Final Conformity Analysis for the Federally Approved 2012–2015 FMATS Transportation Improvement Program (TIP)

prepared for:

Fairbanks Metropolitan Area Transportation System

Approved August 24, 2011

prepared by:

Sierra Research, Inc.
1801 J Street
Sacramento, California 95811
(916) 444-6666

FINAL REPORT

Final Conformity Analysis for the Federally Approved 2012–2015 FMATS Transportation Improvement Program (TIP)

prepared for:

Fairbanks Metropolitan Area Transportation System

July 18, 2011

Principal authors:

Thomas R. Carlson
Robert G. Dulla

Sierra Research, Inc.
1801 J Street
Sacramento, CA 95811
(916) 444-6666

Final Conformity Analysis for the Federally Approved 2012–2015 FMATS Transportation Improvement Program (TIP)

Table of Contents

Page

List of Tables

List of Figures

Figure | Page

1. EXECUTIVE SUMMARY

This report presents the carbon monoxide (CO) and fine particulate matter ($PM_{2.5}$) Conformity Analysis for the federally approved 2012–2015 FMATS Transportation Improvement Program (TIP). The Fairbanks Metropolitan Area Transportation System (FMATS) is the designated Metropolitan Planning Organization (MPO) for the urbanized portion of the Fairbanks North Star Borough (FNSB), including the cities of Fairbanks and North Pole, Alaska, and is responsible for regional transportation planning. The TIP is a four-year spending plan for all federal highway funds anticipated for the FMATS Area for Federal Fiscal Years (FFY) 12-15. The associated Metropolitan Transportation Plan (MTP) is a 25-year look at transportation needs and potential solutions through FFY 2035.

The 2012–2015 TIP and the associated MTP have been financially constrained in accordance with the requirements of 40 CFR 93.108 and consistent with the U.S. DOT metropolitan planning regulations (23 CFR Part 450). A discussion of financial constraint and funding sources is included in the TIP and MTP documents.

The U.S. Environmental Protection Agency (EPA) originally designated a portion of the Fairbanks North Star Borough as a "Moderate Non-Attainment Area" for CO. In March 1998, EPA reclassified Fairbanks to a "Serious CO Non-Attainment Area" as mandated by the 1990 Clean Air Act Amendments since it failed to attain the ambient CO standard by the end of 1995. Since that time, the area has made substantial progress in reducing CO emissions and ambient levels. Effective April 5, 2002, EPA made a determination that the Fairbanks area had attained the NAAQS for carbon monoxide. The State submitted an Air Quality Maintenance Plan on June 21, 2004, and EPA made a formal "CO Maintenance Area" designation approving this plan on September 27, 2004. Fairbanks has not recorded an exceedance of the ambient CO standard since 2000. The Maintenance Plan has been amended several times since the 2004 submission. The most recent revisions were adopted by the State on April 4, 2008.[*] Those revisions included a decision to terminate the Fairbanks I/M Program at the end of 2009. On March 22, 2010, EPA approved[†] this revised version of the Maintenance Plan. Thus, it represents the source of the latest motor vehicle emission budgets for the CO conformity determination.

EPA designated Fairbanks nonattainment for the 2006 $PM_{2.5}$ standard, effective December 14, 2009. Conformity for the $PM_{2.5}$ standard applies one year after the effective date (December 14, 2010). EPA published the Transportation Conformity Rule $PM_{2.5}$ and PM_{10} Amendments on March 24, 2010; the rule became effective on April 23,

[*] http://www.dec.state.ak.us/air/sip.htm
[†] Federal Register, Vol. 75, No. 54, March 22, 2010.

2010[*] (EPA, 2010a). This PM Amendments Final Rule amends the conformity regulation to address the 2006 $PM_{2.5}$ national ambient air quality standard (NAAQS). This analysis demonstrates that the criteria specified in the federal transportation conformity rule for a conformity determination are satisfied by the TIP and MTP. A finding of conformity for the 2012–2015 FMATS TIP is therefore supported.

Consultation occurred in April and May 2011 on the proposed methodology for the conformity analysis for the 2012-2015 TIP. Issues addressed in those consultations included models, associated methods, and assumptions for use in regional emissions analyses; and the basic steps for completing the conformity demonstration. As described in greater detail in the following sub-section, the applicable conformity tests differed for $PM_{2.5}$ and CO; thus, separate methodologies were developed that addressed the requirements of each test and were approved by the interagency consultation participants.

The applicable Federal criteria or requirements for conformity determinations, the conformity tests applied, the results of the conformity assessment, and an overview of the organization of this report are summarized below.

FHWA has developed a Conformity Checklist (included in Appendix A) that contains the required items to complete a conformity determination. Appropriate references to these items are noted on the checklist.

1.1 Conformity Tests

The conformity tests specified in the federal transportation conformity regulation are (1) the emissions budget test, and (2) the interim emission test. If there is no approved air quality plan for a pollutant for which the region is in nonattainment or no emission budget has been found to be adequate for transportation conformity purposes, the interim emission test applies.

At this time Fairbanks has an approved air quality plan for CO, but the State has yet to complete and obtain EPA approval of a State Implementation Plan (SIP) for $PM_{2.5}$. (The $PM_{2.5}$ SIP for Fairbanks is currently scheduled to be completed and submitted to EPA for approval by December 2012.) Thus, the emission budget test applies to CO and the interim emission test applies to $PM_{2.5}$ as described separately below.

CO Conformity – The current CO emission budgets were established in the Maintenance Plan for calendar years 2006, 2010, and 2015 (the horizon year of the Maintenance Plan). Conformity is demonstrated if emissions from the proposed transportation system do not exceed these budgets. The budgets were based on the AKMOBILE6 vehicle emission factor model. (AKMOBILE6 is a modified version of MOBILE6.2 that EPA has approved for use in Alaska to address vehicle operating patterns unique to the state such as warm-up idling and plug-in use that is not handled by MOBILE).

[*] U.S. Environmental Protection Agency, 2010. 40 CFR Part 93. "Transportation Conformity Rule $PM_{2.5}$ and PM_{10} Amendments; Final Rule." Federal Register, March 24, 2010, Vol. 75, No. 56, p. 14260.

Although EPA has recently developed a successor to MOBILE6.2 called MOVES, the agency has given MPOs a two-year transition grace period that extends until March 2012 to allow agencies to use either MOBILE6.2 or MOVES for regional conformity analyses.

Since the existing budgets are based on AKMOBILE6, Fairbanks has to update its existing CO Maintenance Plan using MOVES and get EPA approval of the revised Plan before MOVES can be used for subsequent regional conformity analysis for CO. The Alaska Department of Environmental Conservation (ADEC) and FNSB are currently working to develop a MOVES-based update of the CO Maintenance Plan, but it has not been finalized and submitted to EPA for approval.)

Thus, AKMOBILE6 was used to prepare the CO emission estimates for this conformity determination for consistent comparison to the applicable AKMOBILE6-based emission budgets.

$PM_{2.5}$ Conformity – For areas without an approved air quality plan (and emission budgets), conformity may be demonstrated if the emissions from the proposed transportation system are either less than or no greater than baseline year motor vehicle emissions in a given area (see Section 93.119). $PM_{2.5}$ nonattainment areas may also elect to use the "build-no-greater-than-no-build test." Conformity may also be demonstrated if the emissions from the proposed transportation system ("build" scenario) are less than or equal to emissions from the existing transportation system ("no-build" scenario).

The rule allows $PM_{2.5}$ nonattainment areas to choose between the two interim emissions tests each time that they determine conformity before adequate or approved $PM_{2.5}$ SIP budgets are established. However, the same test must be used for each analysis year in a given conformity determination.

A $PM_{2.5}$ conformity determination for the FMATS LRTP was prepared in October 2010 using MOVES. Unlike CO, a decision was made to transition to a MOVES-based conformity analysis because the conformity test for $PM_{2.5}$ was not based on budgets developed using an earlier model. That effort demonstrated that emissions in future years (2010, 2015, 2025 and 2035) would not exceed 2008 base year levels. During interagency consultation, it was agreed that the same methodology should be used to prepare a $PM_{2.5}$ conformity determination for the 2012-2015 TIP that covered both directly emitted $PM_{2.5}$ (tailpipe, brake wear, and tire wear) and NOx (the only precursor pollutant requiring a determination at this time).

Thus, FMATS chose to use the "no-greater-than-2008 emissions" test for $PM_{2.5}$ (and precursor NOx emissions) using EPA's latest MOVES2010a vehicle emissions model.

1.2 Results of the Conformity Analysis

A regional emissions analysis was conducted to meet the CO and $PM_{2.5}$ conformity requirements. All analyses were conducted using the latest planning assumptions and emissions models. The major conclusions of the FMATS Conformity Analysis are outlined below.

- Total regional vehicle-related CO emissions associated with implementation of the 2012-2015 TIP are lower than the applicable Maintenance Plan budgets for all of the analysis years: 2010, 2015, 2025, and 2035. Thus, the emissions budget tests for CO are satisfied.

- Total regional vehicle-related $PM_{2.5}$ and NOx precursor emissions associated with implementation of the TIP for the analysis years 2010, 2015, 2025, and 2035 contained in the federally approved 2010 conformity analysis have been estimated and are less than or no greater than the 2008 baseline motor vehicle emissions for the 2006 $PM_{2.5}$ standard. Appendix E contains the $PM_{2.5}$ Conformity Results Summary for the Fairbanks nonattainment area. The interim conformity emissions tests for $PM_{2.5}$ are therefore met.

- Consultation has been conducted in accordance with federal requirements, which are incorporated into Alaska Department of Environmental Conservation's (ADEC's) Conformity Regulations.*

1.3 Report Organization

Following this Executive Summary, Section 2 provides an overview of the applicable $PM_{2.5}$ conformity rule and requirements, including an approach to meet requirements and the conformity analysis years. Section 3 contains a discussion of the latest planning assumptions, transportation modeling, and air quality modeling used to estimate regional emissions. Section 4 provides an overview of the interagency consultation conducted by FMATS. The results of the conformity analysis for the TIP/MTP are provided in Section 5.

Consultation documentation and other related information are contained in the appendices. FHWA's checklist for conformity documentation is provided in Appendix A. Appendix B contains a listing of transportation projects, and Appendix C contains the transportation modeling documentation. Appendix D supplies listings of AKMOBILE6 modeling files used in the CO conformity analysis. Appendix E provides tables showing key vehicle classification schemes used to develop modeling inputs and spreadsheets documenting the $PM_{2.5}$ conformity analysis. Appendix F includes copies of interagency consultation correspondence. Appendix G contains public meeting process

---

* State of Alaska Environmental Conservation Regulation, Title 18, Chapter 50. Air Quality Control. Article 7. Conformity (18 AAC 50.700 – 18 AAC 50.720)

documentation. Comments received on the conformity analysis and responses made as part of the public involvement process are included in Appendix H.

