

November 19, 2019

Re: Ozone Advance Path Forward for the Charlotte Region – Progress Report

The purpose of this document is to provide a snapshot (static version) of the above-referenced “Path Forward” document submitted to the U.S. Environmental Protection Agency (USEPA) **Advance Program** by the **Mecklenburg County Air Quality (MCAQ)** entity in 2019. As described in a letter of **September 26, 2019**, from Leslie Rhodes, Director, Mecklenburg County Land Use and Environmental Services Agency, Charlotte, North Carolina, to the U.S. Environmental Protection Agency’s Advance Program (see page 2 of 3): Rather than producing a static document, MCAQ has opted to present the Charlotte region’s Path Forward as a website: airquality.mecknc.gov/BreathingRoom.

Accordingly, this document provides representative content downloaded from the Path Forward website by Advance Program staff. Pages in this document are organized in the same order in which the source links on the webpage appear. Some content downloaded by the Advance Program staff necessarily appears in a format different from that in which it appears on the website itself (<https://www.mecknc.gov/LUESA/AirQuality/Pages/Strategies.aspx>). The snapshot provides representative content as of late November 2019 and so may only approximate the content actually accessible on the Path Forward document’s submission date (September 26, 2019).

This document captures content downloaded from webpages only for which the immediate link to that webpage appears on the main “Breathing Room” webpage (URL provided above); it does not capture content that is accessible only from a linked-to webpage.

Click below to go to The Breathing Room main webpage:
<https://www.mecknc.gov/LUESA/AirQuality/Pages/Strategies.aspx>

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Mecklenburg County, NC > LUESA > Air Quality > Breathing Room

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- Public Comment Opportunities

Code Enforcement

Geospatial Information Services

Solid Waste

Storm Water Services

Online Services

Sustainability

Address

Mailing Address:
Air Quality
2145 Suttle Avenue
Charlotte,
NC 28208

Office Location:

2145 Suttle Avenue
Charlotte,
NC 28208

Breathing Room

COMPLIANCE VALUE

100

70

50

OZONE STANDARD

BREATHING ROOM

Despite dramatic improvements in local air quality over the last decade, Mecklenburg County and the entire Charlotte region only narrowly meet the [health-based standard for ground-level ozone](#). Mecklenburg County Air Quality and the North Carolina Division of Air Quality want to partner with you to put some "breathing room" between our local data and the health standard for ozone.

The Plan

Get Involved

Background

Give us feedback

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Click "The Plan" to go to:

<https://www.mecknc.gov/LUESA/AirQuality/Pages/Strategies.aspx>

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GOVERNMENT

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About LUESA

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The Plan to Create Breathing Room

Print

The Breathing Room Path Forward is a plan to continue the positive trend of improving air quality in our region.

On September 17, 2019, the [Mecklenburg Board of County Commissioners](#) approved the Breathing Room Path Forward, after it was reviewed and endorsed by the [Environmental Stewardship Committee](#) and the [Air Quality Commission](#). The strategies and timeline below, which are part of the Path Forward, were developed based on [community input](#), policy priorities, and available funding.

NOW (2019-2021)

Transit Expansion Advocacy

School Bus Electrification

Greenway Expansion Advocacy

Airport Shuttle Electrification

Ground-support Equipment Electrification

NEXT (2021-2022)

Complete Streets

Community Solar

Property Assessed Clean Energy Program

FUTURE (2023+)

Energy Audit Program

Zoning: EV Charging Infrastructure

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"The Plan" continued

Address

Mailing Address:

Air Quality
2145 Suttle Avenue
Charlotte,
NC 28208

Office Location:

2145 Suttle Avenue
Charlotte,
NC 28208

[MAP](#)

Hours: Mon-Fri 8 a.m. - 5 p.m.

Contact

Megan Green

704-336-5430

[Send an Email](#)

[Property Assessed Clean Energy Program](#)

FUTURE (2023+)

[Energy Audit Program](#)

[Zoning: EV Charging Infrastructure](#)



Air Quality Commission members presented at the Environmental Stewardship Committee meeting.

On Hold (may be added as time and resources allow)

[Cash for Clunkers](#)

[Eco-driving Training](#)

[Zoning: Eliminate Parking Minimum](#)

[Gas Cap and Tire Pressure Check Outreach](#)

[Taxi Electrification](#)

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"The Plan" continued

[555.734.1313](#)
[Zoning: Eliminate Parking Minimum](#)
[Gas Cap and Tire Pressure Check Outreach](#)
[Taxi Electrification](#)

Because the Charlotte region has a history of poor air quality, a number of programs are already in place to [reduce air pollution](#). These successful strategies will continue in the region:

[Industrial source permitting and compliance assistance](#)
[GRADE](#) (Grants to Replace Aging Diesel Engines)
[Air Awareness](#) education and outreach services
[Smoking vehicle program](#)
[Idle reduction resources](#)







[Can you help us create Breathing Room?](#)

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Click on “Transit Expansion Advocacy” to go to:

<https://www.mecknc.gov/LUESA/AirQuality/Documents/Transit%20Expansion.pdf>



The Idea: Transit Expansion

- A regional, interconnected mass transit system will give citizens, especially commuters, ways to reach their destination without the use of a single-occupancy vehicle.

The Action:

- Support efforts to develop an interconnected mass transit system throughout the Charlotte Region
- Quantify the air quality benefits of Mass Transit as an alternative to driving.

The Pollution Source: 23 % of NO_x comes from passenger vehicles¹

The Cost-effectiveness: Unknown

The Factors:

- Transit only reduces pollution if commuters use the service.
- Transit can mitigate traffic congestion on main commuter routes.
- Some services (light rail and streetcar) are powered by electricity, not gas or diesel.
- Particulate Matter – Low co-benefits
- Greenhouse Gases – Medium co-benefits



1 19.37 tons/day of NO_x. Passenger vehicles includes both passenger cars and trucks. Source: Revised Maintenance Plan For The Charlotte-Gastonia-Salisbury, North Carolina 2008 8-Hour Ozone Marginal Nonattainment Area (July 2018)

Click on “School Bus Electrification” to go to:

<https://www.mecknc.gov/LUESA/AirQuality/Documents/School%20Bus%20Electrification.pdf>



Implementation Plan

School Bus Electrification

Existing Efforts:

- In February 2019, Air Quality staff organized an electric bus information session for local school district fleet managers. At the event, Thomas Built Buses (of High Point, NC) demonstrated their new, fully-electric “Jouley” school bus, including capabilities of a cleaner, quieter electric school bus.
- Air Quality staff have worked with local school districts and the N.C. Department of Public Instruction (DPI) to gauge interest in, and identify funding for, electric school buses in the Charlotte region.
- Stakeholders: Regional School Districts, N.C. Department of Public Instruction, N.C. Division of Air Quality

Funding Opportunity: VW Settlement Funds

Next Steps:

- Assist local school districts with applying for VW funding, in consultation with DPI.
- Research other grant funding options and assist with applications as necessary.

