

APPENDIX I: GLOSSARY OF ABBREVIATIONS

LINKING TRANSPORTATION AND AIR QUALITY PLANNING: IMPLEMENTATION OF THE TRANSPORTATION CONFORMITY REGULATIONS IN 15 NONATTAINMENT AREAS

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Appendix I

GLOSSARY OF ABBREVIATIONS

TERMS:

CMAQ	Congestion mitigation and air quality
CO	Carbon monoxide
ECO	Employee Commute Options
EMFAC	California motor vehicle emissions model
HOV	High occupancy vehicle
HPMS	Highway Performance Monitoring System
I/M	Inspection and maintenance
ISTEA	Intermodal Surface Transportation Efficiency Act
LEV	Low emission vehicle
LUTRAQ	L and Use, T Ransportation, and A ir Q uality study conducted in Portland
MIS	Major investment study
MOBILE	EPA motor vehicle emissions model
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NO _x	Nitrogen oxides
NPRM	Notice of proposed rulemaking
PM ₁₀	Particulate matter smaller than or equal to 10 micrometers
RCAP	Regional commuter assistance program
RFG	Reformulated gasoline
RFP	Reasonable further progress
ROP	Rate of progress
RTP	Regional transportation plan
RVP	Reid vapor pressure
SIP	State implementation plan
SOV	Single occupancy vehicle
STIP	State transportation improvement program
TCM	Transportation control measures
TDM	Transportation demand management
TIP	Transportation improvement program
TSM	Transportation systems management
UAM	Urban airshed model
VMT	Vehicle miles traveled
VOCs	Volatile organic compounds

AGENCIES:

ABAG	Association of Bay Area Governments (San Francisco area)
ARC	Atlanta Regional Commission
BMC	Baltimore Metropolitan Council
Caltrans	California Department of Transportation
CATS	Chicago Area Transportation Study

CDPHE	Department of Public Health and Environment (Colorado)
CTPS	Central Transportation Planning Staff (Boston MPO staff)
DEC/EnCon	Department of Environmental Conservation (New York State)
DENR	Department of Environment and Natural Resources (North Carolina)
DEP	Department of Environmental Protection
DNR	Department of Natural Resources
DRCOG	Denver Regional Council of Governments
DVRPC	Delaware Valley Regional Planning Commission (Philadelphia area)
EDF	Environmental Defense Fund
EOTC	Executive Office of Transportation and Construction (Massachusetts)
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GDOT	Georgia Department of Transportation
H-GAC	Houston-Galveston Area Council
IDOT	Illinois Department of Transportation
MARTA	Metropolitan Atlanta Rapid Transit Authority
Metro	Metropolitan Service District (Portland area)
MDE	Maryland Department of Environment
MDOT	Maryland Department of Transportation
MTC	Metropolitan Transportation Commission (San Francisco area)
NJDEP	New Jersey Department of Environmental Protection
NJTPA	New Jersey Transportation Planning Authority
NYMTC	New York Metropolitan Transportation Council
OTAG	Ozone Transport Assessment Group
PennDOT	Pennsylvania Department of Transportation
SEWRPC	Southeastern Wisconsin Regional Planning Commission
TxDOT	Texas Department of Transportation
TNRCC	Texas Natural Resources Conservation Commission
USDOT	US Department of Transportation
USEPA	US Environmental Protection Agency
WFRC	Wasatch Front Regional Council (Salt Lake City area)
WisDOT	Wisconsin Department of Transportation

APPENDIX II: CONFORMITY PROFILES OF 15 STUDY SITES

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Appendix II

CONFORMITY PROFILES OF 15 STUDY SITES

ATLANTA

Pollutant(s): Ozone
1990 Classification: Serious

Geographic Boundaries of Ozone Nonattainment Area:

13 Counties: Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Henry, Paulding and Rockdale.

Geographic Boundaries of MPO Area:

10 Counties: Cherokee, Clayton, Cobb, DeKalb, Douglas, Fayette, Fulton, Gwinnett, Henry, and Rockdale.

Year:	Nonattainment Area Population:	Average Daily VMT:	Percent Annual Population Growth:	Percent Annual Average Daily VMT Growth:	Average Daily VMT/Capita:
1980	1,989,341				
1990	2,653,159	81,472,984	2.9% ^b		30.7
1995	3,038,050	105,218,456 ^a	2.8% ^c	4.4% ^d	34.6 ^e

^a1996 ^c1990-1995 ^e Per capita rates are calculated using 1995 population and 1996 VMT.
^b1980-1990 ^d1990-1996

Key Institutions:

MPO: Atlanta Regional Commission (ARC)
State Transportation Agency: Georgia Department of Transportation (GDOT)
State Air Agency: Georgia Department of Natural Resources (DNR)

Summary of Conformity Issues:

1995 – ARC began implementing model and data upgrades that captured higher emission levels than had been reflected in earlier analyses. As a result, Atlanta barely passed the NO_x budget test.

1996 – Passing the budget test proved even more problematic than it had in 1995. Because the area was experiencing higher than expected VMT growth and was slow to implement inspection and maintenance and reformulated gasoline programs, its 1999 NO_x budget for ozone set an emissions cap that the area could not meet in developing a new TIP. ARC, the Atlanta MPO, and Georgia DOT struggled to develop strategies that would close the large gap between allowable and projected emissions. Ultimately, the northern arc of the Outer Loop was barred from moving into the TIP, the road to the massive new Mall of Georgia was scaled back, and only exempt and grandfathered projects from the previously conformed 1995 TIP were allowed to move forward.

1997- Difficulties continued throughout 1997 during which ARC could not develop a new long-range plan that conformed. In August 1997, FHWA granted a six-month TIP extension, during which a controversy over grandfathering projects surfaced. Not able to develop a full conforming TIP, the MPO drafted an *interim* TIP (ITIP) that contained only TCMs written into SIPs that had received EPA approval, as well as grandfathered

and exempt projects from the 1995 regional transportation plan update. Several dozen projects that ARC originally wanted to regard as grandfathered were not ultimately included in the ITIP because FHWA felt they could not meet the applicable NEPA requirements; EPA simultaneously reviewed the NEPA documents. FHWA's regional office was then prepared to approve the ITIP, but EPA's regional office raised concerns about several of the remaining grandfathered projects in the ITIP.

