

# Denver-North Front Range (Northern Subarea) 8-Hour Ozone Nonattainment Area Conformity Determination

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for the  
North Front Range Metropolitan Planning Area  
2040 Fiscally Constrained Regional Transportation Plan Amendment  
and the  
FY2018-2021 Transportation Improvement Program  
and for the  
Northern Subarea of the Upper Front Range Transportation Planning Region  
2040 Regional Transportation Plan  
and for the  
Northern Subarea of the Upper Front Range Transportation Planning Region  
portion of the  
Colorado FY2017-2020 Statewide Transportation Improvement Program

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## EXECUTIVE SUMMARY

This report demonstrates the Denver-North Front Range (Northern Subarea) 8-Hour Ozone Nonattainment Area meeting of federally prescribed air pollution emissions tests using the emissions budgets established under the 2008 8-Hour Ozone National Ambient Air Quality Standard (NAAQS). This demonstration is based on new travel demand projections and network assignments based on new projects selected for a new FY2018-2021 Transportation Improvement Program (TIP) and projects moved up, with the out year remaining 2040. All other assumptions remain the same from the previously approved conformity determination.

This document will be released to the public on November 11, 2016. It will be available on the North Front Range Metropolitan Planning Organization (NFRMPO) website at <http://nfrmpo.org/air-quality/> and at the NFRMPO Office as a print copy. The public comment period ends at 5:00 p.m. on December 10, 2016. All comments will be presented to the North Front Range Air Quality and Transportation Planning Council (NFRT&AQPC) on February 2, 2017 at the formal public hearing and at the Air Quality Control Commission (AQCC) public meeting on December 15, 2016.

A conformity determination report for the Fort Collins and Greeley Carbon Monoxide (CO) Maintenance Areas was prepared concurrently with this document to have the same effective date.

## LIST OF ACRONYMS

|                 |   |
|-----------------|---|
| APCD            | Air Pollution Control Division                                    |
| AQCC            | Air Quality Control Commission                                    |
| CDOT            | Colorado Department Of Transportation                             |
| CDPHE           | Colorado Department of Public Health and Environment              |
| CFR             | Code of Federal Regulation  |
| CMAQ            | Congestion Mitigation Air Quality                                 |
| CO              | Carbon Monoxide   |
| COLT            | City of Loveland Transit  |
| DRCOG           | Denver Regional Council of Governments                            |
| EPA             | Environmental Protection Agency                                   |
| FHWA            | Federal Highway Administration                                    |
| FTA             | Federal Transit Administration                                    |
| GET             | Greeley-Evans Transit   |
| ICG             | (Air Quality) Interagency Coordination Group                      |
| I/M             | Inspection and Maintenance Program                                |
| MOA             | Memorandum of Agreement   |
| MOVES2014a      | EPA's Motor Vehicle Emission Simulator model                      |
| MPO             | Metropolitan Planning Organization                                |
| MVEB            | Motor Vehicle Emissions Budget                                    |
| NAAQS           | National Ambient Air Quality Standards                            |
| NFRT&AQPC       | North Front Range Transportation and Air Quality Planning Council |
| NFRMPO          | North Front Range Metropolitan Planning Organization              |
| NO <sub>x</sub> | Nitrogen Oxides   |
| PPM             | Parts per Million   |
| RAQC            | Regional Air Quality Council                                      |
| RTDM            | Regional Travel Demand Model                                      |
| RTP             | Regional Transportation Plan                                      |
| RVP             | Reid Vapor Pressure   |
| SIP             | State Implementation Plan   |
| STIP            | State Transportation Improvement Program                          |
| TAZ             | Transportation Analysis Zone                                      |
| TCM             | Transportation Control Measures                                   |
| TDM             | Transportation Demand Management                                  |
| TIP             | Transportation Improvement Program                                |
| TMA             | Transportation Management Area                                    |
| TMO             | Transportation Management Organization                            |
| TPR             | Transportation Planning Region                                    |
| TSSIP           | Traffic Signal System Improvement Program                         |
| UFR             | Upper Front Range Transportation Planning Region                  |
| VMT             | Vehicle Miles Traveled  |
| VOC             | Volatile Organic Compounds  |

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# CHAPTER 1: INTRODUCTION

## Background – 8-Hour Ozone Nonattainment Area

On March 27, 2008,<sup>1</sup> the U.S. Environmental Protection Agency (EPA) lowered the National Ambient Air Quality Standard (NAAQS) for ground-level ozone to 0.075 parts per million (ppm), from the 1997 NAAQS of 0.080 ppm. To attain this standard, the three-year annual average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area must not exceed 0.075 ppm. On April 30, 2012, the EPA designated the Denver-North Front Range Area as Marginal Nonattainment under the 2008 NAAQS.<sup>2</sup> The Marginal Nonattainment designation did not impose new planning requirements on the State of Colorado.

EPA's final rule designating areas for the 2008 Ozone NAAQS became effective July 20, 2012. According to the EPA, a conformity determination must be made with regard to the 2008 Ozone NAAQS for regional transportation plans (RTP) and transportation improvement programs (TIP) within one year of the effective date of the Nonattainment designation.<sup>3</sup> FHWA made an initial conformity determination finding for Denver Regional Council of Governments (DRCOG) and the North Front Range Metropolitan Organization (NFRMPO) in separate letters dated May 30, 2013.

The Denver-North Front Range 8-Hour Ozone Nonattainment Area for the 2008 Ozone NAAQS covers the counties of: Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, Jefferson, and portions of Larimer and Weld counties with the highest concentration of emissions. **Figure 1** shows the full 8-Hour Ozone Nonattainment Area, which is comprised of two subareas, Northern and Southern. The boundary between the two subareas is the Boulder/Larimer County line, extended at the same latitude eastward through southern Weld County to the Morgan County line.

EPA identified the Motor Vehicle Emissions Budgets (MVEBs) for Nitrogen Oxides (NO<sub>x</sub>) and Volatile Organic Compounds (VOC) contained in the Denver-North Front Range 8-Hour Ozone Attainment Plan under the 2008 Ozone NAAQS adequate for transportation conformity purposes effective in 2010.<sup>4</sup> EPA approved these NO<sub>x</sub> and VOC MVEBs with the final rule to approve the *Denver-North Front Range 2008 8-Hour Ozone NAAQS Attainment State Implementation Plan (SIP)* revision.<sup>5</sup> As a result of the EPA's action, DRCOG and NFRMPO used these budgets for subsequent transportation conformity determinations.

<sup>1</sup> 73 FR 16436, <https://federalregister.gov/a/E8-5645>, 2008

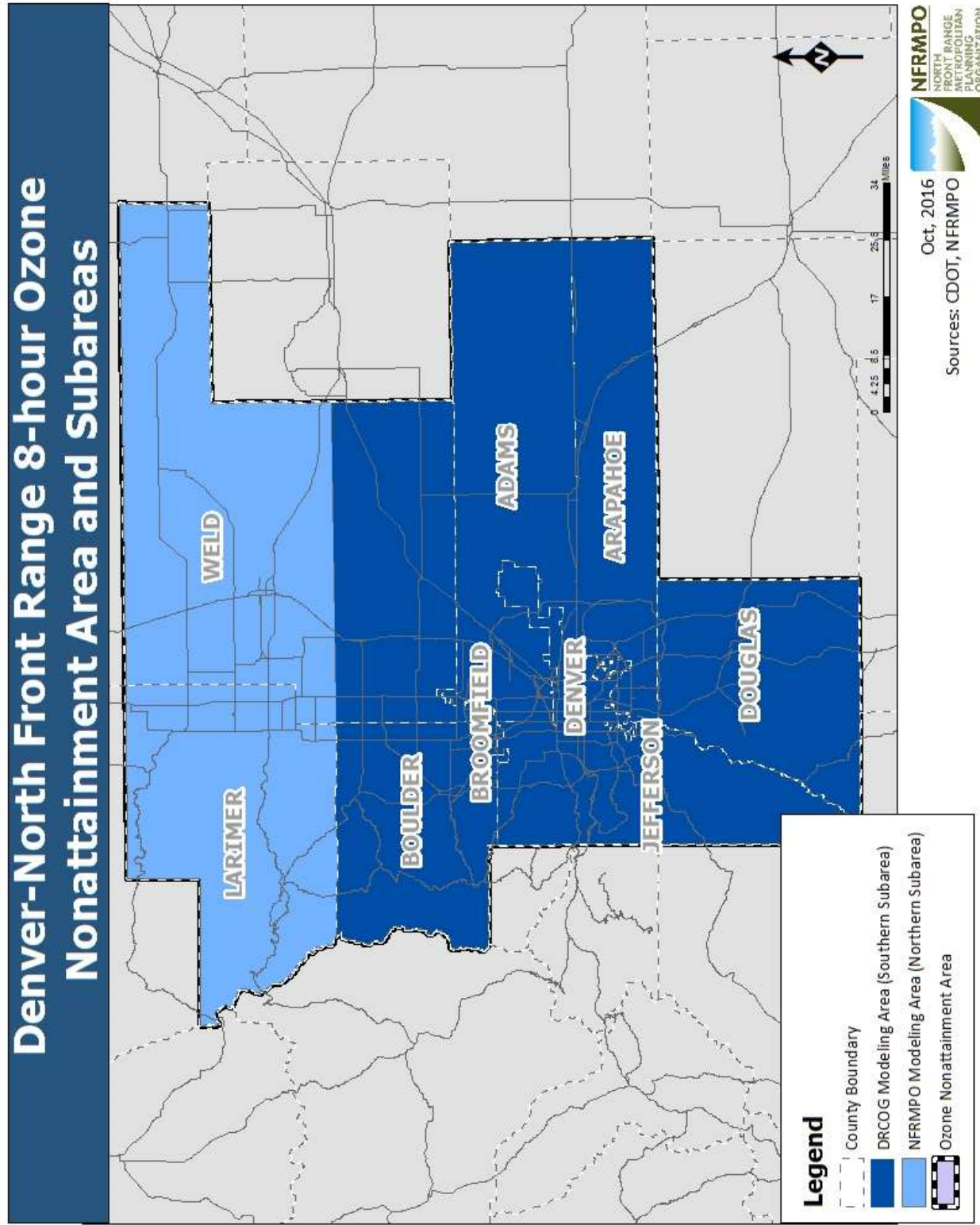
<sup>2</sup> 77 FR 30098, <https://federalregister.gov/a/2012-11618>, 2012

<sup>3</sup> *Transportation Conformity Guidance for 2008 Ozone Nonattainment Areas*, <http://www.epa.gov/otaq/stateresources/transconf/regs/420b12045.pdf>, 2012

<sup>4</sup> 75 FR 9893, <https://federalregister.gov/a/2010-4551>, 2010

<sup>5</sup> 76 FR 47443, <https://federalregister.gov/a/2011-19807>, 2011

**Figure 1: Denver-North Front Range 8-hour Ozone Nonattainment Area and Subareas**





## Federal Requirements

Under the Clean Air Act, Metropolitan Planning Organizations (MPOs) are required to demonstrate conformity of their fiscally constrained RTPs and TIPs with the SIP before transportation plans and programs are adopted.<sup>6</sup> Conformity to a SIP is defined in the Clean Air Act as conformity to the implementation plan's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving attainment quickly. Additionally, activities may not cause or contribute to new violations of air quality standards, exacerbate existing violations, or interfere with the timely attainment of required emissions reduction.