Staff Contact: PJ McKenzie, Paul.McKenzie@MeckNC.gov, 980-314-3374

September 2019



The Idea: School Bus Electrification

- Replace diesel-powered school buses with electric buses.
- The first electric school buses will be manufactured in 2019.

The Action:

Identify and secure funds to defray the cost of new electric school buses and charging infrastructure. Work with local school systems to develop a bus replacement schedule that prioritizes the highest emitting buses for replacement first.

The Pollution Source: 0.1% of NO_x come from school buses¹

The Cost-effectiveness: \$4,695/lb of NO_x²

The Factors:

- Reduces children's exposure to diesel emissions. Children are a "sensitive" population.
- Each project has a larger impact than a passenger vehicle but less than a transit bus.
- There are fewer school buses than cars, but more school buses than transit buses.
- Public-facing project that could spread awareness/information to residents.
- As the power grid changes to lower emission/renewable fuels, overall emissions will decrease further.
- PM – Low co-benefits
- GHG – Medium co-benefits



¹ 0.07 tons/day or NO_x. Source: Revised Maintenance Plan For The Charlotte-Gastonia-Salisbury, North Carolina 2008 8-Hour Ozone Marginal Nonattainment Area (July 2018)

2 Based on one year of NOx reductions; assuming \$200,000 per bus (this is a new technology that does NOT have a definite price at this time).

Click on “Greenway Expansion Advocacy” to go to:

<https://www.mecknc.gov/LUESA/AirQuality/Documents/Greenway%20Expansion.pdf>



The Idea: Greenway Advocacy

- Greenways are protected, multi-use paths that connect people to parks, retail, neighborhoods and restaurants without the use of vehicles.
- Increasing citizens access to greenways can result in fewer vehicle miles traveled, less air emissions and less traffic congestion.

The Action:

- Advocate for using and continuing to develop greenways throughout the Charlotte Region.
- Prioritize construction of greenways that connect people with activity centers.
- Quantify and actively communicate the air quality benefits of greenway use as an alternative to driving.

The Pollution Source: 23% of NO_x comes from passenger vehicles¹

The Cost-effectiveness: Unknown

The Factors:

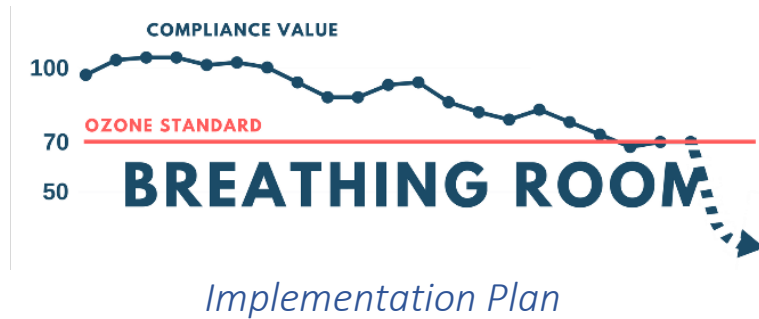
- Greenways only reduces pollution if they are used to make trips that otherwise would have been made by motor vehicle.
- Particulate Matter – Low co-benefits
- Greenhouse Gases – Medium co-benefits



1 19.37 tons/day of NOx. Passenger vehicles includes both passenger cars and trucks. Source: Revised Maintenance Plan For The Charlotte-Gastonia-Salisbury, North Carolina 2008 8-Hour Ozone Marginal Nonattainment Area (July 2018)

Click on “Airport Shuttle Electrification” to go to:

<https://www.mecknc.gov/LUESA/AirQuality/Documents/Airport%20Shuttle%20Electrification.pdf>



Airport Shuttle Electrification

Existing Efforts:

- Charlotte-Douglas International Airport (CLT) staff have committed to converting their transit bus fleet of 70 buses to fully electric models within the next 8 years using their current budgeting.
 - City Council has approved and budgeted for the purchase of five electric shuttle buses plus charging infrastructure in FY20.
- Concord Regional Airport staff are interested in purchasing electric transit buses.

Stakeholders: CLT Airport, Concord Regional Airport, N.C. Division of Air Quality

Funding Opportunity: VW Settlement Funds

Next Steps:

- Assist CLT with applying for VW funding to accelerate the acquisition of electric buses.
- Assist Concord Regional Airport staff with applying for VW funding to pilot electric buses.
- Research other grant funding options and assist with applications as necessary.

Staff Contact: PJ McKenzie, Paul.McKenzie@MeckNC.gov, 980-314-3374

September 2019



The Idea: Airport Shuttle Electrification

- Replace diesel and gas shuttle buses with electric shuttles at regional airports like Charlotte-Douglas International Airport.
- Electric shuttles will have zero tailpipe emissions.

The Action:

- Identify and secure funding to defray the cost of new electric shuttles and charging infrastructure.
- Work with local airports to create a shuttle replacement schedule that prioritizes the highest emission shuttle(s) for replacement first.

The Pollution Source: 0.1% of NO_x comes from transit buses (which includes airport shuttles)¹

The Cost-effectiveness: \$418.06/lb of NO_x ²

The Factors:

- Airport shuttles have high usage, which means that each shuttle has high emissions.
- There aren't very many airport shuttles in the region, so large-scale emission reductions aren't likely.
- Public-facing project that could spread awareness/information to the city and its visitors.
- Emissions generated from charging the vehicles will decrease as renewable energy is adopted into the power grid.
- Particulate Matter – Low co-benefit
- Greenhouse Gas – Medium co-benefit



1 0.11 tons/day of NO_x. Source: Revised Maintenance Plan For The Charlotte-Gastonia-Salisbury, North Carolina
2008 8-Hour Ozone Marginal Nonattainment Area (July 2018)

2 Assuming \$700,000 per bus

Click on “Ground-support Equipment Electrification” to go to:

<https://www.mecknc.gov/LUESA/AirQuality/Documents/GSE%20Electrification.pdf>



Implementation Plan

Ground Support Equipment Electrification

Existing Efforts:

- Since 2008, Piedmont Airlines and US Airways have replaced 101 pieces of older, dirtier diesel ground-support equipment (GSE) with newer, cleaner electric GSE. These conversions were made possible by funding from Mecklenburg County Air Quality's (MCAQ) Grants to Replace Aging Diesel Engines (GRADE) program.
- In 2019, the U.S. Environmental Protection Agency (EPA) awarded \$1.2 million to help replace up to 120 pieces of GSE with electric-GSE through AeroGRADE.