###

2. CONFORMITY REQUIREMENTS

The criteria for determining conformity of transportation programs and plans under the federal transportation conformity rule (40 CFR Parts 51 and 93) and the applicable CO and $PM_{2.5}$ conformity tests for the Fairbanks nonattainment areas are summarized in this section.

FMATS is the designated Metropolitan Planning Organization for Fairbanks, Alaska. As a result of this designation, FMATS prepares the TIP, MTP, and associated conformity analyses.

Presented first is a review of the development of the applicable conformity regulation and requirements and the analysis years for this CO and $PM_{2.5}$ Conformity Analysis.

2.1 Background

EPA published the Transportation Conformity Rule $PM_{2.5}$ and PM_{10} Amendments on March 24, 2010; the rule became effective on April 23, 2010.* This PM Amendments Final Rule amends the conformity regulation to address the 2006 $PM_{2.5}$ NAAQS. The final PM Amendments rule also addresses hot-spot analyses in $PM_{2.5}$, PM_{10}, and carbon monoxide nonattainment and maintenance areas.

EPA's nonattainment area designations for the 2006 $PM_{2.5}$ standard became effective on December 14, 2009. Conformity for a given pollutant and standard applies one year after the effective date of EPA's initial nonattainment designation. Therefore, conformity for the 2006 $PM_{2.5}$ standard began to apply on December 14, 2010, for Fairbanks, Alaska.

In accordance with the conformity rule, the interagency consultation process is being used for conducting regional emissions analyses and demonstrating conformity for the $PM_{2.5}$ standard. The conformity demonstrations were completed in June 2011. Public review of the conformity demonstration will occur over a 30-day period from July 21 through August 20, 2011,, followed by MPO approval scheduled for August 24, 2011. The $PM_{2.5}$ conformity demonstration for the 2012-2015 TIP is scheduled to be submitted to FHWA by August 25, 2011 for FHWA/FTA to issue approvals by September 22, 2011.

* U.S. Environmental Protection Agency, 2010. 40 CFR Part 93. "Transportation Conformity Rule $PM_{2.5}$ and PM_{10} Amendments; Final Rule." Federal Register, March 24, 2010, Vol. 75, No. 56, p. 14260.

2.2 Conformity Regulation Requirements

As summarized earlier in Section 1.1, conformity test requirements differ for areas and pollutants with an EPA-approved air quality plan (i.e., a State Implementation Plan or a Maintenance Plan) and those without an approved plan. Fairbanks has an approved Maintenance Plan for CO, but an air quality plan for $PM_{2.5}$ has not yet been completed and approved by EPA.

Separate requirements for areas or pollutants under each category are described in separate sub-sections that follow.

2.2.1 Areas/Pollutants With SIP-Based Budgets

Section 93.118 of the federal conformity regulations required that the regional transportation plan or TIP must be consistent with the motor vehicle emission budgets in the applicable implementation plan for areas or pollutants with an approved air quality plan (and established vehicle emission budgets). This requirement is satisfied if it is demonstrated that vehicle emissions from the transportation plan are less than or equal to the established emission budgets for those pollutants or precursor pollutants for which an area is in nonattainment or maintenance.

In Fairbanks, CO emission budgets have been established for calendar years 2006, 2010, and 2015 from the CO Maintenance Plan approved by EPA on March 22, 2010. Thus transportation plan emissions covering the entire range of analysis years established under interagency consultation—2010, 2015, 2025, and 2035— must be compared to and found to not exceed these established budgets to satisfy the emissions budget requirement.

The emission budgets in the Fairbanks Maintenance Plan were developed using the AKMOBILE vehicle emission factor model, an enhanced version of EPA's MOBILE6.2 model approved for use in Alaska to address unique wintertime driving conditions and their impacts on motor vehicle CO emissions. Although federal conformity regulations require the use of current or "latest planning assumptions," they also require that emission budget tests be based on the same underlying model and methodologies used to establish the budgets.

In this case, since the CO budgets were based on AKMOBILE6, the transportation conformity analysis for CO in Fairbanks must also employ AKMOBILE6. Even though EPA has released MOVES (the successor to MOBILE6.2), Fairbanks has not yet updated its Maintenance Plan (and its associated motor vehicle emission budgets) based on MOVES. EPA has given local planning agencies a two-year grace period until March 2012 to transition from MOBILE6.2 (or AKMOBILE6) to MOVES. (The agency is also currently considering an extension of the grace period to accommodate modeling issues that have arisen with MOVES.)

Although the FNSB Air Quality Program is currently drafting a MOVES-based update to the Fairbanks CO Maintenance Plan, it has not yet been finalized and submitted to EPA for approval.

Thus, the CO portion of this conformity analysis will employ AKMOBILE6 for the emissions budget test. Table 2-1 shows the applicable AKMOBLE6-based motor vehicle emission budgets from the latest Fairbanks CO Maintenance Plan.

Table 2-1
Fairbanks Motor Vehicle CO Emission Budgets
(tons per average winter day)

Calendar Year	CO (tons/day)
2006	24.62
2010	24.01
2015	23.61

As shown later in Section 5, the budget for 2015 (the horizon year of the Maintenance Plan) was also applied for analysis years beyond 2015.

2.2.2 Areas/Pollutants Without SIP-Based Budgets

Before an adequate or approved SIP budget is available, as is currently the case for $PM_{2.5}$ in Fairbanks, conformity is generally demonstrated with interim emission tests. Conformity may be demonstrated if the emissions from the proposed transportation system are either less than or no greater than baseline year motor vehicle emissions in a given area (see Section 93.119).

In the Fairbanks $PM_{2.5}$ SIP scheduled for adoption by the state in December 2012, the baseline year for the attainment demonstration is calendar year 2008. Thus, 2008 is the baseline year for the interim emissions test.

The 2008 baseline year emissions level must be based on the latest planning assumptions available for the year 2008, the latest emissions model, and appropriate methods for estimating travel and speeds as required by the conformity regulation.

$PM_{2.5}$ nonattainment areas may also elect to use the "build-no-greater-than-no-build test." Conformity is demonstrated if the emissions from the proposed transportation system ("build" scenario) are less than or equal to emissions from the existing transportation system ("no-build" scenario).

The rule allows $PM_{2.5}$ nonattainment areas to choose between the two interim emissions tests each time that they determine conformity before adequate or approved $PM_{2.5}$ SIP budgets are established. However, the same test must be used for each analysis year in a given conformity determination. Fairbanks chooses to use the "no-greater-than-2008 emissions test."

The regional emissions analyses in $PM_{2.5}$ nonattainment areas must consider directly emitted $PM_{2.5}$ motor vehicle emissions from tailpipe, brake wear, and tire wear. EPA's on-road mobile source emissions model MOVES quantifies emissions from these sources. Since MOVES was chosen for use in this conformity analysis, this requirement is satisfied.

Prior to adequate or approved $PM_{2.5}$ SIP budgets, re-entrained road dust and construction-related fugitive dust from highway or transit projects will be included in the regional emissions analyses only if EPA or the Alaska Department of Environmental Conservation (ADEC) has determined that it is a "significant contributor" to the $PM_{2.5}$ regional air quality problem. Until a significance finding is made, $PM_{2.5}$ areas can presume that re-entrained road dust is not a significant contributor and not include road dust in the $PM_{2.5}$ transportation conformity analysis prior to the SIP. In addition, construction-related dust emissions are not to be included in any $PM_{2.5}$ conformity analyses before adequate or approved $PM_{2.5}$ SIP budgets are established. ADEC has indicated the significance determination will be made as part of the SIP process. As a result, the Fairbanks $PM_{2.5}$ conformity analysis will not include re-entrained road dust or construction-related fugitive dust from transportation projects.

In addition, prior to the submission of a SIP, NOx emissions must be considered, unless both ADEC and EPA make a finding that NOx is not a "significant contributor" to the $PM_{2.5}$ air quality problem. Conversely, VOC, SOx, and ammonia emissions do not have to be considered in conformity, unless either ADEC or EPA makes a finding that on-road emissions of any of these precursors is a "significant contributor" to the area's $PM_{2.5}$ air quality issues. ADEC will make the significance determinations as part of the SIP process. As a result, the $PM_{2.5}$ conformity analysis will address only the precursor NOx.

Table 2-2 summarizes $PM_{2.5}$ and NOx emission estimates for the 2008 baseline year. These emission estimates were calculated by running EPA's MOVES model as explained in Section 3.4 using transportation modeling outputs for the Fairbanks $PM_{2.5}$ nonattainment area described in Section 3.3.

Table 2-2
2008 Baseline Vehicle Emissions
(tons per average winter day)

$PM_{2.5}$	NOx
0.43	5.40

2.3 Conformity Analysis Years

Section 93.118(b) of the transportation conformity rule requires that consistency with vehicle emission budgets must be demonstrated for each of the following:

- Each year for which the applicable implementation plan establishes budgets;
- The attainment year (if in the timeframe of the transportation plan and conformity determination);
- The last year of the timeframe of the conformity determination; and
- For any intermediate years within the timeframe of the conformity determination so that analysis years are no more than 10 years apart.

Nonattainment areas that do not have adequate or approved budgets are not required to demonstrate conformity and perform a regional emissions analysis for their attainment year. Under Section 93.119(g)(1) of the conformity rule, nonattainment areas using interim emission tests are required to perform a regional emissions analysis for the following years:

- A year no more than 5 years beyond the year in which the conformity determination is made (e.g., 2015);
- The last year of the transportation plan's forecast period (e.g., 2035); and
- Any additional years within the time frame of the transportation plan so that analysis years are no more than 10 years apart (e.g., 2025).

Regional emissions were thus estimated for calendar years 2010, 2015, 2025, and 2035 in the CO and $PM_{2.5}$ conformity analysis, in accordance with the conformity rule requirements.

###

3. LATEST PLANNING ASSUMPTIONS AND MODELING

The Clean Air Act states that "the determination of conformity shall be based on the most recent estimates of emissions, and such estimates shall be determined from the most recent population, employment, travel, and congestion estimates as determined by the MPO or other agency authorized to make such estimates."

According to the conformity regulation, the time the conformity analysis begins is "the point at which the MPO or other designated agency begins to model the impact of the proposed transportation plan or TIP on travel and/or emissions." The conformity analysis and initial transportation modeling began in April 2011.

Since conformity applies to the nonattainment area, new transportation projects within the donut area have been included. Donut areas are geographic areas outside a metropolitan planning area boundary, but inside the boundary of a nonattainment area that contains any part of the metropolitan area.

