Boston, MA Cleveland, OH Denver, CO Detroit, MI Houston, TX Los Angeles, CA New York, NY Philadelphia, PA Sacramento, CA	Non-Thr           86 city model           11.3           11.9           11.1           11.3           13.9           12.0           11.6           14.1           11.7           12.0           11.6           14.1           11.7           12.1           12.0           ths per 100,000 Popul           Non-Thr           86 city model           12           15           16           15           16           15           16           15           16           15           11           15           11           15           11           15           12           16           17	eshold*           96 city model           12.1           12.7           11.9           12.1           14.9           12.5           15.0           11.9           12.5           13.0           12.8           ation           *eshold*           96 city model           13           16           16           16           16           17           16           17           18	40ppb 1.7 2.4 1.4 1.6 5.1 2.6 2.1 5.3 1.4 2.2 2.7 2.6 40ppb 1.8 3.0 1.8 3.0 1.8 2.3 5.5 3.1 1.9 5.5 1.5 3.0 3.8	45ppb           0.1           0.9           -           0.1           3.9           1.2           0.6           4.1           -           0.7           1.3           1.1           Type of Ozone N           45ppb           0.14           1.2           -           0.15           4.2           1.4           0.56           4.2           -           0.91           1.8	Three           50ppb           -           -           -           2.4           -           2.4           -           2.6           -	shold 55ppb - - - - - - - - - - - - - - - - - -	S6ppb           -           -           -           0.3           -           0.6           -           0.36           -           -           0.62           -           -	60ppb

## Table 7C-11. Sensitivity Analysis – LT Mortality: Threshold models (ozone-only effect estimate) (2009 Current Standard 65ppb) (ozone-attributable deaths, percent of baseline mortality, incidence per 100,000 - compare with Core Results in Table 7B-7).

Ozone-Attributable De	aths							
			Type of Ozone Model					
	Non-Th	reshold*			Thre	shold		
Study Area	86 city model	96 city model	40ppb	45ppb	боррь	55000	56000	борро
Atlanta, GA	(100 590)	3/0	32	-	-	-	-	-
	(100 - 380)	(140 - 390)	(15-51)	()	()	()	()	()
Baltimore, MD	(70, 290)	(92, 400)	(15 50)	(2, 10)	-	-	-	-
	200	(32-400)	(13-33)	(3-10)	()	()	()	()
Boston, MA	(120, 650)	420	55 (14 EC)	-	-	-	-	-
	(120-050)	210	(14 - 50)	()	()	()	()	()
Cleveland, OH	(57, 220)	(76, 220)	(6.25)	-	-	()	( )	( )
	210	220	(0-23)	() 51	26	()	()	()
Denver, CO	(65, 250)	(95, 260)	(28, 110)	(21 90)	(11 42)	()	( )	( )
	270	(85-300)	(28-110)	(21-00)	(11-42)	()	()	()
Detroit, MI	(110, 610)	(150 620)	(27, 110)	(9, 21)	-	()	( )	()
	220	250	(27-110)	(8-31)	()	()	()	()
Houston, TX	(09 540)	(120 550)	(20, 80)	(2 10)	-	-	-	-
	(98- 340)	(150-550)	(20-80)	(3-10)	()	()	()	()
Los Angeles, CA	(210, 1700)	(400, 1700)	(120 520)	(100, 270)	(50, 100)	-	-	-
	(310-1700)	(400-1700)	(150 - 550)	(100-370)	(30 - 190)	()	()	()
New York, NY	(250, 1000)	(460, 2000)	-	-	-	-	-	-
	(350 - 1900)	(460 - 2000)	()	()	()	()	()	()
Philadelphia, PA	550	(220, 040)	/8	(1 2)	-	-	-	-
	(170-910)	(220 - 940)	(51-120)	(1-5)	()	()	()	()
Sacramento, CA	200	(70, 220)	30	11	-	-	-	-
	(00-330)	(79-330)	(14 - 58)	(5-1/)	()	()	()	()
St. Louis, MO	290	310	4/	9	-	-	-	-
	(80-470)	(110 - 460)	(19-73)	(4-15)	()	()	()	()
Demonst of Deceline Inc		to Onene						
Percent of Baseline Inc	Idence Attributable	to Ozone		Turne of Ozona	Model			
	Non Th	rochold*	1	Type of Ozone	Thro	shold		
Study Area	Non-III 96 city model	96 city model	40nnh	4Epph	EOpph	EEnnh	Efonh	60nnh
Atlanta GA	10.9	11 5	1.0	43660	30000	33440	30000	00000
Raltimoro MD	10.8	11.5	1.0	- 0.2	-	-	-	-
Bartiniore, MD	10.9	12.2	1.8	0.5	-	-	-	-
Cloueland OH	10.8	11.5	1.0	-	-	-	-	-
Derwor CO	10.7	11.5	0.9	-	- 17	-	-	-
Deriver, CO	15.5	14.4	4.5	5.2	1.7	-	-	-
Houston TV	11.7	12.3	1.0	0.0	-	-	-	-
	11.4	14.2	1.8	0.2	- 16	-	-	-
LUS Aligeles, CA	15.4	14.5	4.4	5.2	1.0	-	-	-
Dhiladalahia DA	9.0	10.5	1.6	-	-	-	-	-
Filliduelpilid, PA	11.2	12.0	1.0	0.0	-	-	-	-
Sacramento, CA	11.7	12.5	2.1	0.8	-	-	-	-
St. LOUIS, IVIO	11.5	12.5	1.9	0.4	-	-	-	-
Ozona Attributable De	aths nor 100 000 Day							
Ozone-Attributable De	atris per 100,000 Pol	Julation		Type of Ozon	Model			
	Non Th	rochold*	1	Type of Ozone	Thro	shold		
Study Area	86 city model	96 city model	40nnh	45mmh	50pph	55nnh	56nnh	60nnh
Atlanta CA	12	12	40ppb	43660	30000	2200	30000	00000
Baltimore MD	15	16	22	0.30	_	-	-	-
Boston MA	1/	15	12	-	-	-	-	-
Cleveland OH	14	15	1.5	-	-	-	-	-
Donvor CO	15	10	1.2	25	19	-	-	-
Detroit MI	13	10	4.9	0.75	1.0	-	-	-
	14	13	2.3	0.75	-	-	-	-
Los Angolos CA	10	11	1.0	2.21	- 17	-	-	-
Now York NY	14	15	4.0	5.3	1./	-	-	-
Philadolphia DA	10	11	22	0.060	-	-	+ -	-
Sacramonto CA	10	17	2.2	0.000	-	-	-	-
St Louis MO	10	1/	3.0	0.05	-	-	-	-
St. LOUIS, IVIO	1/	10	2.õ	0.55	-	-	-	-

# Table 7C-12. Sensitivity Analysis – LT Mortality: Threshold models (ozone-only effect estimate) (2009 Current Standard 60ppb) (ozone-attributable deaths, percent of baseline mortality, incidence per 100,000 - compare with Core Results in Table 7B-7).

		Type of Ozone Model								
	Non-Th	reshold*		Threshold						
Study Area	86 city model	96 city model	40ppb	45ppb	50ppb	55ppb	56ppb	60ppb		
Atlanta CA	340	360	13	-	-	-	-	-		
Atlanta, GA	(100 - 550)	(130 - 570)	(5 - 21)	()	()	()	()	()		
Poltimore MD	230	240	26	-	-	-	-	-		
Baltimore, ND	(67 - 370)	(89 - 380)	(10 - 41)	()	()	()	()	()		
Poston MA	380	400	16	-	-	-	-	-		
boston, MA	(110 - 620)	(150 - 640)	(7 - 26)	()	()	()	()	()		
Clausiand, OH	180	190	1	-	-	-	-	-		
cieveland, OH	(54 - 300)	(71 - 310)	(0 - 2)	()	()	()	()	()		
Damuar CO	200	210	50	28	1	-	-	-		
Denver, CO	(59 - 320)	(78 - 330)	(20 - 79)	(12 - 43)	(1 - 2)	()	()	()		
Detroit MI	350	380	47	-	-	-	-	-		
Detroit, wi	(110 - 580)	(140 - 600)	(19 - 75)	()	()	()	()	()		
Houston TV	320	340	38	-	-	-	-	-		
nousion, ix	(95 - 520)	(130 - 540)	(15 - 60)	()	()	()	()	()		
	960	1000	260	160	40	-	-	-		
Los Angeles, CA	(290 - 1600)	(380 - 1600)	(110 - 420)	(68 - 260)	(17 - 63)	()	()	()		
New York, NY				NA						
	530	570	53	-	-	-	-	-		
Philadelphia, PA	(160 - 880)	(210 - 910)	(21 - 84)	()	()	()	()	()		
Secremente CA	190	200	23		-	-	-	-		
Sacramento, CA	(56 - 310)	(74 - 320)	(9 - 36)	()	()	()	()	()		
St. Louis MO	270	290	26	-	-	-	-	-		
St. LOUIS, IVIO	(81 - 450)	(110 - 460)	(11 - 42)	()	()	()	()	()		

