



# Memo

Date: April 1, 2020

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Project: West 72<sup>nd</sup> Avenue, Kipling Street to Simms Street

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To: Project File

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From: Sandy Beazley, HDR Environmental Project Manager

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Subject: Air Quality Evaluation

## Project Description

The purpose of the 72<sup>nd</sup> Avenue project is to improve traffic operations and accommodate current and future general vehicular traffic, heavy trucks, bicycles, and pedestrians on 72<sup>nd</sup> Avenue (W. 72<sup>nd</sup> Avenue) between approximately Simms Street and Kipling Street. Improvements includes the following:

- Implement a 4-lane roadway section throughout the project area.
- Replace the existing at-grade railroad crossing with a new underpass.
- Improvements at local access streets and intersections, including Oak Street, Quail Drive, West 70<sup>th</sup> Drive, Pierson Court, and Lee Court.
- Closure of Miller Street, north of 72<sup>nd</sup> Avenue.

See Figure 1 for the project location.

## Existing Conditions

The projects is located in the City of Arvada, Jefferson County, Colorado. Elevation in the project area is approximately 5,500 feet above mean sea level. The nearest meteorological station is located at Rocky Mountain Metropolitan Airport, approximately 5.8 miles north of the project site. Figure 2 shows the prevailing wind direction (IEM, 2020).



