

Air

KEY PERFORMANCE MEASURES

- *Levels of particulate matter pollution*
- *Castle Creek Bridge traffic counts*
- *Radon levels and mitigation*
- *Ozone levels*

Desired Outcome: *The Aspen community enjoys clean healthy air. Aspen's air quality is one of the factors that distinguish it from other places. Residents and visitors alike expect and value clear skies and unpolluted indoor and outdoor air. Because Aspen has clean healthy air, residents can fully enjoy indoor and outdoor activities with reduced concern for their health, including reduced incidence of respiratory and cardiovascular illness and irritation.*

Learn more about [Air](#) as a key environmental sustainability theme for the community.

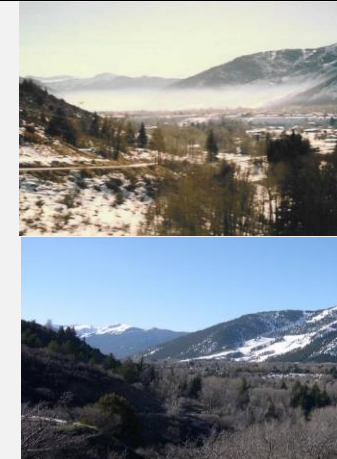
Levels of particulate matter pollution

What is it? Why is it important?

Airborne particulate matter (PM) pollution includes acids, organic chemicals, metals, and dust particles. PM is quantified as coarse particles (PM 10) and fine particles (PM 2.5). Both can reduce visibility and pose respiratory and cardiovascular health threats. Smaller particles cause greater harm, as they more easily enter the nose, throat, and lungs. Cities receive non-attainment status if they exceed the EPA’s National Ambient Air Quality Standard (NAAQS) for PM more than once per year over 3 years.¹ Aspen was designated with non-attainment in 1988 for PM 10, and through rigorous air quality improvement efforts regained attainment in 2003. The Air Quality Index (AQI) is a national tool developed by the EPA to explain how current local air quality effects health.² Aspen City officials use the AQI to act on acute incidents of elevated air pollution.

What does the data/trend say?

Between 2006 and 2016, **none of Aspen’s 24-hr averages fell above the PM 10 NAAQS level of 150 µg/m³** and from 2015-2016, **no PM 2.5 24-hr averages surpassed the EPA’s NAAQS level of 35 µg/m³** (Fig. 1). The highest PM 2.5 levels seen in 2015 relate to wildfire activity originating from other Western states (Fig. 1). The 24-hour average data in Figure 1 tells us that overall, Aspen’s air quality is good. However, micro-spikes on a minute or hourly basis still occur in Aspen, and can affect those participating in outdoor activities or sensitive populations. Typically, these increases are due to vehicles grinding rock particles on the road and wood smoke from residential wood burning or regional wildfires. **AspenAirQuality.com** has information on real-time air quality and health impacts.



Air quality in 1970s and 1980s compared to cleaner present day.