Percent of Baseline Incidence Attributable to Ozone

		Type of Ozone Model								
	Non-Threshold*			Threshold						
Study Area	86 city model	96 city model	40ppb	45ppb	50ppb	55ppb	56ppb	60ppb		
Atlanta, GA	10.4	11.1	0.4	-	-	-	-	-		
Baltimore, MD	11.0	11.8	1.3	-	-	-	-	-		
Boston, MA	10.4	11.1	0.4	-	-	-	-	-		
Cleveland, OH	10.1	10.8	0.1	-	-	-	-	-		
Denver, CO	12.4	13.3	3.1	1.7	0.1	-	-	-		
Detroit, MI	11.2	12.0	1.5	-	-	-	-	-		
Houston, TX	11.0	11.8	1.3	-	-	-	-	-		
Los Angeles, CA	12.7	13.6	3.5	2.2	0.5	-	-	-		
New York, NY		NA								
Philadelphia, PA	10.9	11.6	1.1	-	-	-	-	-		
Sacramento, CA	11.1	11.8	1.3	-	-	-	-	-		
St. Louis, MO	10.9	11.6	1.1	-	-	-	-	-		

	Type of Ozone Model							
	Non-Th	reshold*	Threshold					
Study Area	86 city model	96 city model	40ppb	45ppb	50ppb	55ppb	56ppb	60ppb
Atlanta, GA	11	12	0.44	-	-	-	-	-
Baltimore, MD	14	15	1.6	-	-	-	-	-
Boston, MA	14	15	0.59	-	-	-	-	-
Cleveland, OH	14	15	0.073	-	-	-	-	-
Denver, CO	14	14	3.4	1.9	0.096	-	-	-
Detroit, MI	14	14	1.8	-	-	-	-	-
Houston, TX	10	11	1.2	-	-	-	-	-
Los Angeles, CA	13	14	3.7	2.2	0.55	-	-	-
New York, NY				NA				
Philadelphia, PA	15	16	1.5	-	-	-	-	-
Sacramento, CA	15	16	1.9	-	-	-	-	-
St. Louis, MO	16	17	1.6	-	-	-	-	-

\* The 86 city model is the ozone-only long-term mortality model used for a sensitivity analysis in the Ozone HREA (see Table 7C-7). All other models (including threshold models) presented in this table were generated using the 96 city dataset rather than the 86 city dataset (Jerrett et al., 2014).

NA: for NYC, the model-based adjustment methodology was unable to adjust  $O_3$  distributions such that they would meet the alternative standard level of 60 ppb.

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#### **APPENDIX 8A**

### **City-Specific Ozone-Mortality Effect Estimates**

This Appendix contains two tables specifying the effect estimates from Smith et al. (2009) (Table 8A-1) and Zanobetti and Schwartz (2008) (Table 8A-2) studies that were used in the national-scale epidemiological-based risk assessment. References are included immediately following the tables.

Table 8A-1. Smith et al. (2009) city-specific and regional non-accidental mortality effect estimates for 8-hr daily maximum ozone, using April-October (many just May-September) ozone observations from 1987-2000, based on 98 U.S. urban communities.

	Nationa	l prior	Regional prior		
Location	Beta	Std	Beta	Std	
Akron, OH	0.000305	0.000332	0.000502	0.000279	
Albuquerque, NM	0.000292	0.000349	-5E-05	0.000351	
Arlington, VA	0.000341	0.000353	0.00091	0.000297	
Atlanta, GA	0.000256	0.000283	0.000222	0.000229	
Austin, TX	0.000309	0.000313	-1.6E-05	0.000326	
Bakersfield, CA	0.000342	0.00033	4.41E-05	0.000282	
Baltimore, MD	0.000313	0.000322	0.000863	0.000286	
Baton Rouge, LA	0.000383	0.00031	0.000281	0.000244	
Biddeford, ME	0.000321	0.000349	0.000897	0.000297	
Birmingham, AL	0.000212	0.000318	0.000197	0.00025	
Boston, MA	0.000156	0.000343	0.000803	0.00031	
Buffalo, NY	0.000349	0.000324	0.00052	0.000274	
Cedar Rapids, IA	0.000338	0.000338	-0.00017	0.000482	
Charlotte, NC	0.000236	0.000328	0.000208	0.000254	
Chicago, IL	0.000498	0.000247	0.000568	0.000224	
Cincinnati, OH	0.000513	0.000329	0.000597	0.000277	
Cleveland, OH	0.000488	0.000308	0.00058	0.000264	
Colorado Springs, CO	0.000389	0.000347	0.000257	0.000377	
Columbus, GA	0.000405	0.000321	0.000289	0.000249	
Columbus, OH	0.000309	0.000323	0.000501	0.000274	
Corpus Christi, TX	0.000375	0.000322	8.6E-06	0.000335	
Coventry, RI	0.000251	0.000335	0.000847	0.000297	
Dallas/Ft Worth, TX	0.000538	0.000238	0.000392	0.000213	
Dayton, OH	0.000314	0.000334	0.000507	0.00028	
Denver, CO	0.000182	0.000345	0.000163	0.000372	
Des Moines, IA	0.000188	0.000342	-0.00024	0.00048	
Detroit, MI	0.000439	0.000299	0.000554	0.000259	
El Paso, TX	0.000173	0.000347	-9.7E-05	0.000347	
Evansville	0.000275	0.000326	0.000486	0.000277	
Ft Wayne, IN	0.000319	0.00034	0.000512	0.000283	
Fresno, CA	0.000188	0.000334	-2.6E-05	0.000283	
Grand Rapids, MI	0.000377	0.000335	0.000537	0.00028	
Greensboro, NC	0.000291	0.000346	0.000231	0.000262	
Honolulu, HI	0.000451	0.000358	6.17E-05	0.000236	
Houston, TX	0.000403	0.000215	0.00032	0.000189	
Huntsville, AL	0.000548	0.000357	0.000349	0.000271	

	National prior		Regional prior		
Location	Beta	Std	Beta	Std	
Indianapolis, IN	0.000246	0.000331	0.000474	0.00028	
Industrial Midwest	N/A	N/A	0.000521	0.00018	
Jackson, MS	0.000269	0.000327	0.000223	0.000253	
Jacksonville, FL	0.000201	0.000322	0.000192	0.000252	
Jersey City, NJ	0.000117	0.000336	0.000769	0.000314	
Johnston, PA	0.000329	0.000334	0.000884	0.00029	
Kansas City, KS	0.000146	0.000339	-0.00025	0.000473	
Kansas City, MO	0.000395	0.000321	-0.00013	0.000467	
Kingston, NY	0.000452	0.000342	0.000944	0.000287	
Knoxville, TN	0.000471	0.000339	0.000316	0.00026	
Lafayette, LA	0.000236	0.000315	0.000209	0.000247	
Lake Charles, LA	0.000263	0.000312	0.000222	0.000245	
Las Vegas, NV	0.00014	0.000348	-0.00011	0.000346	
Lexington, KY	0.000172	0.000345	0.000443	0.00029	
Lincoln, NE	0.000426	0.000349	0.000941	0.000292	
Little Rock, AR	0.000217	0.000339	0.000198	0.000261	
Los Angeles, CA	0.000148	0.000165	5.24E-05	0.000161	
Louisville, KY	0.000351	0.000322	0.000521	0.000273	
Madison, WI	0.000456	0.000355	0.000577	0.000292	
Memphis, TN	0.000391	0.000312	0.000284	0.000245	
Miami, FL	0.000233	0.000277	0.000211	0.000226	
Milwaukee, WI	0.00029	0.000315	0.000488	0.00027	
Mobile, AL	0.000359	0.000323	0.000266	0.00025	
Modesto, CA	0.000322	0.000341	0.000227	0.000372	
Muskegon, MI	0.000305	0.000346	0.000508	0.000287	
Nashville, TN	0.000347	0.000329	0.00026	0.000253	
National Average	0.000322	8.42E-05	N/A	N/A	
New Orleans, LA	0.000252	0.000321	0.000216	0.00025	
New York, NY	0.000917	0.00023	0.001055	0.000195	
Newark, NJ	0.000549	0.000333	0.000972	0.000276	
North East	N/A	N/A	0.000908	0.000192	
North West	N/A	N/A	0.000224	0.000308	
Oakland, CA	0.000214	0.000334	0.000179	0.000366	
Oklahoma City, OK	0.000358	0.000317	4.62E-06	0.000331	
Omaha, NE	0.000377	0.000345	0.000917	0.000292	
Orlando, FL	-3.3E-05	0.000358	7.91E-05	0.000286	
Philadelphia, PA	0.000574	0.000296	0.000948	0.000253	
Phoenix, AZ	0.00034	0.000301	7.84E-06	0.00032	
Pittsburgh, PA	0.000155	0.000306	0.000412	0.000272	