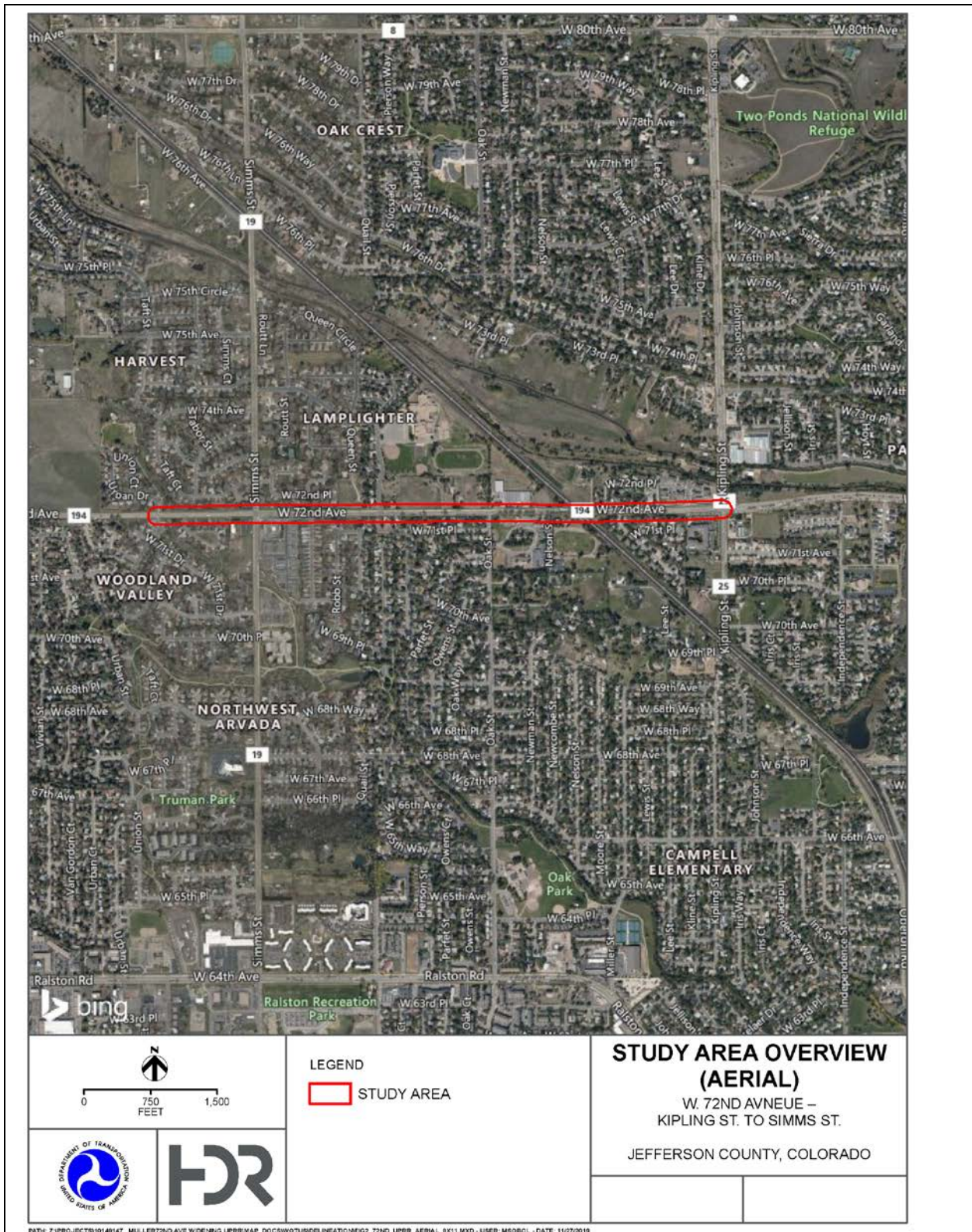


Figure 1: Project Location Map

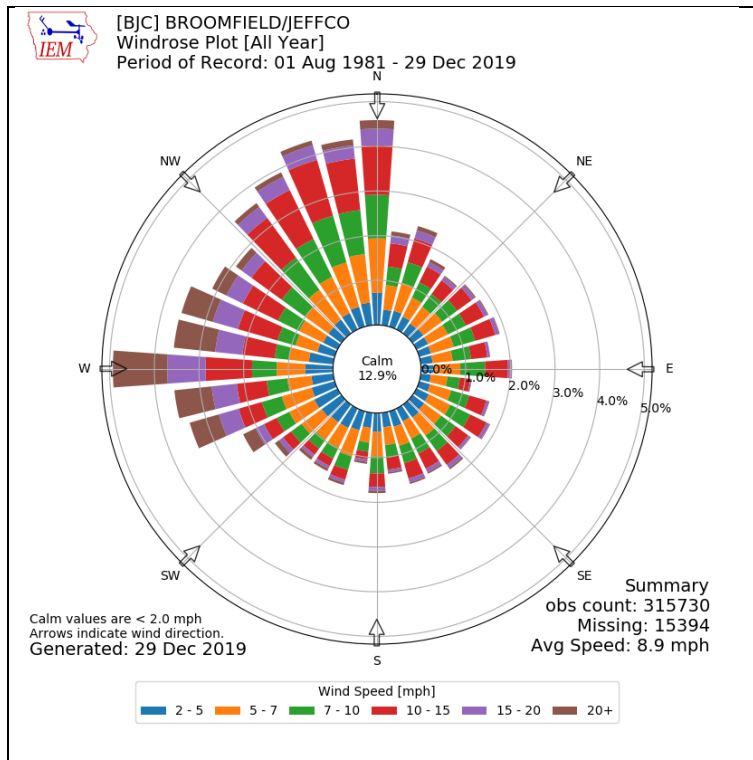


Figure 2: Prevailing Wind Speed and Direction

The Clean Air Act of 1970 and its amendments led to the U.S. Environmental Protection Agency (EPA) establishing National Ambient Air Quality Standards (NAAQS) for criteria air pollutants: carbon monoxide (CO), lead, nitrogen dioxide, ground level ozone (O<sub>3</sub>), particulate matter less than 10 microns (PM<sub>10</sub>) and less than 2.5 microns (PM<sub>2.5</sub>), and sulfur dioxide (Table 1). The project study area is located within Jefferson County, which is in attainment with all NAAQS except for ground level ozone. The project study area is located within the Denver Metro/North Front Range Ozone Nonattainment Area (CDPHE, 2017).

Table 1: Regional NAAQS Status by Pollutants

Pollutant	Status	Classification	Year of Standard	Anticipated Year That the 20-Year Maintenance Period Will End	SIP Title	SIP Date
O <sub>3</sub>	Nonattainment	Moderate	2008	N/A	Denver- Boulder- Greeley- Ft. Collins- Loveland, CO	7/3/18
O <sub>3</sub>	Nonattainment	Marginal	2015	N/A	Denver Metro/North Front Range, CO	TBD
CO	Attainment	N/A	1971	N/A	N/A	NA
PM <sub>10</sub>	Attainment	N/A	1987	N/A	N/A	NA
PM <sub>2.5</sub>	Attainment	N/A	2006	N/A	N/A	NA
NO <sub>2</sub>	Attainment	N/A	2018	N/A	N/A	NA