This led to sharp policy disagreements among the federal agencies. Even though the 1995 plan had received a conformity determination, EPA's regional office argued that the conformity analysis had not satisfied all of the applicable requirements of the conformity rule. EPA therefore believed that the disputed projects should not be grandfathered because they would ultimately substantially increase highway capacity, worsening air quality problems. Staff from the White House Council on Environmental Quality ultimately brokered a regional-level agreement among EPA, FHWA, and FTA that allowed five of six disputed projects to move forward in the ITIP, with two of these limited to planning and design. ARC removed the sixth project from the ITIP. The EPA-FHWA-FTA agreement also established dates by which the Atlanta area should complete a conforming long-range plan and an ozone attainment demonstration.¹ Conformity lapsed in Atlanta on January 17, 1998.

¹In addition, it recognized the need for national-level staff of EPA, FHWA, and FTA to develop a national memorandum of understanding or make changes in the conformity regulations to ensure proper use of the grandfathering provision, particularly to see that it was not used to evade the consequences of a conformity lapse.

BALTIMORE

Pollutant(s): Ozone
Carbon Monoxide

1990 Classification: Severe 1
Moderate 2 (Redesignated to Attainment 1995)

Geographic Boundaries of Ozone Nonattainment Area:

6 Counties: Anne Arundel, Baltimore, Baltimore City, Carroll, Harford, and Howard.

Geographic Boundaries of MPO Area:

6 Counties: Anne Arundel, Baltimore, Baltimore City, Carroll, Harford, and Howard.

Year:	Nonattainment Area Population:	Average Daily VMT:	Percent Annual Population Growth:	Percent Annual Average Daily VMT Growth:	Average Daily VMT/Capita:
1980	2,173,989				
1990	2,348,219	49,900,000	0.8% ^a		21.3
1995	2,432,993	55,900,000	0.7% ^b	2.3% ^b	23.0

^a1980-1990 ^b1990-1995

Institutions:

MPO: Baltimore Metropolitan Council (BMC)

State Transportation Agency: Maryland Department of Transportation (MDOT)

State Air Agency: Maryland Department of the Environment (MDE)

Summary of Conformity Issues:

1993 – During Interim Conformity, the Chesapeake Bay Foundation and the Environmental Defense Fund jointly challenged the MPO’s modeling practices. This temporarily delayed the area’s conformity determination.

1995 – The Sierra Club Legal Defense Fund questioned the MPO’s use of emission reductions from the ECO program to pass the build/no-build test because ECO had been made voluntary and its funding had been cut by the legislature. The MPO therefore dropped ECO from the conformity analysis and substituted a regional commuter assistance program that it developed and pledged to fund and implement in 2005.

1996 – The Sierra Club Legal Defense Fund again raised issues with the conformity determination, questioning whether Baltimore could claim full emission reduction credit for the enhanced I/M program, which had not yet been implemented. EPA, however, advised that the conformity analysis should be calculated assuming implementation of the measures in the *submitted* SIP, whether or not they were moving forward on time.

1997 – The Maryland legislature passed a bill to make the I/M program voluntary. The Governor vetoed this bill at least in part because of the conformity implications of failing to implement the required form of I/M. If the program had become voluntary, EPA would have disapproved the SIP and conformity of the transportation plan/TIP would have been frozen.

BOSTON

Pollutant(s):	1990 Classification:
Ozone	Serious
Carbon Monoxide	Moderate 2 (Redesignated to Attainment 1996)

Geographic Boundaries of Ozone Nonattainment Area:

9 Counties: Barnstable, Bristol, Dukes, Essex, Middlesex, Norfolk, Plymouth, Suffolk, and Worcester. (But study focused only on geographic area congruent with that of the Boston MPO.)

Geographic Boundaries of MPO Area:

The Boston MPO covers 101 towns and cities within the larger ozone nonattainment area.

Year:	Nonattainment Area Population:	Average Daily VMT:	Percent Annual Population Growth:	Percent Annual Average Daily VMT Growth:	Average Daily VMT/Capita:
1980	4,945,835				
1990	5,204,103	59,816,200	0.5% ^b		11.5
1995	5,274,317	64,412,700 ^a	0.4% ^c	1.2% ^d	12.2 ^e

^a1996 ^c1990-1995 ^ePer capita rates are calculated using 1995 population and 1996 VMT.

^b1980-1990 ^d1990-1996

Institutions:

MPO: Boston MPO, staffed by the Central Transportation Planning Staff (CTPS)

State Transportation Agency: The Executive Office of Transportation and Construction (EOTC)

State Air Agency: Massachusetts Department of Environmental Protection (DEP)

Summary of Conformity Issues:

1994 – Boston could not pass the build/no-build tests for CO, NO_x and VOCs, due to an error in a spreadsheet supplied to CTPS by DEP for the conformity analysis. The conformity determination was delayed for about two months while the agencies discovered and corrected the problem.

Conformity was also held up in 1994 over fiscal constraint issues. During the approval process for the FY 1995-97 STIP, FHWA's Massachusetts division office cited two fiscal constraint problems. First, FHWA believed that the second year of the STIP (FY 1996) was 100% over-programmed because the state had budgeted the sum of its highway apportionments, plus its unobligated balance. Second, the state was counting on money from a bond bill not yet approved by the legislature to fund a major project during the first two years of the STIP. FHWA and FTA therefore deferred approval of the STIP pending resolution of these issues. Although highway funding was held-up and TIP conformity could not proceed, this was not technically a "conformity lapse," having been caused by a funding dispute between FHWA and the state over the STIP.