## Conformity Regulations for the 8-Hour Ozone Standard

The EPA's final transportation conformity rule addresses revised standards and changes in conformity requirements through several amendments to the final rule.<sup>7</sup> EPA found the submitted NO<sub>x</sub> and VOC MVEBs adequate<sup>8</sup> and approved these MVEBs in 2011.<sup>9</sup> EPA's latest version of the conformity rule was published on March 14, 2012, incorporating MAP-21 requirements,<sup>10</sup> which were carried forward in the Fixing America's Surface Transportation (FAST) Act, signed into law on December 4, 2015.

## Planning Organizations

The NFRMPO is the MPO for the North Front Range Transportation Management Area (TMA), which includes Berthoud, Fort Collins, Loveland, and portions of Johnstown, Timnath, and Windsor. The NFRMPO also serves the Transportation Planning Region (TPR) for 15 local governments in the urbanized areas of Larimer County and northeastern Weld County.

The Upper Front Range (UFR) covers the remainder of the 8-Hour Ozone Nonattainment Northern Subarea. Located in north-central Colorado, the UFR is comprised of portions of Larimer and Weld counties and Morgan County, and excludes the portion of southwestern Weld County included in the DRCOG TMA. **Figure 2** illustrates the Northern Subarea boundaries for the NFRMPO and the UFR.

## Memorandum of Agreement (MOA)

A Memorandum of Agreement (MOA) was signed in 2008 by the Air Pollution Control Division (APCD) of the Colorado Department of Public Health and Environment (CDPHE), CDOT, Regional Air Quality Council (RAQC), UFR, NFRMPO, and DRCOG per federal transportation regulations,<sup>11</sup> **Appendix A**. The MOA allows the option to establish subarea emissions budgets for Volatile Organic Compounds (VOC) and Oxides of Nitrogen (NO<sub>x</sub>) based on subareas, defined in **Figure 1**. The MOA stipulates DRCOG will conduct conformity determinations for the Southern Subarea of the 8-Hour Ozone Nonattainment Area, while the NFRMPO will conduct conformity determinations for the Northern Subarea. It states the course of action to be pursued if one (or both) subareas fail a conformity test or exceed emissions budgets.

<sup>6</sup> Clean Air Act Requirements and History, <http://www.epa.gov/air/caa/requirements.html>, 2015

<sup>7</sup> 40 CFR Part 93, <http://www.epa.gov/air/genconform/documents/20100324rule.pdf>

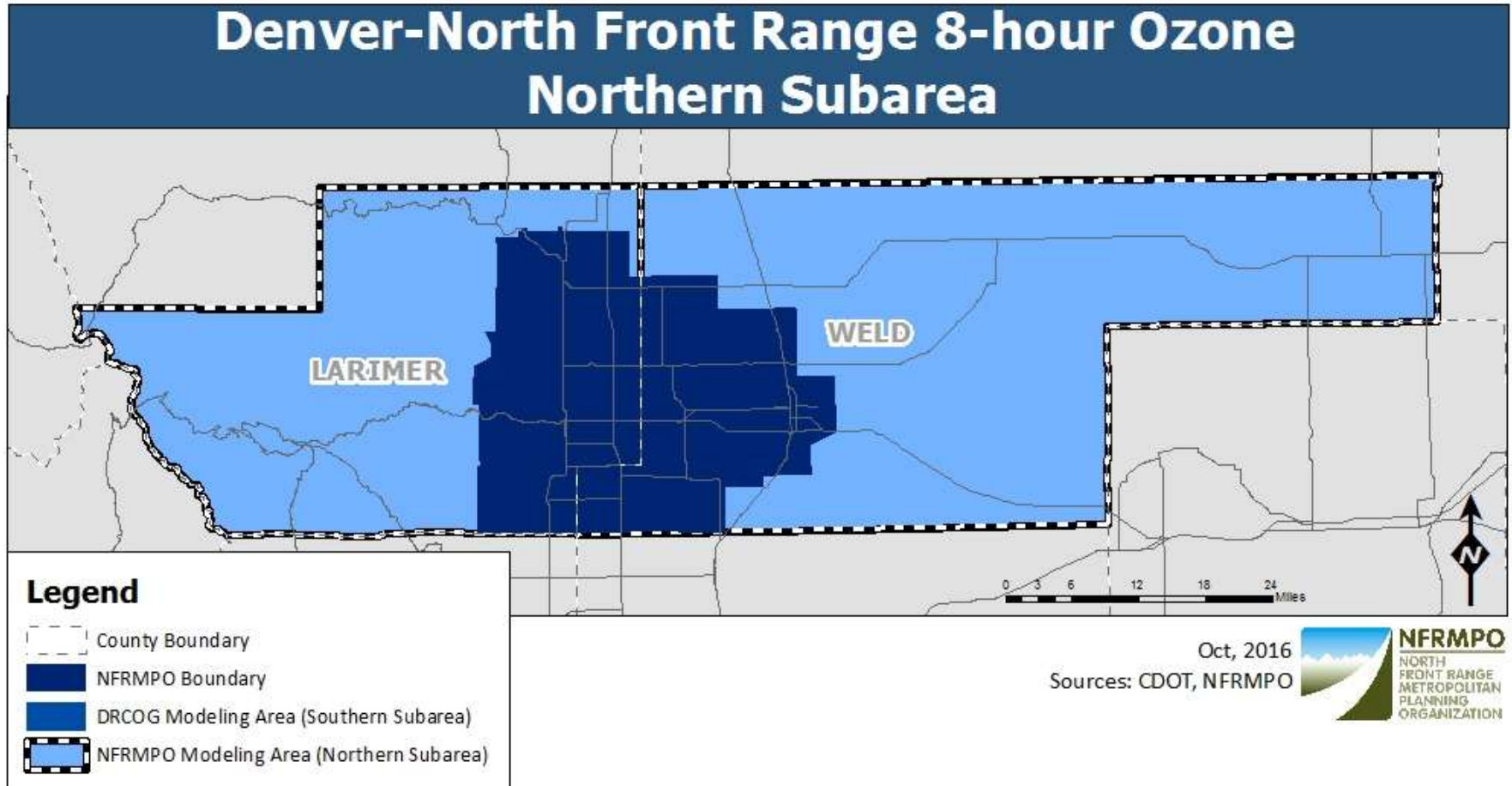
<sup>8</sup> 75 FR 9893, <https://federalregister.gov/a/2010-4551>, 2010

<sup>9</sup> 76 FR 47433, <https://federalregister.gov/a/2011-19433>, 2011

<sup>10</sup> 77 FR 14979, <https://federalregister.gov/a/2012-6207>, 2012

<sup>11</sup> 23 CFR 450.314(b), <http://www.gpo.gov/fdsys/pkg/CFR-2011-title23-vol1/pdf/CFR-2011-title23-vol1-sec450-314.pdf>, 2011

Figure 2: Northern Subarea





## Review of Conformity Determination

The NFRMPO and DRCOG worked cooperatively with the Air Quality Interagency Coordination Group (ICG) which includes membership from the Federal Highway Administration (FHWA), Federal Transit Administration (FTA), EPA, Colorado Department of Transportation (CDOT), and APCD to review the conformity documentation and planning assumptions for this report. Furthermore, members of the NFRMPO's Technical Advisory Committee (TAC), or their representatives, served as the review team for the North Front Range Socio-economic Data and NFRMPO 2040 Regional Travel Demand Model (RTDM) assumptions, pursuant to the State of Colorado's Air Quality Control Commission's (AQCC) Regulation Number 10.<sup>12</sup>

## Current Situation

### Transportation Planning

#### North Front Range Metropolitan Organization

The NFRMPO 2040 RTP Amendment and the NFRMPO FY2018-2021 TIP reflect the last two years of the NFRMPO FY2016-2019 Call for Projects, the NFRMPO FY2020-2021 Call for Projects, CDOT FASTER program funded projects, and all regionally significant air quality projects.

#### Upper Front Range

The UFR 2040 RTP was approved by the UFR Regional Planning Commission on March 5, 2015. The UFR 2040 RTP is vision-based and fiscally constrained. More information can be found in the UFR 2040 RTP on CDOT's Transportation Matters website: <http://bit.ly/2ekAXHf>.

### Air Quality Planning

#### 8-Hour Ozone Nonattainment Area

The current SIP for the Denver-North Front Range 8-Hour Ozone Nonattainment Area was approved by the AQCC in December 2008; and approved by the EPA on August 5, 2011.<sup>13</sup> This SIP demonstrates how the region would attain the 1997 8-Hour Ozone Standard (0.08 ppm) by 2010, and also establishes mobile source emissions budgets. Two air quality planning agencies were charged with preparing the SIP: RAQC and the North Front Range Transportation and Air Quality Planning Council (NFRT&AQPC). RAQC is the air quality planning agency for the Denver metropolitan area (Southern Subarea). The NFRT&AQPC was the air quality planning agency for the Northern Subarea when the SIP was developed. In 2013, the RAQC was named the lead air quality planning agency for the entire Denver/North Front Range 8-Hour Ozone Nonattainment Area.<sup>14</sup> The nine-county Denver-Northern Front Range Area has been designated as Marginal Nonattainment for the 2008 8-Hour Ozone NAAQS.

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<sup>12</sup> 5 CCR 1001-12, <https://www.sos.state.co.us/CCR/GenerateRulePdf.do?ruleVersionId=4498&fileName=5%20CCR%201001-12,2012>

<sup>13</sup> 76 FR 47443, <https://federalregister.gov/a/2011-19807>, 2011

<sup>14</sup> Executive Order B 2013 007, <http://www.colorado.gov/cs/Satellite/GovHickenlooper/CBON/1251650380954>, 2013

## Process

### ***Agency Roles – Conformity State Implementation Plan***

The Conformity SIP, also known as the AQCC Regulation Number 10 or conformity implementation plan, was developed by the AQCC and adopted in 1998. It formally defines the process for finding conformity. The EPA approved the Regulation Number 10 on September 21, 2001 (66FR48561), making it federally enforceable. Regulation Number 10 was updated and approved by the AQCC on February 18, 2016.