Stakeholders: Piedmont Airlines, American Airlines, other local carriers, CLT Airport, EPA, Federal Aviation Administration (FAA)

Funding Opportunity: EPA - Diesel Emission Reduction Act, FAA – Voluntary Airport Low Emission (VALE)

Next Steps:

- Identify diesel to electric GSE conversion projects for AeroGRADE funding
- Advocate for CLT Airport and airlines to install the charging infrastructure required for eGSE fueling.
- Assist stakeholders with VALE and other grant applications.

Staff Contact: PJ McKenzie, Paul.McKenzie@MeckNC.gov, 980-314-3374

September 2019



The Idea: Ground Support Equipment Electrification

- Replace diesel ground support equipment (GSE) with electric GSE (eGSE) at airports in the region.
- Charlotte Douglas International Airport has approximately 330 pieces of diesel GSE.¹

The Action:

- Identify new funding for AeroGRADE, Mecklenburg County Air Quality's "Grants to Replace Aging Diesel Engines" program targeting airport equipment.
- Work with local airports to fund the installation of required charging infrastructure for electric GSE.

The Pollution Source: 0.4% of NO_x comes from airport support equipment²

The Cost Effectiveness: \$29.78/lb NO_x

The Factors:

- GSE are being operated almost 24 hours per day, 365 days per year; emission decreases are compounded through high usage.
- Past eGSE projects have significantly reduced emissions.
- This equipment is concentrated in Mecklenburg County.
- Particulate Matter – Medium co-benefits
- Greenhouse Gases – Medium co-benefits



¹ There are already 101 pieces of electric GSE at CDIA.

2 0.33 tons/day of NO_x. Source: Revised Maintenance Plan For The Charlotte-Gastonia-Salisbury, North Carolina
2008 8-Hour Ozone Marginal Nonattainment Area (July 2018)

Click on “Complete Streets” to go to:

<https://www.mecknc.gov/LUESA/AirQuality/Documents/Complete%20Streets.pdf>



The Idea: Local Complete Streets Policies

- Complete Streets policies direct transportation planners to design transportation corridors for concurrent use by pedestrians, bicyclists, motorists and transit riders.¹
- Complete streets give citizens transportation choices by offering multiple, safe ways to travel to and from destinations.
- N.C. Department of Transportation and many local municipalities already have complete streets policies.

The Action:

- Promote and support adoption of complete streets policies by local municipalities that do not already have a policy.
- Advocate for pedestrian and bike accommodations on roadway projects.

The Pollution Source: 23% of NO_x comes from passenger vehicles²

The Cost-effectiveness: Unknown

The Factors:

- Complete Streets only reduces pollution if people use these facilities instead of driving to destinations.
- Policies do not guarantee that complete streets will be built
- Complete streets infrastructure improves safety for pedestrians and bicyclists.
- Particulate Matter – Low co-benefits
- Greenhouse Gases – Medium co-benefits



¹ Smart Growth America. “What are complete streets?.” <https://smartgrowthamerica.org/>.

² 19.37 tons/day of NO_x. Passenger vehicles includes both passenger cars and passenger trucks. Source: Revised Maintenance Plan For The Charlotte-Gastonia-Salisbury, North Carolina 2008 8-Hour Ozone Marginal Nonattainment Area (July 2018)

Click on “Community Solar” to go to:

<https://www.mecknc.gov/LUESA/AirQuality/Documents/Community%20Solar.pdf>



The Idea: Community Solar

- Families, businesses, and groups receive a credit on their electricity bill or taxes when they buy-in to a solar power installation near their home or office.
- Solar installations reduce demand for power generated by traditional power plants, many of which are powered using fossil fuels.

The Action:

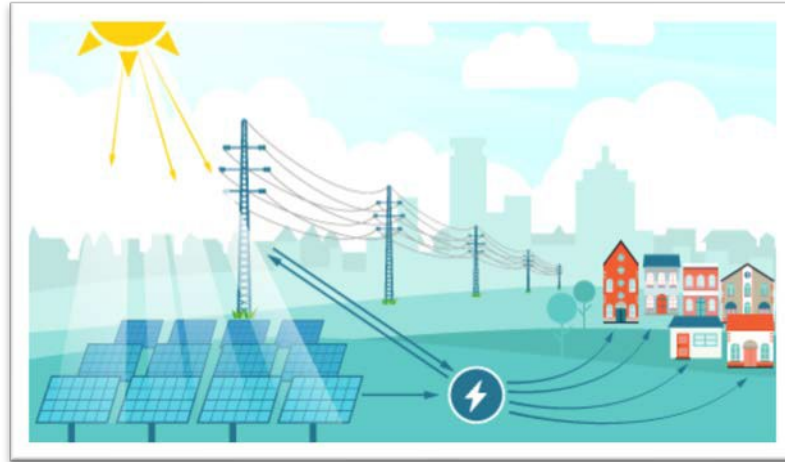
- Advocate for electrical utilities, like Duke Energy, to site their planned community solar projects in the Charlotte region.
- Research what policy changes are needed to allow non-utilities (like nonprofits or neighborhood associations) to pursue community solar projects in North Carolina.

