AIR QUALITY CONFORMITY DETERMINATION FOR THE INTERIM 2035 ANCHORAGE METROPOLITAN TRANSPORTATION PLAN

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APPROVED BY
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and
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INTRODUCTION AND BACKGROUND

The federally recognized local agency for transportation planning is Anchorage Metropolitan Area Transportation Solutions (AMATS). AMATS is updating the 2035 Anchorage Metropolitan Transportation Plan (MTP) by means of an interim MTP in 2015, identifying long-range goals for surface transportation over a 20 year period. The interim plan will ensure conformity with federal regulations requiring MTP updates every four years.

Clean Air Act Amendments require that federally funded transportation plans conform to air quality goals established by state air quality implementation plans (SIP). This conformity determination was performed to ensure that plans and projects within the Interim MTP do not hinder the continued maintenance of air quality standards required by the Alaska SIP.

The Alaska SIP contains limited maintenance plans for both carbon monoxide (CO) and PM-10 air pollutants within areas of the Municipality of Anchorage. EPA allows demonstration of conformity in such Limited Maintenance Areas (LMA) to be based on analysis of air monitoring data rather than demonstrating, through modeling, that projected transportation emissions will be under the emission budget established in the SIP. LMAs do not have set emissions budgets.

This document confirms the continued eligibility of Anchorage's Limited Maintenance Area status for CO and PM-10, and documents that Transportation Control Measures (TCMs) required by the SIP continue to be implemented.

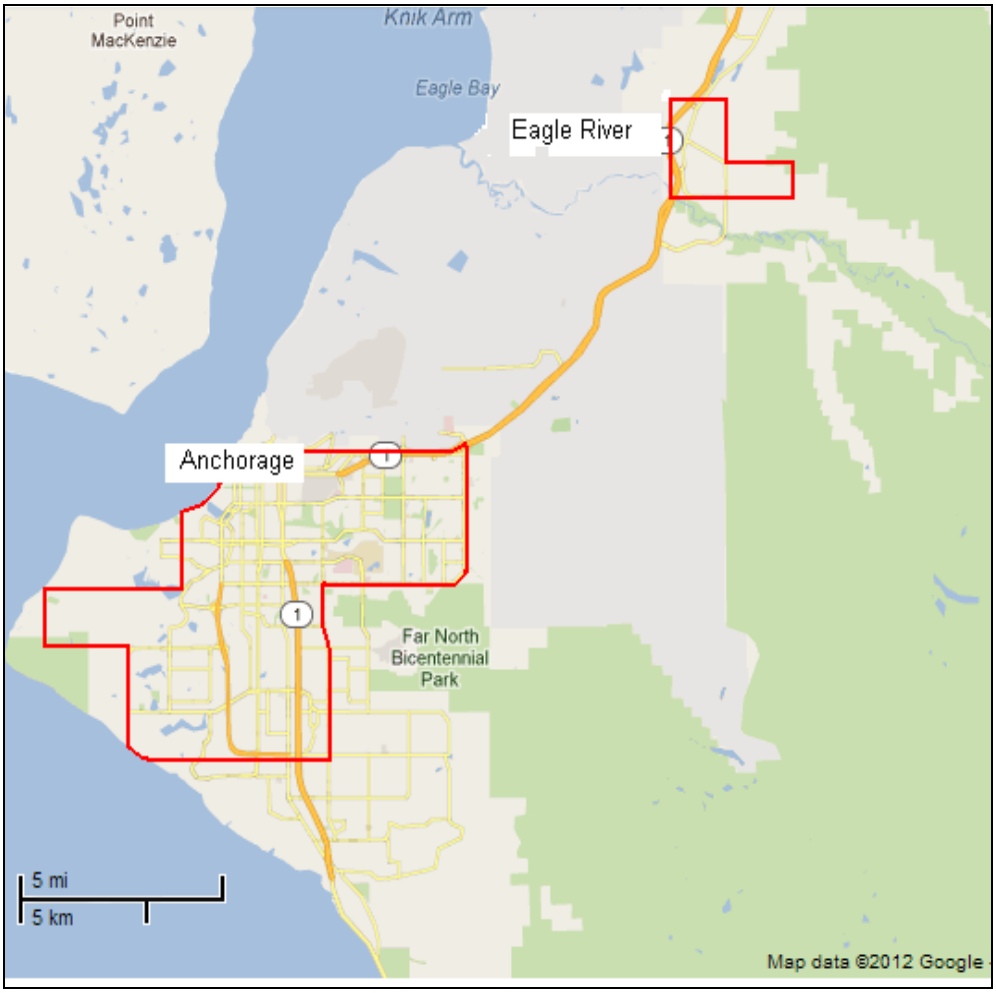
Interagency consultation has taken place between local, state and federal agencies concerning the approach used in this document. Public review has also been performed in accordance with the AMATS Public Participation Plan.