	Nationa	al prior	Regiona	Regional prior		
Location	Beta	Std	Beta	Std		
Portland, OR	0.00037	0.000335	0.00025	0.000369		
Providence, RI	0.000418	0.000333	0.000922	0.000284		
Raleigh, NC	0.000271	0.000337	0.000223	0.000258		
Riverside, CA	0.000206	0.000295	2.3E-06	0.000257		
Rochester, NY	0.000406	0.000339	0.000923	0.000287		
Sacramento, CA	0.000306	0.000313	0.000225	0.000351		
Salt Lake City, UT	0.000296	0.000345	0.000215	0.000375		
San Antonio, TX	7.15E-05	0.000307	-0.00012	0.000313		
San Bernardino, CA	0.00034	0.000283	7.61E-05	0.000254		
San Diego, CA	0.000118	0.000289	-3.6E-05	0.000252		
San Jose, CA	0.000351	0.000323	0.000244	0.00036		
Santa Ana/Anaheim, CA	0.0002	0.000279	8.65E-06	0.000246		
Seattle, WA	0.000283	0.000325	0.000212	0.00036		
Shreveport, LA	0.000366	0.00032	0.00027	0.000248		
South East	N/A	N/A	0.000242	0.000135		
South West	N/A	N/A	-4.4E-05	0.000273		
Southern California	N/A	N/A	1.73E-05	0.000189		
Spokane, WA	0.000327	0.000353	0.000227	0.000381		
St. Louis, MO	0.000476	0.000336	0.000581	0.000281		
St Petersburg, FL	0.000147	0.000288	0.000166	0.000235		
Stockton, CA	0.00036	0.000343	0.000244	0.000374		
Syracuse, NY	0.00053	0.000357	0.000985	0.000292		
Tacoma, WA	0.00036	0.000342	0.000245	0.000373		
Tampa, FL	0.000223	0.000299	0.000204	0.000239		
Toledo, OH	0.000414	0.000333	0.000553	0.000279		
Tucson, AZ	0.000333	0.000334	-2.1E-05	0.000342		
Tulsa, OK	0.000382	0.000325	0.000277	0.000251		
Upper Midwest	N/A	N/A	-0.0002	0.000445		
Washington, DC	0.000239	0.000321	0.000823	0.000294		
Wichita, KS	0.000249	0.000345	-0.00022	0.000486		
Worcester, MA	0.000467	0.000337	0.000946	0.000283		

Table 8A-2. Zanobetti and Schwartz (2008) city-specific all-cause mortality effect estimates for June-August 8-hr daily mean (10am-6pm) ozone from 1989-2000, using a 0-3 day lag, based on 48 U.S. cities.

Location	Beta	Std
All cities (48)	0.00053	0.000125
Albuquerque, NM	0.000528	0.000416
Atlanta, GA	0.000295	0.000289
Austin, TX	0.00045	0.000393
Baltimore, MD	0.000515	0.000314
Birmingham, AL	0.000293	0.000356
Boston, MA	0.000682	0.000328
Boulder, CO	0.000602	0.000419
Broward, FL	0.000593	0.000382
Canton, OH	0.000489	0.000401
Charlotte, NC	0.000571	0.000381
Chicago, IL	0.000479	0.000299
Cincinnati, OH	0.000509	0.000361
Cleveland, OH	0.000596	0.000355
Colorado Springs, CO	0.000497	0.000418
Columbus, OH	0.000739	0.000368
Dallas, TX	0.000578	0.000317
Denver, CO	0.000352	0.000409
Detroit, MI	0.001046	0.000344
Greensboro, NC	0.000478	0.000397
Honolulu, HI	0.000486	0.00042
Houston, TX	0.000163	0.000263
Jersey city, NJ	0.000354	0.00038
Kansas City, KS	0.000922	0.000387
Los Angeles, CA	0.000274	0.000213
Miami, FL	0.000607	0.000373
Milwaukee, WI	0.000659	0.000382
Nashville, TN	0.00046	0.000383
New Haven, CT	0.000647	0.000364
New Orleans, LA	0.000218	0.000375
New York, NY	0.001092	0.000236
Oklahoma City, OK	0.00062	0.00038
Orlando, FL	0.000487	0.000377
Philadelphia, PA	0.000625	0.000315
Phoenix, AZ	0.00071	0.000374
Pittsburgh, PA	0.00028	0.000328
Provo/Orem, UT	0.000527	0.00042

Location	Beta	Std
Sacramento, CA	0.000569	0.000389
Salt Lake City, UT	0.000478	0.000407
San Diego, CA	0.000448	0.000373
San Francisco, CA	0.000566	0.000416
Seattle, WA	0.000491	0.00038
Spokane, WA	0.00059	0.000415
St. Louis, MO	0.000544	0.000333
Tampa, FL	0.000123	0.000366
Terra Haute, IN	0.000659	0.00042
Tulsa, OK	0.000871	0.000391
Washington, DC	9.56E-05	0.00036
Youngstown, OH	0.000448	0.000394

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- Zanobetti, A. and J. Schwartz. 2011. Ozone and survival in four cohorts with potentially predisposing diseases. *American Journal of Respiratory and Critical Care Medicine*. 194:836-841.

### **APPENDIX 8B**

### Supplement to the Representativeness Analysis of the 12 Urban Study Areas

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Following the analysis discussed in the main body of the HREA Section 8.2, this Appendix provides graphical comparisons of the empirical distributions of components of the risk function, and additional variables that have been identified as potentially influencing the risk associated with ozone exposures. In each graph, the blue line represents the cumulative distribution function (CDF) for the complete set of data available for the variable. In some cases, this many encompass all counties in the U.S., while in others it may be based on a subset of the U.S., usually for large urban areas. The black squares at the bottom of each graph represent the specific value of the variable for one of the case study locations, with the line showing where that value intersect the CDF of the nationwide data.

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# 8B-2. VARIABLES EXPECTED TO INFLUENCE THE RELATIVE RISK FROM OZONE



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### **APPENDIX 8C**

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	NOX emissions reduction CMAQ simulation to April-October seasonal average
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	NOx and VOC emissions reduction CMAQ simulation to April-October seasonal
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	shown in each panel (January, April-October). Panels spin population by 9
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Figure 8C-57. Histograms of US population living in locations with increasing and decreasing mean ozone. Values on the x-axis represent the absolute (ppb) change of mean ozone from the 2007 base CMAQ simulation to the 50% NOx cut CMAQ

- Figure 8C-59. Histograms of US population living in locations with increasing and decreasing mean ozone. Values on the x-axis represent the absolute (ppb) change of mean ozone from the 2007 base CMAQ simulation to the 90% NOx cut CMAQ simulation to the mean ozone in the 2007 base CMAQ simulation. The percentages of the US population living in areas that have changes less than -1 ppb, between -1 and +1 ppb and greater than +1 ppb are shown on the y-axis. Left plots show population numbers in locations not included in one of the urban study areas while right plots show population numbers in locations included in one of the urban study areas. Top plots show ratios of January monthly mean ozone, middle plots show ratios of season mean June-August ozone, and bottom Figure 8C-60. Histograms of US population living in locations with increasing and decreasing mean ozone. Values on the x-axis represent the absolute (ppb) change of mean ozone from the 2007 base CMAQ simulation to the 90% NOx and VOC cut CMAQ simulation to the mean ozone in the 2007 base CMAQ simulation. The percentages of the US population living in areas that have changes less than -1 ppb, between -1 and +1 ppb and greater than +1 ppb are shown on the y-axis. Left plots show population numbers in locations not included in one of the urban study areas while right plots show population numbers in locations included in one of the urban study areas. Top plots show ratios of January monthly mean

This Appendix provides additional plots and information to support the analysis provided in Chapter 8, section 8.2.3 of the main text of the Health Risk and Exposure Assessment (HREA).

# 8C-1. AMBIENT TRENDS OVER A PERIOD OF NATIONALLY DECREASING NOX EMISSIONS

## 8C-1.1. Nationwide Maps Showing Absolute Changes in Ozone Between 2001-2003 and 2008-2010

In HREA Chapter 8 we provided maps of US ozone monitors showing absolute changes in ozone percentiles between a 3-year period before many of the nationwide NO<sub>x</sub> reductions took place (2001-2003) and a period after many of these reductions took place (2008-2010). Here we provide a full set of maps which includes not only the behavior of the 50<sup>th</sup> and 95<sup>th</sup> percentiles but also 5<sup>th</sup>, 25<sup>th</sup>, and 75<sup>th</sup> percentiles for three different groupings of months: short summer season (June-August), longer warm season (April-October), and all year. These plots further support the general trends that were noted in HREA Chapter 8: ozone increases occurred more in cooler months than warmer months, ozone increases occurred more at the lower end of the distribution that the upper end of the distribution, and ozone increases were more likely to occur in urban core area than at locations further from the city centers. The plots of 95<sup>th</sup> percentile ozone changes show that high ozone days have decreased across the country at all times of year. The June-August plots show that mid-range ozone has also decreased at most locations during the warmest time of year when ozone levels are highest. See Figure 8C-1 through Figure 8C-15 for details.



Figure 8C-1. Change in 5<sup>th</sup> percentile June-August summer season daily 8-hour maximum ozone concentrations between 2001-2003 and 2008-2010.



Figure 8C-2. Change in 25<sup>th</sup> percentile June-August summer season daily 8-hour maximum ozone concentrations between 2001-2003 and 2008-2010.



Figure 8C-3. Change in 50<sup>th</sup> percentile June-August summer season daily 8-hour maximum ozone concentrations between 2001-2003 and 2008-2010.



Figure 8C-4. Change in 75<sup>th</sup> percentile June-August summer season daily 8-hour maximum ozone concentrations between 2001-2003 and 2008-2010.



Figure 8C-5. Change in 95<sup>th</sup> percentile June-August summer season daily 8-hour maximum ozone concentrations between 2001-2003 and 2008-2010.



Figure 8C-6. Change in 5<sup>th</sup> percentile April-October summer season daily 8-hour maximum ozone concentrations between 2001-2003 and 2008-2010.


Figure 8C-7. Change in 25<sup>th</sup> percentile April-October summer season daily 8-hour maximum ozone concentrations between 2001-2003 and 2008-2010.