The Pollution Source: 11% of NO_x comes from Electricity Generation¹

The Cost Effectiveness: \$210/lb of NO_x²

The Factors:

- It takes significant, sustained reductions in energy demand to decrease production by power plants.
- While customers see energy off-sets on their bill, that doesn't directly translate into emissions avoided from power generation.
- Community solar Increases access to solar by renters, homeowners with shaded lots, etc.
- Can be structured to assist low-income households.
- Particulate Matter – Medium co-benefits
- Greenhouse Gas – High co-benefits



1 9.08 tons/day of NO_x. Source: Revised Maintenance Plan For The Charlotte-Gastonia-Salisbury, North Carolina 2008 8-Hour Ozone Marginal Nonattainment Area (July 2018)

2 Based on one year of NO_x reductions, assuming \$1 per watt or \$233 per share.

Click on “Property Assessed Clean Energy Program” to go to:

<https://www.mecknc.gov/LUESA/AirQuality/Documents/PACE.pdf>



The Idea: Property Assessed Clean Energy (PACE)

- Functions like a public-sector loan.
- Municipalities use public money¹ to cover the up-front cost of clean energy or energy efficiency improvements at private commercial or residential² properties.
- The cost of the improvements becomes a property lien and the municipality recovers those costs over time through a multi-year special tax assessment.
- North Carolina session law 2009-525 provides authority to local municipalities to implement this type of program.

The Action:

- Research the legal requirements for a PACE program.
- Partner with local municipalities to develop and implement PACE programs in the region.

The Pollution Source: 11% of NOx comes from Electricity Generation³

The Cost-effectiveness: \$359/lb of NOx⁴

The Factors:

- It takes significant, sustained reductions in energy demand to decrease production by power plants.
- While customers see energy off-sets on their bill, that doesn't directly translate into emissions avoided from power generation.
- Particulate Matter – Low co-benefit
- Greenhouse Gas – Medium co-benefit



¹ Revenue or general obligation bonds, project development financing debt instruments, or general revenues.

2 Currently, Federal Housing Finance Agency guidance makes it difficult to pursue residential PACE projects with a first-lien special assessment.

3 9.08 tons/day of NOx. Source: Revised Maintenance Plan For The Charlotte-Gastonia-Salisbury, North Carolina 2008 8-Hour Ozone Marginal Nonattainment Area (July 2018)

4 Based on one year of emission reductions.

Photo: SolarWorld, Witherspoon Distillery, Lewisville, TX

Click on “Energy Audit Program” to go to:

<https://www.mecknc.gov/LUESA/AirQuality/Documents/Energy%20Audits.pdf>



The Idea: Energy Audits

- Energy audits identify opportunities where new equipment or operational changes could reduce energy consumption.
- To be effective, audit recommendations must be implemented, and property owners determine which recommendations to implement.
- Available for commercial, industrial, and residential properties.

The Action:

- Research commercial, industrial, and residential energy audit opportunities and prioritize sectors.
- Identify a service provider to conduct energy audits and provide recommendations that will reduce energy consumption within prioritized sector(s).
- Incentivize action by property owners. For example, audit fees could be charged and then refunded when audit recommendations of equal or greater value are implemented. Audit fees would be waived for low-income households.

The Pollution Source: 11% of NO_x comes from Electricity Generation¹

The Cost-effectiveness: \$141/lb of NO_x

The Factors:

- Audits only reduce energy use if recommendations are implemented.
- It takes significant, sustained reductions in energy demand to decrease production by power plants.
- Participants may see savings on their bill, but that doesn't directly translate into emissions avoided from power generation.
- Particulate Matter – Medium co-benefits
- Greenhouse Gas – High co-benefits



¹ 9.08 tons/day of NO_x. Source: Revised Maintenance Plan For The Charlotte-Gastonia-Salisbury, North Carolina 2008 8-Hour Ozone Marginal Nonattainment Area (July 2018)

Click on “Zoning: EV Charging Infrastructure” to go to:

https://www.mecknc.gov/LUESA/AirQuality/Documents/Zoning_EV%20Charging.pdf



The Idea: Zoning: EV Charging Infrastructure

- Cities can require or incentivize electric vehicle (EV) charging stations in new parking lots or decks through zoning ordinance revisions.
- Increased charging infrastructure will help to reduce ‘range anxiety’ for electric vehicle owners, leading to increased EV use and decreased tailpipe emissions.

The Action:

- Promote EV charging stations in new parking lots and decks in the region

The Pollution Source: On-road vehicles

The Cost-effectiveness: \$479.65/lb of NO_x¹

The Factors:

- Emission reductions will depend on how much influence “range anxiety” has over a driver’s decision making. To reduce emissions, charging station availability would need to increase a driver’s use or purchase of an EV vehicle rather than a conventional vehicle.
- Particulate Matter – Low co-benefit
- Greenhouse Gas – Medium co-benefit



¹ Assuming \$8,000 per level 2 charging station

Click on “Cash for Clunkers” to go to:

<https://www.mecknc.gov/LUESA/AirQuality/Documents/Cash4Clunkers.pdf>



The Idea: Cash for Clunkers

- Vehicle owners receive a rebate for repairing smoking vehicles or replacing their older vehicle¹ with a less polluting vehicle.
- Old vehicles are decommissioned if they are replaced.
- Many programs target assistance to low-income residents.

The Action:

- Identify funding to support a Cash for Clunkers program.
- Develop a local Cash for Clunkers program to help low-income residents repair their smoking vehicles or replace their high-emission vehicles.

The Pollution Source: 23% of NO_x comes from passenger vehicles²

Cost Effectiveness: ³ \$221,875/lb of NO_x or \$4,450/ lb of NO_x for a smoking vehicle

The Factors:

- Smoking vehicles emit up to 12-times more pollution than properly maintained vehicle.
- Incentives are only effective if they exceed the resale value of the car.
- Newer vehicles are more reliable, so owners save on vehicle maintenance costs.
- Particulate Matter – Low co-benefits
- Greenhouse Gases – Medium co-benefits



¹ Vehicles typically must meet eligibility requirements (ex. Old car at least 10 years old, failed emissions test, replaced with model year 2017 or newer, etc.).

2 19.37 tons/day of NO_x. Passenger vehicles includes both passenger cars and trucks. Source: Revised Maintenance Plan For The Charlotte-Gastonia-Salisbury, North Carolina 2008 8-Hour Ozone Marginal Nonattainment Area (July 2018)

Click on “Eco-driving Training” to go to:

<https://www.mecknc.gov/LUESA/AirQuality/Documents/Eco-Driving.pdf>



The Idea: Eco-Driving Training

- Teach drivers how to improve their fuel efficiency with mindful driving behaviors and vehicle maintenance.
- Eco-driving can reduce emissions from trips that must be made by single occupancy vehicles.
- Targeting training toward fleets can increase the impact.

The Action:

- Present Eco-driving training to fleet drivers, commuters, or other groups of drivers.