1995 – When trying to conform the FY 96-98 TIP, CTPS encountered problems with the build/no-build test for NO_x, VOCs and CO due to a technicality in the way the conformity analysis is calculated. These problems arose because, for some milestone years, the build and no-build scenarios were the same. For example, in analysis of the 1996 milestone year, FY 96 was in both the no-build scenario (because it had already been conformed in the FY 95-97 TIP) and the build scenario. Because there had been no substantial, regionally significant changes made to projects, the analysis showed no decrease in emissions in the build scenario, which is required by the conformity rule. To solve the problem, CTPS added a CMAQ project to the TIP and did an off-model analysis to pass the test.

1997 – The Boston metropolitan region could not pass the NO_x build/no-build test due not to road projects but to high NO_x emissions from diesel commuter trains. However, because the nonattainment area encompasses the entire eastern half of the state, Boston’s conformity analysis is combined with those of nine other MPOs. When Boston’s NO_x emissions were averaged across the entire nonattainment area, passing the NO_x build/no-build test was not a problem.

CHARLOTTE

Pollutant(s):	1990 Classification:
Ozone	Moderate (Redesignated to Attainment 1995)
Carbon Monoxide	Not Classified (Redesignated to Attainment 1995)

Geographic Boundaries of Ozone Nonattainment Area:

2 Counties: Mecklenburg and Gaston.

Geographic Boundaries of MPO Area:

2 Counties: Mecklenburg and Union.

Year:	Nonattainment Area Population:	Average Daily VMT:	Percent Annual Population Growth:	Percent Annual Average Daily VMT Growth:	Average Daily VMT/Capita:
1980	566,838				
1990	686,574	14,515,000	1.9% ^a		21.1
1995	760,939	18,442,000	2.0% ^b	4.9% ^b	24.2

^a1980-1990

^b1990-1995

Institutions:

MPO: Mecklenburg/Union MPO, staffed by the Charlotte Department of Transportation

State Transportation Agency: North Carolina Department of Transportation (NCDOT)

State Air Agency: Department of Environment and Natural Resources (DENR)

Summary of Conformity Issues:

1994 – During its first conformity determination under the 1993 conformity rule, the area found that future VOC and NO_x emission projections derived from the transportation plan were higher than the emission budgets in the ozone maintenance plan. Planners at the state air agency believed that the higher emissions in the transportation plan were due not to an actual increase in pollution, but to the difference between the methods used to calculate VMT in the base year for the emission budgets (using HPMS and other data) and that used to develop the new transportation plan (using the MPO's travel demand models). To rectify this problem, the area developed a reconciliation methodology that applied a corrections factor to the base-year inventories to make them comparable to the 1990 emission levels in the transportation plan. The air agency argued that once the difference in the base-year VMT calculations was reconciled, the area should conform if the emissions growth rate in the transportation plan stayed below the growth rate in the maintenance plan. Although the area passed conformity in 1994 using this methodology, EPA subsequently required that the area develop a technique that adjusted base-year VMT to match the SIP's base-year emissions inventory rather than vice versa, as any adjustments applied to the budget would require a SIP amendment. The state and MPO subsequently accomplished this.

1996 – In 1995, the MPO had decided that a conformity analysis was not required since the projects in the new TIP came from a conforming plan and had not undergone any major changes. Later in the year, however, the air agency discovered an error in its emission budget calculations. When the error was corrected and the new, much lower budgets were used in the 1996 conformity analysis, the area showed substantial exceedances of both the VOC and NO_x emission budgets, especially for the 2005 and 2015 analysis years. Charlotte continued to move forward grandfathered and exempt projects while the MPO, state DOT, and state air agency worked at the staff level to find a solution to this thorny problem.

1997 – Charlotte’s conformity lapsed in January 1997. The area had enough grandfathered projects to continue building through the year with only three projects being held up by the conformity lapse. In late 1997, under pressure from the backers of one of the stalled projects, the Governor directed the transportation and air quality agencies to do whatever was necessary to resolve the lapse. However, by the end of the study period no resolution was forthcoming.

DENVER

Pollutant(s):	1990 Classification:
Ozone	Transitional
Carbon Monoxide	Moderate (reclassified to Serious 1997)
PM ₁₀	Moderate

Geographic Boundaries of Ozone Nonattainment Area:

6 Counties: Adams, Arapahoe, Boulder, Denver, Douglas, and Jefferson.

Geographic Boundaries of MPO Area:

8 Counties: Adams, Arapahoe, Boulder, Clear Creek, Denver, Douglas, Gilpin, and Jefferson.

Year:	Nonattainment Area Population:	Average Daily VMT:	Percent Annual Population Growth:	Percent Annual Average Daily VMT Growth:	Average Daily VMT/Capita:
1980	1,618,461				
1990	1,848,319	39,100,000	1.3% ^b		21.2
1995	2,085,158	50,900,000 ^a	1.7% ^c	4.5% ^d	24.4 ^e

^a1996

^c1990-1995

^ePer capita rates are calculated using 1995 population and 1996 VMT.

^b1980-1990

^d1990-1996

Institutions:

MPO: Denver Regional Council of Governments (DRCOG)

State Transportation Agency: Colorado Department of Transportation (CDOT)

State Air Agency: Colorado Department of Public Health and Environment (CDPHE)

Lead Agency for SIP Planning: Regional Air Quality Council (RAQC)

Summary of Conformity Issues:

1993 – Denver did not have difficulty satisfying the requirements of the interim conformity guidance. However, in anticipation of a more stringent final federal conformity rule, environmental advocacy groups strongly criticized a non-federal project proposed by a public toll authority. The advocacy groups feared that this project, the E-470 segment of a circumferential roadway, would open new land to development, creating more PM₁₀ emissions than planners were forecasting. The transportation agencies also had concerns about emissions from this project and sought assurances that E-470 would not jeopardize the area's ability to demonstrate conformity in the future. Project sponsors eventually agreed to certain specific mitigation measures and created an escrow fund to finance additional mitigation, if that proved necessary.