Conformity requirements are outlined in federal regulation 40 CFR 93. These regulations describe who the regulation applies to, when and how conformity determinations are to be performed, and the consultation process required between the MPO, federal, state and local agencies.

The conformity determination that follows builds on the analysis performed for the 2015-2018 AMATS Transportation Improvement Program (TIP) and was approved by AMATS in August of 2014. Air quality data through 2014 has been included in this report.

Part 1 of this report will describe the conformity analysis performed for the Anchorage CO Limited Maintenance Area. Part 2 will address conformity for the Eagle River PM-10 Limited Maintenance Area.

Figure 1.1
Anchorage CO and Eagle River PM-10 Limited Maintenance Areas



Interagency Consultation

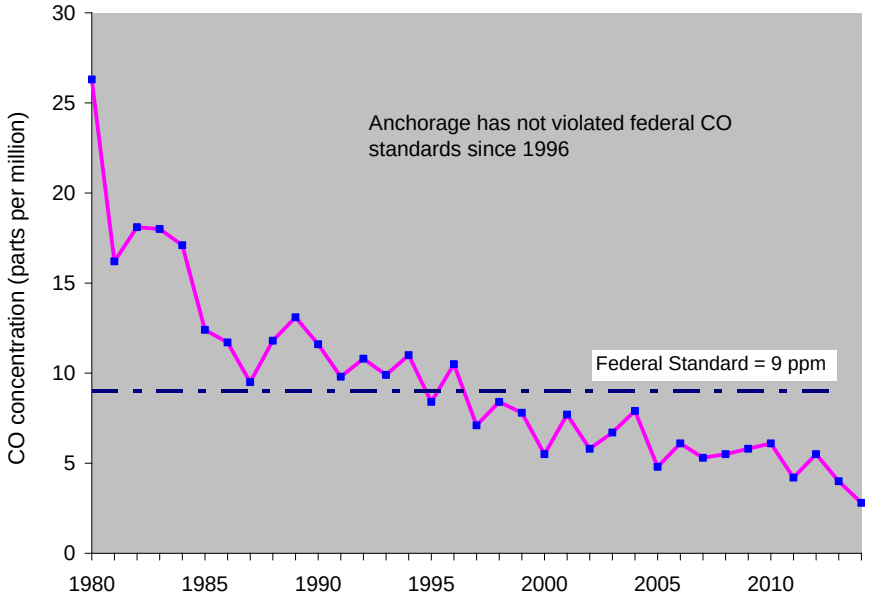
AMATS, state and local air quality officials, and representatives from Alaska DOT&PF, FHWA and US EPA took part in the consultation process for this current conformity determination. AMATS staff agreed to document continued eligibility for the Anchorage CO and Eagle River PM-10 limited maintenance plans as well as compliance with the administrative requirements of the conformity rules to demonstrate conformity with the Interim MTP. These include maintenance of transportation control measures contained in the SIP, an assurance that the transportation plan is fiscally constrained, use of the latest planning assumptions and adherence to the process of interagency and public review. This plan has been prepared and will be reviewed consistent with these requirements.

PART 1: CONFORMITY ANALYSIS FOR THE ANCHORAGE CO MAINTENANCE AREA

1.1 Anchorage CO Attainment Status

Anchorage was first identified as experiencing high levels of ambient CO concentrations in the early 1970s. In the early 1980s as many as 50 violations of the national ambient air quality standard (NAAQS) were measured in a single year. However, in the past three decades there has been a steady decline in ambient CO due to improvements in motor vehicle emission control technology. Local control programs such as carpooling and vanpooling programs and public awareness programs that encourage motorists to reduce cold start CO emissions by using engine block heaters prior to starting have also contributed to emission reductions. CO concentrations have declined by over 70% since the 1980s and there have been no violations of the NAAQS since 1996. The trend in CO concentrations is shown in Figure 1.2.

Figure 1.2
Trend in Annual 2nd Maximum 8-hour CO Concentration
at Anchorage Monitoring Stations (1980 – 2014)



In February 2004, on behalf of the Municipality of Anchorage, the State of Alaska requested that the EPA redesignate Anchorage from a nonattainment area for CO to an area that has attained the standard. This request was accompanied by a maintenance plan that showed Anchorage should continue to maintain compliance with the NAAQS.