The Pollution Source: 23 % of NO_x comes from passenger vehicles¹

The Cost-effectiveness: Can't calculate because costs are “In-kind” (e.g. staff time)

The Factors:

- In the best-case scenario, emission reductions are minimal (less than 10% per vehicle). Some drivers will not reduce emission at all.
- Training presentations may lead to new partnership opportunities, or increase awareness of other air quality information and programs.
- Drivers can save up to \$180/yr in fuel costs
- PM – Low co-benefits
- GHG – Medium co-benefits



¹ 19.37 tons/day of NO_x. Passenger vehicles includes both passenger cars and trucks. Source: Revised Maintenance Plan For The Charlotte-Gastonia-Salisbury, North Carolina 2008 8-Hour Ozone Marginal Nonattainment Area (July 2018)

Click on “Zoning: Eliminate Parking Minimum” to go to:

https://www.mecknc.gov/LUESA/AirQuality/Documents/Zoning_Parking%20Minimums.pdf



The Idea: Zoning: Eliminate Parking Minimums

- Eliminating minimum parking requirements in zoning ordinances would encourage drivers to make trips by transit, carpool, bike, or foot because of decreased amounts of surplus, free parking.
- Without parking minimums, developers can build parking based on market demand and avoid land acquisition and construction costs of building unused, surplus parking.
- Parking scarcity can reduce the likelihood of driving to a destination by 20%.¹

The Action:

- Work with municipal zoning staff in the region to eliminate parking minimums in zoning ordinances.

The Pollution Source: 23 % of NOx comes from passenger vehicles²

The Cost-effectiveness: Unknown

The Factors:

- It may take years or decades for this strategy to impact the availability of parking and thereby start to change driving behavior.
- Developers would save \$24,000-\$34,000 per parking space avoided.³
- As parking decreases, there will be less stormwater runoff because of less impervious parking area.
- Particulate Matter – Low co-benefits
- Greenhouse Gases – Medium co-benefits



- 1 Christiansen, P., et al. (2017). "Parking facilities and the build environment: impacts on travel behavior." Transportation Research Part A (95), pp 198-206.
- 2 19.37 tons/day of NOx. Passenger vehicles includes both passenger cars and trucks. Source: Revised Maintenance Plan For The Charlotte-Gastonia-Salisbury, North Carolina 2008 8-Hour Ozone Marginal Nonattainment Area (July 2018)
- 3 Shoup, D. (2014). "the high cost of minimum parking requirements." Transportation and Sustainability (5), pp 87-113. Retrieved from <http://shoup.bol.ucla.edu/HighCost.pdf>

Click on “Gas Cap and Tire Pressure Check Outreach” to go to:

<https://www.mecknc.gov/LUESA/AirQuality/Documents/Gas%20Cap%20and%20Tire%20Pressure%20Checks.pdf>



The Idea: Gas Cap and Tire Pressure Checks

- Car check-up events use participatory outreach to engage drivers and teach them about air pollution while properly inflating a driver's tires and replacing leaking gas caps.
- The U.S. Environmental Protection Agency recommends inflating tires to vehicle recommended pressure to increase fuel economy.
- Testing gas caps to ensure they are vapor tight also reduces VOC emissions and increases fuel economy by avoiding loss of fuel.

The Action:

- Organize events at local employment centers to check gas caps and tire pressure.
- Use the time during car check-ups to engage drivers and teach them about air pollution.

The Pollution Source: 23% of NO_x comes from passenger vehicles¹

The Cost-effectiveness: Unknown

The Factors:

- Negligible air quality benefit, but improvements in air quality knowledge/awareness.
- Particulate Matter – Low co-benefits
- Greenhouse Gases – Low co-benefits



1 19.37 tons/day of NOx. Passenger vehicles includes both passenger cars and trucks. Source: Revised Maintenance Plan For The Charlotte-Gastonia-Salisbury, North Carolina 2008 8-Hour Ozone Marginal Nonattainment Area (July 2018)

Click on “Taxi Electrification” to go to:

<https://www.mecknc.gov/LUESA/AirQuality/Documents/Taxi%20Electrification.pdf>



The Idea: Taxi Electrification

- Provide funding to taxi operators in the Charlotte region to replace their older vehicles with newer electric vehicles.

The Action:

- Identify and secure funds to defray the cost of new electric taxis and charging infrastructure.
- Work with taxi companies to create a taxi replacement schedule that prioritizes the highest emissions taxis for replacement first.
- Solicit business partners (hotels, restaurants, etc.) who will prioritize giving customer referrals to electric taxi operators.

The Pollution Source: 23 % of NO_x comes from passenger vehicles¹ (including taxis)

The Cost Effectiveness: \$1,620/lb of NO_x²

The Factors:

- Taxis are a small percentage of the passenger vehicle fleet. However, taxis drive a higher-than- average number of miles per year.
- Because they are high-mileage vehicles, taxis reach the end of their life more quickly, so they may already be cleaner than the average passenger vehicle.
- Public-facing project that could spread awareness/information to residents and visitors.
- As the power grid changes to lower emission/renewable fuels, overall emissions will decrease further.
- Particulate Matter – Medium co-benefits
- Greenhouse Gas – High co-benefits



- 1 19.37 tons/day of NOx. Passenger vehicles includes both passenger cars and trucks. Source: Revised Maintenance Plan For The Charlotte-Gastonia-Salisbury, North Carolina 2008 8-Hour Ozone Marginal Nonattainment Area (July 2018)
- 2 Assuming \$30,000 per taxi

35 of 55

“reduce air pollution” continued

Nonroad Mobile

Examples include construction equipment, trains, airplanes and even lawn equipment.

- Use electric or hand-powered lawn equipment.
- Reduce use of gasoline-powered lawn equipment.
- Wait until after 6pm to use gas-powered equipment on [Code Orange, Red or Purple days](#).

What MCAQ is doing:

- Administers the Grants to Replace Aging Diesel Engines ([GRADE](#)) program.
- Organizes and promotes a Green Lawn Maintenance program: [MowGreenCLT](#).

Industrial Sources

Examples include manufacturing and power plants.

- Buy energy-efficient appliances and lighting.
- Install a programmable thermostat to save energy (and money) when you are away or asleep.
- Use major appliances (oven, dishwasher, washer and dryer) during cooler parts of the day.
- Turn off unused lights, appliances and computers.
- Insulate your home to cut down on heating and cooling.
- Learn more way you can save money will improving air quality on our [Energy Efficiency Resource](#) page.