3.1 Latest Planning Assumptions

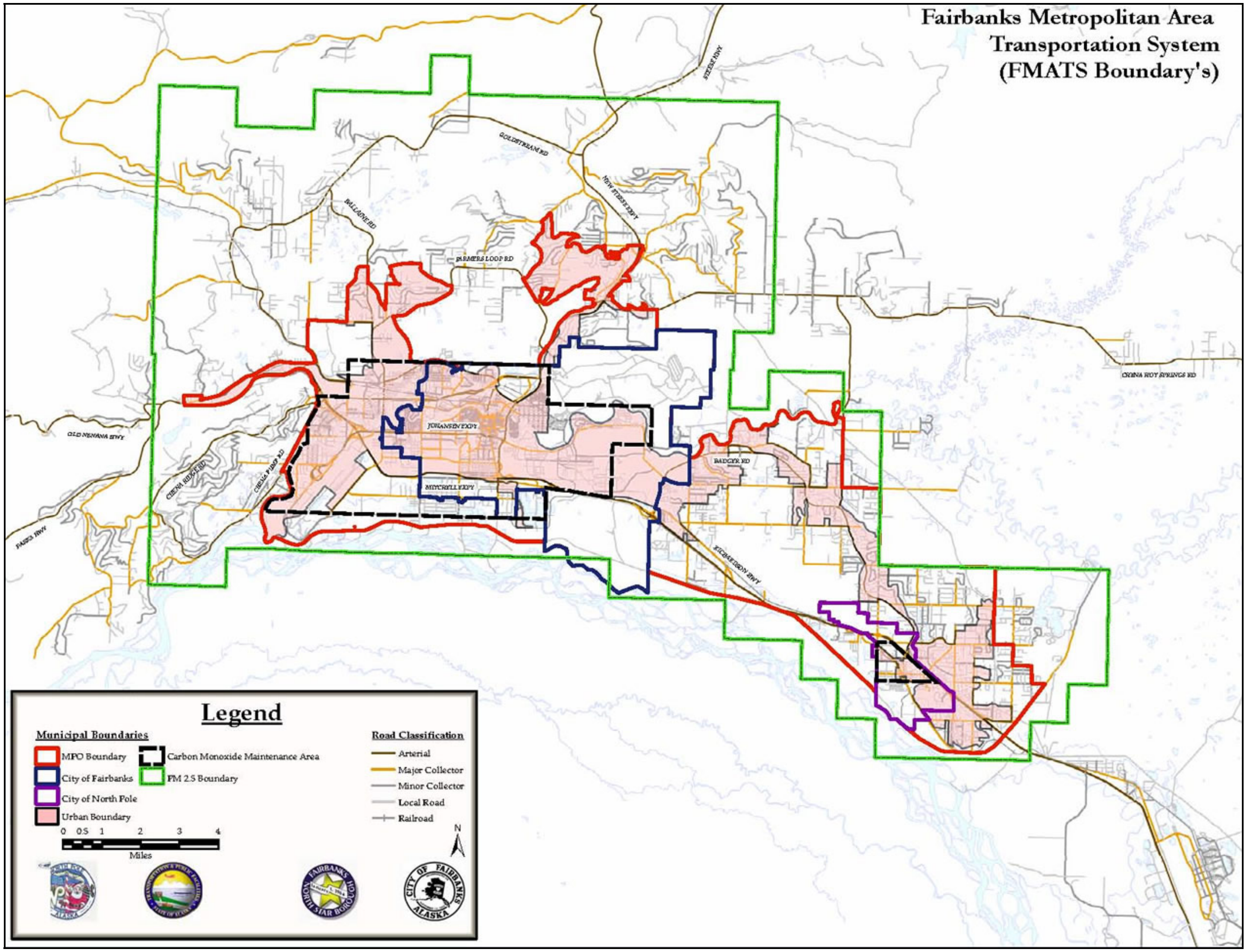
There has been one key set of official updates to the socioeconomic projections used by the FMATS transportation models since the prior 2010 Conformity Analysis. Recently released block-level census data from the 2010 U.S. Census were used by FMATS to update population and household data underlying the MPOs regional transportation planning model. (Socioeconomic projections in the prior conformity analysis had been based off of Alaska-specific projections from the earlier 2000 Census.)

Thus, in accordance with Section 93.110 of the federal conformity rule, the most recent estimates of population and employment projections that have been officially approved by the Metropolitan Planning Organization were used.

3.2 Transportation Modeling

The modeling network for FMATS' TransCAD travel demand forecasting model was expanded during the prior conformity analysis to reflect the entire extent of the $PM_{2.5}$ nonattainment area. Figure 3-1 illustrates the differences between the CO and $PM_{2.5}$ nonattainment areas as well as the different urban planning boundaries. As can be seen, the $PM_{2.5}$ nonattainment area is significantly larger than the CO nonattainment area.

Figure 3-1
Fairbanks Metropolitan Area Transportation System (FMATS) Planning Areas



For this analysis, the TransCAD model was updated to employ these latest socioeconomic data and projections from the 2010 Census. Consistent with these Census data, the base year for these updated runs was set to 2010. The base year model runs were calibrated and validated using 2009 measured traffic volumes collected by the Alaska Department of Transportation and Public Facilities (ADOT&PF) at over 50 screenline stations across the entire modeling domain. The validated model also included a truck traffic component and driving speeds calibrated to speed data collected via GPS-equipped floating car traverses.

Appendix C provides further details on the travel demand modeling runs and validation procedures used to support this conformity analysis.

3.3 Traffic Estimates

TransCAD model runs were performed for FMATS by Dr. Ming Lee from the University of Alaska-Fairbanks (UAF) for the 2010 base year and a 2035 forecast. Population and household forecasts in the 2035 run were based on 2010 U.S. Census projections. For forecasted employment, Dr. Lee applied a 1% annual growth rate projected by the Institute of Social and Economic Research at the University of Alaska Anchorage.

A summary of the travel estimates for the FMATS modeling area employed in the conformity analysis is presented in Table 3-1. TransCAD-based average daily vehicle miles traveled (VMT) estimates for the entire modeling area (which corresponds to the $PM_{2.5}$ nonattainment area) and the smaller CO nonattainment area are shown. Table 3-1 shows that travel between 2010 and 2035 is forecast to increase by 31% over the entire modeling area, which corresponds to an annual rate of 1.1%. Morning peak period travel is forecast to grow more rapidly than any other period of the day. Within the smaller CO nonattainment area, travel growth is marginally lower at 26% (less than 1% annually).

Table 3-1
Annual Average Daily VMT in the Travel Model Base and Forecast Years by Daily Period and Key Vehicle Categories

Period / Vehicle Type	Entire Modeling Area (PM NA Area)			CO Nonattainment Area		
	2010	2035	% Change	2010	2035	% Change
Daily Period[a]						
AM Peak (AM)	132,469	187,841	**41.8%**	66,381	92,025	**38.6%**
PM Peak (PM)	380,135	509,440	**34.0%**	188,218	246,287	**30.9%**
Off-Peak (OP)	1,206,159	1,587,234	**31.6%**	617,197	774,932	**25.6%**
Vehicle Type						
Passenger VMT	1,718,763	2,284,514	**32.9%**	871,796	1,113,244	**27.7%**
Truck VMT	105,132	104,201	**-0.9%**	47,072	47,702	**1.3%**
Total VMT	**1,823,895**	**2,388,715**	**31.0%**	**918,868**	**1,160,946**	**26.3%**

[a] VMT by daily period was developed only for the passenger vehicle fleet; truck VMT was modeled only on a daily basis.

Though not explicitly listed in Table 3-1, the splits in passenger car and heavy-truck VMT ranged from 4-6% over the modeling years and planning areas shown.

3.4 Vehicle Emissions Modeling

As noted earlier, two different vehicle emission factor models were used to support this conformity analysis: AKMOBILE6 was used for the CO emissions budget test; MOVES was used to estimate $PM_{2.5}$ and NO_x emissions for the "no greater than 2008" test. The methods and inputs used within each of these models are described in separate sub-sections below.

3.4.1 AKMOBILE6-Based CO Emissions

Modeling Approach – Motor vehicle CO emissions for the urban nonattainment area of Fairbanks were computed using AKMOBILE6. AKMOBILE6 combines the estimates of warm-up idling and plug-in CO benefits based on Alaska-specific test data with "traveling" or on-road emission factors from MOBILE6.2. (AKMOBILE6 operates as a "shell" built around MOBILE6.2.) The AKMOBILE6 model* was used to establish the attainment demonstration and emissions budgets contained in the approved Maintenance Plan. As noted earlier, the years to be analyzed in this analysis were established via interagency consultation and consisted of calendar years 2010, 2015, 2025, and 2035.

The AKMOBILE6-based modeling approach was identical to that employed in the Maintenance Plan. As described below updated modeling inputs were developed and applied to satisfy "latest" planning assumption requirements.

Modeling Inputs – Estimates of average winter day VMT, vehicle trips and average area speeds for the CO nonattainment area were based on the 2012-2015 TIP travel modeling runs. (Annual average daily VMT estimates for 2010 and 2035 were reported earlier in Table 3-1.) The adjustment of annual to winter daily travel levels was based on a winter season factor of 93.1% compiled from a composite of monthly traffic volumes for 2009 collected from 13 Permanent Traffic Counter (PTR) stations maintained by ADOT&PF within the CO nonattainment area. (A winter season factor of 94.6% had been used in the Maintenance Plan based on traffic counts collected in 2000.)

Table 3-2 provides VMT and vehicle trip estimates within the CO nonattainment area for each of the four calendar years examined under this analysis. (VMT, vehicle trips and speeds for the 2015 and 2025 intermediate years were linearly interpolated from the 2010 and 2035 modeling runs.)

---

* AKMOBILE6 version 1.10 dated January 26, 2004 and MOBILE version 6.2 .03 dated September 24, 2003.

Table 3-2 Fairbanks CO Nonattainment Area Average Winter Day VMT and Vehicle Trips		
Calendar Year	VMT (miles/day)	Vehicle Trips (trips/day)
2010	855,754	112,599
2015	900,843	120,112
2020	991,022	135,756
2035	1,081,201	152,282

Table 3-3 presents a comparison of CO nonattainment area VMT estimates from the latest travel modeling runs for the 2012-2015 TIP to those reflected in the adopted CO Maintenance Plan. As it shows, VMT for 2010 has been downwardly revised based on data from the 2010 Census and improved base year model calibrations.

Table 3-3 Comparison of 2008 Maintenance Plan and 2012-2015 TIP Average Winter Day VMT Estimates for the CO Nonattainment Area			
Calendar Year	Maintenance Plan	TIP	% Difference
2010	917,126	855,754	-6.7%
2015	989,950	900,843	-9.0%
2025	1,153,406	991,022	-14.1%
2035	-	1,081,201	NA

Future year VMT and growth rates have also been downwardly revised from those contained in the Maintenance Plan, although they are not explicitly listed in Table 3-3. Over the 2010-2025 period where a comparison can be made, the Maintenance Plan forecasted a 1.5% annual growth in VMT. Based on the latest 2010 Census data and Alaska employment projections, annualized VMT growth over the same period was forecasted at 0.9%.