Figure 1. Top 24-Hr Averages of PM 10 and PM 2.5

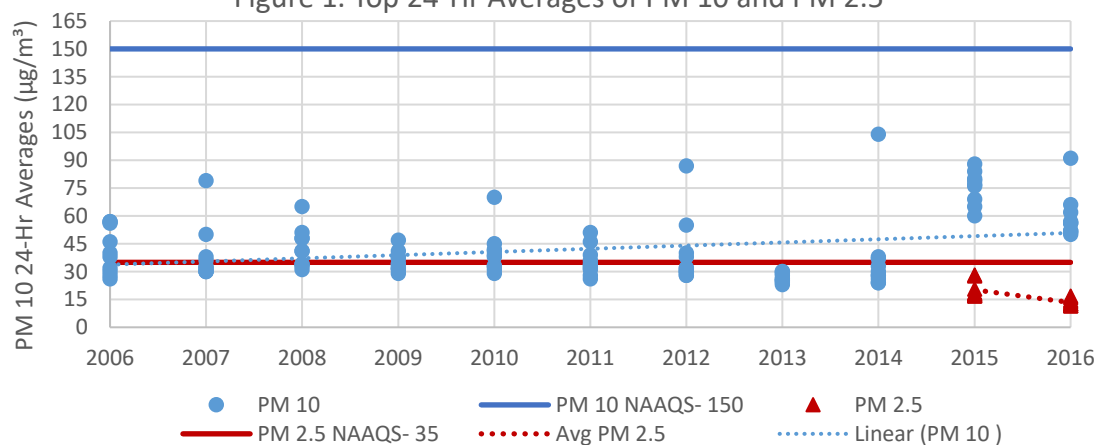


Figure 2. Air Quality Index for Particulate Matter

AQI Rating	Actions to Protect Your Health Against PM
Good	None
Moderate	If unusually sensitive, consider reducing prolonged or heavy exertion.
Unhealthy for sensitive groups	Sensitive groups* should reduce prolonged or heavy outdoor exertion. Everyone else should limit prolonged or heavy exertion.
Unhealthy	Sensitive groups* should avoid all physical activity outdoors. Everyone should avoid long or heavy exertion.
Very unhealthy	Sensitive groups* should remain indoors with low activity. Everyone should avoid physical activity outdoors.

* People with heart or lung disease, children, and older adults.

Visit: AspenAirQuality.com for current air quality!

Targets

Aspen’s Target is to not exceed the EPA’s NAAQS levels for PM 10 and PM 2.5. **Aspen met its target in 2016** with no 24-hr averages above 150 µg/m³ for PM 10, or above 35 µg/m³ for PM 2.5.

Data Sourcing and Considerations

In Figure 1, the PM 10 data jumps up noticeably in 2015. Though causation is uncertain, this increase could be connected to the fact that the monitoring was upgraded in 2015 to a GRIMM system, which has an increased level of quality assurance and control.

Sources: [1] EPA NAAQS Table: <https://www.epa.gov/criteria-air-pollutants/naaqs-table>. [2] AirNow. EPA. 2017. <<https://airnow.gov/>>. [Photos] City of Aspen Department of Environmental Health and Sustainability.

Castle Creek Bridge traffic counts

What is it? Why is it important?

This metric is used to determine the success of traffic reduction measures, which can improve local air quality. In the nineties, community concern over traffic and congestion prompted the City of Aspen to begin tracking vehicle counts on the Castle Creek Bridge at the Northwest entrance of town. The City of Aspen is committed to not exceeding the 1993 baseline traffic levels. Consistent traffic counts began in 1999 and continue to present day.¹

What does the data/trend say?

The 1993 baseline value for **Annual Average Daily Trips (AADT)** across Castle Creek Bridge is 23,675 trips, which **has not been exceeded** since data collection began in 1999 (Fig. 1). The lowest AADT value is 21,351 trips in 2010, since which values have risen annually to a total of 22,196 in 2016 (Fig. 1). **Monthly comparisons** show that in 2015, the number of daily trips in **Apr., Nov., and Dec. did exceed** 1993 monthly levels, while **all other months in 2014-2016 fell below 1993 levels** (Fig. 2).² April and November are low season months in Aspen, when traffic and resulting poor air quality are relatively low. Increased traffic in high-volume months, such as December, is more concerning for air quality concerns.