What MCAQ is doing:

- Ensures compliance of local [permitted sources](#) of air pollution.
- Supports workplace [Light's Out!](#) energy efficiency campaigns.

Area Sources

Examples include gas stations, drycleaners, vegetation, and forest fires.

- Never burn trash or other man-made materials.
- Refuel vehicles and lawn equipment after 6pm when ground-level ozone is least likely to form.
- Use water-based paints and cleaners instead of solvent-based products.

What MCAQ is doing:

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“reduce air pollution” continued

Area Sources

Examples include gas stations, drycleaners, vegetation, and forest fires.

- Never burn trash or other man-made materials.
- Refuel vehicles and lawn equipment after 6pm when ground-level ozone is least likely to form.
- Use water-based paints and cleaners instead of solvent-based products.

What MCAQ is doing:

- Enforces local regulations at [gas stations](#).
- Tracks other, smaller sources of air pollution.

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Click on “Industrial source permitting” to go to:

<https://www.mecknc.gov/LUESA/AirQuality/PermittingRegulations/Pages/default.aspx>

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Mecklenburg County, NC > LUESA > Air Quality > Permitting Regulations

Air Quality

- > Air Quality Home
- > Air Quality Commission
- > Community Information
- > Contact Us
- > e-Pay Air Quality Fees
- > Facility Database
- > Motor Vehicles
- > Public Comment Opportunities

Regulated Industry Print

Mecklenburg County Air Quality administers the Mecklenburg County Air Pollution Control Ordinance (MCAPCO) as well as state and federal regulatory programs to limit and minimize criteria and toxic air pollutants from industrial sources. Air pollution reductions are achieved by reviewing applications, issuing permits, conducting inspections, responding to citizen requests for service, overseeing asbestos abatement from building demolition and renovation, and educating business and industry.

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Address

Mailing Address:
Air Quality
2145 Suttle Avenue
Charlotte,
NC 28208

Office Location:
2145 Suttle Avenue
Charlotte,
NC 28208

[MAP](#)

Hours: Mon-Fri 8 a.m. - 5 p.m.

Contact
Megan Green
704-336-5430
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Most Commonly Used Links

[MCAPCO](#) | [Permitting Forms](#) | [Reporting Forms](#) | [Asbestos NESHAP Program](#) | [Emission Calculation Spreadsheets](#) | [GovOnline](#)

Permitting Tools

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Annual Meetings: [Compliance Assistance Workshops](#) and [Annual Air Quality Forum](#) | [Airwaves](#)

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Information
 Annual Meetings: [Compliance Assistance Workshops](#) and [Annual Air Quality Forum](#) | [Airwaves: MCAQ's Newsletter for Permitted Sources](#) | [General Asbestos Information](#) | [Criteria Pollutants](#) | [Environmental Assistance Resources](#) | [Find more information on our Community Information page](#)

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Click on “compliance assistance” to go to:

<https://www.mecknc.gov/LUESA/AirQuality/PermittingRegulations/Pages/Spring%20Workshops.aspx>

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MAP

Hours: Mon-Fri 8 a.m. - 5 p.m.

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MCAQ Compliance Assistance Workshops

Print



Emission Reporting Workshop

4/10/2019

Facilities joined MCAQ to learn about emission calculations resources and [GovOnline](#), a new, electronic portal for submitting some air quality reports and notification.

Presentations:

[Welcome / Introduction](#)

[Overview of Emission Inventories - Why Report?](#)

[How to Calculate Emissions - Introduction](#)

[How to Calculate Emissions - VOC Example](#)

[How to Calculate Emissions - Combustion Examples](#)

[How to Submit Your Emission Report](#)

[CROMERR Overview - Why We Built GovOnline](#)

Tools for Environmental Success

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"compliance assistance" continued

Tools for Environmental Success

5/22/2018


During the "Tools for Environmental Success" workshop, presenters highlighted a variety of compliance assistance tools available locally. The workshop concluded with breakout sessions by industry type where attendees heard hot topics related to their industry. You can view presentations from this workshop, as well as past workshops, below.

Presentations:

-  [Welcome & Introduction](#)
-  [MCAQ Permitting and Enforcement: A Day in the Life](#)
-  [If We Were in Your Shoes - Common Compliance Issues and MCAQ's Tools](#)
-  [Website Resources for AQ Permitted Facilities](#)
-  [The Environmental Stewardship Initiative](#)



Breakout Sessions - Compliance Help For Your Industry:

-  [Title V Sources](#)
-  [Asphalt, Concrete, Quarry - PM Sources](#)
-  [Coating, Printing, Solvent Use - VOC Sources](#)

"Seeing 20/20 on Compliance Inspections" Workshop

5/24/2017


During the 2017 "Seeing 20/20 on Compliance Inspections" Workshop, attendees from Mecklenburg County regulated industries were given insight to the air quality inspection process, MCAQ's requirements for a full compliance evaluation were discussed along with tips on managing compliance from a facility perspective. Various tools were also shared: MCAQ's own industry-specific inspection checklists (linked below), enforcement statistics, and web enhancements.

Compliance Inspection Checklists for:

Asphalt Plants ( [PDF](#) or  [Word](#))

Presentations:

















 [Introduction](#)

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statistics, and web enhancements.

Compliance Inspection Checklists for:

- Asphalt Plants ( [PDF](#) or  [Word](#))
- Boilers ( [PDF](#) or  [Word](#))
- Coating & Printing ( [PDF](#) or  [Word](#))
- Concrete Plants ( [PDF](#) or  [Word](#))
- Gas Terminals ( [PDF](#) or  [Word](#))
- Generators ( [PDF](#) or  [Word](#))
- Quarry & Material Crushing ( [PDF](#) or  [Word](#))
- Spray Painting ( [PDF](#) or  [Word](#))

Presentations:








-  [Introduction](#)
-  [What is an FCE?](#)
-  [What to expect when MCAQ arrives](#)
-  [Permit Requirements](#)
-  [Compliance Assistance Tools](#)
-  [Compliance from an Industry Perspective](#)
-  [What happens if there's a problem?](#)


2017 Asbestos NESHAP Workshop
3/23/2017

During the [2017 Asbestos NESHAP Workshop](#), customers were introduced to GovOnline, the 1st EPA-approved electronic NESHAP notification system in the southeast region! Attendees had an opportunity to preview the new system, and to learn about the role that various local and state agencies play in reviewing, approving, and inspecting demolition and renovation projects in Mecklenburg County.