Figure 8C-8. Change in 50<sup>th</sup> percentile April-October summer season daily 8-hour maximum ozone concentrations between 2001-2003 and 2008-2010.

8C-5



Figure 8C-9. Change in 75<sup>th</sup> percentile April-October summer season daily 8-hour maximum ozone concentrations between 2001-2003 and 2008-2010.



Figure 8C-10. Change in 95<sup>th</sup> percentile April-October summer season daily 8-hour maximum ozone concentrations between 2001-2003 and 2008-2010.



Figure 8C-11. Change in 5<sup>th</sup> percentile annual daily 8-hour maximum ozone concentrations between 2001-2003 and 2008-2010.



Figure 8C-12. Change in 25<sup>th</sup> percentile annual daily 8-hour maximum ozone concentrations between 2001-2003 and 2008-2010.



Figure 8C-13. Change in 50<sup>th</sup> percentile annual daily 8-hour maximum ozone concentrations between 2001-2003 and 2008-2010.



Figure 8C-14. Change in 75<sup>th</sup> percentile annual daily 8-hour maximum ozone concentrations between 2001-2003 and 2008-2010.



Figure 8C-15. Change in 95<sup>th</sup> percentile annual daily 8-hour maximum ozone concentrations between 2001-2003 and 2008-2010.

## 8C-1.2. Thirteen-year Ozone Trends Across the U.S. and in Urban Study Areas

An initial illustrative summary of the O<sub>3</sub> trends by the categories described in HREA Chapter 8, section 8.2.4 of the main text is shown in Figure 8C-16, where the trend for annual medians of each monitor under study are displayed as separate lines. Although it generally illustrates the range in which average concentrations of O<sub>3</sub> tend to fall (often 40-60 ppb), the simplicity of the plot makes it difficult to discern either spatial or temporal trends. Information about other parts of the annual distribution are also likely to be useful. To concisely display many different distributions in the same template of panels as Figure 8C-16, kernel density estimates (KDEs) of the data were calculated. This process is displayed in Figure 8C-17.



Figure 8C-16. Annual medians of ozone concentrations at each monitor based on different subsets of months.

Figure 8C-17 visually illustrates the process of forming and display a KDE from a year of O<sub>3</sub> data from a single monitoring site. This raw data is displayed in the top panel as a time series of O<sub>3</sub> concentrations. A KDE is then formed from the raw data, which is similar in principle to a histogram, which gives counts of data that fall within user-defined bins. However, the KDE "smoothes" out the histogram so that arbitrary bins do not need to be set, and converts the counts to a "density". The density can yield a probability if desired, but that is beyond the scope of this display; for our purposes, a higher density for a given concentration simply means that more O<sub>3</sub> measurements were collected near that value compared to other possible concentrations. The curve of the KDE can then be converted to a color stripe as shown in the bottom panel of Figure 8C-17, where the color is related to the height of the curve in the middle panel.



Figure 8C-17. Procedure for creating the display of O<sub>3</sub> distributions shown in Figure 8C-18.

Each year of data shown in the groups in Figure 8C-16 was thus converted to a colorbased KDE as shown in Figure 8C-17, and the resulting collection of KDEs is shown in Figure 8C-18. Annual medians and modes of the distributions across all monitors in each group indicated by the plot's panels are also shown, with color indicating the direction of the trend over time. Statistical significance for multi-year ozone trends was determined using the Spearman rank order correlation coefficient (p-value < 0.05). The general pattern of KDEs over time appears to be either small or insignificant changes to the central tendencies of the distributions (i.e. mode and median), but with a "condensing" of the concentration to the 40-50 ppb range, meaning that lower concentrations grow and high concentrations decrease.



Figure 8C-18. KDEs of groups of monitors' annual O<sub>3</sub> concentrations for different subsets of months, shown on a linear color scale. The modes and medians of these concentrations across the year and monitors for each group are shown in the overlaying lines.

HREA chapter 8, section 8.2.3provided maps showing summertime (May-September) ozone trends at specific monitor locations within two urban study areas. Here, we provide similar maps for the other 13 urban study areas. In section 8.2.3 we also described the general trend of fourth high ozone values decreasing in most locations while mean and median values were more likely to increase in core urban areas and decrease in surrounding suburban and rural areas. In addition, in most cities, the monitor with the highest design values did not occur in the urban core. These trends were demonstrated by maps of the New York and Chicago areas in the main text. Here we see that the trends are visible in many other urban study areas, including Baltimore, Boston, Cleveland, Denver, Houston, Los Angeles, and Saint Louis. However, ozone trends in a few urban areas exhibit different behavior. In Atlanta and Sacramento, the highest design value monitor occurs near the urban core. In Atlanta, mid-range ozone has statistically significant decreases trends at monitors both in the urbanized and in the surrounding area. All

urban monitors in Detroit and Sacramento showed no significant trend in either mean or median ozone values. In Dallas, significant increases in mid-range ozone occurred at sites outside of the urban core. Finally in Philadelphia, there was no statistically significant trend at any monitor for the fourth highest 8-hour daily maximum ozone value. See Figure 8C-19 through Figure 8C-30 for details.



Figure 8C-19. Map of ozone trends at specific monitor locations in the Atlanta area. All upward and downward facing triangles represent statistically significant trends from 1998-2001 (p<0.05), circles represent locations with no significant trends. The pink star indicates the site with the highest design values in 2011. Left panel shows trends in May-September 4<sup>th</sup> highest 8-hour daily maximum ozone values, center panel shows trends in May-September mean 8-hour daily maximum, and left panel shows trends in May-September median 8-hour daily maximum ozone values.



Figure 8C-20. Map of ozone trends at specific monitor locations in the Baltimore/Washington D.C. area. All upward and downward facing triangles represent statistically significant trends from 1998-2001 (p<0.05), circles represent locations with no significant trends. The pink star indicates the site with the highest design values in 2011. Left panel shows trends in May-September 4<sup>th</sup> highest 8-hour daily maximum ozone values, center panel shows trends in May-September mean 8-hour daily maximum, and left panel shows trends in May-September median 8-hour daily maximum ozone values.



Figure 8C-21. Map of ozone trends at specific monitor locations in the Boston area. All upward and downward facing triangles represent statistically significant trends from 1998-2001 (p<0.05), circles represent locations with no significant trends. The pink star indicates the site with the highest design values in 2011. Left panel shows trends in May-September 4<sup>th</sup> highest 8-hour daily maximum ozone values, center panel shows trends in May-September mean 8-hour daily maximum, and left panel shows trends in May-September median 8-hour daily maximum ozone values.



Figure 8C-22. Map of ozone trends at specific monitor locations in the Cleveland area. All upward and downward facing triangles represent statistically significant trends from 1998-2001 (p<0.05), circles represent locations with no significant trends. The pink star indicates the site with the highest design values in 2011. Left panel shows trends in May-September 4<sup>th</sup> highest 8-hour daily maximum ozone values, center panel shows trends in May-September mean 8-hour daily maximum, and left panel shows trends in May-September median 8-hour daily maximum ozone values.



Figure 8C-23. Map of ozone trends at specific monitor locations in the Dallas area. All upward and downward facing triangles represent statistically significant trends from 1998-2001 (p<0.05), circles represent locations with no significant trends. The pink star indicates the site with the highest design values in 2011. Left panel shows trends in May-September 4<sup>th</sup> highest 8-hour daily maximum ozone values, center panel shows trends in May-September mean 8-hour daily maximum, and left panel shows trends in May-September median 8-hour daily maximum ozone values.



Figure 8C-24. Map of ozone trends at specific monitor locations in the Denver area. All upward and downward facing triangles represent statistically significant trends from 1998-2001 (p<0.05), circles represent locations with no significant trends. The pink star indicates the site with the highest design values in 2011. Left panel shows trends in May-September 4<sup>th</sup> highest 8-hour daily maximum ozone values, center panel shows trends in May-September mean 8-hour daily maximum, and left panel shows trends in May-September median 8-hour daily maximum ozone values.



Figure 8C-25. Map of ozone trends at specific monitor locations in the Detroit area. All upward and downward facing triangles represent statistically significant trends from 1998-2001 (p<0.05), circles represent locations with no significant trends. The pink star indicates the site with the highest design values in 2011. Left panel shows trends in May-September 4<sup>th</sup> highest 8-hour daily maximum ozone values, center panel shows trends in May-September mean 8-hour daily maximum, and left panel shows trends in May-September median 8-hour daily maximum ozone values.



Figure 8C-26. Map of ozone trends at specific monitor locations in the Houston area. All upward and downward facing triangles represent statistically significant trends from 1998-2001 (p<0.05), circles represent locations with no significant trends. The pink star indicates the site with the highest design values in 2011. Left panel shows trends in May-September 4<sup>th</sup> highest 8-hour daily maximum ozone values, center panel shows trends in May-September mean 8-hour daily maximum, and left panel shows trends in May-September median 8-hour daily maximum ozone values.



Figure 8C-27. Map of ozone trends at specific monitor locations in the Los Angeles area. All upward and downward facing triangles represent statistically significant trends from 1998-2001 (p<0.05), circles represent locations with no significant trends. The pink star indicates the site with the highest design values in 2011. Left panel shows trends in May-September 4<sup>th</sup> highest 8-hour daily maximum ozone values, center panel shows trends in May-September mean 8-hour daily maximum, and left panel shows trends in May-September median 8-hour daily maximum ozone values.