In November 1998, the APCD and NFRMPO signed a MOA for the purpose of defining the specific roles and responsibilities in conformity evaluations and findings. A similar MOA was also signed by the CDPHE and DRCOG in November 1998. EPA approved the updated Regulation Number 10 in early 2014 and the 1998 MOA between CDPHE and NFRMPO was updated to reflect the changes made in Regulation Number 10. The new 2015 MOA included NFRMPO, CDPHE, RAQC, and DRCOG, and updated the specific roles and responsibilities in conformity evaluations and findings for each agency, including allowing for routine conformity determinations to be performed and approved through the APCD, rather than through a public hearing with the AQCC.

### ***Public Participation***

The NFRMPO invited public participation throughout the development of:

- the FY 2018-2021 TIP,
- the fiscally constrained 2040 RTP Amendment, and
- this current conformity determination.

A public hearing notice will be published on December 2, 2016, with the documents made available to the public on November 11, 2016. The NFRT&AQPC will hold a public hearing regarding this conformity determination prior to their monthly meeting on February 2, 2017 at the Evans Community Complex, Cottonwood Room at 1100 37th Street, Evans, CO 80620. Consistent with the MOA, no specific public hearing for this conformity determination will be held in the UFR; however, a public hearing notice will be circulated within the UFR. Minutes of the NFRMPO Council's public hearing will be included and available at the NFRMPO office and website: [nfrmpo.org](http://nfrmpo.org).

The FY2018-2021 TIP will also be made available for a 30-day public comment period from December 2 through December 31, 2016. Public comments will also be taken at the February 2, 2017 NFRT&AQPC meeting. It is anticipated the TIP will be adopted at this meeting.

## CHAPTER 2: IMPLEMENTATION OF CONTROL MEASURES

For this conformity determination, no new transportation control measures (TCMs) are identified for timely completion or implementation as part of the applicable implementation plan. The 8-Hour Ozone Attainment Plan (SIP) adopted by the Air Quality Control Commission (AQCC) in 2008 and approved by the Environmental Protection Agency (EPA) on August 5, 2011, did not include any TCMs.

## CHAPTER 3: EMISSIONS TESTS

### General Description

The transportation plan and program must pass a series of 8-hour ozone emissions tests to demonstrate conformity. These emissions tests relate to the two ozone precursors, Nitrogen Oxides (NO<sub>x</sub>) and Volatile Organic Compounds (VOC). The plan and program must respect the Motor Vehicle Emission Budgets (MVEBs) in the applicable State Implementation Plan (SIP) or SIP submittal. Satisfying these tests involves demonstrating relevant emissions in future years are less than or equal to the emissions budget established in the approved SIP.

### 8-Hour Ozone Emissions Tests

The Environmental Protection Agency (EPA) found the MVEBs for NO<sub>x</sub> and VOCs contained in the *Denver-North Front Range 8-Hour Ozone Attainment Plan* adequate for transportation conformity purposes on March 4, 2010 and approved these MVEBs on August 5, 2011. As a result of these actions, the North Front Range Metropolitan Planning Organization (NFRMPO) is required to use these budgets for subsequent transportation conformity determinations.

### Budgets Analysis Years

In accordance with EPA regulations,<sup>15</sup> the Interagency Consultation Group (ICG) agreed on the following staging years for determining 8-hour ozone conformity:

- 2017 – the attainment year of the Denver Metro/North Front Range nonattainment area
- 2025 – an intermediate modeling year
- 2035 – an intermediate modeling year
- 2040 – the last year (horizon) of the regional transportation plan

### Technical Process

The technical process used to estimate future pollutant emission levels is based on the latest planning assumptions in effect at the time of this conformity determination. Assumptions behind the analysis were derived from estimates of current and future population, employment, travel, and congestion most recently approved and developed by the NFRMPO.<sup>16</sup> The MOA stipulates the emissions estimates for the Northern Subarea portion of the 8-Hour Ozone Nonattainment Area are to be performed by the Air Pollution Control Division (APCD).

The NFRMPO 2040 Regional Travel Demand Model (RTDM), developed for input to the emissions model covers the Northern Subarea of the 8-Hour Ozone Nonattainment Area. **Appendix B** describes the modeling structure for the RTDM in more detail.

<sup>15</sup> 40 CFR 93.118, <http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=1&SID=4c2888da2e1fb443b24ff76fcd7cfc84&ty=HTML&h=L&mc=true&r=PART&n=pt40.20.93>,

<sup>16</sup> 2040 Regional Socioeconomic Forecast, <http://www.nfrmpo.org/Resources/Documents.aspx>, 2013

## Demographic Assumptions

**Table 1** presents the latest demographic assumptions for the Northern Subarea, including the NFRMPO. The 2017 estimated population for the Northern Subarea is approximately 566,034. The population forecast for the Northern Subarea in 2040 is approximately 896,791, an increase of 58 percent. Employment is forecast to be approximately 428,599 in 2040 compared to the year 2017 estimate of 292,869, an increase of 46 percent. Growth in population and employment will be the principal factors for the increased demand on the region's transportation facilities and services.

| <b>Table 1: Population and Employment Forecasts – NFRMPO Ozone Modeling Northern Subarea</b> |             |             |             |             |
|--|-------------|-------------|-------------|-------------|
| <b>Statistic</b>   | <b>2017</b> | <b>2025</b> | <b>2035</b> | <b>2040</b> |
| <b>Population</b>  | 566,034     | 679,202     | 825,174     | 896,791     |
| <b>Employment</b>  | 292,869     | 342,818     | 398,996     | 428,599     |

## Transportation Assumptions

To complete the emissions tests, the applicable staging years (2017, 2025, 2035, and 2040) and transportation networks were defined for the NFRMPO boundary and the Upper Front Range (UFR) area within the Northern Subarea. The RTDM includes all capacity improvements (widening) and regionally significant projects for the Northern Subarea for the respective staging years. **Appendix C** contains the list and map of regionally significant transportation improvement projects coded in the RTDM. Funding sources for these projects are identified in the project list. Projects that are not federally funded are either committed funds by the state, a local jurisdiction, or private developer within the Northern Subarea.

## Air Quality Modeling Assumptions

APCD estimated air pollution emissions shown in this report using the EPA Motor Vehicle Emissions Simulation (MOVES2014a) model.

The RTDM includes the effects of some Travel Demand Management (TDM) programs on a select regional corridors, such as signal coordination and the regional vanpool program; however, the impacts of the current programs in the emissions analysis are very small.

## Emission Test Results – Northern Subarea

The results of the Northern Subarea emissions tests by year are reported in **Table 2**. APCD generated the emissions estimates using the transportation inputs from the RTDM and the MOVES2014a emissions model. APCD performed the 8-hour ozone conformity analysis for the years 2017, 2025, 2035, and 2040, which meet the EPA staging year requirements.<sup>17</sup>

<sup>17</sup> 40 CFR 93.118, <http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=1&SID=c9ad38a0577544cc1bd184aaa325cb6a&ty=HTML&h=L&mc=true&r=PART&n=pt40.20.93>, 2013

| <b>Table 2: 8-Hour Ozone Conformity for Denver-North Front Range (Northern Subarea<sup>18</sup>) (Emission Tons per Day<sup>19</sup>)</b> |                    |             |             |             |             |                  |
|---|--------------------|-------------|-------------|-------------|-------------|------------------|
|   | <b>SIP budgets</b> | <b>2017</b> | <b>2025</b> | <b>2035</b> | <b>2040</b> | <b>Pass/Fail</b> |
| <b>Volatile Organic Compounds (VOC)</b>   | <b>19.5</b>        | 7.87        | 6.93        | 4.24        | 4.69        | <b>PASS</b>      |
| <b>Oxides of Nitrogen (NOx)</b>   | <b>20.5</b>        | 11.83       | 7.50        | 5.01        | 4.69        | <b>PASS</b>      |

### **Summary of 8-hour Ozone Conformity Findings**

Based on the quantitative conformity analysis, NFRMPO staff has determined the NFRMPO fiscally constrained 2040 RTP Amendment, the NFRMPO FY 2018-2021 Transportation Implementation Plan (TIP), the UFR 2040 RTP, and the UFR portion of the Colorado FY 2017-2020 Statewide Implementation Plan (STIP) demonstrate conformity for the 8-Hour Ozone National Ambient Air Quality Standard (NAAQS) using the 8-hour ozone emissions budgets for the Northern Subarea. **Appendix C** includes more information on the transportation and demographic assumptions used in the 8-hour ozone emissions analysis.

<sup>18</sup> The Northern Subarea includes the NFRMPO region and the UFR TPR “donut” area (within the Northern Subarea).

<sup>19</sup> The emissions of both VOC and NOx shown in the table are considered conservative because of two modeling assumptions: First, additional VOC emission reductions would have been calculated if a more stringent, lower gasoline Reid Vapor Pressure (RVP) specification had been modeled. The assumed RVP for the Northern Subarea was 8.5 pounds per square inch (psi) and 10 percent by volume ethanol in all gasoline. In contrast, EPA established an applicable standard for gasoline at 7.8 psi under the federal volatility control program in the Denver-Boulder-Greeley-Ft. Collins-Loveland, Colorado 1997 8hour ozone nonattainment area--as codified in volume 40 of the Code of Federal Regulations (CFR) Part 81--during the high ozone season, effective on March 31, 2010. Second, no emission reduction credit in the modeling had been calculated for the State-only inspection and maintenance (I/M) program that is currently active in Larimer and Weld Counties.





***Appendix A: Memorandum of Agreement – Transportation Conformity Evaluations  
Conducted Under the 8-Hour Ozone Standard***

MEMORANDUM OF AGREEMENT

FOR

TRANSPORTATION CONFORMITY EVALUATIONS  
CONDUCTED UNDER THE 8-HOUR OZONE STANDARD

BY AND BETWEEN

THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT,  
THE DENVER REGIONAL AIR QUALITY COUNCIL,  
THE COLORADO DEPARTMENT OF TRANSPORTATION,  
THE UPPER FRONT RANGE TRANSPORTATION PLANNING REGION,  
THE NORTH FRONT RANGE TRANSPORTATION AND AIR QUALITY  
PLANNING COUNCIL (a.k.a. the North Front Range MPO),  
AND THE DENVER REGIONAL COUNCIL OF GOVERNMENTS

March 14, 2008

**Abbreviations Guide**

APCD – Air Pollution Control Division  
AQCC – Air Quality Control Commission, (“the Commission”)  
CDPHE – Colorado Department of Public Health and Environment  
CDOT - Colorado Department of Transportation  
DRCOG – Denver Regional Council of Governments  
MOA – Memorandum of Agreement  
MPA – Metropolitan Planning Area  
MPO – Metropolitan Planning Organization  
NFR – North Front Range  
NFRT& AQPC – North Front Range Transportation & Air Quality Planning Council (the NFR MPO)  
NOx – Nitrogen Oxides  
RAQC – (Denver) Regional Air Quality Council  
SIP – State Implementation Plan  
UFR – Upper Front Range  
TIP – Transportation Improvement Program  
TPR – Transportation Planning Region  
USDOT – United States Department of Transportation  
USEPA – United States Environmental Protection Agency  
VOC – Volatile Organic Compounds

**Terminology**

Consulting parties – Those agency parties involved in data and document review for the purposes making or commenting on a Conformity Determination. Includes the Air Quality Control Commission, USDOT and USEPA, who are not signatory parties to this MOA.