1994 – During the conformity analysis of the 1994 TIP, transportation planners could not demonstrate that emissions in the final horizon year of the transportation plan (2015) would stay below the 1997 PM₁₀ budget of 44 tpd in the maintenance plan. The area lapsed for almost a year and advanced only grandfathered and exempt projects while it undertook the difficult and contentious task of amending the PM₁₀ budgets. Working together, transportation and regional air quality planners determined that the regional PM₁₀ emissions budget could be raised from 44 to 60 tpd – without either imposing new controls on stationary and area sources or causing violations of the NAAQS. This could be accomplished by adopting mitigation measures that would reduce 2015 emissions to the 60 tpd level in the Denver core, while allowing the permissible level of PM₁₀

emissions to rise to the 60 tpd level in the suburban areas of the region. This proposal provoked months of controversy and criticism from environmental and public health advocates regarding the health effects of increased particulate levels. The state environmental agency approved this increase for only three years, which would have created conformity problems later on. The state legislature intervened to permit the increase for the full SIP period. The area was then able to conform the plan and TIP in 1995.

1996 – Denver had difficulties in 1996 demonstrating conformity for the annual TIP revision. Having upgraded its transportation demand modeling, DRCOG found additional amounts of forecasted VMT and hence higher levels of PM₁₀ emissions from re-entrained dust and from NO_x precursors of PM₁₀. To resolve the PM₁₀ problems, DRCOG negotiated agreements with local governments to alter their street sanding and sweeping practices to reduce the dust kicked up by automobiles. To deal with the NO_x problems the air agency, after discussions with stakeholders, committed to lower I/M NO_x cut-points after 2001.

In 1996, Denver area environmentalists raised fiscal constraint issues during the conformity process. Arguing that the MPO was mitigating emissions from the E-470 tollway project by claiming credit for transit expansion projects that did not have secure funding, they threatened to sue on the grounds that the plan was not adequately fiscally constrained. The MPO counter-argued that the emission benefits of the transit projects were so small that the projects could be totally removed from the plan without threatening the conformity determination. Ultimately, no litigation was filed, and there was no delay in the conformity determination.

HOUSTON

Pollutant(s): Ozone
1990 Classification: Severe

Geographic Boundaries of Ozone Nonattainment Area:

8 Counties: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller

Geographic Boundaries of MPO Area:

13 Counties: Austin, Brazoria, Chambers, Colorado, Fort Bend, Galvston, Harris, Liberty, Matagorda, Montgomery, Walker, Waller, and Wharton.

Year:	Nonattainment Area Population:	Average Daily VMT:	Percent Annual Population Growth:	Percent Annual Average Daily VMT Growth:	Average Daily VMT/Capita:
1980	3,118,480				
1990	3,731,029	90,400,000	1.8% ^a		24.2
1995	4,164,393	105,800,000	2.0% ^b	3.2% ^b	25.4

^a1980-1990 ^b1990-1995

Institutions:

MPO: Houston-Galveston Area Council (HGAC)

State Transportation Agency: Texas Department of Transportation (TxDOT)

State Air Agency: Texas Natural Resources Conservation Commission (TNRCC)

Summary of Conformity Issues:

1994 - Houston had difficulty passing the VOC budget test. As a result of this, and also due to fiscal constraint difficulties, the large Grand Parkway project was scaled back and spread out over several years.

In 1994, Houston was also unable to pass the build/no-build test for NO_x for ozone and, as a result, conformity was delayed while waiting for a NO_x waiver.

1995 - Houston was granted a temporary NO_x waiver until 1997.

1997 - Houston attempted its first conformity analysis using a 1999 VOC budget which tightened the emissions cap from the 1996 budget level. The conformity analysis showed that at the end of the twenty year planning horizon, Houston would not be below the 1999 levels for VOCs. By switching to modeled VMT estimates rather than HPMS VMT and by correcting for an over-estimation of VMT on local streets, the area revised the budgets and demonstrated conformity.

MILWAUKEE

Pollutant(s): Ozone
1990 Classification: Severe 2

Geographic Boundaries of Ozone Nonattainment Area:

6 Counties: Kenosha, Milwaukee, Ozaukee, Racine, Washington, and Waukesha.

Geographic Boundaries of MPO Area:

7 Counties: Kenosha, Milwaukee, Ozaukee, Racine, Walworth, Washington, and Waukesha.

Year:	Nonattainment Area Population:	Average Daily VMT:	Percent Annual Population Growth:	Percent Annual Average Daily VMT Growth:	Average Daily VMT/Capita:
1980	1,693,289				
1990	1,735,364	33,072,000	0.2% ^a		19.1
1995	1,780,769	35,900,000	0.3% ^b	1.7% ^b	20.2

^a1980-1990 ^b1990-1995

Institutions:

MPO: Southeastern Wisconsin Regional Planning Commission (SEWRPC)

State Transportation Agency: Wisconsin Department of Transportation (WisDOT)

State Air Agency: Wisconsin Department of Natural Resources (DNR)

Summary of Conformity Issues:

The most significant conformity issue which confronted the Milwaukee area was passing the build/no-build tests, but this never caused the area a major problem or delay in making its conformity determinations. The Milwaukee area was helped in dealing with conformity by the results of a broad-based SIP planning task force was established through which all actors came to the table (including both public and private interests from mobile, stationary, and area sources) to evaluate various strategies for reducing emissions within each source category; to consider carefully the trade-offs among mobile, stationary and area source controls, and thus to set budgets with an understanding of their future implications.

1995 - Milwaukee was saved from a conformity lapse by the February 1995 conformity amendments which increased the time for areas to submit complete SIPs to two years, effectively aligning the SIP conformity lapse with imposition of CAAA highway sanctions.

NEW YORK

Pollutant(s):	1990 Classification:
Ozone	Severe 2
Carbon Monoxide	Moderate 2
PM ₁₀	Moderate

Geographic Boundaries of Ozone Nonattainment Area:

10 Counties: Bronx, Kings, Nassau, New York, Orange, Queens, Richmond, Rockland, Suffolk, and Westchester.

Geographic Boundaries of MPO Area:

10 Counties: Bronx, Kings, Nassau, New York, Putnam, Queens, Richmond, Rockland, Suffolk and Westchester.

Year:	Nonattainment Area Population:	Average Daily VMT:	Percent Annual Population Growth:	Percent Annual Average Daily VMT Growth:	Average Daily VMT/Capita:
1980	11,063,184				
1990	11,379,764	133,577,052	0.3% ^a		11.7
1995	11,462,260	132,284,161	0.2% ^b	-0.2% ^{b,c}	11.5

^a1980-1990 ^b1990-1995 ^cNYMTC does not regard the negative VMT rate for this period as indicative of future trends.