Figure 1. Annual Average Daily Trips as a Percent of Target Maximum

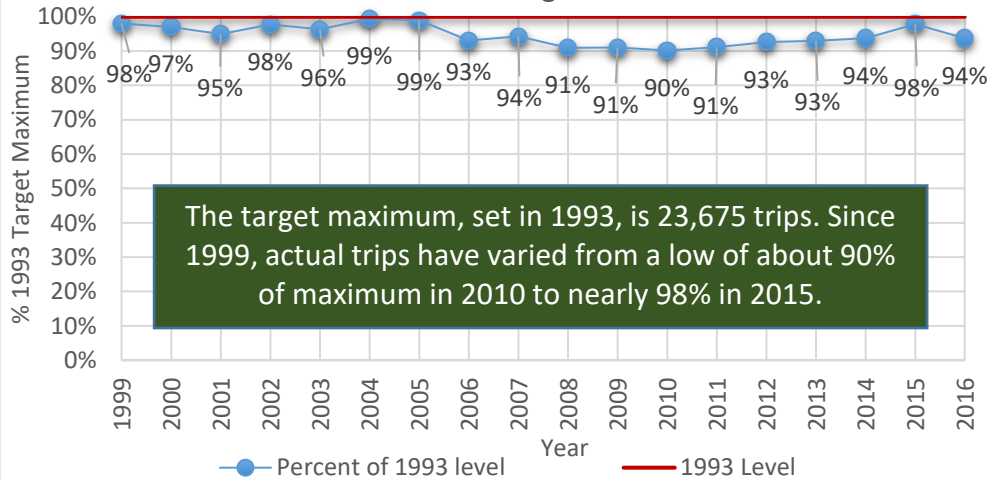
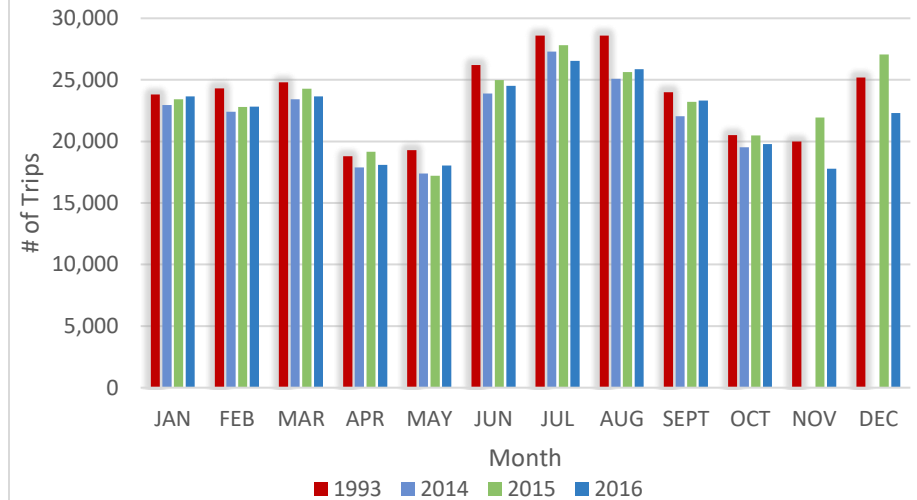


Figure 2. Monthly Castle Creek Bridge Traffic Counts



Targets

Castle Creek Bridge Traffic counts will remain below the 1993 baseline levels. **In AADT, Aspen has met its target in every year since 1999.** In 2016, the AADT was 1,479 trips lower than the 1993 baseline. **Monthly average daily trips in 2015 exceeded 1993 counts in April, November, and December.**

Data Sources and Considerations

While this bridge is not the only entrance to town, and thereby cannot be used as a measurement of total traffic, data from this location can be monitored on a regular basis, and used as a proxy to gauge fluctuations in total vehicle trips.

Sources: [1] [2] City of Aspen Department of Transportation. [Photo] Armstrong, Laura. 2016.

Radon levels and mitigation

What is it? Why is it important?

Radon is a radioactive gas found in nature, which comes from the decay of uranium atoms, and has no color, odor, or taste. There is no safe level of radon; however, the EPA has designated an action level of 4 picocuries per liter of air (pCi/L), above which buildings should be mitigated. A building with high levels of radon poses a significant health risk over a 10 to 20-year period exposure period. Radon is the second leading cause of lung cancer and the number one cause among non-smokers. The Colorado Department of Public Health & Environment rates all of Colorado's counties with high radon risk.¹ Radon is one of the identified priorities of the Pitkin County Public Health Improvement Plan. Environmental and public health officials believe that approximately 50% of homes tested for radon from Aspen to Rifle have radon. To encourage residents to test for and mitigate radon levels where needed, the City of Aspen began giving out grant-funded free radon test kits to residents in 2010.

What does the data/trend say?