Signatories/Signatory parties –The parties signatory to this document. This group of six agencies does not include USDOT or USEPA.

On-road motor vehicle – Refers to cars, trucks, buses, motorcycles, vans and other motorized vehicles that use public highways, streets and roadways; to be distinguished from motor vehicles that may be designed for off-road use, e.g., all-terrain vehicles, and from agricultural and construction equipment.

### **A. Background and Purpose**

The U.S. Environmental Protection Agency (USEPA) has designated an area (See map, Attachment A) inclusive of the Denver Metro Area and portions of both the North Front Range Metropolitan Planning area and the Upper Front Range Transportation Planning Region as nonattainment under the 8-hour ozone standard. The nonattainment designation became effective November 20, 2007. The Upper Front Range TPR is not represented by a Metropolitan Planning Organization as it comprises a largely rural area. Furthermore, the TPR lacks the expertise and wherewithal to provide or purchase transportation and modeling forecasts as part of the Conformity Determination process for the 8-hour ozone area.

Federal Transportation Regulations at 23CFR 450.314 (b) state that where a metropolitan planning area does not include an entire nonattainment area or maintenance area, “there shall be written agreement among the State Department of Transportation, State air quality agency, affected local agencies, and the MPO describing the process for cooperative planning and analysis of all projects outside the MPA within the nonattainment or maintenance area. The agreement must also indicate how the total transportation-related emissions for the nonattainment or maintenance area, including areas outside the MPA, will be treated for the purposes of determining conformity in accordance with EPA’s transportation conformity rule (40 CFR Part 93). The agreement shall address policy mechanisms for resolving conflicts concerning transportation-related emissions...**(and)** (c): In nonattainment or maintenance areas, if the MPO is not the designated agency for air quality planning...there shall be a written agreement between the MPO and the designated air quality planning agency describing their respective roles and responsibilities for air quality related transportation planning. (d) If more than one MPO has been designated to serve an urbanized area, there shall be written agreement among the MPOs, the State(s), and the public transportation operator(s) describing how the metropolitan transportation planning processes will be coordinated to assure the development of consistent metropolitan transportation plans and TIPs across the MPA boundaries....”

Similarly, EPA regulations at 40 CFR 93.105(e) and 51.390 require states to create consultation procedures in the SIP whereby MPO representatives, state and local air quality planning agencies, state and local transportation agencies and other organizations must consult with each other and with U.S. Environmental Protection Agency (USEPA) and U.S. Department of Transportation (USDOT) regarding development of State Implementation Plans (SIPs), transportation plans, transportation improvement programs (TIPs), and Conformity Determinations.

This Memorandum of Agreement (MOA) is designed to allow for and to guide cooperative transportation planning in conformance with State air quality plans, and related review and analysis in the pursuit of transportation Conformity Determinations associated with the 8-hour ozone State Implementation Plan (SIP).

### **B. Conformity Determinations Prior to/In Lieu of the Establishment of On-Road Motor Vehicle Emission Budgets**

The first Conformity Determination for the area of concern is due November 20, 2008, as required by the federal Conformity Rule at 40 CFR 93.102(d). Since adequate or

approved motor vehicle emission budgets will not be available until late 2009, one or more Conformity Determinations for the nonattainment or maintenance area of concern must follow the procedures at 40 CFR 93.109(e)(2)(iii).

The Denver Regional Council of Governments and the North Front Range MPO shall perform transportation emissions forecasting for the respective areas described in Section C.1 and C.2 for Conformity Determinations, regardless of whether emission budgets have been established, and regardless of whether overall nonattainment-or maintenance area emission budgets or sub-area emission budgets are used.

### **C. Motor Vehicle Emission Budgets for the 8-Hour Ozone Nonattainment (or Maintenance) Area and Sub-Areas**

In the SIP development process, the Air Pollution Control Division (APCD), the North Front Range Metropolitan Planning Organization (NFRMPO), and the Regional Air Quality Council (RAQC) shall work together to propose overall area motor vehicle emission budgets for volatile organic compounds (VOC) and nitrogen oxides (NO<sub>x</sub>) for the 8-hour ozone nonattainment or maintenance area. Said budgets must be adopted by the Commission and affirmed via USEPA adequacy determinations in order to become viable for use in Conformity Determinations.

Sub-area emission budgets for ozone precursors under the 8-hour ozone standard may also be proposed to the AQCC for the following two sub-areas:

1. The combined areas of the Denver Metro Region and the southern portion of the Upper Front Range Transportation Planning Region (TPR) as designated nonattainment by USEPA, i.e., the area south of the north line of Township 3 north of the 6<sup>th</sup> Principal Meridian; said line is the southern boundary of the North Front Range MPO extended to the east line of Weld County. For this sub-area, the budgets for NO<sub>x</sub> and VOC shall be proposed during SIP development for the federal 8-hour ozone standard by the RAQC with input from the APCD, CDOT, DRCOG, and UFR to be considered for adoption by the Commission.
2. The combined areas of the North Front Range MPO area and the northern portion of the Upper Front Range TPR, as designated nonattainment by USEPA, i.e., the area north of the north line of Township 3 north of the 6<sup>th</sup> Principal Meridian; said line is the southern boundary of the North Front Range MPO extended to the east line of Weld County. For this sub-area, the budgets for NO<sub>x</sub> and VOC shall be proposed determined during SIP development for under the federal 8-hour ozone standard by the NFR MPO in consultation with the APCD and the RAQC, with input from CDOT and UFR, to be considered for adoption by the Commission.

Sub-area budgets, agreed to by the signatories and approved by the Commission, may be used to measure the conformity of plans and programs for the respective areas, once determined adequate by the USEPA.

Sub-areas as described above and Conformity procedures described in this document shall remain the same when and if the 8-Hour Nonattainment Area is re-designated an “Attainment/Maintenance Area.

#### **D. Granting of Authority, Responsibilities**

The Upper Front Range TPR lacks the expertise and wherewithal to provide or purchase transportation and modeling forecasts as part of the Conformity Determination process for the 8-hour ozone area. By this agreement:

1. The DRCOG agrees to provide transportation forecasts and make Conformity Determinations for the area described in Section C.1 above. The area includes the DRCOG MPO area and other 8-hour ozone nonattainment areas within the DRCOG TPR, as well as a portion of the nonattainment area of the Upper Front Range TPR.
2. The North Front Range MPO agrees to provide transportation forecasts and make Conformity Determinations for an area described in Section C.2 above. The area includes North Front Range MPO 8-hour ozone nonattainment areas as well as portions of the Upper Front Range TPR nonattainment area.
3. The Upper Front Range TPR authorizes the DRCOG and the NFR MPO to prepare transportation forecasts and make Conformity Determinations for the relevant nonattainment areas of the Upper Front Range as described in Section C of this document.
4. The agreed-upon transportation forecasting authorities shall continue for the 8-Hour Ozone Area after it is re-designated “Attainment/Maintenance” status by USEPA.



### **E. Compensation to MPOs for Additional Responsibilities**

It is anticipated that over the next one-to-four years, funding will be needed for enhanced transportation forecasting and to perform Conformity Determinations for the Upper Front Range areas of concern. The CDOT has the responsibility to fund required Conformity Determinations and associated transportation modeling efforts for areas outside of the MPOs.

As forecasting and modeling work for the UFR will extend beyond the MPO boundaries, the CDOT will provide necessary funding to DRCOG and NFR based upon a mutually agreeable course of action delineating tasks, schedule, and costs among the signatory agencies. The signatory agencies will look to the USEPA and USDOT to assure consistency with federal requirements regarding tasks. The CDOT will execute separate intergovernmental agreements with the NFRMPO and DRCOG detailing the specific work that will be done for the agreed-to compensation.

### **F. Conformity Review – Procedural**

The agencies shall follow the interagency consultation process and procedures identified in Colorado Air Quality Control Commission Regulation No. 10 for sharing information and conducting review of transportation data, projections, and determining Transportation Conformity to the State Implementation Plan under the 8-hour ozone standard, and generally the process outlined in memoranda of agreement for Transportation Conformity evaluations by and between the CDPHE and the Denver Regional Council of Governments (1998) and with the North Front Range Transportation and Air Quality Planning Council (2003).

The DRCOG and NFR MPO shall provide forecasts for their respective areas as described in Section C. 1 and C.2. In cases where one Conformity finding is to be made for the overall 8-Hour Ozone Nonattainment (or Attainment/Maintenance) Area, and no sub-area emission budgets are to be used, the MPOs, in consultation with the other signatory parties and with USEPA and USDOT, shall sum the ozone precursor emissions from their respective areas for overall-Area totals of VOC and NO<sub>x</sub>, to determine whether forecasted emissions meet the appropriate Conformity test(s). In such cases, the MPOs jointly shall produce one Conformity Determination document for the overall 8-Hour Ozone Nonattainment (or Attainment/Maintenance) Area.

The APCD will perform independent emission budget tests and other applicable analyses for the overall Nonattainment (or Attainment/Maintenance) region and, as well as for the sub-areas described in C.1 and C.2 if sub-area budgets are to be used, within 30 days of receiving the final submittal of transportation data, although such data will be submitted to the APCD as early in the process as possible. The APCD may also assist with enhanced emissions forecasting for the Upper Front Range area, or provide other in-kind assistance to emissions forecasting efforts.

Assuming the APCD agrees with a Conformity Determination, it will recommend that the Air Commission comment formally via letter to the relevant MPO and to CDOT regarding its concurrence.

In the event that future sub-area emissions exceed a Conformity test or emission budget, the sub-area MPO shall immediately and diligently pursue actions, e.g., transportation plan and/or TIP amendment, that would bring projected emissions under budget (or in line with the Conformity test being used) and thus to conform to the SIP (and/or not threaten to increase the severity of the 8-Hour Area's nonattainment status). Such endeavor would be pursued as part of standard interagency process. If the sub-area were to fail to meet a Conformity test/make a positive Conformity Determination, all parties to this MOA shall confer on an emergency basis to review emission budgets and to consider the merits of the following actions, which may be needed to achieve or to re-establish Conformity:

- Potential revisions to transportation plans and/or transportation programs
- Potential modeling (by both MPO's) of the entire nonattainment (or Attainment/Maintenance) Area for a Conformity Determination, if allowed by the SIP
- Potential appeal (via the SIP process) for emission budget revisions
- Potential additional SIP revisions.