The CO Maintenance Plan has been amended several times since 2004. The EPA recently approved the Anchorage Carbon Monoxide Limited Maintenance Plan which streamlines the air

quality conformity demonstration process (79 FR 11707)*. Under the Limited Maintenance Plan (LMP) option, an emissions budget test is not required because maintenance of the eligibility criteria to qualify for the LMP assures a very low potential to exceed the NAAQS. However, the MPO must still adhere to the administrative procedures for conformity with transportation plans and state implementation plans. These include the requirements to complete interagency consultation in accordance with 40 CFR Part 93.112, and to fulfill the public consultation process in accordance with 23 CFR Part 450. In addition the MPO must adhere to the requirements for fiscal constraint of transportation plans and improvement plans consistent with 23 CFR Part 450, and ensure that all transportation plans provide for the timely implementation of transportation control measures as committed to in the SIP. In order to assure that highway or transit projects do no cause or contribute to localized violations for CO or PM-10, 'hot-spot' analyses are performed in accord with 40 CFR 93.123. Although regional emissions analyses exempt specific project categories, localized effects of these projects must be considered. Also, sponsors/owners of projects expected to create high localized concentrations must supply written commitments to mitigation measures prior to conformity determinations consistent with 40 CFR 93.125. Although the transportation conformity rule (40 CFR Part 93) does not require AMATS to demonstrate current compliance with the limited maintenance plan eligibility criteria, AMATS agreed to do so for this conformity determination as an outcome of the interagency consultation process.

1.2 Compliance with CO Limited Maintenance Area Eligibility Criteria

Under the LMP there is no requirement to project emissions over the maintenance period in order to demonstrate conformity with the CO emission budget. EPA policy states that if an area is at or below 85 percent of exceedance levels, continuation of transportation control measures already in the SIP should provide adequate assurance of maintenance over the applicable 10-year maintenance period. When EPA approves a limited maintenance plan, the agency is concluding that an emissions budget may be treated as essentially not constraining for the length of the maintenance period because it is unreasonable to expect that such an area will experience so much growth in that period that a violation of the CO NAAQS would result.

In order to qualify for the CO LMP option, a non-attainment or maintenance area must have a design value that is equal to or less than 7.65 ppm (85 percent of the CO NAAQS exceedance level) based on 8 consecutive quarters of data.† The design value for the area must continue to be at or below 7.65 ppm until the time of final EPA action on the plan. The EPA approved the Anchorage Carbon Monoxide Limited Maintenance Plan effective May 2, 2014.

The CO design value for the 8-hour CO NAAQS is the highest annual second maximum non-overlapping 8-hour concentration during the most recent two years. Table 1-1 shows the design values for all active Anchorage monitoring sites. The highest design value recorded within the limited maintenance area must be 7.65 ppm or less. The locations of CO monitoring sites are

* The Anchorage CO Maintenance Plan is included as part of the Alaska Air Quality Control Plan or SIP. Thus, an amendment of the CO Maintenance Plan also entails an amendment of the larger SIP document. All SIP amendments are subject to approval by the EPA.

† The design value is determined by examining the annual second maximum concentration at each monitoring site over a two-year period. For each site, the higher of the two values is the design value for that site for that two-year period. The highest design value among the individual sites is the design value for the limited maintenance area as a whole.

shown in figure 1.3. The Garden site in the Airport Heights neighborhood of Anchorage is the only CO site operating in 2014; all others have been discontinued.

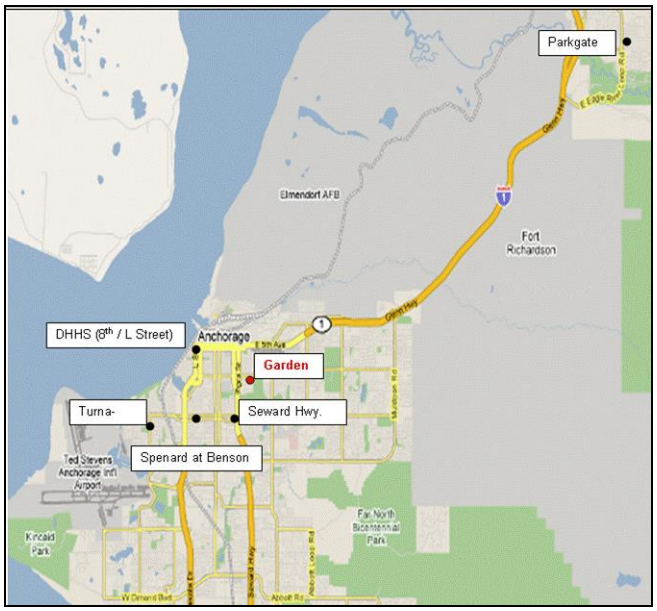
Analysis of the Anchorage CO data from within the Anchorage CO Limited Maintenance Area demonstrates that Anchorage is in compliance with the eligibility criteria for its CO limited maintenance plan.