Between 2010 and the spring of 2017, a total of 614 users have received radon test kits from the City of Aspen or CORE. In 2016, of the 40 new users who tested, 70% received high results and 30% were low. Of those with high results, City of Aspen staff know that at least 61% have now mitigated. Reliable data for the total number of testers who have successfully mitigated high radon levels since 2010 is not accessible, because users typically do not inform the City after mitigation has occurred.



Home radon test kits are distributed by the City of Aspen.

Figure 1. Methods by which radon enters a building.

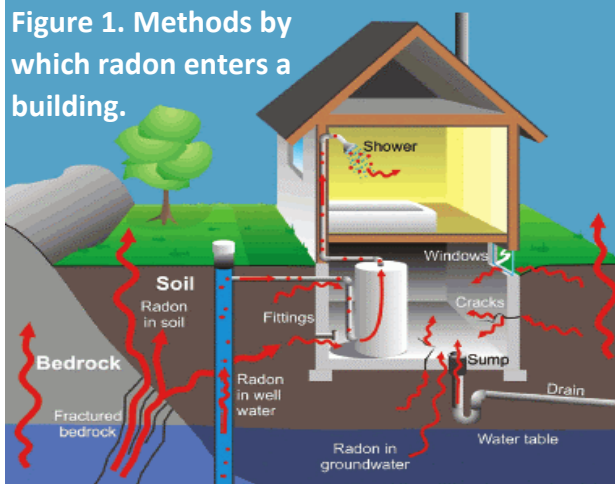


Figure 2. Ways to Reduce Radon in the Your Community

Individuals and Businesses Can:

1. Pick up a radon test kit and do the test. For a free kit, visit the Department of Environmental Health.
2. Mitigate if radon levels are 4 pCi/L or higher.
3. Conduct follow up tests every 2 years.

Local Governments Can:

1. In addition to requiring radon resistant construction for single family homes, require this for all building types, including commercial and multi-family.
2. Spread education and awareness of the risks of radon.
3. Offer radon mitigation rebates through Energy Smart (following Eagle County's example).
4. Lead by example and test all government-owned buildings, installing radon mitigation in buildings with radon levels of 4 pCi/L or higher.

Targets

Due to the current lack of data availability, this measure contains no target.

Data Sourcing and Considerations

The City of Aspen radon database contains only results from radon test kits that the City of Aspen has administered and or which have been voluntarily shared. However, buildings are also tested in real estate transactions and by radon mitigators. Unfortunately, the City does not have a mechanism to capture data outside of its own test kit program.

Sources: [1] "Colorado Radon Zones." Colorado Department of Public Health and Environment, 2017. <https://www.colorado.gov/pacific/cdphe/colorado-radon-zones> [Figures 1,2] City of Aspen Department of Environmental Health [2] A Citizen's Guide to Radon: The Guide to Protecting Your Family and Yourself from Radon. Rep.: Environmental Protection Agency, 2012. [Photo] Armstrong, Laura. 2016.

Levels of ozone

What is it? Why is it important?

Ground level ozone (O₃) reduces visibility and is a respiratory irritant and illness promoter. It forms in the air when Nitrogen Oxides (NO_x) and Volatile Organics (VOC) get “cooked” by sunlight or UV. O₃ levels are reported in a top 8-hour average per day and are measured in parts per billion (ppb). The National Ambient Air Quality Standards (NAAQS) established by the EPA and Clean Air Act state that a city’s annual fourth-highest daily maximum 8-hour concentration of ozone, averaged over 3 years, should not exceed 70 ppb.¹ The Air Quality Index (AQI) is an EPA tool that communicates the health effects of air pollution levels. High O₃ levels are often caused by regional traffic, oil and gas development, or natural weather and fire events. A large VOC source in Aspen is the terpenes released by trees budding in springtime. Stratospheric intrusions can also increase ozone levels in Aspen. This is when naturally ozone-rich air from 10-30 miles above sea level dips down to lower elevations, even reaching the ground level in high altitude regions such as Aspen.

What does the data/trend say?