Estimates of speeds and trip length by roadway link for 2010 and 2035 were also obtained from the TransCAD modeling performed by Dr. Lee under the direction of FMATS. As the analysis was based on trip types and not facility type, an average network speed was computed by weighting link-specific speeds by their travel fractions for each of the analysis years. Average trip lengths were computed from a 2010 base year trip table provided by Dr. Lee and were assumed to remain constant over future years. Table 3-4 lists the resulting average network speed and trip length inputs used for the analysis.

Table 3-4 Fairbanks CO Nonattainment Area Average Vehicle Speeds and Trip Lengths		
Calendar Year	Average Speed (mph)	Average Trip Length (miles)
2010	37.4	7.7
2015	37.8	7.7
2020	38.6	7.7
2035	39.4	7.7

The only other set of AKMOBILE6 inputs that were updated for this analysis compared to those employed in the 2008 CO Maintenance Plan were the vehicle age distribution (model year population fractions by vehicle type) and fleet mix (travel fractions across vehicle types) inputs. As explained in greater detail later in Section 3.4.2, updated DMV registrations and seasonal parking lot survey data for Fairbanks were used to develop the revised age distribution and fleet mix inputs for this CO conformity analysis.

Statewide registration data obtained from ADEC in May 2010 and wintertime parking lot surveys conducted by ADEC during early 2009 were used to update these fleet inputs reflected in the Maintenance Plan that were based on similar data collected in 2005 to address "latest planning assumption" conformity requirements. As explained in Section 3.4.2, Fairbanks vehicle populations were culled from the statewide registration database based on registered ZIP codes. Vehicle records without a current or "active" registration status were also discarded. A MOBILE6/AKMOBILE6 vehicle type category was then assigned to each of the resulting valid vehicle records. As noted in Section 3.4.2, this process was greatly aided by the use of a VIN decoder, which provided additional "vehicle type" attributes that could be mapped into the certification-based scheme of sixteen vehicle categories used in MOBILE6 (and AKMOBILE6).

Repeated wintertime parking lot surveys conducted by ADEC in Fairbanks have shown that older vehicles are operated less in winter, likely due to their degraded drivability in cold weather. As performed in the Maintenance Plan, vehicle model year data collected from winter parking surveys have been used to reflect this wintertime age distribution shift. Again, Section 3.4.2 provides further details on the winter parking surveys and the findings from the latest (early 2009) survey data.

The registration-based and parking survey-adjusted vehicle populations and population fractions with age were then combined with the same mileage accumulation rate data employed in the CO Maintenance Plan in order to determine fleet mix inputs (i.e., travel fractions by vehicle type). These mileage accumulation rates for light-duty gasoline vehicles are based on data analyzed from the Fairbanks I/M program (where odometer readings were taken every two years a vehicle reported for an inspection). For the remaining vehicle categories, MOBILE6.2 defaults were used.

Table 3-5 compares the resulting fleet mix inputs developed using updated 2010 registration and 2009 parking survey data to those employed in the Maintenance Plan that were based on similar data collected in 2005. It lists the travel (VMT) fractions by vehicle type for each of the 16 categories used in AKMOBILE6/MOBILE6. As shown, the more recently compiled fleet data reflect a slight shift in the split between passenger car (LDV) and light-duty truck (LDT1-4) use. The Maintenance Plan data reflected a VMT mix with 27.7% from passenger cars and 47.8% from all light truck categories. The latest data used for this analysis exhibit car and light truck VMT fractions of 25.6% and 55.9% of fleet VMT, respectively.

Table 3-5
Comparison of Fairbanks Fleet VMT Mix Inputs
Between the Maintenance Plan and TIP

Vehicle Type	Description	Maintenance Plan	Updated for TIP
LDV	Light-Duty Vehicles (Passenger Cars)	27.7%	25.6%
LDT1	Light-Duty Trucks 1 (0-6,000 lbs. GVWR, 0-3,750 lbs. LVW)	6.8%	6.5%
LDT2	Light-Duty Trucks 2 (0-6,000 lbs. GVWR, 3,751-5,750 lbs. LVW)	22.7%	20.0%
LDT3	Light-Duty Trucks 3 (6,001-8,500 lbs. GVWR, 0-5,750 lbs. ALVW)	12.5%	12.7%
LDT4	Light-Duty Trucks 4 (6,001-8,500 lbs. GVWR, 5,751 lbs. and greater ALVW)	5.8%	16.7%
HDV2	Class 2b Heavy-Duty Vehicles (8,501-10,000 lbs. GVWR)	7.9%	3.6%
HDV3	Class 3 Heavy-Duty Vehicles (10,001-14,000 lbs. GVWR)	0.8%	3.3%
HDV4	Class 4 Heavy-Duty Vehicles (14,001-16,000 lbs. GVWR)	0.6%	1.4%
HDV5	Class 5 Heavy-Duty Vehicles (16,001-19,500 lbs. GVWR)	0.5%	0.4%
HDV6	Class 6 Heavy-Duty Vehicles (19,501-26,000 lbs. GVWR)	1.8%	0.5%
HDV7	Class 7 Heavy-Duty Vehicles (26,001-33,000 lbs. GVWR)	2.1%	0.5%
HDV8A	Class 8a Heavy-Duty Vehicles (33,001-60,000 lbs. GVWR)	2.3%	1.1%
HDV8B	Class 8b Heavy-Duty Vehicles (>60,000 lbs. GVWR)	8.1%	6.7%
HDBS	School Buses	0.4%	0.3%
HDBT	Transit and Urban Buses	0.2%	0.7%
MC	Motorcycles	0.0%	0.0%
Totals		100.0%	100.0%

LVW – Laden vehicle weight
ALVW – Average laden vehicle weight
GVWR – Gross vehicle weight rating

As highlighted at the bottom of Table 3-5, motorcycle VMT was zeroed out, reflecting the fact that motorcycles are not operated in Fairbanks during harsh winter conditions.

As in the Maintenance Plan this “current baseline” VMT mix was assumed to apply in all future calendar years.

All the remaining AKMOBILE6 modeling inputs (fleet mileage accumulation), I/M assumptions, and fuel characteristics employed in the Maintenance Plan were used in this analysis. Similarly, emissions were estimated using the soak time and initial idling time by trip type (home/work, home/other, and other/other) and the trip type distributions used in the Maintenance Plan.

Further details on the AKMOBILE6 modeling inputs are provided in Appendix D.

3.4.2 MOVES-Based $PM_{2.5}$ and NOx Emissions

Vehicle emissions associated with the proposed TIP were estimated for the Fairbanks modeling area using EPA’s MOVES (Motor Vehicle Emission Simulator). The analysis was based on the MOVES2010a version on August 30, 2010.

MOVES is the successor to EPA’s MOBILE series of on-road vehicle emissions models. It can be used to estimate exhaust and evaporative emissions as well as brake and tire wear emissions from all types of on-road vehicles. Compared to MOBILE6.2, MOVES incorporates substantial new emissions test data and accounts for changes in vehicle technology and regulations as well as an improved understanding of in-use emission levels and the factors that influence them.

EPA designed MOVES using a fundamentally different software platform and user interface than used by MOBILE6.2. To ease users’ migration from MOBILE to MOVES, EPA has also released a series of spreadsheet-based “Conversion Tools” to restructure MOBILE6 inputs into the framework required by MOVES. Since this analysis included the development of new up-to-date Fairbanks vehicle fleet characterizations based on latest available vehicle registrations and other data, these MOBILE6 to MOVES conversion tools were not directly used. However, their underlying methodologies were preserved in developing the necessary MOVES inputs “from scratch” and are carefully discussed later in this sub-section.

Section 93.111 of the conformity regulation requires the use of the latest emission estimation model in the development of conformity determinations. The use of MOVES clearly satisfies this requirement. EPA[*] has given MPOs a two-year grace period that extends until March 2012 to allow agencies to use either MOBILE6.2 or MOVES for regional conformity analyses. During interagency consultation, an agreement was reached to use MOVES instead of MOBILE6.2 to estimate vehicular $PM_{2.5}$ and precursor

[*] Federal Register, Volume 75, No. 401, March 2, 2010.

emissions because it incorporates broader, more detailed and more recent test data, including representation of ambient temperature effects below 20°F, a key consideration for a wintertime Fairbanks emissions analysis.

Modeling Approach – The basic approach in applying MOVES to calculate vehicle emissions associated with the TIP was based on MOVES technical modeling guidance developed by EPA* for use in SIP and regional conformity analyses.

In accordance with that guidance, MOVES was executed for the six-month (October through March) winter season that corresponds to the period in which violations of the ambient $PM_{2.5}$ standard may occur in Fairbanks. Per EPA's guidance, MOVES was also executed on an hourly time-scale to more accurately reflect diurnal variations in travel and ambient conditions that can affect vehicle emissions.

For SIP and conformity analysis, MOVES must be executed using the County Domain/Scale option. (MOVES can also be executed in National Scale and Project Scale modes.) For regional conformity analyses using MOVES County Scale option, EPA's guidance essentially directs users to input a detailed series of data that replace nationwide-based default values with vehicle fleet, travel activity, and other parameters that represent the county or region being modeled.

MOVES was executed for the Fairbanks, Alaska geographic area to produce estimates of $PM_{2.5}$ and NOx crankcase and exhaust emissions (including extended idling). Brake and tire wear emissions for $PM_{2.5}$ were also included.

Discussions of the development of the detailed MOVES inputs in accordance with EPA's MOVES regional conformity guidance are presented below.

(Beyond the detailed MOVES inputs presented in this sub-section as well as Appendix E, electronic versions of the complete package of MOVES run files, input data files and outputs can be supplied upon request.)

Vehicle Fleet Inputs – Outputs from the transportation modeling runs described earlier in Section 3.3 as well as data from several other sources were used to develop the vehicle fleet-related inputs to the MOVES model runs. Each of these fleet-related MOVES inputs is described separately below. (The names of the individual inputs within MOVES are listed in parentheses.)

Vehicle Populations (Source Type Population & Age Distribution) − Vehicle registrations from the Alaska Division of Motor Vehicles (DMV) and recent Alaska Parking Lot Survey data conducted by ADEC provided the basis for the vehicle fleet populations and age distributions used to model the Fairbanks vehicle fleet with MOVES. The DMV data were obtained through ADEC from a "dump" of the statewide registration

---

* "Technical Guidance on the Use of MOVES2010 for Emission Inventory Preparation in State Implementation Plans and Transportation Conformity," U.S. Environmental Protection Agency, Office of Transportation and Air Quality, EPA-420-B-10-023, April 2010.

database as of May 2010. The DMV database includes vehicle make, model, model year, Vehicle Identification Number (VIN), vehicle class code, body style, registration status and expiration date.