Table 1.1
Anchorage CO Design Values by Year

	Spenard at Benson 20200017	Garden 20200018	Seward Hwy 20200037	Turnagain 20200048	DHHS 20200052	**DV**
2002	5.7	5.7	5.2	7.7		**7.7**
2003		5.7	5.4	6.7		**6.7**
2004		6.4	5.5	7.9		**7.9**
2005		6.4	5.5	7.9		**7.9**
2006		4.8		6.1		**6.1**
2007		4.3		6.1		**6.1**
2008		3.8		5.5	3.1	**5.5**
2009		4.4		5.8	3.6	**5.8**
2010		4.4		6.1	3.6	**6.1**
2011		3.8		6.1	2.8	**6.1**
2012		4.3		5.5	2.8	**5.5**
2013		4.3		5.5	2.8	**5.5**
2014		3.1		4.0		**4.0**

Analysis of the Anchorage CO data from within the Anchorage CO Limited Maintenance Area demonstrates that Anchorage is in compliance with the eligibility criteria for its CO limited maintenance plan.

Figure 1.3
Anchorage CO Monitoring Site Locations with
Garden (Active Site) in Red.



1.3 Conformity Requirements for CO LMP

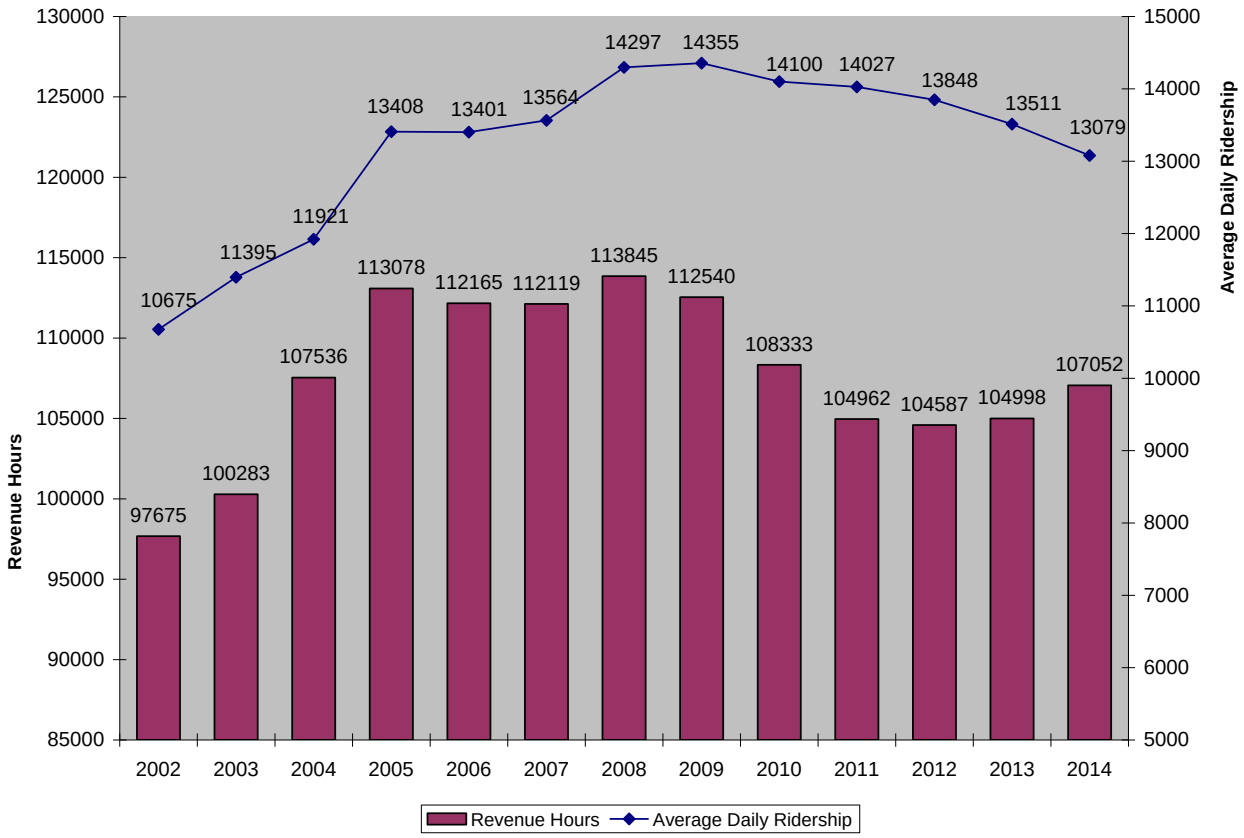
1.3.1 Transit Service

Section 93.110 of the air quality conformity regulations states that the conformity determination for transportation plans must discuss how transit operating policies (including fares and service levels) and assumed transit ridership have changed since the previous transportation plan conformity determination was approved.