A course of action employing one or more of the above-listed actions shall be determined by the parties to this agreement. Parties may appeal to the USDOT and USEPA for guidance in establishing Conformity.

#### **G. Dispute Resolution**

Any protracted disagreements between consulting parties reviewing a Conformity Determination shall be elevated to the Commission, per the provisions in AQCC Regulation No. 10. Any continuing dispute that devolves or threatens to devolve into a situation of official non-conformance of transportation plans with the State Implementation Plan may be elevated to the Governor, just as a disputed Conformity Determination may be elevated to the Governor, as provided in AQCC Regulation No. 10 and at 40 CFR Section 93.105(d).

#### **H. Termination of Agreement**

This agreement shall be binding upon the signatory parties-until the 8-hour ozone area has achieved attainment status and maintains said status for a period of at least 20 years, unless the undersigned agencies revise or replace this MOA via unanimous, written agreement.

The undersigned hereby agree to the delegations, responsibilities and procedures described above.



3/14/08

Paul Tourangeau, Director, Air Pollution Control Division, CDPHE

Date



3/14/08

Jennifer Finch, Director, Transportation Development Division, CDOT

Date



3/14/08

Kenneth H. Lloyd, Executive Director, Regional Air Quality Council

Date



3/24/08

Robert D. Masden, Weld County Commissioner,  
Chairman, Upper Front Range TPR

Date



3/20/08

Cliff Davidson, Executive Director, North Front Range MPO

Date

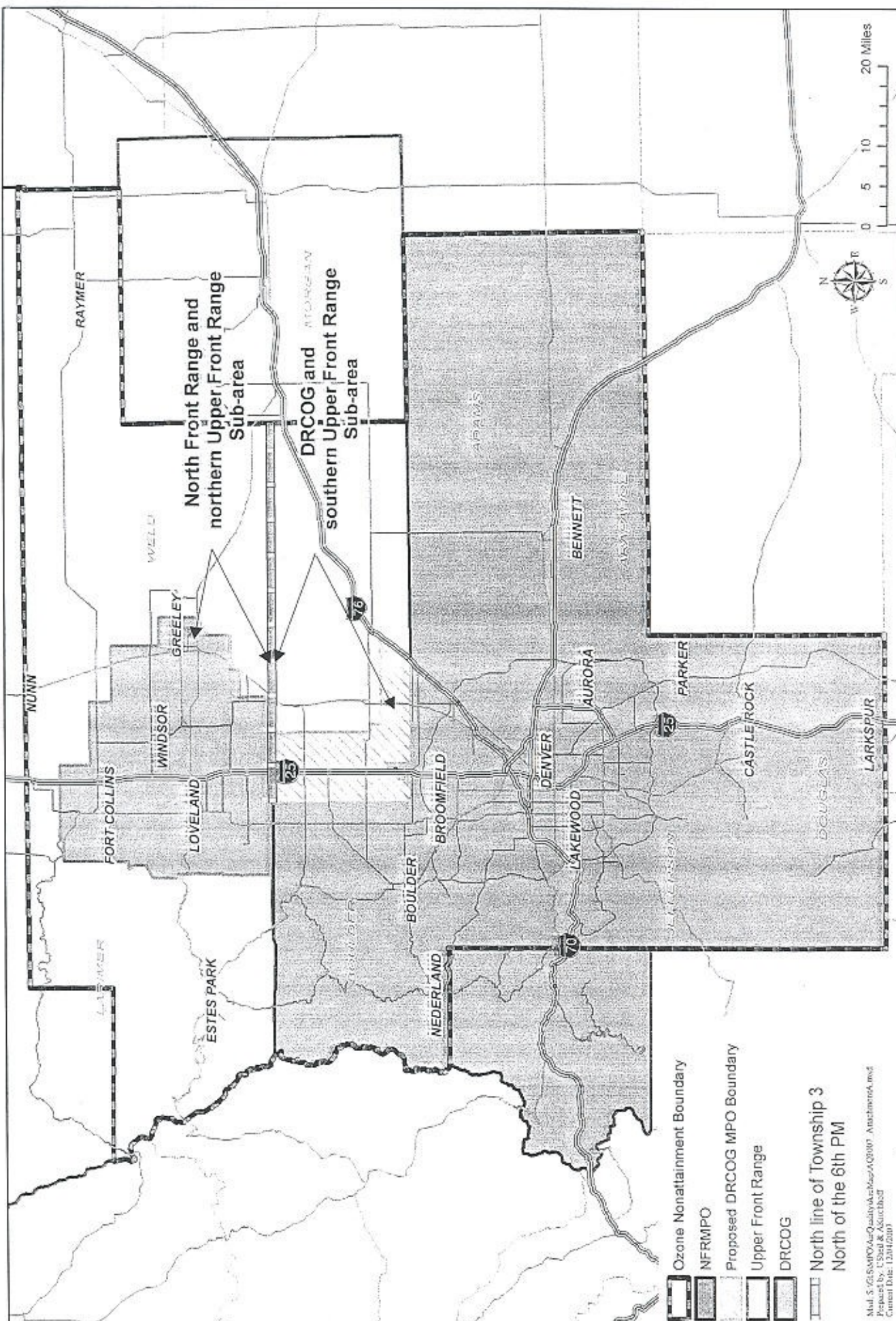


3/14/08

Jennifer Schaufele, Executive Director,  
Denver Regional Council of Governments

Date

**Attachment A:  
8-Hour Ozone Nonattainment Area  
and Sub-areas**



- Ozone Nonattainment Boundary
- NFRMPO
- Proposed DRCOG MPO Boundary
- Upper Front Range
- DRCOG
- North line of Township 3
- North of the 6th PM

***Appendix B: 2040 NFRMPO Regional Travel Demand Model Description***



The 2040 NFRMPO Regional Travel Demand Model (RTDM) is a traditional four-step travel model incorporating trip generation, trip distribution, mode choice, and trip assignment. The model was updated in 2011 to incorporate results from the North Front Range Metropolitan Planning Organization (NFRMPO) *Household Survey, 2010* and the *NFRMPO On-Board Transit Survey, 2009*. The household survey was used to develop the trip generation rates, trip length frequency distributions, and auto occupancy rates. The on-board survey was used in combination with the household survey to produce updated mode share targets. Detailed information on the modeling process, inputs, and procedures can be found in the *2040 NFRMPO RTDM Documentation* available at the NFRMPO offices.

The model was calibrated using data from the household and on-board surveys. Roadway results were validated using traffic count data collected between 2008 and 2013. Transit results were calibrated to match boarding counts on the three transit systems in the region, at the system level.

To facilitate modeling of the expanded ozone nonattainment area, the model was expanded to cover additional portions of Larimer and Weld counties not within the NFRMPO boundary. The majority of this additional area is very sparsely populated. The expanded area does include the Estes Park area, which is heavily influenced by seasonal tourist activity. To best reflect the unique nature of the Estes Park area, an additional lodging-based trip purpose was included. In addition, the Estes Park area was modeled to represent summer conditions rather than school-season conditions due to the heavily seasonal nature of the area. The remainder of the modeling area remains reflective of an average weekday when school is in session.

The model incorporates a transportation analysis zone (TAZ) structure developed based on existing land use and roadway conditions, future household and employment projections, and staff comments from member governments. The TAZ structure also includes additional details on the proximity of existing and proposed transit facilities to improve the accuracy of the mode choice component of the travel model. For the Northern Subarea, the TAZ structure includes 1,032 internal zones and 19 external stations. **Figure 3** depicts the complete TAZ structure, slightly larger than the 8-Hour Ozone Nonattainment Northern Subarea. The RTDM has a base year of 2012 and forecast years of 2015, 2025, 2035, and 2040. The conformity test is based on the MVEB approved by the EPA and is in the current Colorado Statewide Implementation Plan (SIP). The 2012 analysis was obtained directly from the base year of the RTDM.

### Demographic Development Estimation

Socio-economic data is the input activity-based information that provides the foundation for trip-making in the RTDM. Data is recorded for basic, retail, and service employment types and households by income groups and household sizes. Data for the Estes Park area also includes lodging information to better represent tourist/visitor trips. The socio-economic data is contained in the TAZ structure. Employment data is used in the RTDM primarily as generators of trip attractions. Household data is used in the RTDM primarily as a generator of trip productions. The NFRMPO develops and maintains a parcel-based land use allocation model which distributes total households and employment by TAZ. The land use allocation model uses the control total for the region and sub-regions to distribute at the parcel level, which then aggregates to the TAZ level.



Figure 3: TAZ Structure



May 2015  
Sources: CDOT, EPA, NFRMPO

- LEGEND**
-  TAZ
  -  Northern Subarea
  -  County Boundary
  -  Major Roadway

## Highway and Transit System

Roadway and transit networks contain basic input information for use in the model and represents real-world conditions to the greatest extent possible. The highway system contains over 6,100 links described according to functional classification, area type, speeds, capacities, etc. The roadway network is used to distribute trips and route transit and automobile trips. The roadway network was prepared based on data from the NFRMPO and from scheduling/phasing of projects in the RTP and TIP. The NFRMPO also collaborated with local jurisdictions as necessary to verify construction and opening dates. The model also contains base and forecast year transit route systems, based on information provided by Transfort, City of Loveland Transit (COLT), and Greeley-Evans Transit (GET). Existing transit networks represent only walk access to local service. Forecast year transit networks also include Bus Rapid Transit and informal park-n-ride facilities.

## Trip Generation

The trip generation module estimates trip productions and attractions based on zonal attributes (e.g. population, households, income, employment, etc.). Productions and attractions are generated for each TAZ and balanced by trip purpose at the regional level. Cross-classified trip rates are applied in the model to represent trip-making characteristics that vary by household size and income. Generally, trip rates increase as household size and income increase. The model includes the following trip purposes:

- **Home-Based Work (HBW):** Commute trips between home and work and vice versa
- **Home-Based University (HBU):** Trips between home and university locations (i.e., CSU, UNC) and vice versa for school related purposes.
- **Home-Based Shop (HBS):** Trips between home and shopping locations (and vice versa).
- **Home-Based Other (HBO):** All other trips with one end at home.
- **Work-Based Other (WBO):** Work-related trips without an end at home.
- **Other-Based Other (OBO):** Trips with neither an end at home nor a work-related purpose.
- **Lodging-Based Other (LBO):** Trips with one end at a lodging facility and the other end at a non-home, non-work location (only applied to the Estes Park area).
- **Internal-Internal (I-I) Small Truck:** Trips made by small, single-unit trucks starting and ending within the modeling area.
- **I-I Large Truck:** Trips made by large combination trucks that start and end within the modeling area.
- **External-External (EE):** Trips traveling through the NFRMPO, but neither start nor end in the modeling area. These trips have no additional purpose definition associated with them other than vehicle type (i.e., small/single-unit truck, large/combination trucks, and other vehicles).