Using a VIN decoding tool licensed by ADEC, supplemental information such as vehicle class, gross vehicle weight, vehicle type, body type and fuel type (e.g., gasoline vs. diesel) were also determined in order to help classify each vehicle into one of the 13 MOVES Source Types. In Appendix E, tables spanning the first 10 pages list each of the key vehicle attribute fields from the DMV database and VIN decoder outputs that were used to categorize each vehicle record into one of the 13 usage-based "Source Type" categories as defined in MOVES to characterize the vehicle fleet.

Table 3-6 lists each of these "Source Type" categories and identifies the primary vehicle attribute fields in either the DMV database itself (DMV) or output from the VIN decoder (Decoder) that were used to determine the Source Type for each vehicle record.

Table 3-6
MOVES Vehicle Fleet Source Type Categories

Source Type ID	Source Type Description	Primary Attributes/Sources
11	Motorcycle	Class Code (DMV), Body Style (DMV) – Categories MB and MC, Vehicle Type (Decoder), Vehicle Class (Decoder)
21	Passenger Car	Class Code (DMV), Vehicle Type (Decoder) , Vehicle Class (Decoder)
31	Passenger Truck	Class Code (DMV), Vehicle Type (Decoder) , Vehicle Class (Decoder)
32	Light Commercial Truck	Class Code (DMV), Vehicle Class (Decoder), GVWR Class (Decoder) – up to Class 5 (16,001-19,500 lb)
41	Intercity Bus	Class Code (DMV), Body Style (DMV), Vehicle Type (Decoder) , Vehicle Class (Decoder)
42	Transit Bus	Class Code (DMV), Body Style (DMV), Vehicle Type (Decoder) , Vehicle Class (Decoder)
43	School Bus	Class Code (DMV), Body Style (DMV), Vehicle Type (Decoder) , Vehicle Class (Decoder)
51	Refuse Truck	Body Style (DMV) – Category GG
52	Single Unit Short-haul Truck	Class Code (DMV), Body Style (DMV), Vehicle Class (Decoder), GVWR Class (Decoder) – Class 6 and above
53	Single Unit Long-haul Truck	Apportioned from MOVES default 52/53 splits
54	Motor Home	Body Style (DMV) – Category MH
61	Combination Short-haul Truck	Class Code (DMV), Body Style (DMV), Vehicle Class (Decoder) – Category "Truck Tractor", GVWR Class (Decoder), Fuel Type (Decoder)
62	Combination Long-haul Truck	Apportioned from MOVES default 61/62 splits

For nearly all the records, the Source Type could be conclusively determined from specific combinations of these attributes. In some cases such as Source Types 51 (Refuse Trucks) and 54 (Motorhomes), single values of the Body Style field in the DMV database were used to discern the appropriate Source Type. In other cases, Source Types were assigned based on categorical values in several attribute fields as noted in Table 3-6. In a few cases, vehicle make and model fields were also examined and then fed to a web-based search engine to identify whether the vehicle was a single or combination-unit truck.

As also noted in Table 3-6, the DMV and VIN decoder attribute data were not sufficient to distinguish between short-haul trucks (Source Types 52 and 61) and long-haul trucks (Source Types 53 and 62). All of the single and combination-unit truck records were assigned short-haul Source Type categories of either 52 or 61. The *SourceTypeYear* table in the MOVES database was then queried to extract nationwide vehicle populations (for calendar year 1999, the closest base year to those modeled) for Source Type categories 52, 53, 61 and 62. Relative splits between short- and long-haul vehicle fractions in these categories were then calculated and used to estimate the populations of long-haul single-unit (53) and combination-unit (62) vehicles in the Fairbanks fleet.

Table 3-7 shows the resulting summation of vehicles by their sourceTypeID as determined from the VIN decoder and DMV data.

Table 3-7
Fairbanks Vehicle Populations by MOVES Source Type

Source Type ID	Source Type Description	**Vehicle Population**
11	Motorcycle	4,234[a]
21	Passenger Car	25,441
31	Passenger Truck	50,102
32	Light Commercial Truck	6,309
41	Intercity Bus	98
42	Transit Bus	53
43	School Bus	372
51	Refuse Truck	34
52	Single Unit Short-haul Truck	1,100
53	Single Unit Long-haul Truck	103
54	Motor Home	1,898
61	Combination Short-haul Truck	694
62	Combination Long-haul Truck	526
Total Vehicle Fleet		**90,964**

[a] As explained later, motorcycle activity in Fairbanks during the winter months was assumed to be zero.

The DMV registration data also identified the model year of the vehicle, which enabled distributions of populations by vehicle age[*] to be calculated for each Source Type and input to MOVES. For the three light-duty passenger vehicle types (11-motorcycles, 21-passenger cars, and 31-passenger trucks), vehicle age distributions from winter parking lot surveys[†] conducted by ADEC in Fairbanks during January and February 2009 were used instead of those based on DMV registrations. This is because it was found in both these 2009 surveys as well as similar parking lot surveys conducted earlier by ADEC in 2005 and 2000 that older passenger vehicles are driven less during harsh winter conditions in Fairbanks.

Figure 3-2 compares the vehicle age fractions (by age group) for light-duty passenger cars in Fairbanks developed from the DMV registrations and the Parking Lot Surveys. As Figure 3-2 clearly shows, vehicle fractions in the newer groups (< 15 years) from the Parking Lot Surveys are distinctly higher than from the DMV registrations. This pattern is reversed for the older vehicle groups (15 or more years old).

Another expected finding from the Fairbanks parking lot surveys is that motorcycles are simply not operated during cold wintertime conditions. Although motorcycles make up roughly 5% of the Fairbanks-registered vehicle fleet, as shown earlier in Table 3-6, only a single motorcycle was identified in the entire sample of over 8,500 vehicles from the 2009 Fairbanks surveys (which represents 0.01% of the survey sample).

Thus, for Source Type categories 11 (motorcycles), 21 (passenger cars) and 31 (passenger trucks), vehicle age distributions were based on the Parking Lot Survey data to reflect well-documented winter season shifts toward greater use of newer vehicles in the passenger car and passenger truck fleets as well as non-use of motorcycles during winter months. These survey-based winter seasonal adjustments for Fairbanks have been employed in wintertime emission inventories developed in previous CO SIPs and transportation conformity determinations that have been approved by EPA and FHWA.

For the remaining MOVES source type categories (32 and above), age distributions were based on the DMV registration data for Fairbanks. Appendix E contains a detailed table labeled "MOVES Age Distribution Inputs" showing the vehicle age distributions developed for each of the MOVES source types using either the DMV or Parking Lot Survey data as described above. These age distributions developed for the 2008 Baseline fleet were also assumed to apply for future fleets in the 2015, 2025, and 2035 modeling runs.[‡]

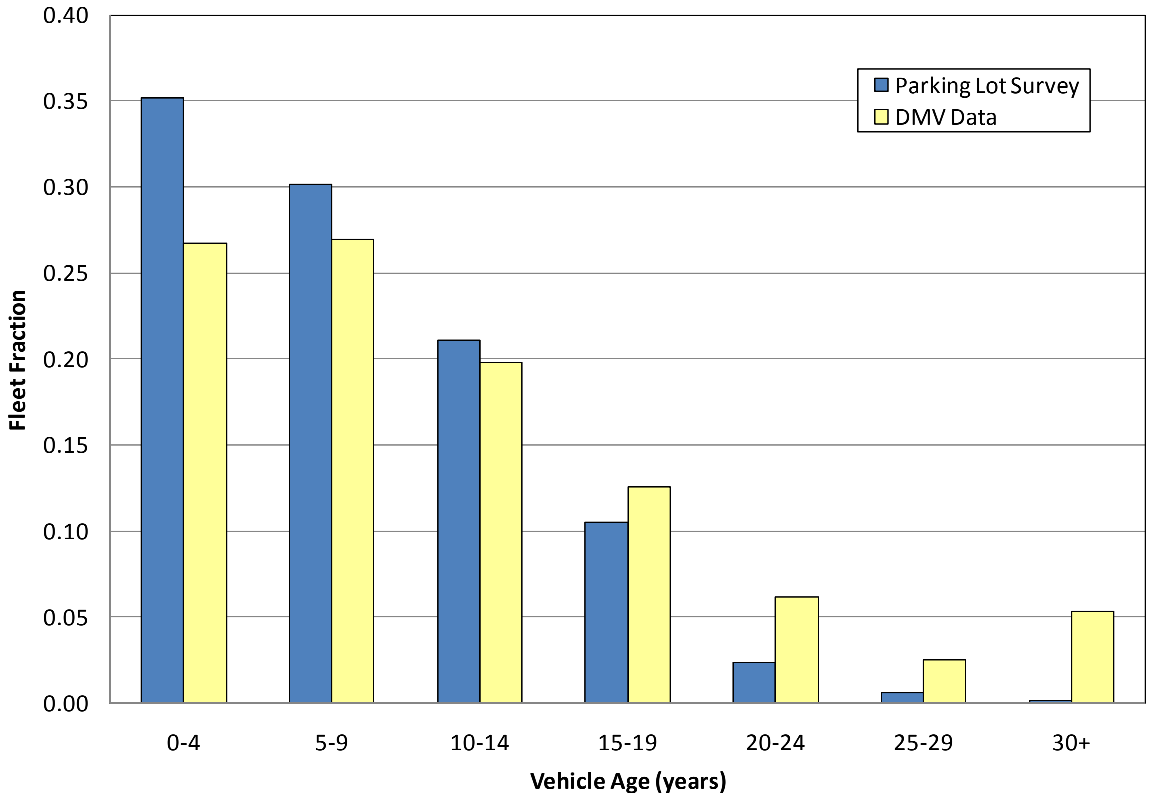
---

[*] Vehicle age in years was simply calculated by subtracting the model year from 2010, the calendar year in which the DMV database obtained.

[†] The purpose of the surveys was to collect data for assessing the performance of the I/M Program. A review of the location of the surveys found broad representation beyond the boundary of the CO nonattainment area in Fairbanks, North Pole, and Chena Ridge areas. While no data were collected in Goldstream Valley, the results sufficiently represent the $PM_{2.5}$ nonattainment area to be used in the analysis.