Institutions:

MPO: New York Metropolitan Transportation Council (NYMTC)

State Transportation Agency: New York State Department of Transportation (NYSDOT)

State Air Agency: New York State Department of Environmental Conservation (DEC or EnCon)

Summary of Conformity Issues:

1994 - New York demonstrated conformity using qualitative analysis and sketch planning techniques.

1995 - New York did not have the required network model in operation by the January deadline. The region advanced only exempt and grandfathered projects in 1995. New York's inability to develop the required modeling capacity stemmed in part from a state-mandated hiring freeze, which made adding technical staff or outside consultants impossible.

1996 - The network based models continued to be non-operational through 1996. To compensate, the area sought and received a third-year extension of its 1994 TIP, continuing to advance only exempt and grandfathered projects.

1997 - An interim network model was approved and New York was able to complete the required conformity analysis to adopt a new TIP.

PHILADELPHIA

Pollutant(s): Ozone
Carbon Monoxide

1990 Classification: Severe 1
Moderate 1 (Redesignated to Attainment 1996)

Geographic Boundaries of Ozone Nonattainment Area:
5 Counties: Bucks, Chester, Delaware, Montgomery, and Philadelphia.

Geographic Boundaries of MPO Area:
9 Counties: Bucks, Chester, Delaware, Montgomery, and Philadelphia counties in Pennsylvania; Burlington, Camden, Gloucester, and Mercer in New Jersey.

Year:	Nonattainment Area Population:	Average Daily VMT:	Percent Annual Population Growth:	Percent Annual Average Daily VMT Growth:	Average Daily VMT/Capita:
1980	3,682,450				
1990	3,728,991	64,565,000	0.1% ^b		17.3
1995	3,731,703	70,195,000 ^a	0.0% ^c	1.4% ^d	18.8 ^c

^a1996 ^c1990-1995 ^ePer capita rates are calculated using 1995 population and 1996 VMT.
^b1980-1990 ^d1990-1996

Institutions:

MPO: Delaware Valley Regional Planning Commission (DVRPC)
State Transportation Agency: Pennsylvania Department of Transportation (PennDOT)
State Air Agency: Pennsylvania Department of Environmental Protection (DEP)

Summary of Conformity Issues:

The most significant conformity issue which confronted the Philadelphia area was passing the build/no-build tests, but this never caused the area a major problem or delay in making its conformity determinations.

1995 - Philadelphia was saved from a conformity lapse by the February 1995 conformity amendments which increased the time for areas to submit complete SIPs to two years, effectively aligning the SIP conformity lapse with imposition of CAAA highway sanctions.

PHOENIX

Pollutant(s):	1990 Classification:
Ozone	Moderate (Reclassified Serious in 1997)
Carbon Monoxide	Moderate (Reclassified Serious in 1996)
PM ₁₀	Moderate (Reclassified Serious in 1996)

Geographic Boundaries of Ozone Nonattainment Area:

2 Counties: Maricopa² and Pinal.

Geographic Boundaries of MPO Area:

1 County and Two Tribal Communities: Maricopa County, the Gila River Indian Community, the Salt River Pima Maricopa Indian Community.

Year:	Nonattainment Area Population:	Average Daily VMT:	Percent Annual Population Growth:	Percent Annual Average Daily VMT Growth:	Average Daily VMT/Capita:
1980	1,600,093				
1990	2,238,498	49,600,000	3.4% ^a		22.2
1995	2,563,582	57,000,000	3.2% ^b	2.8% ^b	22.2

^a1980-1990 ^b1990-1995

Institutions:

MPO and Lead Agency for SIP Development: Maricopa Association of Governments (MAG)

State Transportation Agency: Arizona Department of Transportation (ADOT)

State Air Agency: Arizona Department of Environmental Quality (DEQ)

Summary of Conformity Issues:

1994 - Realizing that it would not be able to pass the build/no-build test for NO_x as a precursor to ozone, Phoenix applied for a NO_x waiver. This application process delayed the area's conformity determination by several months during which time MAG advanced only exempt and grandfathered projects. Phoenix was eventually granted a permanent waiver for NO_x.

1995 - Model enhancements to the area's existing network model briefly delayed conformity determination. MAG obtained the assistance of outside consultants for several years in order to improve its modeling capability.

²Ozone nonattainment area only includes those parts of Maricopa county which are included in the Maricopa Association of Governments (MAG).

PORTLAND

Pollutant(s):	1990 Classification:
Ozone	Marginal (Redesignated to Attainment 1997)
Carbon Monoxide	Moderate 1 (Redesignated to Attainment 1997)

Geographic Boundaries of Ozone Nonattainment Area:

3 Partial Counties: Clackamas, Multnomah, and Washington.

Geographic Boundaries of MPO Area:

3 Counties: Clackamas, Multnomah, and Washington.

Year:	Nonattainment Area Population:	Average Daily VMT:	Percent Annual Population Growth:	Percent Annual Average Daily VMT Growth:	Average Daily VMT/Capita:
1980	1,050,418				
1990	1,174,291	20,413,000	1.1% ^a		17.4
1995	1,300,729	22,437,000	1.4% ^b	1.9% ^b	17.2

^a1980-1990 ^b1990-1995

Institutions:

MPO: Metropolitan Service District (Metro)

State Transportation Agency: Oregon Department of Transportation (ODOT)

State Air Agency: Oregon Department of Environmental Quality (DEQ)

Summary of Conformity Issues:

1994 - Portland experienced difficulties in interpreting the build/no-build requirements and as a result, the MPO incorrectly assigned projects to the baseline and action scenarios, invalidating the conformity analysis. When the mistakes were uncovered, the area decided to let conformity lapse for a year rather than expending the resources to re-do the analysis. All current projects were either exempt or grandfathered and therefore not affected by the conformity lapse.