Some TAZs have unique land uses and generate a significantly different number of trips in

comparison to the model's estimation. It is assumed the trip rates at these locations are significantly higher or lower than the model generates using the standard trip equations. For these locations, special generator values are applied in the model to define the number of trips produced and attracted to the locations.

The main Colorado State University (CSU) campus in Fort Collins and the University of Northern Colorado (UNC) campus in Greeley are the two University special generators used in the NFRMPO model area. Additionally, Rocky Mountain National Park is treated as a special generator in the extended model area. The model represents two types of external travel. Through trips are represented by the EE trip purpose described previously and were estimated using traffic count data and information from an external station study previously conducted by the NFRMPO. Trips with one end inside the modeling area and another outside of the modeling area can be referred to as Internal-External/External-Internal (IE/EI) trips. These trips are included in the primary model trip purposes described previously. At external stations, the number of IE/EI trips by purpose is based on traffic count data and analysis of the *NFRMPO Household Travel Survey* data.

### Trip Distribution

Trip distribution is the process used to apportion person trip productions and attractions from the trip generation model among all zone pairs by trip purpose. The resulting trip table matrix contains both intrazonal trips (trips that do not leave the zone) on the diagonal and interzonal trips in all other zone interchange cells. The NFRMPO model uses a standard gravity model equation and applies friction factors to represent the effects of impedance between zones. The trip distribution model is calibrated to replicate trip length distributions observed in the *NFRMPO Household Travel Survey*. Because the Survey only includes records from within the NFRMPO boundary, calibration was performed using an unexpanded version of the model. The expanded model produced consistent trip length distributions for trips occurring within the original modeling area. Calibration required the use of gamma function based friction factors. K-factors are not included in the calibrated trip distribution model.

### Mode Analysis

The RTDM includes two steps for determining travel modes. The first step in the mode analysis process is the non-motorized mode split where bicycle and pedestrian trips are separated from the other person trips using a distance-based function. The second step involves the consideration of motorized trips in which the transit and carpool trips are processed using a logit-based mode choice model. The mode choice model uses a nested structure for HBW trips and a simplified binary structure for all other trip purposes. The mode choice model is only applied to trips within the NFRMPO boundary. Outside of the NFRMPO boundary, trip rates are adjusted to produce person trips in vehicles rather than total person trips.

### Traffic Assignment/Time-of-Day Analysis

The traffic assignment module loads vehicle trips onto the roadway network to estimate link-specific traffic volumes. This is done for eight time periods which cover the entire day. As part of the RTDM's 2012 base year development using the household survey and traffic count data, time-of-day parameters were developed to represent the variation of travel patterns throughout the day. The time-of-day assignment process uses the vehicle trip table in

production/attraction format from the mode choice model and converts it into eight time periods: AM peak, AM shoulder, midday peak, PM peak, three PM shoulders, and an off-peak period representing the remainder of the day. Each of these trip tables is assigned to the roadway network using a capacity constrained equilibrium assignment procedure. The resulting traffic volumes from the four assignments are summed to estimate a 24-hour volume for each link in the network.

## Model Validation

Validation involves testing the RTDM's predictive capabilities. Validation tests include quantifying the model's ability to replicate observed conditions and performing sensitivity tests. The base year validation effort was conducted by comparing model results to observed traffic count data. The overall sum of model volumes is within one percent of the traffic counts on the same links. Model volume totals by facility type are within five percent of the sum of traffic counts for arterials and freeways and within 10 percent for collectors. The overall percent root mean square error (percent RMSE) is within 35 percent.

## Speed Feedback

A speed feedback loop is incorporated into the modeling process to ensure consistency of speeds. This corrects a fundamental problem with travel demand models when estimated speeds used in the trip distribution process are not the same as those which result from the traffic assignment/speed estimation process.

## Air Quality Modeling

The Air Pollution Control Division (APCD) conducts the air pollutant emissions modeling using the Environmental Protection Agency (EPA) Motor Vehicle Emissions Simulator (MOVES) computer software, MOVES2014. The NFRMPO, APCD, and other agencies work together in this effort, both to develop the modeling techniques, assumptions, and parameters, and reviewing the executed model runs. The RTDM outputs are one of the principal inputs to the air pollutant emissions model. The air pollutant emissions model estimates the amount of emissions of Volatile Organic Compounds (VOCs) and Nitrogen Oxides (NO<sub>x</sub>) generated by motor vehicles. The results are then combined with numerous assumptions concerning meteorology and atmospheric chemical reactions to produce air pollutant concentration estimates. No dispersion modeling was conducted for this analysis; only emission estimates were calculated.

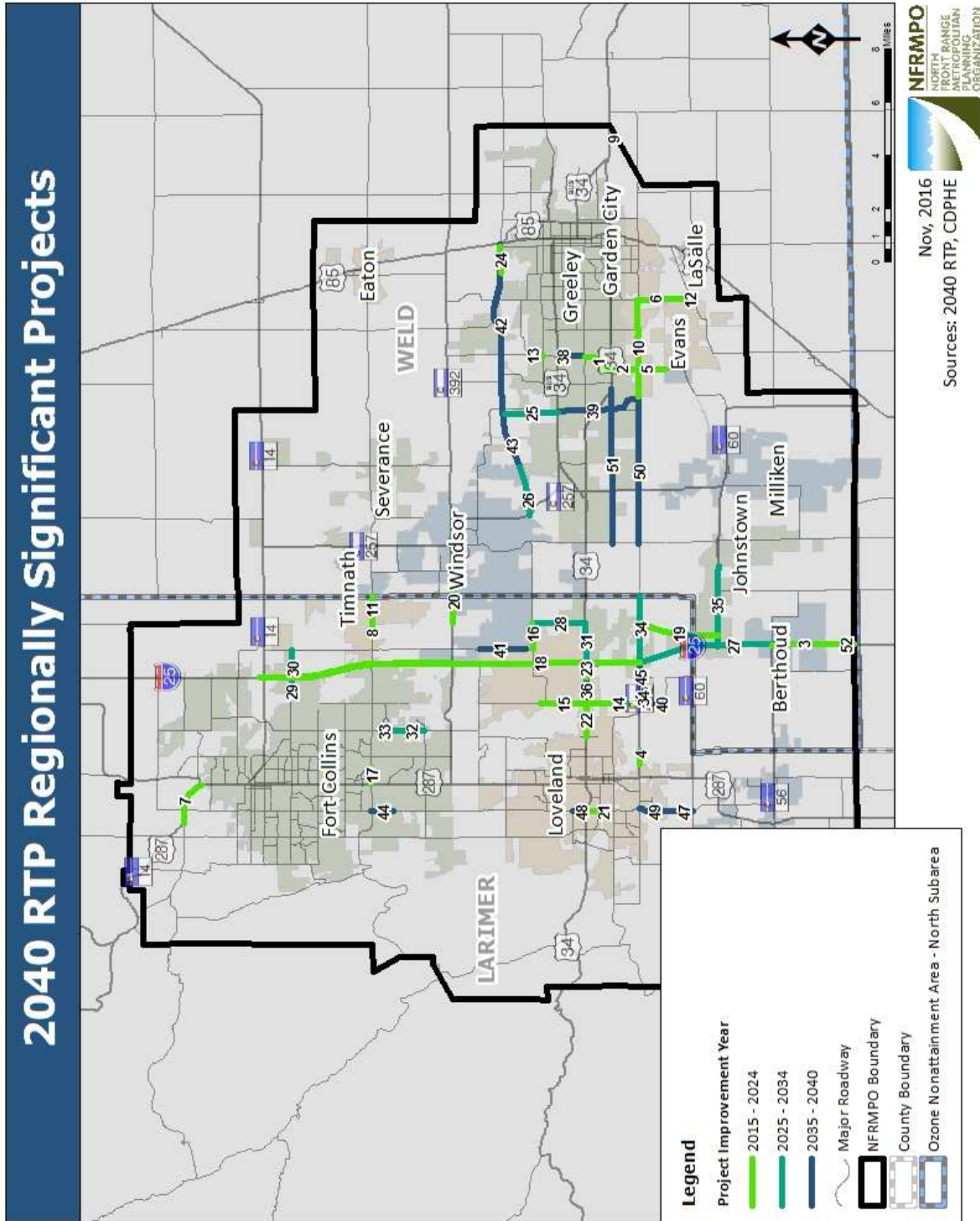
Inputs included the link vehicle miles traveled (VMT) and speeds from the transportation networks, vehicle fleet mix estimates from the Colorado Department of Transportation (CDOT) automatic traffic counters, maximum and minimum temperature, the ethanol content, and Reid Vapor Pressure (RVP) of the gasoline. The emissions model did not include adjustments for emission reduction credits from the State-only I/M program.<sup>20</sup> For the Northern Subarea the RVP was 8.5 psi and 10 percent by volume ethanol in all gasoline. The results reflect recent vehicle age distribution and mileage accumulation rates from the Mobile Sources program.