[‡] Although new vehicle sales nationwide have decreased during the last two or three years due to rising fuel prices and the economic recession, it is difficult to forecast when new vehicle sales will return to previous levels. Thus, although the baseline fleet inputs used in the analysis reflect recent depressed sales patterns,

Figure 3-2
Comparison of DMV and Survey-Based Vehicle Age Distributions of Passenger Cars in Fairbanks



Gasoline vs. Diesel-Fueled Vehicle Fractions (AVFT Strategies) – MOVES provides users the ability to override its default nationwide based travel splits between different fuels and technologies. These Alternative Vehicle Fuel and Technology (AVFT) inputs are supplied to MOVES through the Strategies panel in the user interface, not the County Data Manager.

In order to account for differences in splits between gasoline- and diesel-fuel vehicles in the Fairbanks fleet compared to the U.S. as a whole, fuel fraction tables by source type and model year were also constructed using the DMV VIN decoded data described earlier. Not surprisingly, the MOVES default splits between gasoline and diesel vehicles was not representative of the Fairbanks fleet. Generally speaking, gasoline fractions were

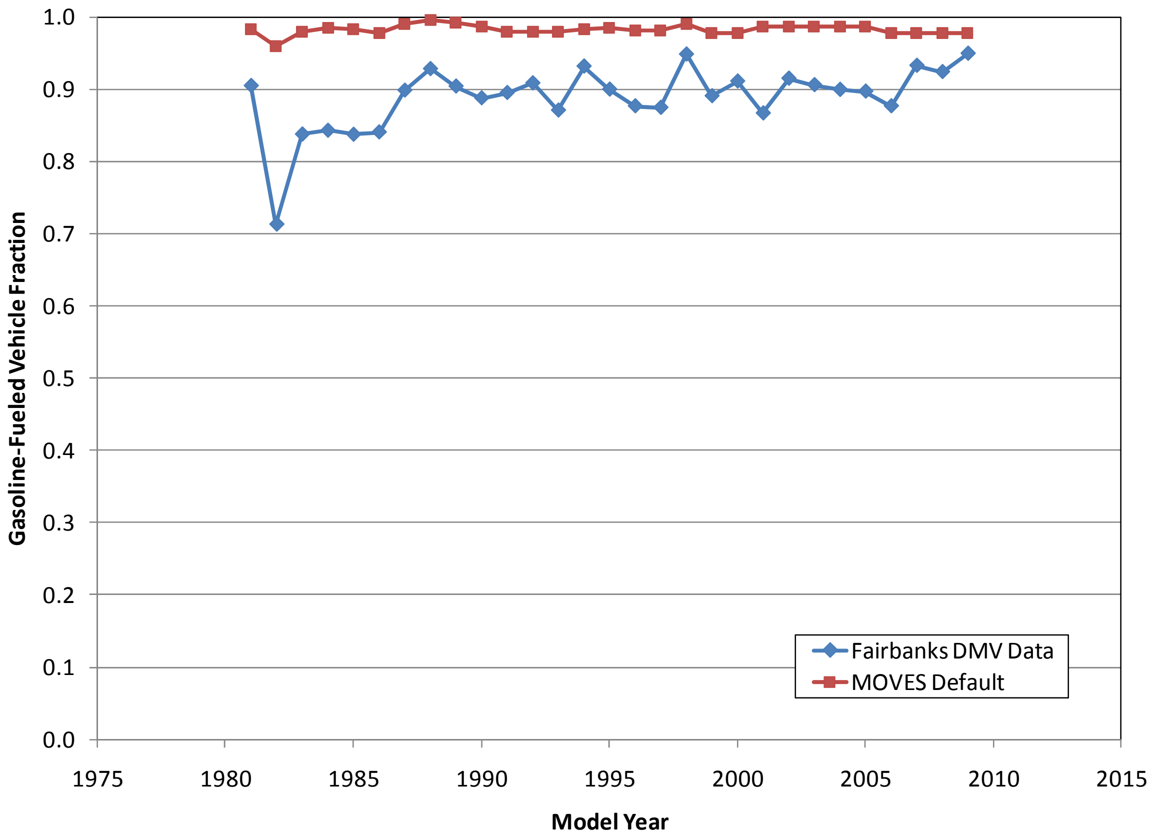
---

the future year fleets do as well. This constant age distribution assumption over time avoids the problem of under-representing emissions in future years due to shifts toward increased new vehicle fractions that cannot be predicted with any certainty. If new vehicle sales return to earlier historical levels, the constant age distribution assumption reflected in this analysis will be conservative (i.e., it will understate future fleet emission reductions).

found to be lower in Fairbanks than the nationwide-based MOVES defaults (and diesel fractions were commensurately higher).

This is illustrated in Figure 3-3, which compares the gasoline vehicle fractions by model year for passenger trucks (MOVES Source Type 31) from the Fairbanks DMV data against the default fractions contained in MOVES. As seen in Figure 3-3, actual gasoline vehicle fractions for passenger trucks in Fairbanks are roughly 10% lower than the MOVES defaults (meaning diesel fractions are roughly 10% higher). Modest differences were also observed for some of the commercial vehicle categories as well.

Figure 3-3
Comparison of Passenger Truck Gasoline-Fuel Vehicle Fractions by Model Year
Fairbanks DMV Data vs. MOVES Defaults



As illustrated by the range of model years compared in Figure 3-3, DMV VIN decoder-based gasoline vs. diesel vehicle fractions were available only for model years 1981 through 2009 (the VIN decoder only operates on 1981 and later models). In setting up the AVFT fuel split input to MOVES, the fuel fractions must be specified by model year, not vehicle age. For earlier model years prior to 1981, the MOVES default fractions were used. For model years 2010 and later, the DMV-based fuel type fractions from model year 2009 were generally assumed to remain constant in future model years except in the passenger truck category where the MOVES defaults reflect a modest increase in diesel penetration in future model years. For passenger trucks in model years 2010 and later, the MOVES defaults were used.

Travel Activity (Vehicle Type VMT) – Estimates of VMT over the expanded transportation modeling network (covering the entire $PM_{2.5}$ nonattainment area) from the TransCAD travel model link output files were processed and input to MOVES through the "Vehicle Type VMT" input within the County Data Manager. The Vehicle Type VMT input must be in units of VMT per year, not VMT per day. The annual VMT must also be supplied by "HPMS Vehicle Type" which is essentially an aggregated version of the 13-category MOVES Source Type scheme. Since states are required to provide periodic travel (i.e., VMT) estimates to FHWA via the Highway Performance Monitoring System (HPMS), EPA has designed MOVES to accept VMT input by these HPMS Vehicle Type categories.

Table 3-8 below shows the mapping of Source Type to HPMS Vehicle Type categories. It also shows how the Fairbanks baseline vehicle populations shown earlier in Table 3-3 were aggregated into the HPMS Vehicle Type categories.

Table 3-8
MOVES Source Type to HPMS Vehicle Type Mapping

Source Type ID	Source Type Description	HPMS VehType ID	HPMS Vehicle Type Description	2008 Baseline Vehicle Popn.
11	Motorcycle	10	Motorcycles	4,234
21	Passenger Car	20	Passenger Cars	25,441
31	Passenger Truck	30	Other 2 axle-4 tire vehicles	**50,102**
32	Light Commercial Truck			**6,309**
41	Intercity Bus	40	Buses	523
42	Transit Bus			
43	School Bus			
51	Refuse Truck	50	Single Unit Trucks	3,135
52	Single Unit Short-haul Truck			
53	Single Unit Long-haul Truck			
54	Motor Home			
61	Combination Short-haul Truck	60	Combination Trucks	1,220
62	Combination Long-haul Truck			
Total Vehicle Fleet				90,964

The green and tan cell shading in Table 3-8 shows where the separate Passenger Vehicle VMT and Truck VMT outputs from the TransCAD transportation model were allocated. Passenger VMT applies to Source Types 11, 21, and 31 (shown in green) and Truck

VMT applies to the remainder of the fleet covering Source Types 32 and above (and shown in tan).

These allocations were assumed based on a review of the FHWA Vehicle Classification Count scheme* used by ADOT&PF to collect volume counts by individual vehicle classification and on which the separate travel model estimates of Passenger Vehicle and Truck VMT were based (see Appendix C).

This FHWA vehicle classification scheme is listed below.

Single Unit

- Class 01: Motorcycles
- Class 02: Automobiles, Automobiles with trailers
- Class 03: Pick up Trucks, Pick up Trucks with Trailers
- Class 04: Buses (2 or 3 axles)
- Class 05: Delivery Trucks, Recreational Vehicles, Dump Trucks (2 axles, 6 Tires)
- Class 06: Dump Trucks, Recreational Vehicles (3 axles)
- Class 07: Concrete Trucks, Fuel or Propane Delivery Trucks (4 or more axles)

Single Trailer

- Class 08: Tractor/Truck with Trailer (2 axles, 6 tires)
- Class 09: Tractor/Truck with Trailer (3axles)
- Class 10: Tractor/Truck with Trailer (4 or more axles)

Multi- Trailer

- Class 11: Tractor/Truck with 2 Trailers (5 axles)
- Class 12: Tractor/Truck with 2 or more Trailers (6 axles)
- Class 13: Tractor/Truck with 2 or more Trailers (7 or more axles)

The separate Truck VMT travel model outputs correspond to FHWA Class 04 and higher vehicles. Comparing this FHWA scheme to the Source Type scheme in MOVES indicates that FHWA Class 04 and higher closely represents MOVES Source Types 32 and higher. (See Table 3-6 for a listing of the Source Type categories.)

As highlighted by the boldface populations in the rightmost column of Table 3-9, this split of Passenger and Truck VMT from the travel model outputs falls within HPMS Vehicle Type category 30, which contains both passenger and light commercial trucks. Thus in developing the HPMS Vehicle Type VMT inputs to MOVES, separate allocations of Source Types 31 and 32 within HPMS Vehicle Type 30 were maintained until the end of the calculations.

The next step in calculating the HPMS Vehicle Type VMT inputs consisted of extracting average annual mileage per vehicle by HPMS Vehicle Type categories from MySQL

* "2006, 2007, 2008 Annual Traffic Volume Report, Northern Region," State of Alaska Department of Transportation and Public Facilities, 2009.

database[*] underlying the MOVES model. This was done by dividing annual VMT by HPMS Vehicle Type category in the MOVES database table *HPMSVTypeYear* (for the MOVES default baseline year of 1999) by MOVES default vehicle populations (also for the model's 1999 base year) contained in the *SourceTypeYear* table after the Source Type populations were allocated into the corresponding HPMS Vehicle Type categories.

Table 3-9 shows these data from the MOVES database and the calculated annual mileage per vehicle by HPMS Vehicle Type category.