There is a Colorado Department of Public Health and Environmental (CDPHE) air quality monitoring station for ozone located on the north side of Rocky Flats, approximately 6.5 miles north/northwest of the project area. This air quality station only monitors for O<sub>3</sub>. There are no monitors for CO, particulates, or NO<sub>2</sub> in the project area. The most recent monitoring data set available from CDPHE is for 2018 (CDPHE, 2019). Monitoring data for this pollutant (O<sub>3</sub>) indicates that the 3-year average of the 4<sup>th</sup> maximum value is 77 ppb, exceeding the 8-hour ozone standard of 70 ppb. Because this a locally funded project, air quality conformity does not apply, so this project has not been modeled as part of the regional transportation plan.

Traffic analysis was completed at the intersection of 72<sup>nd</sup> Avenue and Simms Street do determine the existing Level of Service, shown in Table 2:

**Table 2: Existing Level of Service Analysis**

Intersection	AM Peak	Noon Peak	PM Peak
Existing Signalized Intersection (72 <sup>nd</sup> Avenue/Simms Street)	C	C	D

These levels indicate the amount of delay motorists experience as they navigate the intersection, with Level of Service A the best, and then idle times getting longer through Level of Service F. Existing traffic volumes were used in this analysis, and include 14,700 vehicles per day on 72<sup>nd</sup> Avenue and 12,200 vehicles per day on Simms Street.

### Future Conditions

The intersection alternatives of 72<sup>nd</sup> Avenue and Simms Street were analyzed under future conditions to forecast long-term operations. Future year 2040 volumes were projected using a 0.63% annual growth rate on each intersection approach over 21 years (2019 to 2040) based on output from the 2015 and 2040 Denver Regional Council of Governments Regional Travel Demand Model.

Analysis included two different signalized intersection configurations and one roundabout. The results are summarized in Table 3.

**Table 3: Future Intersection Level of Service Analysis**

Intersection Type	AM Peak	Noon Peak	PM Peak
Signalized: Permissive-Protected Lefts	C	B	C
Signalized: Protected-Only Lefts	C	C	D
Roundabout	A	A	A

Because a signalized intersection will not require right-of-way acquisition and has less engineering constraints, primarily less steep grades on the intersection approaches, the signalized intersection with permissive-protected left turns has been recommended. This intersection is predicted to operate at a better level of service than the existing intersection. This reduction in delay, and therefore decreased idling times, will result in fewer vehicular emissions in the immediate area.

### Construction Emissions

Local air quality impacts will result from construction activities, and include increased equipment emissions. Long-term construction projects near sensitive receptors can represent health concerns;

however, the duration of construction for this project is not considered long-term as it will last for less than five years. Construction emissions can be reduced through implementation of the following best management practices:

- Cover, wet, compact, or use chemical stabilization binding agent, to control dust and excavated materials at construction sites
- Have a wheel wash station and/or crushed stone apron at egress/ingress areas to prevent dirt being tracked onto streets
- Use vacuum-powered street sweepers to remove dirt tracked onto streets
- Cover all dump trucks leaving sites to prevent dirt from spilling onto streets
- Minimize disturbed areas—particularly in winter
- Prohibit unnecessary idling of construction equipment
- Locate construction diesel engines as far away as possible from residential areas
- Locate staging areas as far away as possible from residential areas
- Install engine pre-heater devices to eliminate unnecessary idling for wintertime construction
- Prohibit tampering with equipment to increase horsepower or to defeat an emission control device's effectiveness
- Require construction vehicle engines to be properly tuned and maintained
- Use construction vehicles and equipment with the minimum practical engine size for the intended job

## References

CDPHE. 2019. Colorado Department of Public Health and Environment Colorado 2018 Annual Monitoring Network Plan. Accessed on March 25, 2020.

[https://www.colorado.gov/airquality/tech\\_doc\\_repository.aspx?action=open&file=2018AnnualNetworkPlan.pdf](https://www.colorado.gov/airquality/tech_doc_repository.aspx?action=open&file=2018AnnualNetworkPlan.pdf)

IEM. 2020. Iowa State University Iowa Environmental Mesonet. Accessed on March, 25, 2020.

[https://mesonet.agron.iastate.edu/sites/windrose.phtml?station=BJC&network=CO\\_ASOS](https://mesonet.agron.iastate.edu/sites/windrose.phtml?station=BJC&network=CO_ASOS)