On January 1, 2014 Anchorage cash bus fares increased from $1.75 to $2.00 and 30-day passes increased from $55 to $60; however, at the same time fares for youth, senior and disabled riders dropped to half of the full fare price. A prior increase in cash fares from $1.50 to $1.75 occurred in October 2005. In January 1, 2012, the cost of a monthly pass increased from $50 to $55; a day pass increased from $4 to $5; a monthly pass for senior/disabled increased from $15 to $19.25; and a senior/disabled daily pass increased from $1.25 to $1.50.

Figure 1.3 shows how transit service levels, as indicated by weekday revenue hours, have varied between 2002 and 2014. Weekday transit service provided within the Municipality reached a peak in 2008 when 113,845 hours of weekday service were provided. Ridership peaked a year later at 14,355 trips per day. Weekday transit service was cut by 8% between 2008 and 2013. Ridership has dropped by about 7% during the same period.

Figure 1.4
Trend in Transit Service and Ridership (2002-2014)



1.3.2 Transportation Control Measures (TCMs)

In maintenance areas such as the Municipality of Anchorage, priority must be given to the implementation of TCMs included in the SIP. Transportation control measures are defined as any measure that is specifically identified and committed to in the applicable implementation plan or any other measure for the purpose of reducing emissions or concentrations of air pollutants from transportation sources by reducing vehicle use or changing traffic flow or congestion conditions.

Ridesharing, van pooling and transit marketing are the only TCMs identified in CO Maintenance Plan. They are funded in the current Transportation Improvement Program. Although these measures are identified in the Plan, no CO reduction is claimed for these measures.

The van pooling program has increased in popularity over the past decade. The number of vanpoolers in the program has increased nearly four-fold, from 270 to about 1000 in recent years.

In contrast, the number of registered carpoolers has dropped during the same period. In 2002, there were 419 registered carpoolers among 209 carpools. By 2013, the number of carpoolers dropped to 266 among 127 carpools. It is likely that competition from vanpooling is reducing carpool numbers.

It is difficult to distinguish the effect that transit marketing has had on ridership because other factors, such as the price of gasoline, socio-economic influences, and changes in service also affect ridership.

Table 1.2
Vanpool Program Participation (2002-2014)

Year	Number of Vanpools	Number of Vanpoolers
2002	21	270
2003	23	323
2004	24	363
2005	24	375
2006	41	569
2007	42	589
2008	52	810
2009	52	917
2010	54	923
2011	66	1152
2012	65	992
2013	65	972
2014	65	972

1.4 Conclusion regarding Anchorage CO Conformity

This analysis demonstrates that the Interim 2035 Anchorage Metropolitan Transportation Plan is in conformance with the Alaska State Implementation Plan for air quality and meets conformity requirements outlined in 40 CFR 93 for CO. Furthermore, it has been determined that the MTP will not undermine the ability of the Municipality of Anchorage to maintain compliance with the NAAQS for CO.