Table 3-9
Calculation of Annual Mileage per Vehicle by HPMS Vehicle Type

HPMS Vehicle. Type ID	HPMS Vehicle Type Description	Source Type Categories Contained	Base Year Annual VMT (millions)	Base Year Vehicle Population	**Avg. Annual Mileage (per vehicle)**
10	Motorcycle	11	10,600	4,173,870	**2,540**
20	Passenger Car	21	1,568,640	130,163,000	**12,051**
30	Other 2 axle-4 tire vehicles	31,32	900,735	76,296,500	**11,806**
40	Buses	41,42,43	7,657	732,189	**10,458**
50	Single-Unit Trucks	51,52,53,54	70,274	5,726,791	**12,271**
60	Combination Trucks	61,62	132,358	1,887,707	**70,116**

It is important to note that the MOVES base year 1999 data and resulting annual mileage per vehicle by HPMS Vehicle Type is used only to develop relative scaling factors by HPMS Vehicle Type to apply to the actual Passenger VMT and Truck VMT estimates from the Fairbanks travel model runs. The Fairbanks travel model VMT cannot simply be allocated to the HPMS scheme based on vehicle populations because the annual mileage driven per vehicle differs significantly across some of the HPMS Vehicle Type categories (ranging from 2,540 miles/year for motorcycles to 70,116 miles/year for combination trucks). Thus, the relative differences in annual mileage between HPMS Vehicle Type categories were used to scale the 2010 Baseline Fairbanks vehicle populations by HPMS category shown earlier in Table 3-4 to annual VMT values. These values were then normalized so that when summed across HPMS categories, they matched the total VMT from the travel model outputs and preserved the travel model splits between Passenger and Truck VMT.

A detailed table showing these calculations labeled "Calculation of VMT Allocations by HPMS Vehicle Type Category" is supplied in Appendix E.

Table 3-10 presents the resulting annual VMT by HPMS Vehicle Type category inputs supplied to MOVES for the 2010 Baseline and 2035 LRTP scenarios and the 2015 and 2025 analysis years. In the absence of travel model outputs for 2015 and 2025, MOVES

[*] The MOVESDB20100515 version of the database was used. This was the latest version released by EPA at the time of the conformity analysis.

Table 3-10
MOVES HPMS Vehicle Type VMT (VMT/year) Inputs by Analysis Year

HPMS Vehicle. Type ID	HPMS Vehicle Type Description	2010	2015	2025	2035
10	Motorcycle	7,422,302	7,910,930	8,888,185	9,865,440
20	Passenger Car	211,636,581	225,569,112	253,434,173	281,299,235
30	Other 2 axle-4 tire vehicles	422,302,600	449,156,427	502,864,082	556,571,737
40	Buses	1,029,000	1,027,177	1,023,530	1,019,884
50	Single-Unit Trucks	7,237,648	7,224,823	7,199,173	7,173,523
60	Combination Trucks	16,093,625	16,065,107	16,008,072	15,951,036
Total Vehicle Fleet – Annual VMT		**665,721,757**	**706,953,576**	**789,417,215**	**871,880,854**
Total Vehicle Fleet – Daily VMT		**1,823,895**	**1,936,859**	**2,162,787**	**2,388,715**

annual VMT inputs for those years were developed by linear interpolation of the 2010 and 2035 VMT by HPMS Source Type. (The highlighted columns in Table 3-10 represent those analysis years [2010 and 2035] for which travel model outputs were available.)

At the bottom of Table 3-10, total fleet VMT is shown on both an annual and average day basis, the latter for comparison to the travel model daily VMT outputs summarized earlier in Table 3-1.

It should also be noted that the SourceType population inputs described earlier for the 2010 base year were calculated for the other analysis years (2015, 2025, and 2035) by scaling the VMT for each analysis year in Table 3-10 against the actual 2010 base year vehicle populations presented earlier in Tables 3-6 and 3-7. In other words, the VMT growth over time reflected in Table 3-10 was also applied to future vehicle populations.

This approach assumed that the annual mileage per vehicle was constant across all analysis years. Although one could estimate projected trends of VMT by vehicle type based on a series of MOVES national scale default runs, trends in annual mileage accumulation rates can vary by urban area depending on the growth rate and demographics of each area. Trends in annual mileage rates are probably fairly small for an area like Fairbanks with very mild growth projected in the vehicle fleet and transportation network. Use of national scale MOVES runs would be based on nationwide projections of per-vehicle annual VMT over time that may or may not track well with Fairbanks; thus, we opted to simply hold annual mileage rates per vehicle constant over time given the mild growth projected for Fairbanks at this time.

Other MOVES Inputs – The remaining MOVES modeling inputs representing the Fairbanks $PM_{2.5}$ nonattainment area included seasonal, daily and diurnal travel fractions; travel activity by speed range (or bin) and roadway type; freeway ramp fractions; ambient temperature profiles; I/M program inputs; and fuel specifications. Each of these inputs was supplied to MOVES to represent Fairbanks specific conditions through the model's County Data Manager Importer and are discussed separately below.

Monthly, Day-of-Week and Hourly VMT Fractions – In conjunction with annual VMT by HPMS Vehicle Type, MOVES also requires inputs of monthly, weekday/weekend, and hourly travel fractions. Based on data assembled by ADOT&PF from 2009 seasonal traffic counts, traffic within the FMATS modeling area exhibits a seasonal variation such that roughly 92%[*] of annual average daily travel within the $PM_{2.5}$ nonattainment area occurs on average winter days (with 108% occurring on average summer days). These seasonal variations were incorporated into the MonthVMTFraction input table.[†]

Day-of-week fractions were set to assume that travel levels are the same on weekends as weekdays. In the absence of a weekend or seven-day travel model, this is a reasonable assumption.

Hourly VMT fractions were defined based on diurnal trip percentages used to support the travel model development and validation that are listed in Appendix C.

Travel by Speed Bin and Roadway Type (Average Speed Distribution & Road Type Distribution) – Link-level TransCAD model output files from the transportation modeling performed by Dr. Lee were processed to prepare these two sets of MOVES inputs for each analysis year.

The roadway type classification scheme employed in MOVES consists of the following five categories:

1. Off-Network;
2. Rural, Restricted Access;
3. Rural, Unrestricted Access;
4. Urban, Restricted Access; and
5. Urban, Unrestricted Access.

The "Off-Network" category is used by MOVES to represent engine-off evaporative or starting emissions that occur off of the travel network. For SIP and regional conformity analysis, EPA's MOVES guidance indicated that the user must supply Average Speed Distribution and Road Type Distribution inputs for the remaining on-network road types

[*] This is slightly lower than the 93.1% winter season factor developed from the same data for the smaller CO nonattainment area discussed earlier in Section 4.2.1.
[†] As noted earlier, motorcycle activity was assumed to be zero during winter monthly. Initially this was handled by setting the monthly VMT fractions to zero for October through March in this MonthVMTFraction input table. However, it was discovered that MOVES produced inconsistent activity and emissions outputs when these values were zeroed. As a workaround until EPA releases an updated version of the model that corrects this apparent bug, monthly activity for motorcycle was set to the same values of the rest of the fleet, but the motorcycle emissions were simply excluded from tabulations of the MOVES output results.

(2 through 5), but direct MOVES to calculate emissions over all five road types. In this manner, starting and evaporative emissions are properly calculated and output.

The first of the two sets of inputs, Average Speed Distributions, consists of time-based[*] (not distance-based) tabulations of the fractions of travel within each of MOVES' 16 speed bins (at 5 mph-wide intervals) by road type and hour of the day. These inputs were calculated from the TransCAD link outputs by time of day. The TransCAD outputs consisted of travel times, average speeds and vehicle volumes for each link in the expanded modeling network for each of three daily periods:

1) AM Peak (7-9 AM);
2) PM Peak (3-6 PM); and
3) Off-Peak (9 AM-3 PM, plus 6 PM-7 AM).

Spreadsheet calculations were performed on the TransCAD link outputs to calculate time-based travel (multiplying link travel time by vehicle volume to get vehicle hours traveled or VHT) across all links. The link VHT was then allocated by MOVES road type and average speed bin. (The link classification scheme employed in the TransCAD modeling could easily be translated to the MOVES Rural/Urban and Limited/Unlimited Access road types.) Normalized speed distributions (across all 16 bins) were then calculated for each road type and time of day period and formatted for input into MOVES.

MOVES allows these Average Speed Distribution inputs to be specified separately by Source Type (i.e., vehicle category). Thus, individual distributions were developed from Passenger VHT and Truck VHT tabulations of the TransCAD outputs. The Passenger VHT was available for each of the three modeling periods. Truck VMT was only available on a single daily basis. (As stated earlier, Passenger activity was applied to MOVES Source Types 11, 21, and 31, while Truck activity was applied to categories 32 and higher.)

Appendix E contains tabular summaries of the normalized average speed distribution inputs developed from the 2010 and 2035 TransCAD outputs. (Distributions for 2015 and 2025 were interpolated from the 2010 and 2035 outputs.)

Similar spreadsheet calculations were also performed to tabulate distance-based (i.e., VMT-based) Road Type Distribution inputs to MOVES. The resulting tabulations and normalized Road Type distributions are also provided in Appendix E. (Road type distributions for 2015 and 2025 were similarly interpolated from the 2010 and 2035 TransCAD outputs.)

Freeway Ramp Fractions (Ramp Fraction) – MOVES uses default values of 8% (or 0.08) to represent the fraction of time-based limited access roadway travel (Road Types 2 and 4) that occur on freeway ramps. Fairbanks-specific ramp fraction values were tabulated

[*] MOVES requires Average Speed Distribution inputs on a time-weighted basis and Road Type Distribution inputs on a distance-weighted basis.

from the TransCAD link level outputs and were supplied to MOVES in the Ramp Fraction input section of the County Data Manager to override the nationwide-based defaults.

These Fairbanks ramp travel fractions are presented below in Table 3-11 as tabulated from the 2010 and 2035 travel model outputs. As shown in Table 3-11, the Fairbanks ramp fractions in urbanized areas are higher than the default values in MOVES, reflecting the fact that shorter freeway lengths (with resulting higher ramp fractions) are driven in Fairbanks compared to the nationwide-based defaults.

Table 3-11
Fairbanks Ramp Fraction Inputs

	Fraction of Time-Based Limited Access Travel on Ramps			
	2010 Baseline		2035 LRTP	
	Rural	Urban	Rural	Urban
Daily Ramp Travel Fractions	0.064	0.196	0.068	0.177

Ambient Temperature Profiles (Meteorology Data) – Monthly average diurnal (i.e., hour-by-hour) ambient temperature and humidity profiles compiled by EPA for each county in the U.S. and contained in MOVES' default database were used for the emission modeling runs. According to EPA guidance, these ambient meteorology data profiles were compiled from 30 years (1971-2000) of daily temperature and humidity data. The profiles for Fairbanks (ZoneID=20900) are based on the station at the Fairbanks International Airport. The ambient temperatures range from +31.8°F in October (Hour 16) down to -16.1°F in January (Hour 5). Relative humidity (used in the NOx emission calculations) ranged from 48% to 82%.