1996- In developing its 1996 ozone attainment demonstration/maintenance plan, Portland took a proactive approach to future conformity determinations by setting emissions budgets for ozone precursors for the years beyond the milestone year of the maintenance plan. Quantifying its safety margin between total emissions in the attainment year (1992) and 2006, it gradually allocated part of its safety margin to create somewhat larger mobile source emission budgets for 2010, 2015, and 2020. This established a budget to accommodate some possible future VMT growth in the area.

Portland placed TCMs in the SIP specifically to ensure their implementation. Other areas were reluctant to place numerous TCMs into their SIPs as their presence could trigger a lapse of conformity if the area could not demonstrate timely implementation. Facing regular challenges in the legislature on the state growth management law, Portland included its urban growth boundary and related transit measures in the SIP to protect them from possible changes in the political climate.

SALT LAKE CITY

Pollutant(s):	1990 Classification:
Ozone	Moderate (Redesignated to Attainment 1997)
Carbon Monoxide	Not Classified
PM ₁₀	Moderate

Geographic Boundaries of Ozone Nonattainment Area:

2 Counties: Davis and Salt Lake.

Geographic Boundaries of MPO Area:

5 Counties: Davis, Morgan, Tooele, Salt Lake, and Weber.

Year:	Nonattainment Area Population:	Average Daily VMT:	Percent Annual Population Growth:	Percent Annual Average Daily VMT Growth:	Average Daily VMT/Capita:
1980	765,606				
1990	913,897	20,130,479	1.8% ^b		22.0
1995	1,023,7659	25,864,357 ^a	2.0% ^c	4.3% ^d	25.3 ^e

^a1996 ^c1990-1995 ^ePer capita rates are calculated using 1995 population and 1996 VMT.

^b1980-1990 ^d1990-1996

Institutions:

MPO: Wasatch Front Regional Council (WFRC)

State Transportation Agency: Utah Department of Transportation (UDOT)

State Air Agency: Utah Department of Environmental Quality (DEQ)

Summary of Conformity Issues:

1993 - Salt Lake City submitted an attainment demonstration and maintenance plan for ozone rather than put forth a 15% SIP. Conformity was frozen until the SIP was found complete.

1994 - The area had difficulty passing the NO_x budget test for PM₁₀. This was partially due to the region's previous SIP for PM₁₀ which had been developed in the late 1980's before the budget concept for pollutants or the conformity procedures. Additionally, the city's previous budget for NO_x had used MOBILE 4 while the conformity analysis mandated MOBILE 5, which calculated much higher emissions from mobile sources. The area's conformity lapsed from November 1994 to October 1995. Advancing only grandfathered and exempt projects, the area tried to convince EPA that the budget problem was not the result of real increases in emissions but of differences in the way MOBILE 4 and MOBILE 5 projected NO_x emissions. EPA was eventually persuaded and has since allowed the Salt Lake City area to use MOBILE 4 in the conformity analysis for NO_x (as a precursor of PM₁₀, but not of ozone).

In 1994, the area was also unable to show that at the end of the 2005 planning horizon the city would be within the approved levels for NO_x for ozone. To correct this situation, the area extended the maintenance plan to 2015. By adding ten years to the budget, the area was able to demonstrate that, without adding any additional control measures to the SIP, NO_x emissions could rise after the first ten years of the plan without causing a violation of the NAAQS.

1995 - With the extended plan for ozone maintenance, the area was able to demonstrate conformity and has not experienced conformity problems since that time.

SAN FRANCISCO

Pollutant(s):	1990 Classification:
Ozone	Moderate (Redesignated to Attainment 1995, Proposed Reclassification to Nonattainment, 1997)
Carbon Monoxide	Moderate 1 (Redesignated to Attainment 1998)

Geographic Boundaries of Ozone Nonattainment Area:

9 Partial Counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma.

Geographic Boundaries of MPO Area:

9 Counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma.

Year:	Nonattainment Area Population:	Average Daily VMT:	Percent Annual Population Growth:	Percent Annual Average Daily VMT Growth:	Average Daily VMT/Capita:
1980	5,179,759				
1990	6,020,147	113,389,000	1.5% ^a		18.8
1995	6,302,933	123,666,900	1.3% ^b	1.8% ^b	19.6

^a1980-1990 ^b1990-1995

Institutions:

MPO: Metropolitan Transportation Commission (MTC)

State Transportation Agency: California Department of Transportation (Caltrans)

State Air Agency: California Environmental Protection Agency (CalEPA)

Joint SIP Development Responsibility: Bay Area Air Quality Management District (BAAQMD), Association of Bay Area Governments (ABAG), and MTC

Summary of Conformity Issues:

1989- The Sierra Club Legal Defense and other environmental advocates brought a litigation challenge to MTC's modeling practices. The extensive model upgrades that MTC instituted as a result of settling the suit influenced the national politics reflected in the conformity requirements, and they positioned MTC to meet those requirements once 1993 regulations were promulgated.

1996 - In accordance with the settlement of a previous suit, MTC was obligated to incorporate into its ozone maintenance plan several TCMs which originated in the area's 1982 SIP. Due to the imprecise definitions of some of those TCMs, the BAAQMD and the EPA regional office questioned their timely implementation. In response, MTC supplied more detailed descriptions of the TCMs and the timelines for their implementation. MTC's response satisfied the air district and EPA that the conformity requirement was being met.