No fourth-highest daily 8-hour concentrations of O₃ exceeded the NAAQS between 2010-2016, though several of the top 8-hr averages exceeded that level (Fig. 1). The 75 ppb value in 2012 is believed to be due to a naturally-caused stratospheric intrusion.² The highest O₃ levels in 2015 and 2016 were recorded between April and June (Fig. 2).² This means that during springtime in particular, residents and visitors should use **AspenAirQuality.com** to know when levels are good, moderate, or unhealthy, adjusting behavior accordingly.

Visit
AspenAirQuality.com
for current air quality and
health ranking

Good
Moderate
Unhealthy for sensitive groups
Unhealthy
Very unhealthy

Figure 1. 8-Hour Ozone Annual Trends

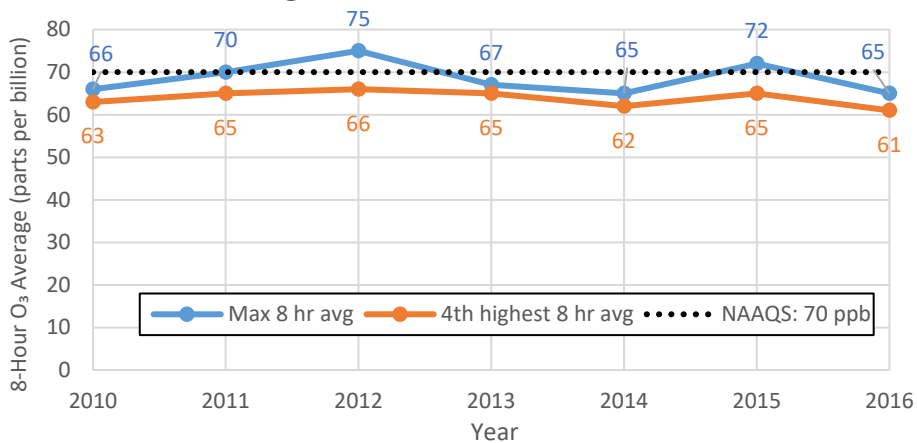
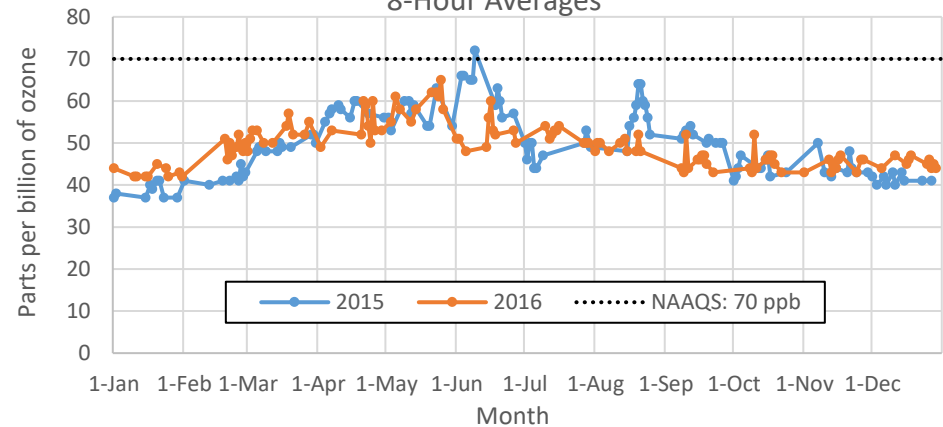


Figure 2. Seasonal Variation of Monthly Top 10 8-Hour Averages



Targets

Aspen’s target is to meet the EPA’s National Ambient Air Quality Standard for ozone.
From 2010-2016, Aspen has met this target.

Data Sourcing and Considerations

Ozone data collection began in Aspen in 2010. Data is measured with a Teledyne 400 monitor.

Sources: [1] EPA NAAQS Table: <https://www.epa.gov/criteria-air-pollutants/naaqs-table> [2] [Figures] Jannette Whitcomb, City of Aspen Senior Environmental Health Specialist; City of Aspen Department of Environmental Health and Sustainability, 2017. [Photo] Armstrong, Laura. 2016.