Profiles for each of the six winter months modeled (October through March) were exported from the MOVES database and input via the County Data Manager.

I/M Program Data (I/M Programs) – Since the Fairbanks I/M program was terminated at the end of 2009, the "Use I/M Program" input element to MOVES for each of the analysis years 2010,2015, 2025, and 2035 was set from "Yes" to :No" to account for the elimination of the program.

According to EPA's MOVES documentation, I/M emission benefits are only assumed for HC, CO and NOx. No I/M benefits for particulate emissions are assumed in MOVES.

Fuel Specifications (Fuel Supply) – EPA has developed detailed fuel specifications (e.g., RVP, oxygen content, sulfur content, etc.) for different gasoline and diesel fuel blends used in each county of the U.S. and has loaded these specifications into the *FuelFormulation* and *FuelSupply* tables in the MOVES default database. (The first of these tables identifies the detailed properties of a specific fuel blend, the second table identifies that state and county of the U.S. and the calendar year to which it applies.) Semi-annual fuel survey data collected by the Alliance of Automobile Manufacturers (AAM) were reviewed to confirm whether the default fuel properties for Fairbanks defined in MOVES were correct. Retail gasoline data for the 2008 winter for Fairbanks from the AAM surveys indicated that sulfur and oxygen contents in MOVES reasonably matched measured levels.

However, Fairbanks diesel blends are not included in the AAM surveys. MOVES assumed diesel fuel sulfur content of 43 ppm in 2008 through 2011 and 11 ppm in 2012 and later years. These sulfur levels are believed to be reasonably representative of those required under Alaska's Ultra Low-Sulfur Diesel (ULSD) regulation.

Thus, MOVES default gasoline and diesel fuel specifications for Fairbanks were used in the analysis.

<u>State Implementation Plan Measures</u> – At this point, the $PM_{2.5}$ SIP has not been completed and no vehicle-related $PM_{2.5}$ control measures have been adopted. This analysis does, however, account for all committed CO control measures and their impact on $PM_{2.5}$ and precursor emissions.

###

4. CONSULTATION PROCEDURES

The requirements for consultation procedures are listed in section 93.105 of the transportation conformity rule. Consultation is necessary to ensure communication and coordination among air and transportation agencies at the local, state, and federal levels on issues that would affect the conformity analysis, such as the underlying assumptions and methodologies used to prepare the analysis. Section 93.105 of the conformity rule notes that there is a requirement to develop a conformity SIP that includes procedures for interagency consultation, resolution of conflicts, and public consultation as described in paragraphs (a) through (e). Section 93.105(a)(2) states that prior to EPA approval of the conformity SIP, "MPOs and State departments of transportation must provide reasonable opportunity for consultation with State air agencies, local air quality and transportation agencies, DOT and EPA, including consultation on the issues described in paragraph (c)(1) of this section, before making conformity determinations."

Section 93.112 of the conformity regulation requires documentation of the interagency and public consultation requirements according to Section 93.105. A summary of the interagency consultation and public consultation conducted to comply with these requirements is provided below. Interagency consultation on the Conformity Analysis for the 2012-2015 TIP is documented in Appendix F. The responses to comments received as part of the public comment process are included in Appendix H.

4.1 Interagency Consultation

In April 2011, an interagency consultation meeting (and conference call) was conducted to review the $PM_{2.5}$ conformity requirements, latest planning assumptions, and schedule. A follow-up interagency consultation meeting (and conference call) was conducted in May 2011 to provide a status update, as well as to discuss implications from updated transportation modeling based on the 2010 Census data. Interagency call notes are included as part of the consultation record in Appendix F.

The Draft Conformity Analysis for the federally approved 2012-2015 FMATs TIP was released on July 21, 2011 for a 30-day public comment period, followed by Board adoption on August 24, 2011. Federal approval of the 2012-2015 TIP Conformity Analysis is anticipated by September 21, 2011.

4.2 Public Consultation

In general, agencies making conformity determinations shall establish a proactive public involvement process that provides the opportunity for public review and comment on a conformity determination for a TIP. In addition, all public comments must be addressed in writing.

On May 19, 2010, FMATS approved its Public Participation Plan. The purpose of this revision was to ensure that FMATS meets the requirements of SAFETEA-LU (Safe, Accountable, Flexible, Efficient, Transportation Equity Act, A Legacy for Users), the current Surface Transportation Bill. One of the requirements is that government spending on transportation becomes more transparent to State and Local Officials, as well as the public.

The Plan defines a process for providing citizens, affected public agencies, representatives of public transportation employees, freight shippers and transportation services, representatives of users of pedestrian walkways and bicycle transportation facilities, representatives of the disabled, and other interested parties with meaningful and measurable opportunities to be involved in the transportation planning process.
In general, the TIP and corresponding conformity analysis is the subject of a public notice and 30 day review period prior to adoption. A public meeting is also conducted prior to adoption and all public comments are responded to in writing. Appendix G will contain documentation of the public meeting process. The responses to comments will be incorporated into the final report and listed in Appendix H.

###

5. TIP CONFORMITY

The principal requirements of the federal transportation conformity rule for TIP/MTP assessments are as follows:

1. For pollutants for which applicable SIP emission budgets have been established, vehicle emissions from the transportation plan represented in the TIP/MTP must not exceed the SIP-based budgets;

2. For pollutants for which emission budgets are not yet available, the TIP and MTP must pass an interim emissions budget (FMATs chose to use the "no-greater-than-2008 emissions test");

3. The latest planning assumptions and emission models must be employed;

4. The TIP and MTP must provide for the timely implementation of transportation control measures (TCMs) specified in the applicable air quality implementation plans; and

5. Consultation procedures must be followed.

The final determination of conformity for the TIP/MTP is the responsibility of the Federal Highway Administration and the Federal Transit Administration.

The previous sections and the appendices present the documentation for all of the requirements listed above for conformity determinations except for the conformity test results. Prior sections have also addressed the updated documentation required under the federal transportation conformity rule for the latest planning assumptions.

This section presents the results of the CO and $PM_{2.5}$ conformity tests, satisfying the remaining requirements of the federal transportation conformity regulation. The applicable conformity tests were reviewed in Section 2. For each test, the required emissions estimates were developed using the transportation and emission modeling approaches required under the federal transportation conformity rule and documented in Section 3. The results are summarized and discussed separately for each pollutant below.

CO Conformity – AKMOBILE6-based wintertime CO emission estimates for the portion of TIP vehicle travel within the CO nonattainment area are presented in Table 5-1. For each of the four analysis years, the two "components" of CO emissions estimated by AKMOBILE6 are shown: (1) warm-up initial idling emissions; and (2) travel emission (on-road activity occurring after initial idling). These components are then summed in the row labeled "Modeled Vehicle Emissions." After accounting for benefits of local SIP control measures* (which are not addressed within AKMOBILE6), motor vehicle emissions from TIP activity are highlighted at the bottom of Table 5-1.

Table 5-1
Fairbanks 2012-2015 TIP On-Road Vehicle Winter CO Emissions
(Within CO Nonattainment Area)

Source Component	CO Emissions by Calendar Year in Tons/Day			
	2010	2015	2025	2035
Warm-up Idle Emissions	2.24	1.94	1.70	1.85
Travel Emissions	14.95	13.30	13.34	14.58
Modeled Vehicle Emissions	17.20[a]	15.25[a]	15.04	16.43
Additional Local Controls	-0.33	-0.03	-0.03	-0.03
Motor Vehicle Emissions	**16.87**	**15.22**	**15.01**	**16.40**

[a] Modeled vehicle emission totals round to the two decimal digits shown. Idle and travel emissions reported separately do not sum to total emissions due to rounding.

Table 5-2 compares the resulting motor vehicle emissions from the TIP to the calendar-year-specific CO emission budgets from the 2008 Maintenance Plan. (As noted earlier, the furthest horizon year in the Maintenance Plan was 2015. Thus, the 2015 budget was applied for calendar year 2025 and 2035 as well.) As shown in Table 5-2, TIP emissions are projected to be comfortably below applicable budgets for all analysis years, indicated as a "surplus" in the table.

Table 5-2
Comparison of Maintenance Plan Emission Budgets and
2012 TIP Winter CO Emissions (tons/day)

Emissions Estimate	Analysis Year			
	2010	2015	2025	2035
Emissions Budget	24.01	23.61	23.61	23.61
TIP	16.87	15.22	15.01	16.40
Surplus (+) or Shortfall (-)	**+7.14**	**+8.30**	**+8.60**	**+7.21**
Conformity Finding	**Yes**	**Yes**	**Yes**	**Yes**

* The control measures and related emission benefit estimates are the same as those employed in the most recent Maintenance Plan.

Based on these findings, Fairbanks meets all CO emission budget tests and demonstrates conformity of its transportation program in accordance with Sections 93.109 – 93.118 of the Final Conformity Rule and parallel State of Alaska requirements in the Air Quality Control Plan and the Alaska Administrative Code Title 18, Chapter 50.

$PM_{2.5}$ Conformity - Table 5-3 presents results for $PM_{2.5}$ and NOx (for the 2006 24-hour standard $PM_{2.5}$ standard) in tons per winter day for each of the analysis years considered.

Table 5-3
$PM_{2.5}$ Conformity Test Results

Year	$PM_{2.5}$ (tons per day)	$PM_{2.5}$ Emissions ≤ Base Year	NOx (tons per day)	NOx Emissions ≤ Base Year
2008 Baseline	**0.43**	-	**5.40**	-
2010	0.34	Yes	3.92	Yes
2015	0.25	Yes	2.42	Yes
2025	0.19	Yes	1.35	Yes
2035	0.20	Yes	1.26	Yes

In accordance with the Transportation Conformity Rule, if a 2006 $PM_{2.5}$ area does not have adequate or approved budgets, it must use one of the interim tests. Conformity may be demonstrated if the emissions from the proposed transportation system are either less than or no greater than the 2008 motor vehicle emissions in a given area. For the $PM_{2.5}$ conformity determination, FMATS chose to use the "no-greater-than-2008 emissions test" for the analysis years 2010, 2015, 2025, and 2035.

Emissions were estimated using the latest emissions model consistent with the conformity methodology. Both $PM_{2.5}$ exhaust and NOx exhaust were estimated for a winter average day, which was used for the 24-hour standard. The modeling results for all analysis years indicated that $PM_{2.5}$ and NOx exhaust emissions for each TIP "build" scenario are equal to or less than the 2008 base year emissions estimates. The TIP therefore satisfies the interim conformity emissions tests for the 2006 $PM_{2.5}$ standard.

As all requirements of the Transportation Conformity Rule have been satisfied, a finding of conformity for the new 2006 $PM_{2.5}$ standard is supported for the Federally Approved 2012-2015 Transportation Improvement Program.

###