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<sup>20</sup>40 CFR 93.122(a)(3)(i). <http://www.gpo.gov/fdsys/pkg/CFR-2012-title40-vol21/pdf/CFR-2012-title40-vol21-sec93-122.pdf>, 2012

***Appendix C: NFRMPO Regional Travel Demand Model Projects***

Figure 4: Map of NFRMPO Regional Travel Demand Model Projects





**Table 3: List of NFRMPO Regional Travel Demand Model Projects**

| Map #                    | Street Name                      | From                          | To                                | Description of Improvement |                      | Year of Improvement | Cost (thousands) | Funding Source   |
|--------------------------|----------------------------------|-------------------------------|-----------------------------------|----------------------------|----------------------|---------------------|------------------|--|
|                          |                                  |                               |                                   | Before                     | After                |                     |                  |  |
| <b>2015-2024 Network</b> |                                  |                               |                                   |                            |                      |                     |                  |  |
| 1                        | 59 <sup>th</sup> Avenue          | 20 <sup>th</sup> Street       | US 34 Bypass                      | 2                          | 2 (Center turn lane) | 2015                | \$1,500          | Greeley – Capital Improvement Program                          |
| 2                        | 65 <sup>th</sup> Avenue          | US 34 Bypass                  | Weld CR 54                        | 2                          | 4                    | 2015                | \$3,000          | Greeley – Road Development Funds                               |
| 3                        | I-25 Southbound                  | Approximately Mile Marker 247 | Approximately Mile Marker 249     | 2                          | 3                    | 2015                | \$9,700          | NFRMPO – STP-Metro Funds                                       |
| 4                        | SH 402                           | St. Louis Avenue              | Boise Avenue                      | 2                          | 4                    | 2015                | \$6,000          | Loveland – Transportation Capital Improvement Plan Funds; CDOT |
| 5                        | 65 <sup>th</sup> Avenue          | 37 <sup>th</sup> Street       | 49 <sup>th</sup> Street           | 2                          | 4                    | 2016                | \$1,000          | Evans – Capital Projects Street Fund Future Development        |
| 6                        | 35 <sup>th</sup> Avenue          | 37 <sup>th</sup> Street       | 49 <sup>th</sup> Street           | 2                          | 4                    | 2016                | \$1,000          | Evans – Capital Projects Street Fund Future Development        |
| 7                        | US 287                           | Shields Street                | LaPorte Bypass                    | 2                          | 4                    | 2016                | \$22,000         | CDOT – FASTER Safety/RAMP                                      |
| 8                        | Harmony Road                     | RR tracks                     | Three Bell Parkway (Larimer CR 3) | 2                          | 4                    | 2017                | \$3,325          | Timnath – General Fund/Adjacent Development                    |
| 9                        | Weld County Parkway (Weld CR 49) | US 34                         | I-76                              | 0-4                        | 4 (Center turn lane) | 2017                | \$12,500         | Weld County – General Fund                                     |
| 10                       | 37 <sup>th</sup> Street          | 35 <sup>th</sup> Avenue       | Two Rivers Parkway                | 2                          | 4                    | 2018                | \$1,500          | Evans – Capital Projects Street Fund Future Development        |



**Table 3: List of NFRMPO Regional Travel Demand Model Projects**

| Map #                            | Street Name             | From                              | To                            | Description of Improvement |       | Year of Improvement | Cost (thousands) | Funding Source  |
|----------------------------------|-------------------------|-----------------------------------|-------------------------------|----------------------------|-------|---------------------|------------------|---|
|                                  |                         |                                   |                               | Before                     | After |                     |                  |   |
| <b>2015-2024 Network (Cont.)</b> |                         |                                   |                               |                            |       |                     |                  |   |
| 11                               | Harmony Road            | Three Bell Parkway (Larimer CR 3) | Lathem Parkway (Larimer CR 1) | 2                          | 4     | 2019                | \$3,500          | Timnath – General Fund/Adjacent Development   |
| 12                               | 35 <sup>th</sup> Avenue | 49 <sup>th</sup> Street           | Weld CR 35 & Weld CR 394      | 0                          | 4     | 2020                | \$1,500          | Evans – Capital Projects Street Fund Future Development   |
| 13                               | 59 <sup>th</sup> Avenue | 4 <sup>th</sup> Street            | C Street                      | 2                          | 4     | 2020                | \$2,400          | Greeley – Road Development Funds  |
| 14                               | Boyd Lake Avenue        | Larimer CR 20C                    | US 34                         | 2                          | 4     | 2020                | \$1,988          | Loveland – Transportation Capital Improvement Plan Funds  |
| 15                               | Boyd Lake Avenue        | US 34                             | Canal                         | 2                          | 4     | 2020                | \$2,732          | Loveland – Centerra Metro District  |
| 16                               | Crossroads Boulevard    | Centerra Parkway                  | Larimer CR 3                  | 2                          | 4     | 2020                | \$2,365          | Loveland – Transportation Capital Improvement Plan Funds  |
| 17                               | Harmony Road            | College Avenue                    | Boardwalk Drive               | 4                          | 6     | 2020                | \$9,349          | Fort Collins – Street Oversizing Fund, Developer Contribution, Sales Tax  |
| 18                               | I-25                    | SH 402                            | SH 14                         | 4                          | 6     | 2020                | \$250,000        | CDOT – Regional Priority Program, FASTER, Surface Treatment, TC Contingency, HPTE, Strategic Transit, RoadX, Strategic Funds; Federal – FAST Freight State Allocation, TIGER; Local Funds; Private Funds; Flexible Funds – RTP, Other STBG, CMAQ; Tolling Revenue |

**Table 3: List of NFRMPO Regional Travel Demand Model Projects**

| Map #                            | Street Name             | From                                     | To               | Description of Improvement |                                     | Year of Improvement | Cost (thousands) | Funding Source   |
|----------------------------------|-------------------------|--|------------------|----------------------------|-------------------------------------|---------------------|------------------|--|
|                                  |                         |  |                  | Before                     | After                               |                     |                  |  |
| <b>2015-2024 Network (Cont.)</b> |                         |  |                  |                            |                                     |                     |                  |  |
| 19                               | Larimer CR 3            | Weld CR 50                               | Larimer CR 18    | 0                          | 2                                   | 2020                | \$7,605          | Johnstown - Johnstown/Adjacent Developers  |
| 20                               | SH 392                  | 17 <sup>th</sup> Street                  | Larimer CR 3     | 2                          | 4                                   | 2020                | \$1,500          | Windsor - Road Impact Fee and Adjacent Development                                     |
| 21                               | Taft Avenue             | Arkins Branch                            | US 34            | 4                          | 4 (Center turn lane and bike lanes) | 2020                | \$10,509         | Loveland – Transportation Capital Improvement Plan Funds                               |
| 22                               | US 34                   | Denver Avenue                            | Boyd Lake Avenue | 4                          | 6                                   | 2020                | \$6,506          | Loveland – Transportation Capital Improvement Plan Funds; CDOT; STBG                   |
| 23                               | US 34                   | Rocky Mountain Avenue                    | I-25             | 4                          | 6                                   | 2020                | \$2,066          | Loveland - Centerra Metro District   |
| 24                               | O Street                | 11 <sup>th</sup> Avenue                  | Weld CR-37       | 2                          | 4                                   | 2021                | \$7,222          | STBG; Greeley – Road Development Fund; Weld County – General Fund; Adjacent Developers |
| <b>2025-2034 Network</b>         |                         |  |                  |                            |                                     |                     |                  |  |
| 25                               | 83 <sup>rd</sup> Avenue | US 34 Business (10 <sup>th</sup> Street) | US 34 Bypass     | 2                          | 4                                   | 2025                | \$5,900          | Greeley – Road Development Funds   |
| 26                               | Crossroads Boulevard    | Great Western Drive                      | SH 257           | 0                          | 2 (Center turn lane)                | 2025                | \$5,000          | Windsor - Road Impact Fee and Adjacent Development                                     |

**Table 3: List of NFRMPO Regional Travel Demand Model Projects**

| Map #                            | Street Name     | From              | To                              | Description of Improvement |       | Year of Improvement | Cost (thousands) | Funding Source   |
|----------------------------------|-----------------|-------------------|---------------------------------|----------------------------|-------|---------------------|------------------|--|
|                                  |                 |                   |                                 | Before                     | After |                     |                  |  |
| <b>2025-2034 Network (Cont.)</b> |                 |                   |                                 |                            |       |                     |                  |  |
| 27                               | I-25            | SH 56             | SH 402                          | 4                          | 6     | 2025                | \$84,000         | CDOT – Regional Priority Program, FASTER, Surface Treatment, TC Contingency, Strategic Transit, Strategic Funds; Federal – FAST Freight State Allocation; Local Funds; Flexible Funds – RTP, Other STBG, CMAQ; Tolling Revenue |
| 28                               | Larimer CR 3    | US 34             | Crossroads Boulevard            | 0                          | 2     | 2025                | \$8,073          | Loveland – Transportation Capital Improvement Plan Funds   |
| 29                               | Prospect Road   | Summit View Drive | I-25                            | 2                          | 4     | 2025                | \$7,500          | Fort Collins - Street Oversizing Fund, Developer Contribution, Sales Tax   |
| 30                               | Prospect Road   | I-25              | Growth Management Area Boundary | 2                          | 4     | 2025                | \$3,000          | Fort Collins - Street Oversizing Fund, Developer Contribution, Sales Tax   |
| 31                               | US 34           | Centerra Parkway  | Kendall Parkway (Larimer CR 3E) | 4                          | 6     | 2025                | \$5,568          | Loveland – Centerra Metro District   |
| 32                               | Timberline Road | Trilby Road       | Kechter Drive                   | 2                          | 4     | 2025                | \$15,000         | Fort Collins - Street Oversizing Fund  |
| 33                               | Timberline Road | Kechter Drive     | Stetson Creek Drive             | 2                          | 4     | 2025                | \$7,755          | Fort Collins – Street Oversizing Fund, NFRMPO – STBG   |

**Table 3: List of NFRMPO Regional Travel Demand Model Projects**

| Map #                            | Street Name                         | From               | To                                      | Description of Improvement |                      | Year of Improvement | Cost (thousands) | Funding Source   |
|----------------------------------|-------------------------------------|--------------------|---|----------------------------|----------------------|---------------------|------------------|--|
|                                  |                                     |                    |   | Before                     | After                |                     |                  |  |
| <b>2025-2034 Network (Cont.)</b> |                                     |                    |   |                            |                      |                     |                  |  |
| 34                               | Larimer CR 18                       | I-25 Frontage Road | Weld CR 13                              | 2                          | 4                    | 2030                | \$13,890         | Johnstown; Adjacent Developers                                 |
| 35                               | SH 60                               | I-25               | Weld CR 15                              | 2                          | 4                    | 2030                | \$17,363         | Johnstown; CDOT  |
| 36                               | US 34                               | Boyd Lake Ave.     | Rocky Mountain Ave.                     | 2                          | 2                    | 2030                | \$4,291          | Loveland – General Fund - CDOT                                 |
| 37                               | US 34                               | I-25               | Centerra Parkway                        | 4                          | 6                    | 2030                | \$2,543          | Loveland – Transportation Capital Improvement Plan Funds; CDOT |
| <b>2035-2040 Network</b>         |                                     |                    |   |                            |                      |                     |                  |  |
| 38                               | 59 <sup>th</sup> Avenue             | US 34 Bypass       | 20 <sup>th</sup> Street                 | 2                          | 4                    | 2035                | \$3,500          | Greeley – Road Development Funds                               |
| 39                               | 83 <sup>rd</sup> Avenue             | Weld CR 54         | Weld CR 64                              | 2                          | 2 (Center turn lane) | 2035                | \$7,000          | Greeley - Road Development Funds                               |
| 40                               | Boyd Lake Avenue                    | SH 402             | Larimer CR 20E                          | 2                          | 4                    | 2035                | \$6,300          | Loveland – Transportation Capital Improvement Plan Funds       |
| 41                               | N. Fairground Avenue (Larimer CR 5) | Rodeo Road         | 71 <sup>st</sup> Street (Larimer CR 30) | 2                          | 4                    | 2035                | \$3,000          | Loveland – Transportation Capital Improvement Plan Funds       |
| 42                               | O Street                            | SH 85              | 83 <sup>rd</sup> Avenue                 | 2                          | 2 (Center turn lane) | 2035                | \$4,700          | Greeley – Road Development Funds                               |