PART 2: CONFORMITY ANALYSIS FOR THE EAGLE RIVER PM-10 AREA

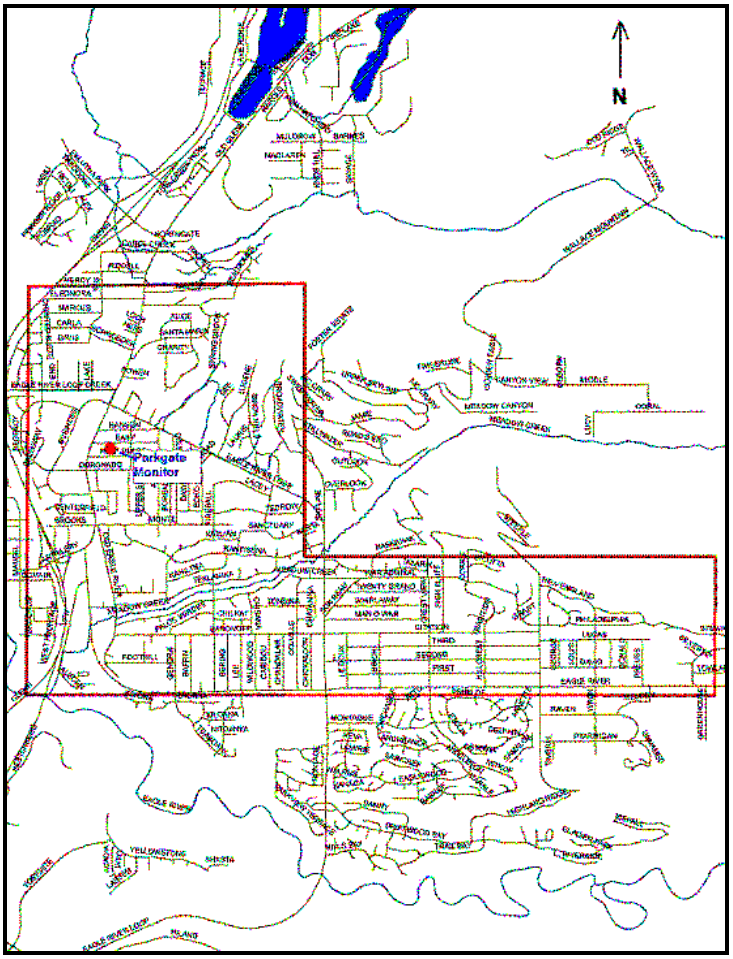
2.1 Eagle River PM-10 Attainment Status - Qualification as a Limited Maintenance Area for Conformity Purposes

Between 1985 and 1987 Eagle River frequently violated the NAAQS for PM-10 or particulate matter air pollution with an aerodynamic diameter less than or equal to 10 µm in size. The main source of this pollution was identified as unpaved roads in the area. As a consequence, in 1991 the EPA designated a nine square kilometer area in Eagle River as a moderate nonattainment area for PM-10 and required the submission of an air quality attainment plan to bring the area into compliance with the NAAQS.

In 1991, the Municipality of Anchorage and the Alaska Department of Environmental Conservation prepared the *Eagle River PM-10 Control Plan* which was submitted to the EPA as amendment to the Alaska SIP to address the PM-10 problem in Eagle River. The plan outlined an ambitious road paving program to reduce emissions from this source. The EPA approved the plan as an amendment to the SIP in 1993 (58 FR 43084).

By 1993, most of the 22 miles of unpaved local roads in the 9 km^2 PM-10 problem area were either surfaced with recycled asphalt or paved. By 2007 there were no unpaved local roads within the problem zone.

Figure 2.1
Eagle River Limited Maintenance Area Boundary with Parkgate Monitoring Site



The road paving and recycled asphalt surfacing program has dramatically reduced PM-10 concentrations in Eagle River. The last violations of the PM-10 NAAQS occurred in 1987.[‡]

In October 2010, the EPA made a determination that Eagle River had attained the NAAQS (75 FR 64162). However, before Eagle River could be officially redesignated as an attainment area, a maintenance plan had to be submitted to EPA to demonstrate that the air quality control measures in place in Eagle River are sufficient to ensure continued maintenance of NAAQS.

The EPA offers a less rigorous and more streamlined process of gaining redesignation to attainment to areas that can demonstrate they have a low risk of violating the PM-10 NAAQS. This is known as the Limited Maintenance Plan (LMP) option. When EPA approves a limited maintenance plan, the agency is concluding that an emissions budget may be treated as essentially not constraining for the length of the maintenance period because it is unreasonable to expect that such an area will experience so much growth in that period that a violation of the PM-10 NAAQS would result.

Nonattainment areas that wish to qualify for this streamlined process must show that: (1) their average design value over the past five years is below 98 $\mu g/m^3$ and therefore have a low probability of violating the NAAQS, and (2) that PM-10 emissions anticipated from growth in motor vehicle travel in the area are unlikely to cause a future violation.[§] Eagle River met both of these criteria. In September 2010, on behalf of the Municipality of Anchorage, the State submitted the *Eagle River PM-10 Limited Maintenance Plan* to EPA as a proposed amendment to the SIP.

EPA approved the Eagle River PM-10 LMP, effective March 8, 2013 (78 FR 900). Areas that have been designated as "limited maintenance areas" or have had their LMPs approved for conformity purposes have a simplified conformity procedure. This simplified LMP procedure is used in this analysis.

2.2 PM-10 LMP Conformity Criteria

Areas with approved LMPs or areas that have had them approved for conformity determinations are not required to perform an emission budget test as long as the area continues to meet the LMP criteria. Areas with an LMP are required to annually re-compute their 5-year average DV to determine whether it is below 98 $\mu g/m^3$ and therefore still meets this LMP criterion.[**] Table 2.1 shows that the 5-year average DV in Eagle River has consistently met this requirement. The method used to compute these 5-year average DVs is explained in detail in the Appendix of this document.