Figure 8C-28. Map of ozone trends at specific monitor locations in the Philadelphia area. All upward and downward facing triangles represent statistically significant trends from 1998-2001 (p<0.05), circles represent locations with no significant trends. The pink star indicates the site with the highest design values in 2011. Left panel shows trends in May-September 4<sup>th</sup> highest 8-hour daily maximum ozone values, center panel shows trends in May-September mean 8-hour daily maximum, and left panel shows trends in May-September median 8-hour daily maximum ozone values.



Figure 8C-29. Map of ozone trends at specific monitor locations in the Sacramento area. All upward and downward facing triangles represent statistically significant trends from 1998-2001 (p<0.05), circles represent locations with no significant trends. The pink star indicates the site with the highest design values in 2011. Left panel shows trends in May-September 4<sup>th</sup> highest 8-hour daily maximum ozone values, center panel shows trends in May-September mean 8-hour daily maximum, and left panel shows trends in May-September median 8-hour daily maximum ozone values.



Figure 8C-30. Map of ozone trends at specific monitor locations in the Saint Louis area. All upward and downward facing triangles represent statistically significant trends from 1998-2001 (p<0.05), circles represent locations with no significant trends. The pink star indicates the site with the highest design values in 2011. Left panel shows trends in May-September 4<sup>th</sup> highest 8-hour daily maximum ozone values, center panel shows trends in May-September mean 8-hour daily maximum, and left panel shows trends in May-September median 8-hour daily maximum ozone values.

In addition to the ozone trends, HREA Chapter 8 includes Table 8-8 which shows relationships between regional trends in NO<sub>x</sub> and VOC emissions and regional ozone trends. The objective was to investigate possible similarities in broad trends of O<sub>3</sub> concentrations and anthropogenic NO<sub>x</sub> and VOC emissions. Trends of emissions were derived from county-level emissions data from the 2002, 2005, 2008, and 2011 EPA National Emissions Inventory (NEI). This data was in the form of annual totals for the 'Tier 1' sectors, which refers to the most general classification scheme of source categories in the NEI. This raw data is plotted in U.S. maps in Figure 8C-31. The row of maps labeled "TierTotal" refers to the sum of all the other maps. Note that the Wildfires and Biogenics sectors are absent from all these analyses due to their large magnitude and non-anthropogenic origin.



Figure 8C-31. Maps of  $NO_x$  and VOC emissions by source sector for 2002, 2005, 2008, and 2011.

To analyze trends, emissions were spatially summed for each year and each sector across the NOAA Climate Regions<sup>1</sup> (shown in Figure 8C-32). The resulting trend lines for each sector and emissions pollutant are shown in Figure 8C-33. For direct comparison to O<sub>3</sub> trends, the ozone data from the urban study areas was grouped together by the same NOAA climate regions, and annual percentiles of the resulting distributions were calculated, which are shown in Figure 8C-34 and Figure 8C-35. The descriptors show in HREA Chapter 8 Table 8-8 of the main document were derived from Figure 8C-33, Figure 8C-34, and Figure 8C-35.



Figure 8C-32. Map of nine NOAA climate regions that were used to aggregate emissions and ambient ozone trends. Dots show locations of ozone monitors.

<sup>&</sup>lt;sup>1</sup> Climate regions are defined by NOAA's National Climate Data Center: http://www.ncdc.noaa.gov/monitoring-references/maps/us-climate-regions.php



Figure 8C-33. Plots of  $NO_x$  and VOC emissions trends by source sector. Emissions are aggregated by NOAA climate region and by urban, rural, and suburban location.



Figure 8C-34. Distributions of low population density (rural) monitors' O<sub>3</sub> concentrations for different subsets of months over a 13-year period. From top to bottom in each ribbon plot, the blue and white lines indicate the spatial mean of the 95<sup>th</sup>, 75<sup>th</sup>, 50<sup>th</sup>, 25<sup>th</sup>, and 5<sup>th</sup> percentiles for each monitor for every year from 1998-2011. Trend are shown for 7 of 9 NOAA climate regions (The Northwest and West North Central regions did not contain any urban study areas).



Figure 8C-35. Distributions of high population density monitor O<sub>3</sub> concentrations for different subsets of months over a 13-year period. From top to bottom in each ribbon plot, the blue and white lines indicate the spatial mean of the 95<sup>th</sup>, 75<sup>th</sup>, 50<sup>th</sup>, 25<sup>th</sup>, and 5<sup>th</sup> percentiles for each monitor for every year from 1998-2011. Trend are shown for each of 7 of 9 NOAA climate regions (The Northwest and West North Central regions did not contain any urban study areas).

## 8C-2. MODELED OZONE CHANGES IN RESPONSE TO ACROSS THE BOARD EMISSIONS REDUCTIONS

## 8C-2.1. Maps of Ratios of Mean Ozone from 2007 CMAQ Simulations including Emissions Reductions to Mean Ozone from 2007 Base CMAQ Simulations.

In HREA Chapter 8 section 8.2.3.2 we evaluated ozone response from two CMAQ model simulations with across-the-board reductions in US anthropogenic emissions. We presented results using ratios of the mean ozone concentrations in the emissions reduction scenario to mean ozone concentrations in the 2007 base CMAQ simulation. Here we provide a full set of maps which include mean ozone response over three different time periods (January 2007, April-October 2007, and May-September 2007) and for four different emissions reduction scenarios (50% NO<sub>x</sub> reductions, 50% NO<sub>x</sub> and VOC reductions, 90% NO<sub>x</sub> reductions, and 90% NO<sub>x</sub> and VOC reductions). These plots show that ozone increases are most pronounced in cooler months with January maps showing broad ozone decreases across most of the modeling domain. The April-October maps show ozone decreases in most areas but localized increases in some large

cities. Also, comparing the NO<sub>x</sub> and VOC reductions to reductions in NO<sub>x</sub> alone show the VOC has some effect at decreasing region ozone but does not fully mitigate ozone increases in urban areas in the April-October maps nor change the general trends described above. See Figure 8C-36 through Figure 8C-47 for details.



Figure 8C-36. Ratio of January monthly average ozone concentrations in brute force 50% NO<sub>x</sub> emissions reduction CMAQ simulation to January monthly average ozone concentration in the 2007 base CMAQ simulation.



Figure 8C-37. Ratio of January monthly average ozone concentrations in brute force 50% NO<sub>x</sub> and VOC emissions reduction CMAQ simulation to January monthly average ozone concentration in the 2007 base CMAQ simulation.



Figure 8C-38. Ratio of January monthly average ozone concentrations in brute force 50% NO<sub>x</sub> and VOC emissions reduction CMAQ simulation to January monthly average ozone concentration in the 2007 base CMAQ simulation.



Figure 8C-39. Ratio of January monthly average ozone concentrations in brute force 90% NO<sub>x</sub> and emissions reduction CMAQ simulation to January monthly average ozone concentration in the 2007 base CMAQ simulation.



Figure 8C-40. Ratio of April-October seasonal average ozone concentrations in brute force 50%  $NO_x$  emissions reduction CMAQ simulation to April-October seasonal average ozone concentration in the 2007 base CMAQ simulation.



Figure 8C-41. Ratio of April-October seasonal average ozone concentrations in brute force 50% NO<sub>x</sub> and VOC emissions reduction CMAQ simulation to April-October seasonal average ozone concentration in the 2007 base CMAQ simulation.



Figure 8C-42. Ratio of April-October seasonal average ozone concentrations in brute force 90% NO<sub>x</sub> emissions reduction CMAQ simulation to April-October seasonal average ozone concentration in the 2007 base CMAQ simulation.



Figure 8C-43. Ratio of April-October seasonal average ozone concentrations in brute force 90% NO<sub>x</sub> and VOC emissions reduction CMAQ simulation to April-October seasonal average ozone concentration in the 2007 base CMAQ simulation.



Figure 8C-44. Ratio of May-September seasonal average ozone concentrations in brute force 50% NO<sub>x</sub> emissions reduction CMAQ simulation to May-September seasonal average ozone concentration in the 2007 base CMAQ simulation.



Figure 8C-45. Ratio of May-September seasonal average ozone concentrations in brute force 50% NO<sub>x</sub> and VOC emissions reduction CMAQ simulation to May-September seasonal average ozone concentration in the 2007 base CMAQ simulation.



Figure 8C-46. Ratio of May-September seasonal average ozone concentrations in brute force 90% NO<sub>x</sub> emissions reduction CMAQ simulation to May-September seasonal average ozone concentration in the 2007 base CMAQ simulation.



Figure 8C-47. Ratio of May-September seasonal average ozone concentrations in brute force 90% NO<sub>x</sub> and VOC emissions reduction CMAQ simulation to May-September seasonal average ozone concentration in the 2007 base CMAQ simulation.

These maps can be further understood by breaking down response by month and binning increases and decreases by base ozone concentration. Figure 8C-48 and Figure 8C-49 show this breakdown for each emissions reduction scenario. This plot clearly shows that ozone increases predominantly occur at lower base ozone concentrations while high modeled base ozone concentrations appear to decrease in almost all cases in the emissions reduction scenarios. The ozone decreases occur more often and are more substantial during the months of June, July, August, and September. The 90% NO<sub>x</sub> reduction simulations have few locations with ozone increases than the 50% NO<sub>x</sub> reduction simulation however there are a limited number of grid cells in which the ozone increases are larger in the 90% NO<sub>x</sub> reduction than in the 50% NO<sub>x</sub> reduction simulation. Overall, the distributions of ozone response look similar when VOC reductions are added on top of NO<sub>x</sub> reductions, although the NO<sub>x</sub> and VOC reduction cases are shifted slightly more toward reducing ozone than the NO<sub>x</sub> only reduction cases.