Representatives from MCAQ, Mecklenburg County Code Enforcement, N.C. Department of Labor (OSHA), and N.C. Health Hazards Control Unit (HHCU) were all on hand to answer questions and to assist customers.

View presentations and recorded presentations here:

- Workshop Introduction ( [pdf](#) or  [video](#))
- Mecklenburg County Code Enforcement's Demolition Permitting Process ( [pdf](#) or  [video](#))
- GovOnline Electronic Asbestos NESHAP Submittal Portal ( [pdf](#) or  [video](#))
- Operational Awareness of Asbestos ( [pdf](#))

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GovOnline Electronic Asbestos NESHAP Submittal Portal ( pdf or  video)

Occupational Awareness of Asbestos ( pdf)

NC Asbestos & Lead Hazard Management Rules and Regulations Overview ( pdf)

Asbestos Compliance Assistance Tools ( pdf)

"Digging Into Your Permit" Workshop

5/10/2016

Air permits can be difficult to follow and understand but the point of this workshop was to break a permit down into its most important parts. Staff from MCAQ talked specifically about monitoring, recordkeeping, notification, and reporting requirements plus provided resources that can help manage compliance. Gordon Miller, Air Quality Commission member, also gave a presentation on compliance from an industrial perspective.



View presentations here:

 [Workshop Introduction](#)

 [UNCC Energy and Environmental Assistance Office \(EEAO\)](#)

 [Permit Overview](#)


 [Monitoring and Recordkeeping Requirements](#)

 [Notification and Reporting Requirements](#)

 [Compliance From an Industry Perspective](#)

Emissions Inventory Compliance Workshops - 3/31/2015 & 4/7/2015

MCAQ complies with emission regulations from all permitted facilities by April 30 each year. In 2015, the

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[!\[\]\(5bd3139e49b8ec618dddaa46174de8b0_img.jpg\) Workshop Introduction](#)
[!\[\]\(9aae4ef11f04080694e1bcd3250dc654_img.jpg\) UNCC Energy and Environmental Assistance Office \(EEAO\)](#)
[!\[\]\(1f875e8ff0db454eb302861a56ff194f_img.jpg\) Permit Overview](#)
[!\[\]\(05604d380e755a92e3161ab249a7c58e_img.jpg\) Monitoring and Recordkeeping Requirements](#)
[!\[\]\(e63e8c500251dacf23596c452b949a7b_img.jpg\) Notification and Reporting Requirements](#)
[!\[\]\(4e9fae44a361e010dd9b40478631f996_img.jpg\) Compliance From an Industry Perspective](#)

Emissions Inventory Compliance Workshops - 3/31/2015 & 4/7/2015

MCAQ requires annual emission reporting from all permitted facilities by April 30 each year. In 2015, two emissions inventory workshops were held to assist permittees with preparing their facility's reports. The events focused on calculating emissions from volatile organic compound (VOC) and particulate matter (PM) emitting processes as well as how to comply with the triennial air toxics emission inventory.

View presentations here:

[!\[\]\(291d60f8ea76bfcdc84ecdc27afad621_img.jpg\) MCAQ Website Overview](#)
[!\[\]\(74e44e2c59dd7d970284b26514a54a5f_img.jpg\) Air Toxics Inventory Requirements](#)
[!\[\]\(403ebf52593e340687e8aded0b7b53fb_img.jpg\) VOC Autobody and Surface Coating Compliance Update](#)
[!\[\]\(3c91d4dc7b0c743e2609acf6d93f9b89_img.jpg\) VOC Mass Balance Calculation Procedures](#)
[!\[\]\(232de3636ca251589b129aeedc51159a_img.jpg\) VOC Calculation Examples](#)
[!\[\]\(3b5ecfa064a4dda06f360f79ee36c06b_img.jpg\) PM Quarry and Rock Crushing Compliance Update](#)
[!\[\]\(ad1048dc3d84320ca7de02b9d612d2b6_img.jpg\) PM Stone Crushing and Abrasive Blasting Calculation Examples](#)
[!\[\]\(3633c8592762657dfade429fec5f252b_img.jpg\) PM Stack Test and Asphalt Calculation Examples](#)
[!\[\]\(aed1102c5ab6cae9cfa4e0f45a8d8df3_img.jpg\) UNC Charlotte Energy & Environmental Assistance Office](#)

"Get Fired Up About Air Quality Compliance" Combustion Source Workshop - 5/15/2014

Combustion sources like boilers and generators have many air quality requirements such as permitting, compliance with federal emission standards (GACTS), and review under the North Carolina Air Toxics Program. MCAQ's 2014 workshop focused on those key requirements and included some tools to help boiler and generator owners stay on top of compliance.

View presentations here:

[!\[\]\(cf962b3ce2b1f8428703c4d940f76d67_img.jpg\) When do I permit a combustion source](#)
[!\[\]\(e54840313b45385e3c5f1205e062835a_img.jpg\) How to comply with the 4Z RICE GACT](#)
[!\[\]\(294ee2e443058df07623c2c655169ac1_img.jpg\) How to comply with 6J Boiler GACT](#)
[!\[\]\(3aa471127a9c0322576231a4ff4b031a_img.jpg\) How to use the boiler emission calculation spreadsheet](#)
[!\[\]\(112b0a581cc2e721ddeac537358ebb4e_img.jpg\) How to use the generator emission calculation spreadsheet](#)
[!\[\]\(57d12fddbef97f030b3d85f9693c6761_img.jpg\) 2014 NC Toxics Program Update](#)







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View presentations here:

-  [When do I permit a combustion source](#)
-  [How to comply with the 4Z RICE GACT](#)
-  [How to comply with 6J Boiler GACT](#)
-  [How to use the boiler emission calculation spreadsheet](#)
-  [How to use the generator emission calculation spreadsheet](#)
-  [2014 NC Toxics Program Update](#)

Permitting 101 Workshop - 4/22/2012

Prior to installing a new source or modifying an existing source of regulated emissions, a facility must submit a permit application and receive an Air Quality Permit to Construct/Operate. MCAQ's 2012 Spring Workshop: "Permitting 101" focused on the fundamentals of compiling and submitting a complete permit application.