[‡] PM-10 concentrations have exceeded the 150 ug/m^3 NAAQS (as a 24-hour average) on a number of occasions since 1987, but all of these "exceedances" have been attributed to natural events. These include glacial river dust transported by high winds from the Matanuska River and volcanic ash resulting from the eruption of the Mt. Spurr volcano in August 1992. EPA excludes these events when considering whether an area has met the NAAQS.

[§] PM-10 LMP guidance is outlined in a memorandum from Lydia Wegman, Director, Air Quality Standards and Strategies Division, EPA, August 9, 2001.

[**] This requirement is found in the Wegman PM-10 LMP guidance. It is not a requirement of the transportation conformity rule. AMATS agreed to include the Eagle River PM-10 Limited Maintenance Area design value analysis in this conformity determination as an outcome of interagency consultation.

Table 2.1
5-Year Average Eagle River PM-10 Design Values

5-Year Period	AverageDV ($\mu g/m^3$)
2002-2006	95.0
2003-2007	92.3
2004-2008	85.0
2005-2009	81.5
2006-2010	77.9
2007-2011	80.5
2008-2012	81.9
2009-2013	86.6
2010-2014	92.8
LMP Qualification Criteria	**< 98.0 $\mu g/m^3$**

The following conformity requirements apply to LMPs or areas that have had their LMPs approved for conformity purposes:

	Criteria
93.110	The conformity determination must be based on the latest planning assumptions.
93.112	Conformity must be determined according to the consultation procedures in this subpart and in the applicable implementation plan, and according to the public involvement procedures established in compliance with 23 CFR Part 450.
93.113(b)	The transportation plan must provide for the timely implementation of TCMs from the applicable SIP.

As per 40 CFR 93.113(b), the transportation plan must: (1) provide for timely implementation of the TCMs in the applicable SIP; and (2) nothing in the transportation plan should interfere with a TCM in the SIP. Both these conditions have been met. When the *Eagle River PM-10 Control Plan* was submitted to EPA in 1991, 6.6 miles of the 22 miles of unpaved road in the problem zone had already been paved or surfaced with recycled asphalt product (RAP). The plan assumed that an additional 8.6 miles of paving or recycled asphalt surfacing would be completed by 1993. This was accomplished; by 1993 over 15 miles of the 22 miles of unpaved roads in the problem zone had been paved or RAP-treated. By 2007, there were no unpaved roads in the problem zone.

The *Eagle River PM-10 Control Plan* also called for changes in winter traction sanding practices to reduce PM-10 emissions during the spring break-up period. These included reductions in the amount applied and new specifications that limited the silt content in the sand to 2% or less. These measures were implemented in 1989 and continue to be implemented today. The fact that Eagle River has been in compliance with the NAAQS since 1989 attests to the effectiveness of the implemented control

strategies. There is nothing in the Interim 2035 Anchorage Metropolitan Transportation Plan that would interfere with the continued implementation of these TCMs.

2.3 Conclusion regarding Eagle River PM-10 Conformity

This analysis demonstrates that the Interim 2035 Anchorage Metropolitan Transportation Plan is in conformance with the Alaska State Implementation Plan for air quality and meets conformity requirements outlined in 40 CFR 93 for PM-10. Furthermore, it has been determined that the 2015 Interim MTP will not undermine the ability for Eagle River to maintain compliance with the PM-10 NAAQS.

APPENDIX

Computation of PM-10 Design Value Concentrations for Eagle River

Computation of PM-10 Design Value Concentrations for Eagle River

Computational methods for determining the 24-hour design value (DV) are outlined in the *PM-10 SIP Development Guideline (EPA-450/2-86-001, June 1987)*. The empirical frequency distribution approach (see Section 6.3.3. of the guideline) was used to determine the site-specific PM-10 concentration that would be expected to be exceeded at a frequency of once every 365 days.

The *Eagle River PM-10 Limited Maintenance Plan* describes how the DVs were computed by three-year block during the 1998 – 2014 period. (Data through 2007 were considered in the Plan.) An identical method was used to compute the DV concentrations from data collected since the submission of the Plan.

We will describe how the empirical frequency distribution method was used to compute the DV for the three-year period 2012-14. During this period, the number of unflagged 24-hour average PM-10 measurements (n) was 1041. These concentrations were assigned rank where the highest concentration was rank = 1, and lowest was rank = 1041. An abbreviated version of this table is shown below. During this 2012-14 period, the lowest PM-10 concentration measured was 1 μg/m3 (rank = 1041); the highest was 174 μg/m3 (rank = 1).