Figure 8C-48. Density scatter plot comparing modeled monthly mean ozone in the 2007 base CMAQ simulation to modeled monthly mean ozone in the emissions reduction CMAQ simulations. Colors depict the number of points occurring at any location on the scatter plot.



Figure 8C-49. Density scatter plot comparing modeled monthly mean ozone in the 2007 base CMAQ simulation to the relative change in monthly mean ozone from the emissions reduction CMAQ simulations. Relative change is shown as the ratio of ozone in the emissions reduction simulation to ozone in the 2007 base simulation. Colors depict the number of people living in areas that fall at any location on the scatter plot.

## 8C-2.2. Modeled Ozone Response Paired with Population Data

In addition to maps showing increases and decreases in mean ozone values, the gridded model data were paired with population information to quantify the number of people living in locations where modeled ozone decreased and increased for various time periods. Figure 8C-50 through Figure 8C-60 break down this information by location. These figures show changes in ozone using two different metrics: a relative metric (the ratio of mean ozone in the NO<sub>x</sub> reduction CMAQ simulations (50% and 90%) to mean ozone in the 2007 base CMAQ simulation) and an absolute metric (the ppb change in mean ozone from the 2007 base CMAQ simulation to the emissions reduction CMAQ simulations). Note that the maps in the HREA chapter 8 show relative changes while the barplots in chapter 8 show absolute changes.

Figure 8C-50 shows the total population living in areas experiencing different ratios of mean ozone in the NO<sub>x</sub> reduction CMAQ simulations (50% and 90%) to mean ozone in the 2007 base CMAQ simulation for the nine NOAA climate regions of the U.S. For each climate region, this information is shown for locations in an urban study area and for locations not in an urban study area. Two regions, the Northwest and the West North Central regions, did not include any urban study areas. Each area is further split out into high and low-mid population density classifications. Values for each month are displayed along the x-axis of each panel. Figure 8C-51 shows the same information for the combined NO<sub>x</sub> and VOC reduction scenarios. Although there are more total people living in non- urban study area locations than urban study area locations within each region, the patterns in the two look similar for within each population density classification in each region. It should be noted that for the two regions of the country without an urban study area, the Northwest has larger percentages of their population living in areas where the ratio is > 1 (ozone increases) than most other regions and the West North Central has larger percentages of their population living in areas where the ratio is < 1 (ozone decreases) than most other regions. Figure 8C-52 shows the same information for the 15 urban study areas from all four emissions reduction CMAQ simulations but does not split out high versus low-mid population density locations. Also note that Figure 8C-52 shows breakdowns by percentage of urban study area population rather than by total population so that different urban study areas can more easily be compared.



Figure 8C-50. Populations living in locations with various ranges of ratios of monthly mean ozone in the NO<sub>x</sub> reduction simulations to monthly mean ozone in the 2007 base CMAQ simulation. Eight different monthly ratios are shown in each panel (January, April-October). Panels split population by 9 climate regions, urban study area vs non-urban study area, urban versus non-urban and 50% NO<sub>x</sub> reduction scenario vs 90% NO<sub>x</sub> reduction scenario.



Figure 8C-51. Populations living in locations with various ranges of ratios of monthly mean ozone in the combined NO<sub>x</sub> and VOC reduction simulations to monthly mean ozone in the 2007 base CMAQ simulation. Eight different monthly ratios are shown in each panel (January, April-October). Panels split population by 9 climate regions, urban study area vs non-urban study area, urban versus non-urban and 50% NO<sub>x</sub>/VOC reduction scenario vs 90% NO<sub>x</sub>/VOC reduction scenario.





Section 8.2.3 further examined these ozone ratios using histograms and lumping all urban study areas together and all non- urban study areas together. The main text provided histograms for the NO<sub>x</sub> reduction scenarios only. This Appendix provides histograms for all four emission reduction simulations in using both relative and absolute metrics (Figure 8C-53 through Figure 8C-60). These figures show that the breakdown of people living in locations of increasing versus decreasing ozone for various monthly and seasonal time-periods does not change much between the NO<sub>x</sub> reduction scenarios and the equivalent NO<sub>x</sub> and VOC reduction scenarios. Table 8C-1 provides the numbers going into the 50% NO<sub>x</sub> reduction and 90% NOx reduction histograms. Table 8C-2 and Table 8C-3 break down the April-October seasonal mean ozone results by two further classification schemes: high versus low-mid population density locations and by the 15 urban study areas.



Figure 8C-53. Histograms of US population living in locations with increasing and decreasing mean ozone. Values on the x-axis represent the ratio of mean ozone in the 50% NO<sub>x</sub> cut CMAQ simulation to the mean ozone in the 2007 base CMAQ simulation. The percentages of the US population living in areas that have ratios less than 0.95, from 0.95 to 1.05 and greater than 1.05 are shown on the y-axis. Left plots show population numbers in locations not included in one of the urban study areas while right plots show population numbers in locations included in one of the urban study areas. Top plots show ratios of January monthly mean ozone, middle plots show ratios of season mean June-August ozone, and bottom plots show ratios of seasonal mean April-October ozone.



Figure 8C-54. Histograms of US population living in locations with increasing and decreasing mean ozone. Values on the x-axis represent the ratio of mean ozone in the 50% NO<sub>x</sub> and VOC cut CMAQ simulation to the mean ozone in the 2007 base CMAQ simulation. The percentages of the US population living in areas that have ratios less than 0.95, from 0.95 to 1.05 and greater than 1.05 are shown on the y-axis. Left plots show population numbers in locations not included in one of the urban study areas while right plots show population numbers in locations included in one of the urban study areas. Top plots show ratios of January monthly mean ozone, middle plots show ratios of season mean June-August ozone, and bottom plots show ratios of seasonal mean April-October ozone.



Figure 8C-55. Histograms of US population living in locations with increasing and decreasing mean ozone. Values on the x-axis represent the ratio of mean ozone in the 90% NO<sub>x</sub> cut CMAQ simulation to the mean ozone in the 2007 base CMAQ simulation. The percentages of the US population living in areas that have ratios less than 0.95, from 0.95 to 1.05 and greater than 1.05 are shown on the y-axis. Left plots show population numbers in locations not included in one of the urban study areas while right plots show population numbers in locations included in one of the urban study areas. Top plots show ratios of January monthly mean ozone, middle plots show ratios of season mean June-August ozone, and bottom plots show ratios of seasonal mean April-October ozone.


Figure 8C-56. Histograms of US population living in locations with increasing and decreasing mean ozone. Values on the x-axis represent the ratio of mean ozone in the 90% NO<sub>x</sub> and VOC cut CMAQ simulation to the mean ozone in the 2007 base CMAQ simulation. The percentages of the US population living in areas that have ratios less than 0.95, from 0.95 to 1.05 and greater than 1.05 are shown on the y-axis. Left plots show population numbers in locations not included in one of the urban study areas while right plots show population numbers in locations included in one of the urban study areas. Top plots show ratios of January monthly mean ozone, middle plots show ratios of season mean June-August ozone, and bottom plots show ratios of seasonal mean April-October ozone.



Figure 8C-57. Histograms of US population living in locations with increasing and decreasing mean ozone. Values on the x-axis represent the absolute (ppb) change of mean ozone from the 2007 base CMAQ simulation to the 50% NO<sub>x</sub> cut CMAQ simulation to the mean ozone in the 2007 base CMAQ simulation. The percentages of the US population living in areas that have changes less than -1 ppb, between -1 and +1 ppb and greater than +1 ppb are shown on the y-axis. Left plots show population numbers in locations not included in one of the urban study areas while right plots show population numbers in locations included in one of the urban study areas. Top plots show ratios of January monthly mean ozone, middle plots show ratios of season mean June-August ozone, and bottom plots show ratios of seasonal mean April-October ozone.



Figure 8C-58. Histograms of US population living in locations with increasing and decreasing mean ozone. Values on the x-axis represent the absolute (ppb) change of mean ozone from the 2007 base CMAQ simulation to the 50% NO<sub>x</sub> and VOC cut CMAQ simulation to the mean ozone in the 2007 base CMAQ simulation. The percentages of the US population living in areas that have changes less than -1 ppb, between -1 and +1 ppb and greater than +1 ppb are shown on the y-axis. Left plots show population numbers in locations not included in one of the urban study areas while right plots show population numbers in locations included in one of the urban study areas. Top plots show ratios of January monthly mean ozone, middle plots show ratios of season mean June-August ozone, and bottom plots show ratios of seasonal mean April-October ozone.



Figure 8C-59. Histograms of US population living in locations with increasing and decreasing mean ozone. Values on the x-axis represent the absolute (ppb) change of mean ozone from the 2007 base CMAQ simulation to the 90% NO<sub>x</sub> cut CMAQ simulation to the mean ozone in the 2007 base CMAQ simulation. The percentages of the US population living in areas that have changes less than -1 ppb, between -1 and +1 ppb and greater than +1 ppb are shown on the y-axis. Left plots show population numbers in locations not included in one of the urban study areas while right plots show population numbers in locations included in one of the urban study areas. Top plots show ratios of January monthly mean ozone, middle plots show ratios of season mean June-August ozone, and bottom plots show ratios of seasonal mean April-October ozone.