**Table 3: List of NFRMPO Regional Travel Demand Model Projects**

| Map #                            | Street Name                           | From                              | To  | Description of Improvement |                                     | Year of Improvement | Cost (thousands) | Funding Source  |
|----------------------------------|---------------------------------------|-----------------------------------|---|----------------------------|-------------------------------------|---------------------|------------------|---|
|                                  |                                       |                                   |   | Before                     | After                               |                     |                  |   |
| <b>2035-2040 Network (Cont.)</b> |                                       |                                   |   |                            |                                     |                     |                  |   |
| 43                               | <b>O Street</b>                       | 83rd Avenue                       | Weld CR 23  | 0                          | 2 (Center turn lane)                | 2035                | \$7,400          | Greeley – Road Development Funds  |
| 44                               | <b>Shields Street</b>                 | Fossil Creek Drive                | Harmony Road  | 2                          | 4                                   | 2035                | \$6,500          | Fort Collins – Street Oversizing Fund   |
| 45                               | <b>SH 402</b>                         | Larimer CR 9                      | I-25  | 2                          | 4                                   | 2035                | \$33,378         | Loveland – Transportation Capital Improvement Plan Funds; CDOT  |
| 46                               | <b>SH 402</b>                         | US 287                            | St. Louis Avenue                                    | 2                          | 4                                   | 2035                | \$3,000          | Loveland – Transportation Capital Improvement Plan Funds; CDOT  |
| 47                               | <b>Taft Avenue/<br/>Larimer CR 17</b> | SH 60/Larimer CR 14               | 28 <sup>th</sup> Street Southwest/<br>Larimer CR 16 | 2                          | 4                                   | 2035                | \$6,123          | Loveland – Transportation Capital Improvement Plan Funds  |
| 48                               | <b>Taft Avenue</b>                    | US 34                             | 22 <sup>nd</sup> Street                             | 4                          | 4 (Center turn lane and bike lanes) | 2035                | \$6,123          | Loveland – Transportation Capital Improvement Plan Funds  |
| 49                               | <b>Taft Avenue</b>                    | 28 <sup>th</sup> Street Southwest | 14 <sup>th</sup> Street Southwest                   | 4                          | 4 (Center turn lane and bike lanes) | 2035                | \$3,920          | Loveland – Transportation Capital Improvement Plan Funds  |
| 50                               | <b>Weld CR 54</b>                     | 35 <sup>th</sup> Avenue           | Weld CR 17  | 2                          | 2 (Center turn lane)                | 2035                | \$6,800          | Greeley – Road Development Funds  |
| 51                               | <b>Weld CR 56</b>                     | US 34 Bypass                      | Weld CR 17  | 0                          | 2                                   | 2035                | \$21,000         | Greeley – Road Development Funds  |
| 52                               | <b>I-25</b>                           | Weld CR 38                        | SH 56   | 4                          | 6                                   | 2040                | \$85,000         | CDOT Strategic Projects, Strategic Transit, Local Funds, Flexible Funds – RTP, Other STP Metro, CMAQ, FASTER Safety |

***Appendix D: 8-Hour Ozone Nonattainment Area Modeling Summary***

**Table 4: 8-Hour Ozone Non-attainment Area Modeling Summary**

|   | 2017<br>(Base)    | 2040<br>(Horizon) |
|---|-------------------|-------------------|
| <b>Socioeconomic Data</b>   |                   |                   |
| Population  | 537,273           | 896,191           |
| Employment  | 280,207           | 428,599           |
| Households  | 523,898           | 879,891           |
| <b>Speed by Roadway Type</b>  |                   |                   |
| Freeway   | 58.6              | 46.4              |
| Expressway  | 42.4              | 29.8              |
| Major Arterial  | 33.7              | 26.6              |
| Minor Arterial  | 34.2              | 24.5              |
| Frontage Road   | 46.4              | 32.8              |
| Collector   | 33.1              | 28.1              |
| Ramp  | 24.9              | 11.7              |
| Centroid Connector  | 27.1              | 26.7              |
| <i>Average</i>  | <i>36.1</i>       | <i>28.1</i>       |
| <b>Daily VMT Summaries</b>  |                   |                   |
| Freeway   | 1,705,912         | 2,789,345         |
| Expressway  | 1,944,553         | 2,912,497         |
| Major Arterial  | 3,484,907         | 5,550,652         |
| Minor Arterial  | 2,545,883         | 4,914,133         |
| Frontage Road   | 130,417           | 259,976           |
| Collector   | 1,399,124         | 3,727,931         |
| Ramp  | 61,794            | 107,759           |
| Centroid Connector  | 1,289,249         | 2,470,087         |
| <i>Total</i>  | <i>12,571,356</i> | <i>22,732,380</i> |
| <b>Lane Miles by Roadway Type</b>   |                   |                   |
| Freeway   | 132               | 182               |
| Expressway  | 404               | 409               |
| Major Arterial  | 759               | 849               |
| Minor Arterial  | 1,046             | 1,176             |
| Frontage Road   | 78                | 72                |
| Collector   | 1,770             | 1,887             |
| Ramp  | 17                | 17                |
| Centroid Connector  | 1,643             | 1,626             |
| <i>Total</i>  | <i>5,849</i>      | <i>6,219</i>      |
| <i>Source: NFRMPO 2040 Regional Travel Demand Model, 2040 Regional Socioeconomic Forecast</i> |                   |                   |



***Appendix E: Resolution 2017-01 North Front Range Transportation & Air Quality  
Planning Council (NFRT&AQPC) Adoption***



**RESOLUTION NO. 2017-01**  
**OF THE NORTH FRONT RANGE TRANSPORTATION & AIR QUALITY PLANNING COUNCIL**  
**ADOPTING CONFORMITY DETERMINATIONS**  
**FOR THE NORTH FRONT RANGE METROPOLITAN PLANNING AREA 2040 FISCALLY**  
**CONSTRAINED REGIONAL TRANSPORTATION PLAN AMENDMENT**  
**AND THE FY2018-2021 TRANSPORTATION IMPROVEMENT PROGRAM**  
**AND FOR THE NORTHERN SUBAREA OF THE UPPER FRONT RANGE TRANSPORTATION**  
**PLANNING REGION 2040 REGIONAL TRANSPORTATION PLAN, THE 2040 UPPER FRONT**  
**RANGE TRANSPORTATION PLANNING REGION RTP, AND COLORADO FY2017-2020**  
**STATEWIDE TRANSPORTATION IMPROVEMENT PROGRAM**

**WHEREAS**, 49 CFR PART 613 §450.324 requires development through continuing, cooperative, and comprehensive (“3C”) multimodal transportation planning process of a fiscally constrained Regional Transportation Plan (RTP) and Transportation Improvement Program (TIP) for Metropolitan Planning Organizations (MPOs); and

**WHEREAS**, the Planning Council as the MPO is the agency responsible for developing and amending the RTP and TIP; and

**WHEREAS**, portions of the cities of Fort Collins and Greeley are currently designated as maintenance areas for carbon monoxide (CO) for which the Planning Council performs conformity determinations; and

**WHEREAS**, the Planning Council through a Memorandum of Agreement (MOA) (2008) has agreed to perform ozone conformity determinations for the Northern Subarea of the Denver-North Front Range 8-hour ozone nonattainment area which includes portions of Larimer and Weld counties outside the MPO contained in the Upper Front Range Transportation Planning Region (UFRTPR); and

**WHEREAS**, Section 93.110(a) of the conformity rule requires conformity determinations based on the most recent planning assumptions in force at the time of conformity analysis; and


**WHEREAS**, the planning assumptions for the Northern Subarea were updated prior to conformity analysis, updating from forecast year 2035 to 2040; and


**WHEREAS**, the air quality conformity determinations conducted on the MPO’s fiscally constrained 2040 RTP Amendment and FY2018-2021 TIP, and the Colorado FY2017-2020 Statewide TIP (STIP) using the 2040 planning assumptions were within the federally approved emissions budgets; and

**WHEREAS**, the Planning Council received no public comment opposing the finding of conformity during the public comment period or during the public hearing;

**NOW, THEREFORE, BE IT RESOLVED BY North Front Range Transportation & Air Quality Planning Council**, the fiscally constrained 2040 RTP Amendment, FY2018-2021 TIP, the 2040 Upper Front Range, and the Colorado FY2017-2020 STIP conform to the State Implementation Plan (SIP) demonstrating positive air quality conformity determinations.

Passed and adopted at the regular meeting of the North Front Range Transportation & Air Quality Planning Council held the 2<sup>nd</sup> day of February, 2017.

  
\_\_\_\_\_  
Kevin Ross, Chair

ATTEST:  
  
\_\_\_\_\_  
Terri Blackmore, Executive Director

***Appendix F: Colorado Air Quality Control Commission Conformity Concurrence***



**COLORADO**  
**Air Quality Control Commission**  
Department of Public Health & Environment

Dedicated to protecting and improving the health and environment of the people of Colorado

Ms. Terri Blackmore, Executive Director  
North Front Range Metropolitan Planning Organization  
419 Canyon Avenue, Suite 300  
Fort Collins, CO 80521

December 15, 2016

The Colorado Air Quality Control Commission (AQCC) has reviewed your agency's conformity determinations for its Regional Transportation Plan and FY2018-2021 Transportation Improvement Program (TIP). The AQCC agrees that the North Front Range Metropolitan Planning Organization's (NFRMPO) 2040 Fiscally Constrained Regional Transportation Plan Amendment, FY 2018-2021 TIP, the Upper Front Range's (UFR) 2040 Regional Transportation Plan, and the NFRMPO portion of the Colorado FY 2017-2020 Statewide Transportation Improvement Program (STIP), as of December 15, 2016, conform to the State Implementation Plan (SIP) and emissions budgets for ozone precursors and carbon monoxide.

The North Front Range Metropolitan Planning Organization's and the Air Pollution Control Division's analyses indicate that emissions budgets for these pollutants will not be exceeded in any of the project or plan horizon years. Therefore, the AQCC concurs with this conformity determination.

Should you have any questions regarding the AQCC's action, please contact Paul Lee at the APCD, at 303-692-3127 or at [paul.lee@state.co.us](mailto:paul.lee@state.co.us).

Sincerely,

John Clouse, Chair  
Air Quality Control Commission

Cc: Tim Russ, U.S. EPA, Region 8  
Bill Haas, FHWA  
Steve Cook, DRCOG  
Rose Waldman, CDOT  
Paul Lee, APCD



***Appendix G: U.S. Department of Transportation Conformity Finding  
(to be provided)***

