2017 Near-Roadway Ambient Air Monitoring Update

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Air Quality Advisory Committee Meeting (AQAC)
East-West Gateway, St. Louis MO
April 25, 2017
Presentation Overview

- Network Requirements
- Data Analysis: Traffic Counts, NO$_2$, CO, Black Carbon, and Particulate Matter
- Website Resources
Near-Roadway Requirements

- **NO₂**: Final rule revising the NAAQS*, published 2/9/2010; Revised 3/14/2013 and 12/30/2016
  - requires near-road (i.e., ≤ 50 m) NO₂ monitoring at
    - 2 sites in the St. Louis CBSA and
    - 1 site in the Kansas City CBSA (based on population and traffic count).
    - First St. Louis site 1/2013
    - Second St. Louis site begin operation 1/2015
    - Kansas City site began operation 7/2013

Other Required Pollutants- CO, PM₂.₅ One site each required in St. Louis and Kansas City.

Other pollutants funded by EPA Grant: Black Carbon, PM₁₀, PM₁₀⁻₂.₅, Meteorology
# Near-Roadway Site Summary

## Sites

<table>
<thead>
<tr>
<th>Site</th>
<th>2010 AADT</th>
<th>FE-AADT</th>
<th>FE-AADT Rank in CBSA</th>
<th>Start Date</th>
<th>NO₂</th>
<th>CO</th>
<th>PM₂·₅</th>
<th>Black Carbon</th>
<th>PM₁₀ &amp; PM₁₀⁻²·₅</th>
<th>Meteorology</th>
<th>SO₂</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>St. Louis</strong></td>
<td></td>
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<tr>
<td>Forest Park (I-64 Westbound)</td>
<td>159,326</td>
<td>360,077</td>
<td>8</td>
<td>January 2013</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Rider Trail, I-70 (I-70 &amp; 270 West of interchange)</td>
<td>161,338</td>
<td>364,634</td>
<td>7</td>
<td>January 2015</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
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<tr>
<td><strong>Kansas City</strong></td>
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<tr>
<td>Blue Ridge, I-70 (I-70 Westbound near Sterling Ave.)</td>
<td>114,495</td>
<td>347,582</td>
<td>3</td>
<td>July 2013</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</tr>
</tbody>
</table>

**AADT=** Annual Average Daily Traffic Count

**FE-AADT=** Fleet Equivalent AADT- Adjustment for heavy duty vehicle counts

Data Trends

Black Carbon Annual Average Trends, 2003-2016

Note: New monitor model used at all sites by 2014.

^Quality assured data through December 31, 2016
^^Near roadway
2016 data is reported under local condition
Nitrogen Dioxide (NO$_2$) Annual 98$^{th}$ Percentile Trends, 2003-2016

^Quality assured data through December 31, 2016
^Near Roadway Monitor
~~3 years of data
* Discontinued Monitor

Troost
Blue Ridge, I-70^^
Mark Twain State Park
Rider Trail, I-70^^~
Blair Street
Margaretta
Forest Park^^
Liberty*
Hillcrest H. Sch*
West Alton*
Bonn Terre*
Sunset Hill*
Maryland Heights*
Ladue*
1-Hr NO2 NAAQS
Carbon Monoxide (CO) Annual Average Trends, 2003-2016 (2nd Highs by site)

^Quality Assured data through December 31, 2016
^^Near Roadway Monitor
PM$_{2.5}$ Annual Average Trends, 2003-2016
for Selected Sites

- **Blair Street-FRM***
- **Blair Street-FEM**
- **Forest Park, I-64-FEM^^**
- **Blue Ridge, I-70^^**
- **2006 Annual Standard**
- **2012 Annual Standard**

^Quality assured data through December 31, 2016
^^Near Roadway Monitor
Traffic Counts

• Data provided by MoDOT
• Hourly data only available for Rider Trail I-70 and Blue Ridge I-70
• Lots of traffic count data (by length of vehicle, eastbound, westbound)
• Trends slides only use traffic count totals
Weekday Traffic Average by Time of Day, 2016
(vehicle count adjusted to CST only)

Vehicles/hour (total both directions)

hour

Rider Trail I-70
Blue Ridge I-70
Blue Ridge I-70, Weekday Averages, 2016

(vehicle count adjusted to CST only)
Weekday Black Carbon Average by Time of Day, 2016

- Blair Street
- Forest Park
- Blue Ridge I-70

(hour)
Weekday PM$_{2.5}$ Average by Time of Day, 2016

- **Blair Street**
- **Forest Park**
- **Blue Ridge I-70**

$\mu g/m^3$
Weekend and Holiday Traffic by Time of Day, 2016

(vehicle count adjusted to CST only)
Weekend and Holiday PM$_{2.5}$ Average by Time of Day, 2016

July 4 not included

- Blair Street
- Forest Park
- Blue Ridge I-70
Acknowledgments

• MoDOT- Traffic count data

• MoDNR APCP data analysis: -Jerry Downs, Brandi Prater, Patricia Maliro

• Site Operation: MoDNR Environmental Services Program
Website Resources

Monitoring Information-
‘Bookmark’

- Design Value Reports
- Preliminary hourly data reports
- Monitoring Network Plans and More
- More improvements coming…
Monitoring Site GIS Map
Rider Trail I-70 Monitoring Site

Address: 13080 Hollenberg Dr.
Bridgeton, MO 63044

Pollutants monitored: Nitrogen dioxide (NO₂) and sulfur dioxide (SO₂)

Date established: Jan. 1, 2015

Site coordinates:
- Latitude: 38.75264°
- Longitude: -90.4884°

County: St. Louis

EPA Site No: 291890016

The Rider Trail site off Interstate 70 at Exit 231B, Earth City, is the second air monitoring station in the St. Louis area to provide near-road data. The site is in compliance with the one-hour NO₂ standard of 100 parts per billion (ppb). The department began monitoring SO₂ at the site in May 2016. Preliminary data show that the site is in compliance with the one-hour SO₂ standard of 75 parts per billion (ppb). Both pollutants negatively affect respiration.

The following webpage provides additional information about SO₂ monitoring in the area: dnr.mo.gov/bridgeton/index.html.

Nitrogen Dioxide (NO₂) Data

In 2010, EPA established a new one-hour NO₂ standard of 100 parts per billion. An area is in compliance if the design value is at or below the standard. The form to determine design value requires three years of data — the average NO₂ concentrations from each hour. The department and EPA calculate the design value, using the 98th percentile of one-hour daily maximum concentrations, averaged over three years.

Weekly summary of all sites that monitor NO₂

Preliminary up-to-date one-hour averages from Rider Trail.

- NO₂ data in the fifth column
Division of Environmental Quality
Acting Director: Steve Feeler

Date: April 25, 2017

Nothing in this document may be used to implement any enforcement action or levy any penalty unless promulgated by rule under chapter 536 or authorized by statute.