Figure 8C-60. Histograms of US population living in locations with increasing and decreasing mean ozone. Values on the x-axis represent the absolute (ppb) change of mean ozone from the 2007 base CMAQ simulation to the 90% NO<sub>x</sub> and VOC cut CMAQ simulation to the mean ozone in the 2007 base CMAQ simulation. The percentages of the US population living in areas that have changes less than -1 ppb, between -1 and +1 ppb and greater than +1 ppb are shown on the y-axis. Left plots show population numbers in locations not included in one of the urban study areas while right plots show population numbers in locations included in one of the urban study areas. Top plots show ratios of January monthly mean ozone, middle plots show ratios of season mean June-August ozone, and bottom plots show ratios of seasonal mean April-October ozone.

Table 8C-1. Percentage of US population living in locations with increasing and decreasing mean ozone for the 50% NO<sub>x</sub> reduction and 90% NO<sub>x</sub> reductions CMAQ simulations broken down by different seasonal and monthly time periods.

		50	% NO <sub>x</sub> Reductio	n	90% NO <sub>x</sub> Reduction				
	Ratio	Study Area	Non Study Area	US	Study Area	Non Study Area	US		
	<0.95	0.0	0.0	0.0	0.0	0.6	0.6		
	0.95-0.96	0.0	0.0	0.0	0.0	0.3	0.3		
	0.96-0.97	0.0	0.0	0.0	0.0	0.3	0.3		
	0.97-0.98	0.1	0.1	0.1	0.0	0.5	0.5		
	0.98-0.99	0.0	0.4	0.4	0.0	0.7	0.7		
lanuary	0.99-1.00	0.0	0.7	0.7	0.0	0.7	0.8		
January	1.00-1.01	0.0	0.9	1.0	0.0	0.8	0.8		
	1.01-1.02	0.0	1.1	1.1	0.0	0.8	0.8		
	1.02-1.03	0.0	1.1	1.2	0.0	1.0	1.1		
	1.03-1.04	0.1	1.4	1.5	0.0	1.2	1.2		
	1.04-1.05	0.2	1.7	1.9	0.0	1.3	1.3		
	>1.05	28.7	63.6	92.3	28.9	62.6	91.5		
	<0.95	8.4	50.6	59.0	22.3	64.7	87.0		
April- October	0.95-0.96	2.1	3.6	5.7	0.5	0.2	0.8		
	0.96-0.97	1.7	2.8	4.5	0.6	0.6	1.2		
	0.97-0.98	1.7	1.9	3.7	0.2	0.5	0.7		
	0.98-0.99	1.4	1.6	3.0	0.5	0.2	0.6		
	0.99-1.00	1.5	1.4	2.9	0.5	0.2	0.8		
	1.00-1.01	0.8	0.7	1.5	0.2	0.5	0.6		
	1.01-1.02	1.1	0.7	1.8	0.2	0.2	0.3		
	1.02-1.03	0.8	0.9	1.7	0.2	0.3	0.5		
	1.03-1.04	1.1	0.5	1.6	0.4	0.3	0.7		
	1.04-1.05	0.7	0.7	1.4	0.1	0.2	0.3		
	>1.05	7.6	5.5	13.1	3.4	3.2	6.6		
June- August	<0.95	16.4	58.4	74.8	27.4	66.3	93.7		
	0.95-0.96	1.1	1.6	2.7	0.1	0.3	0.4		
	0.96-0.97	1.1	0.9	1.9	0.0	0.3	0.3		
	0.97-0.98	1.1	1.1	2.1	0.0	0.3	0.4		
	0.98-0.99	1.0	0.9	1.8	0.0	0.2	0.2		
	0.99-1.00	1.1	0.7	1.8	0.0	0.2	0.2		
	1.00-1.01	0.5	0.6	1.1	0.1	0.3	0.4		
	1.01-1.02	0.7	0.5	1.2	0.1	0.2	0.3		
	1.02-1.03	0.5	0.5	0.9	0.0	0.0	0.1		
	1.03-1.04	0.6	0.4	1.0	0.0	0.2	0.2		
	1.04-1.05	1.3	0.4	1.7	0.1	0.0	0.2		
	>1.05	3.8	5.0	8.8	1.2	2.4	3.7		

		50	)% NO <sub>x</sub> Reduction		90% NO <sub>x</sub> Reduction					
	Ratio	Study Area	Non Study Area	US	Study Area	Non Study Area	US			
	<0.95	0.8	1.7	2.5	9.8	6.7	16.5			
	0.95-0.96	0.6	0.7	1.3	0.5	0.1	0.6			
	0.96-0.97	0.8	0.6	1.4	0.6	0.4	1.0			
	0.97-0.98	0.9	0.5	1.5	0.2	0.3	0.5			
	0.98-0.99	0.9	0.6	1.6	0.5	0.1	0.6			
High	0.99-1.00	1.1	0.7	1.8	0.5	0.1	0.6			
density	1.00-1.01	0.7	0.3	1.0	0.2	0.3	0.5			
	1.01-1.02	0.9	0.4	1.3	0.2	0.1	0.2			
	1.02-1.03	0.7	0.7	1.4	0.2	0.1	0.3			
	1.03-1.04	1.0	0.3	1.3	0.4	0.2	0.6			
	1.04-1.05	0.7	0.5	1.1	0.1	0.1	0.1			
	>1.05	7.3	3.8	11.1	3.4	2.3	5.7			
	<0.95	7.6	48.9	56.5	12.5	58.1	70.6			
	0.95-0.96	1.5	3.0	4.5	0.1	0.2	0.2			
	0.96-0.97	0.9	2.1	3.1	0.0	0.1	0.1			
	0.97-0.98	0.8	1.4	2.2	0.0	0.2	0.2			
Low-Mid population density	0.98-0.99	0.5	0.9	1.4	0.0	0.1	0.1			
	0.99-1.00	0.4	0.7	1.1	0.0	0.1	0.1			
	1.00-1.01	0.1	0.4	0.5	0.0	0.1	0.2			
	1.01-1.02	0.2	0.3	0.5	0.0	0.1	0.1			
	1.02-1.03	0.1	0.3	0.3	0.0	0.1	0.1			
	1.03-1.04	0.1	0.2	0.3	0.0	0.1	0.1			
	1.04-1.05	0.0	0.2	0.3	0.0	0.1	0.1			
	>1.05	0.3	1.7	2.0	0.0	0.8	0.9			

Table 8C-2. Percentage of US population living in locations with increasing and decreasing April-October seasonal mean ozone in the 50% NO<sub>x</sub> reduction and 90% NO<sub>x</sub> reduction CMAQ simulations broken down by high and low-mid population density areas.

# Table 8C-3. Percentage of U.S. population living in locations with increasing and decreasing April-October seasonal mean ozone in the 50% NO<sub>x</sub> reduction and 90% NO<sub>x</sub> reduction CMAQ simulations broken down by 15 urban study areas.

		Ratio of April-October seasonal mean ozone in reduced emissions CMAQ simulation to April- October seasonal mean ozone in base 2007 CMAQ simulation											
Scenario	Study Area	0- 0.95	0.95- 0.96	0.96- 0.97	0.97- 0.98	0.98- 0.99	0.99- 1.00	1.00- 1.01	1.01- 1.02	1.02- 1.03	1.03- .04	1.04- 1.05	>1.05
	Not in Study Area	50.6	3.6	2.8	1.9	1.6	1.4	0.7	0.7	0.9	0.5	0.7	5.5
	Atlanta	1.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Baltimore	0.4	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0
	Boston	0.4	0.2	0.1	0.1	0.1	0.1	0.0	0.2	0.0	0.0	0.2	0.0
	Chicago	0.5	0.1	0.2	0.2	0.3	0.1	0.1	0.2	0.0	0.2	0.1	0.9
	Cleveland	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0
	Dallas	1.0	0.4	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0
50% NO <sub>x</sub>	Denver	0.1	0.2	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.1
reduction	Detroit	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.2	0.2	0.1	0.3
	Houston	0.8	0.1	0.0	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2
-	Los Angeles	0.2	0.1	0.1	0.0	0.0	0.4	0.0	0.1		0.2	0.0	2.8
	New York	0.5	0.3	0.3	0.2	0.2	0.3	0.1	0.2	0.2	0.1	0.1	3.4
	Philadelphia	0.7	0.1	0.2	0.3	0.2	0.2	0.1	0.0	0.2	0.2	0.0	0.0
	Sacramento	0.2	0.2	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0
	St. Louis	0.6	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
	Washington	1.1	0.1	0.2	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0
	Not in Study Area	64.7	0.2	0.6	0.5	0.2	0.2	0.5	0.2	0.3	0.3	0.2	3.2
	Atlanta	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Baltimore	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Boston	1.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Chicago	2.4	0.0	0.3	0.0	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.1
	Cleveland	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Dallas	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90% NO <sub>x</sub>	Denver	0.7	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
reduction	Detroit	1.0	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0
-	Houston	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0
	Los Angeles	1.7	0.1	0.2	0.1	0.0	0.2	0.1	0.1	0.0	0.2	0.0	1.4
	New York	3.2	0.3	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.2	0.0	1.9
	Philadelphia	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Sacramento	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	St. Louis	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Washington	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