APPENDIX III: INTERVIEW SUBJECTS BY STUDY SITE

LINKING TRANSPORTATION AND AIR QUALITY PLANNING: IMPLEMENTATION OF THE TRANSPORTATION CONFORMITY REGULATIONS IN 15 NONATTAINMENT AREAS

Arnold M. Howitt and Elizabeth M. Moore

Taubman Center for State and Local Government
John F. Kennedy School of Government
Harvard University

March 1999

*A Report to the
U.S. Environmental Protection Agency
and the
Federal Highway Administration,
U.S. Department of Transportation*

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INTERVIEW SUBJECTS BY STUDY SITE

ATLANTA

Atlanta Regional Commission

Patti Schropp, Transportation Planning Division
Denise Wright, Transportation Planning Division
Jane Davis Hayse, Transportation Planning Division
Wayne Hill, ARC Member; Chair, Gwinnett County Board of Commissioners

Georgia Department of Transportation

Frank Danchetz, Chief Engineer

Georgia Department of Natural Resources

Ron Methier, Chief, Air Protection Branch, Environmental Protection Division

Metro Atlanta Chamber of Commerce

Jeff Rader, Transportation Coordinator

Georgia Power Company

Chris Hobson, Manager of Environmental Affairs
Myles Smith, Manager, Urban Affairs Department

Environmental Defense Fund

Michael Replogle, Co-Director, Transportation Project

Georgia Conservancy

Eric Meyer, Environmental Policy Analyst

Automobile Association of America

Ted Allred, Regional Director

Federal Highway Administration

Bob Radics, Intermodal Planning Engineer Manager, Georgia Division
John Humeston, Director, Planning and Program Development, Region 4

U.S. Environmental Protection Agency

Eric Maurer, Environmental Engineer, Mobile Source Planning Unit, Air Programs
Branch, Region 4
Kay Prince, Chief, Regulatory Planning Section, Air Planning Branch, Region 4
Kelly Sheckler, Environmental Scientist, Air Planning Branch, Region 4

BALTIMORE

Baltimore Metropolitan Council

Harvey Bloom, Director of Transportation

John Wing, Chair, Citizen's Advisory Committee

Steven Horn, Member, Transportation Steering Committee (the MPO); Chief of Planning,
Carroll County Board of Commissioners

Maryland Department of Transportation

Missy Drissel Cassidy, Manager, Air Quality Planning, Office of Systems Planning and
Evaluation

Fred Rappe, Director, Systems of Planning and Evaluation

Rick Sheckells, Manager, Air Quality Planning, Office of Systems Planning and Evaluation

Howard Simons, Systems Analyst, Office of Systems Planning and Evaluation

Maryland Department of the Environment

Diane Franks, Chief, Air Quality Planning, Air and Radiation Management Administration

Environmental Defense Fund

Michael Replogle, Co-Director, Transportation Project

Federal Highway Administration

Mario Jorquera, Air Quality Specialist, Region 3

Michelle Waxman-Johnson, Transportation Planner, Maryland Division

U.S. Environmental Protection Agency

Paul Wentworth, Environmental Engineer, Ozone and Mobile Sources Section, Region 3

BOSTON

Metropolitan Area Planning Council

Dan Fortier, Chief Transportation Planner

Central Transportation Planning Staff

Craig Leiner, Manager of Certification Activities

Anne McGahan, Senior Planner

Karl Quackenbush, Deputy Technical Director of Operations

Executive Office of Transportation and Construction

Dan Beagan, Director, Bureau of Transportation Planning and Development

Massachusetts Bay Transportation Authority

Andrew Brennan, Manager of Environmental Affairs

Anne Galbraith, Deputy Director of Planning

Executive Office of Environmental Affairs

Sonia Hamel, Director of Air Policy and Planning

Massachusetts Department of Environmental Protection

Christine Kirby, Manager, Transportation Planning Unit, Division of Air Quality Control

Conservation Law Foundation

Steve Burrington, Senior Attorney

Federal Highway Administration

Ed Silva, Planning and Research Engineer, Massachusetts Division

U.S. Environmental Protection Agency

Donald Cooke, Environmental Scientist, Region 1

CHARLOTTE

City of Charlotte Department of Transportation

William Finger, Assistant Director of Transportation

David McDonald, Transportation Planner

Joseph McLelland, Transportation Planner

North Carolina Department of Transportation

David Hyder, Charlotte Area Coordinator and Air Quality Specialist, Statewide Planning Branch

Marion Ron Poole, Branch Manager, Office of Statewide Planning

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North Carolina General Assembly (State Legislature)

George Givens, Staff Attorney, Environmental Review Commission

Sierra Club

Molly Diggins, State Chair

William Holman, Lobbyist

John Tallmadge, Transportation Planner

Environmental Defense Fund

Michael Replogle, Co-Director, Transportation Project

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Kay Batey, Planning and Program Development Engineer, North Carolina Division

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John Humeston, Director, Planning and Program Development, Region 4
John Schrohenloher, Planning Engineer, North Carolina Division
Joe Stevens, Planning Engineer, North Carolina Division

U.S. Environmental Protection Agency

Eric Maurer, Environmental Engineer Mobile Source Planning Unit, Air Programs Branch,
Region 4
Kay Prince, Chief, Regulatory Planning Section, Air Planning Branch, Region 4
Kelly Sheckler, Environmental Scientist, Air Planning Branch, Region 4

CHICAGO

Chicago Area Transportation Study

Linda Bolte, Deputy Planning
Andrew Plummer, Deputy Director
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Bob Kaiser, Consultant; Senior Project Manager, Michael Baker, Jr., Inc.

Chicago Department of Transportation

Luann Hamilton, Assistant Director of Project Development, Administration and Planning
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Illinois Department of Transportation

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Illinois Environmental Protection Agency

Toby Frevert, Manager, Air Quality Planning Section, Bureau of Air
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Chicago Transit Authority

Marty Johnson, Vice President, Capital Investment Department

Illinois State Toll Highway Authority

Ralph Wehner, Executive Director

City of Batavia

Jeff Schielke, Mayor

METRA

Jack Groner, Director, Grant Development and Programming
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Business and Professional People in the Public Interest

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Center for Neighborhood Technology

Jackie Grimshaw, Coordinator

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Federal Highway Administration

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U.S. Environmental Protection Agency

Patricia Morris, Environmental Scientist, Air and Radiation Division, Region 5

DENVER

Denver Regional Council of Governments

Jeffrey May, Highway and Transit Planning Coordinator

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Colorado Department of Transportation

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Regional Transportation District

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Colorado Department of Public Health and Environment

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Colorado Environmental Coalition