Table 1

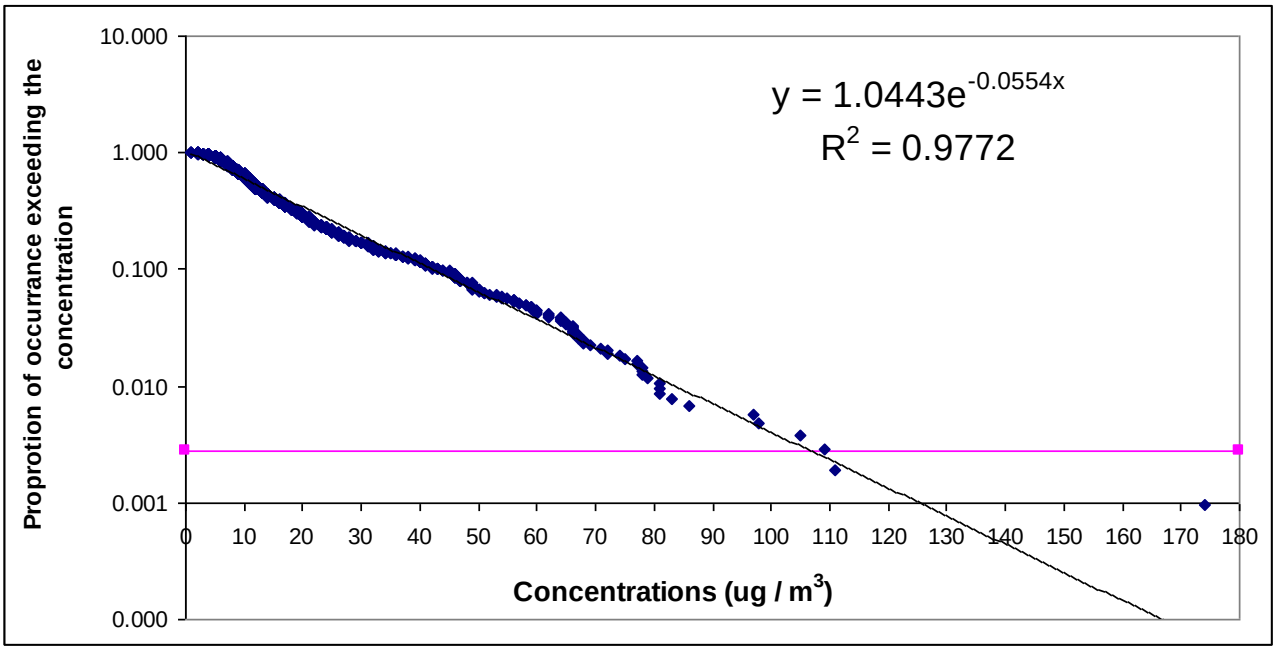
Date	PM-10 (μg/m3)	*i* rank	*P = i /n* Proportion of observations with equal or higher concentration
10/4/12	1	1041	1.000
11/23/13	1	1040	0.999
2/10/13	1	1039	0.998
12/30/12	1	1038	0.997
1/1/13	2	1037	0.996
1/8/13	12	529	0.508
7/11/13	12	528	0.507
7/23/14	12	527	0.506
8/23/14	12	526	0.505
2/1/14	105	4	0.004
1/31/14	109	3	0.003
2/11/14	111	2	0.002
1/15/13	174	1	0.001

The empirical frequency distribution for each 3-year block was then determined by plotting *P* vs. its corresponding PM-10 concentration (see Figure 1). By definition, the DV is the concentration that corresponds to *P* = 1/365, the highest expected concentration during a one-year or 365-day period. The design value concentration can be approximated graphically or computed directly from the equation of the best-fit line.

In this case: $y = 1/365 = 0.00274 = 1.0443\ e^{-0.0554x}$ $x = 107.3\ \mu g/m^3$

Figure 1

Computation of 2012-2014 DV for Eagle River by Empirical Frequency Distribution Method



The DVs for the other three-year periods were computed similarly.

Table 2

Computation of Average DV for Parkgate Site in Eagle River

3-yr Period	n	Equation of Line Describing Empirical Frequency Distribution ++	R^2	DV (computed from previous 3 years data using empirical frequency distribution) ($\mu g/m^3$)
2010-2012	1025	$y = 1.3071e^{-0.0752x}$	0.99	82.0
2011-2013	1035	$y = 1.1524e^{-0.0680x}$	0.96	88.8
2012-2014	1041	$y = 1.0443^{e-0.0554x}$	0.98	107.3
Average DV for the last 5 years (2010 – 2014)				92.7 $\mu g/m^3$
LMP Qualification Criteria				< 98 $\mu g/m^3$