### **APPENDIX 9A**

## Figures Summarizing Exposure and Lung-Function Risk Estimates for Sub-Regions of Each Study Area (Urban Core, Outer Ring, and Total Exposure Region)

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	Decrement. (Spatially stratified: all study area, urban study area, outer study area)
	(Sacramento)
Figure 9A-24.	Lung-Function Risk Estimates – Percent of Person with Specified FEV <sub>1</sub>
	Decrement. (Spatially stratified: all study area, urban study area, outer study area)
	(St. Louis)

#### **OVERVIEW**

Simulated populations within different sub-regions of a given urban study area may have different exposure and lung-function risk distributions reflecting potential differences both in their patterns of behavior (e.g., commuting patterns, outdoor activities) as well as differences in the spatio-temporal ambient ozone fields estimated for each sub-region. To explore potential spatial heterogeneity in both the exposure and lung-function risk estimates, we have completed a stratified analysis of risk for both of these assessments. These stratified analysis consider two sub-regions within each study area including: (a) a smaller urban core sub-area matching that used in the Smith et al., 2009 epidemiology study providing the effect estimates used in modeling short-term exposure-based mortality risk and (b) the outer ring reflecting the remainder of the larger study area used in the exposure and lung-function assessment (excluding the core urban area). In presenting risk estimates based on these two sub-regions, we also include risk estimates based on the entire exposure model urban study area for completeness.

Generating these sub-region risk estimates is relatively straight-forward. As part of our standard APEX output for the exposure and lung function risk estimates summarized in Chapters 5 and 6 respectively, limited exposure and FEV<sub>1</sub> results are retained for each simulated person including their daily maximum 1-hour ozone exposure and counts per ozone season of each time a simulated person experienced an FEV<sub>1</sub> decrement (10%, 15%, and 20%). Also retained is the location of their home census tract (and corresponding location of ambient concentration source used for calculating exposures) within the larger study areas used in the exposure and lungfunction analyses. To generate the sub-region estimates, we subset these broader study area exposure and  $FEV_1$  risk results into two sets of exposure results for each of 12 study areas: one containing those persons residing within the urban core and the other containing persons residing in the outer ring outside the urban core. In addition, two years of data were evaluated for the 12 study areas (2007 and 2009), matching the two years for which short term mortality risks were estimated. In generating these sub-region estimates, we focused on the 12 urban study areas used in the epidemiology-based risk assessment to allow these stratified results to be compared alongside the urban core and CBSA-based estimates generated as part of the epidemiologicalbased risk assessment.

In summarizing these risk estimates, we first focus on the exposure estimates (Figures 9A-1 through 9A-12), including the percent of all simulated individuals experiencing 1-hour exposure at or above each specified benchmark (see Chapter 5 for additional detail on this risk metric). Estimates are presented for both 2007 and 2009 within each figure. In order to compare, for example, exposure estimates (based on the 60 ppb benchmark) for the urban core between

current conditions and the current standard for 2007, we would compare the darker blue column for *urb\_122\_base\_07* with the darker blue column for *urb\_122\_75\_07*.

After presenting the exposure estimates, we then present lung-function estimates (Figures 9A-13 through 9A-24) including percent of all simulated individuals experiencing at least one FEV<sub>1</sub> decrement of 10, 15, or 20% (see Chapter 6 for additional detail on this risk metric). Estimates are presented for both 2007 and 2009 within each figure. In order to compare, for example, exposure estimates (based on the 20 percent FEV1 decrement) for the urban core between current conditions and the current standard for 2007, we would compare the light tan column for  $urb_122\_base_07$  with the light tan column for  $urb_122\_75\_07$ .

Generally for both the exposure and lung-function risk estimates, we see either a pattern of risk reduction or no change in risk when we look across air quality scenarios (recent conditions – current standard – alternative standard 70 ppb) for a given sub-region (i.e., urban core, outer ring or total combined area). Note however, that in one case (Boston for 2009 for the urban sub-region) we do see a slight risk increase for both exposure and lung function risk (see Figure 9A-3 and 9A-15, respectively). When we compare patterns of risk reduction for the urban core and outer ring (across urban study areas), we generally see larger degrees of risk reduction for the outer rings. This may reflect two factors: (a) design monitors (targeted for ozone reductions under simulated attainment of the current and alternative standard levels) tend to be located in the outer ring and consequently ozone levels near these monitors are likely to experience greater degrees of reduction and (b) there may be a degree of dampening of risk reduction in the urban core reflecting the non-linear nature of ozone formation which can result in increase in ozone on lower ozone days following simulation of both current and alternative standard levels (see section 7.1.1 for additional discussion).



Figure 9A-1. Exposure Risk Estimates – Percent of Person with 1-Hour Exposures at or Above Benchmarks. (Spatially stratified: all study area, urban study area, outer study area) (Atlanta).



Figure 9A-2. Exposure Risk Estimates – Percent of Person with 1-Hour Exposures at or Above Benchmarks. (Spatially stratified: all study area, urban study area, outer study area) (Baltimore).



Figure 9A-3. Exposure Risk Estimates – Percent of Person with 1-Hour Exposures at or Above Benchmarks. (Spatially stratified: all study area, urban study area, outer study area) (Boston).



Figure 9A-4. Exposure Risk Estimates – Percent of Person with 1-Hour Exposures at or Above Benchmarks. (Spatially stratified: all study area, urban study area, outer study area) (Cleveland).



Figure 9A-5. Exposure Risk Estimates – Percent of Person with 1-Hour Exposures at or Above Benchmarks. (Spatially stratified: all study area, urban study area, outer study area) (Denver).



Figure 9A-6. Exposure Risk Estimates – Percent of Person with 1-Hour Exposures at or Above Benchmarks. (Spatially stratified: all study area, urban study area, outer study area) (Detroit).



Figure 9A-7. Exposure Risk Estimates – Percent of Person with 1-Hour Exposures at or Above Benchmarks. (Spatially stratified: all study area, urban study area, outer study area) (Houston).



Figure 9A-8. Exposure Risk Estimates – Percent of Person with 1-Hour Exposures at or Above Benchmarks. (Spatially stratified: all study area, urban study area, outer study area) (Los Angeles).



Figure 9A-9. Exposure Risk Estimates – Percent of Person with 1-Hour Exposures at or Above Benchmarks. (Spatially stratified: all study area, urban study area, outer study area) (New York).



Figure 9A-10. Exposure Risk Estimates – Percent of Person with 1-Hour Exposures at or Above Benchmarks. (Spatially stratified: all study area, urban study area, outer study area) (Philadelphia).



Figure 9A-11. Exposure Risk Estimates – Percent of Person with 1-Hour Exposures at or Above Benchmarks. (Spatially stratified: all study area, urban study area, outer study area) (Sacramento).



Figure 9A-12. Exposure Risk Estimates – Percent of Person with 1-Hour Exposures at or Above Benchmarks. (Spatially stratified: all study area, urban study area, outer study area) (St. Louis).



Figure 9A-13. Lung-Function Risk Estimates – Percent of Person with Specified FEV<sub>1</sub> Decrement. (Spatially stratified: all study area, urban study area, outer study area) (Atlanta).



Figure 9A-14. Lung-Function Risk Estimates – Percent of Person with Specified FEV<sub>1</sub> Decrement. (Spatially stratified: all study area, urban study area, outer study area) (Baltimore).



Figure 9A-15. Lung-Function Risk Estimates – Percent of Person with Specified FEV<sub>1</sub> Decrement. (Spatially stratified: all study area, urban study area, outer study area) (Boston).



Figure 9A-16. Lung-Function Risk Estimates – Percent of Person with Specified FEV<sub>1</sub> Decrement. (Spatially stratified: all study area, urban study area, outer study area) (Cleveland).



Figure 9A-17. Lung-Function Risk Estimates – Percent of Person with Specified FEV<sub>1</sub> Decrement. (Spatially stratified: all study area, urban study area, outer study area) (Denver).



Figure 9A-18. Lung-Function Risk Estimates – Percent of Person with Specified FEV<sub>1</sub> Decrement. (Spatially stratified: all study area, urban study area, outer study area) (Detroit).



Figure 9A-19. Lung-Function Risk Estimates – Percent of Person with Specified FEV<sub>1</sub> Decrement. (Spatially stratified: all study area, urban study area, outer study area) (Houston).



Figure 9A-20. Lung-Function Risk Estimates – Percent of Person with Specified FEV<sub>1</sub> Decrement. (Spatially stratified: all study area, urban study area, outer study area) (Los Angeles).



Figure 9A-21. Lung-Function Risk Estimates – Percent of Person with Specified FEV<sub>1</sub> Decrement. (Spatially stratified: all study area, urban study area, outer study area) (New York).



Figure 9A-22. Lung-Function Risk Estimates – Percent of Person with Specified FEV<sub>1</sub> Decrement. (Spatially stratified: all study area, urban study area, outer study area) (Philadelphia).



Figure 9A-23. Lung-Function Risk Estimates – Percent of Person with Specified FEV<sub>1</sub> Decrement. (Spatially stratified: all study area, urban study area, outer study area) (Sacramento).



Figure 9A-24. Lung-Function Risk Estimates – Percent of Person with Specified FEV<sub>1</sub> Decrement. (Spatially stratified: all study area, urban study area, outer study area) (St. Louis).
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