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Environmental Defense Fund

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Robin Smith, Air Quality, Urban Transportation Planner, Region 8

U.S. Environmental Protection Agency

Jeff Houk, Environmental Engineer Air Program, Region 8

HOUSTON

Houston-Galveston Area Council

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Steve Howard, Program Director

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City of Houston

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Texas Department of Transportation

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Sierra Club

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SALT LAKE CITY

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Mountainland Association of Governments

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Sierra Club

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Sciences Library, University of Utah

Federal Highway Administration

Robin Smith, Air Quality-Urban Transportation Planner

U.S. Environmental Protection Agency

Jeff Houk, Environmental Engineer, Air Program, Region 8

SAN FRANCISCO

Metropolitan Transportation Commission

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David Tannehill, Senior Planner

Alameda County

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Contra Costa Transportation Authority

Bob McCleary, Executive Director

San Francisco Transportation Authority

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California Department of Transportation

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California State Senate Transportation Committee

Mehdi Morshed, Staff Director

California Air Resources Board

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Bay Area Air Quality Management District

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Jean Rogenkamp, Manager, Planning and Transportation Section

International Institute for Surface Transportation Policy Studies

Rod Diridon, Executive Director

Regional Alliance for Transit

Matt Williams, Investment Adviser

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Sierra Club Legal Defense Fund

William S. Curtiss, Managing Attorney, San Francisco Regional Office

Sierra Club

John Holtzclaw

Federal Highway Administration

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U.S. Environmental Protection Agency

Mark Brucker, Environmental Scientist, Mobile Sources Section, Region 9

NATIONAL

Federal Highway Administration, U.S. Department of Transportation

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Environmental Protection Agency

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Meg Patulski, Office of Mobile Sources
Kathryn Sargent, Office of Mobile Sources
Laura Voss, Office of Mobile Sources

Environmental Defense Fund

Michael Replogle, Co-Director, Transportation Project
Robert Yuhnke, Attorney

Surface Transportation Policy Project

Hank Dittmar, Executive Director

**APPENDIX IV: SOURCES OF POPULATION
AND TRANSPORTATION DATA**

**LINKING TRANSPORTATION AND AIR QUALITY PLANNING:
IMPLEMENTATION OF THE
TRANSPORTATION CONFORMITY REGULATIONS
IN 15 NONATTAINMENT AREAS**

Arnold M. Howitt and Elizabeth M. Moore

Taubman Center for State and Local Government
John F. Kennedy School of Government
Harvard University

March 1999

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Federal Highway Administration,
U.S. Department of Transportation*

Publication Number
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Appendix IV

SOURCES OF POPULATION AND TRANSPORTATION DATA

Atlanta

Population Source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties in the ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/13.html> on December 17, 1998.

VMT Source: Atlanta Regional Commission, personal correspondence with Chris Chovan.

Baltimore

Population Source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties within ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/24.html> on December 17, 1998.

VMT Source: Maryland State Highway Administration, "A Baltimore Region Daily Vehicle Miles of Travel (In Millions of Miles by Jurisdiction for All Systems)" as supplied by Matthew M. De Rouville of Baltimore Metropolitan Council.

Boston

Population Source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties in the ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/25.html> on December 17, 1998.

VMT Source: Boston MPO, personal correspondence with Ann McGahan, staff member of Central Transportation Planning Staff.

Charlotte

Population Source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties in the ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/37.html> on December 17, 1998.

VMT Source: City of Charlotte, personal correspondence with Joseph McLelland, transportation planner.

Chicago

Population Source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties in the ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/17.html> on December, 17, 1998.

VMT Source: Chicago Area Transportation Study, personal correspondence with Eugene Ryan, Associate Executive Director.

Denver

Population Source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties in the ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/18.html> on December 17, 1998.

VMT Source: Denver Regional Council of Governments, personal correspondence with Christopher Primus.

Houston

Population Source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties in the ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/48.html> on December 17, 1998.

VMT Source: Houston-Galveston Area Council, Personal correspondence with Jacquie Lentz, chief air quality planner.

Milwaukee

Population Source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties in the ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/55.html> on December 17, 1998.

VMT Source: Southeastern Wisconsin Regional Planning Commission, personal correspondence with Ken Yunker, Assistant Director.

New York City

Population Source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties in the ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/36.html> on December 17, 1998.

VMT Source: New York Metropolitan Transportation Council, Personal correspondence with Mary Vogel, staff member.

Northern New Jersey

Population Source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties in the ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/34.html> on December 17, 1998.

VMT Source: North Jersey Transportation Planning Authority, Personal correspondence with Julia Zhou, manager of regional and sub-regional modeling.

Philadelphia

Population Source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties in the ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/42.html> on December 17, 1998.

VMT Source: Delaware Valley Regional Planning Commission, personal correspondence with Ronald Roggenburk.

Phoenix

Population source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties in ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/04.html> on December 17, 1998.

VMT Source: Maricopa Association of Governments, personal correspondence with Cathy Arthur.

Portland

Population Source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties in ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/41.html> on December 17, 1998.

VMT Source: METRO Transportation Department, personal correspondence with Terry Whisler, senior transportation planner.

Salt Lake City

Population Source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties in ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/49.html> on December 17, 1998.

VMT Source: Wasatch Front Regional Council, personal correspondence with Kip Billings, transportation engineer.

San Francisco

Population Source: U.S. Census Bureau, Total Resident Population from 1996 USA County General Profile of all counties in ozone nonattainment area. Accessed from <http://www.census.gov/datamap/www/06.html> on December 17, 1998.

VMT Source: Metropolitan Transportation Commission, "San Francisco Bay Area, County & Regional Vehicles Miles of Travel, Population and Employment: 1990-1995." Accessed from http://www.mtc.ca.gov/facts_and_figures/misc/VMT9095.html on July 13, 1998.

APPENDIX V: REPORT AUTHORS

LINKING TRANSPORTATION AND AIR QUALITY PLANNING: IMPLEMENTATION OF THE TRANSPORTATION CONFORMITY REGULATIONS IN 15 NONATTAINMENT AREAS

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