-  [Permitting 101 Introduction](#)
-  [Understanding A Permit](#)
-  [Preparing A Permit Application](#)
-  [Emission Calculations](#)
-  [North Carolina Toxics Review](#)
-  [Area Source GACT](#)
-  [Title V Attainment](#)
-  [Title V NSR Including PSD](#)
-  [Minor Sources](#)
-  [Miscellaneous Surface Coating](#)







Stage I Vapor Recovery Workshop - 5/21/2012

Gasoline dispensing facilities receive gasoline products in underground storage tanks (UST's) from vapor tight truck tanks. Pipes and valves interconnecting the UST's and truck tank create a "closed loop" (i.e. Stage I gasoline vapor recovery system). The Stage I gasoline vapor recovery system collects 96% of the vapors that would have otherwise been emitted to the atmosphere and returns them to the bulk gasoline terminal for processing.

-  [Gasoline Dispensing Facility \(GDF\) Compliance Guidance](#)


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 [North Carolina Toxics Review](#)
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Stage I Vapor Recovery Workshop - 5/21/2012

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 [Gasoline Dispensing Facility \(GDF\) Compliance Guidance](#)

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Click on "GRADE" to go to:

<https://www.mecknc.gov/LUESA/AirQuality/MobileSources/Pages/GRADE.aspx>

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Office Location:
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 Charlotte,
 NC 28208


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 Hours: Mon-Fri 8 a.m. - 5 p.m.

Contact

Megan Green
 704-336-5430
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Grants to Replace Aging Diesel Engines (GRADE)

Print



In 2007, Mecklenburg County Air Quality launched an innovated air quality improvement program called Grants to Replace Aging Diesel Engines or GRADE. GRADE is designed to reduce oxides of nitrogen (NOx), an ozone forming air pollutant, by providing businesses and organizations funding incentives to replace or repower heavy-duty non-road equipment with newer, cleaner, less polluting engines.

Since its inception, GRADE has funded over 300 projects and awarded **\$6.6 million**. These projects have reduced over 880 tons of ozone-forming NOx in the Charlotte region. Watch the award-winning [GRADE video](#) for more information.

Application Deadline Extended!

\$1.6 Million in AeroGRADE funding is available. **Apply by October 31, 2019.**

Option 1: Airport GSE Projects

Replace old, diesel ground-support equipment (GSE) with new, fully electric GSE. \$1.5 million available for GSE electrification at Charlotte-Douglas Airport.

[GSE Application](#)
[GSE Project Guidelines](#)
[AeroGRADE FAQs for GSE Projects](#)

Option 2: Electrification Pilot Projects

Replace a diesel terminal tractor with a fully electric version or repower a Class 7/8 semi-truck with a hybrid drive system. Funding for one of each type.


[Pilot Project Application](#)
[Pilot Project Guidelines](#)
[AeroGRADE FAQs for Pilot Projects](#)


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Replace old, diesel ground-support equipment (GSE) with new, fully electric GSE. \$1.5 million available for GSE electrification at Charlotte-Douglas Airport.


 [GSE Application](#)


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Replace a diesel terminal tractor with a fully electric version or repower a **Class 7/8 semi-truck** with a hybrid drive system. Funding for one of each type.

 [Pilot Project Application](#)

 [Pilot Project Guidelines](#)

 [AeroGRADE FAQs for Pilot Projects](#)

[Get Started with GRADE](#): Learn the four-step GRADE process and start completing your application.


[Project Summary](#): Read about current projects and past successes in this quarterly report.

[Regional Results](#): See a map of GRADE's regional impact.


[Receive Notifications](#): Join our email distribution list so you will be notified when grant funding is available.


[Report Semi-annual Usage On-line](#).


For more information, contact Mecklenburg County Air Quality at 704-336-5430.





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Click “Idle reduction resources” to go to:

<https://www.mecknc.gov/LUESA/AirQuality/MobileSources/Pages/HeavyDutyIdling.aspx>

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Hours: Mon-Fri 8 a.m. - 5 p.m.

Contact

Megan Green

704-336-5430

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Heavy Duty Idle Reduction

Print

Unnecessary idling wastes fuel, costs money, and pollutes the air!

That is why heavy-duty fleets are encouraged to eliminate unnecessary idling. Idle Reduction Materials have been developed by Mecklenburg County Air Quality (MCAQ) to assist companies in creating an idle reduction plan and to encourage their vehicle operators to comply with company anti-idling practices. The resources below are aimed at reducing unnecessary idling by heavy-duty vehicles.

Click to download these idle reduction materials:

Summary Page

Idle Reduction Planning Tool

Idle Reduction Challenge How-to

Driver/Operator Idling Fact Card

Myths and Facts About Idling Flier

If you have any questions regarding idle reduction or if you would like to request free 12" x 18" metal "Turn Off Your Engine" signs, please call 704-336-5430.

For additional facts and frequently asked questions about idling, please visit the NC Division of Air Quality's [Idle Reduction website](#) or the Department of Energy's [IdleBox Toolkit](#).

If you received a letter from MCAQ stating that your heavy-duty diesel vehicle was observed idling, use the link below to provide a response detailing actions taken.

RESPOND to an idling heavy-duty vehicle letter.

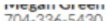
To REPORT excessive idling of heavy-duty vehicles (more than five consecutive minutes in one hour) in Mecklenburg County, complete the [Unnecessary Idling Complaint form](#) or call 311.

License plates on most vehicles are typically in the rear of the vehicle with company information and US DOT Number on the side.

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“Idle reduction resources” continued



 704-336-5430

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[RESPOND to an idling heavy-duty vehicle letter.](#)

To **REPORT** excessive idling of heavy-duty vehicles (more than five consecutive minutes in one hour) in Mecklenburg County, complete the [Unnecessary Idling Complaint form](#) or call 311. License plates on most vehicles are typically in the rear of the vehicle with company information and US DOT Number on the side.

MCAQ will contact the owner of the vehicle and provide them with information and assistance to help improve their idling practices.

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Give us feedback

Click on "Can you help us create Breathing Room?" to go to:
<https://www.mecknc.gov/LUESA/AirQuality/Pages/Input.aspx>

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Air Quality

2145 Suttle Avenue

Charlotte,

NC 28208

Get Involved

Print


Thank you to the almost 500 community members who helped shape the region's plan to create Breathing Room! The stakeholders came from across the region ranging from high school youth and college students, to elected officials and city planners, to business and manufacturing leaders and non-governmental organizations.

Using your input, Mecklenburg County Air Quality and the North Carolina Division of Air Quality created a "[path forward](#)," a list of actions we will pursue now, next, and in the future to improve local air quality.

Can you help us create Breathing Room? Here are a few ways you can get involved:

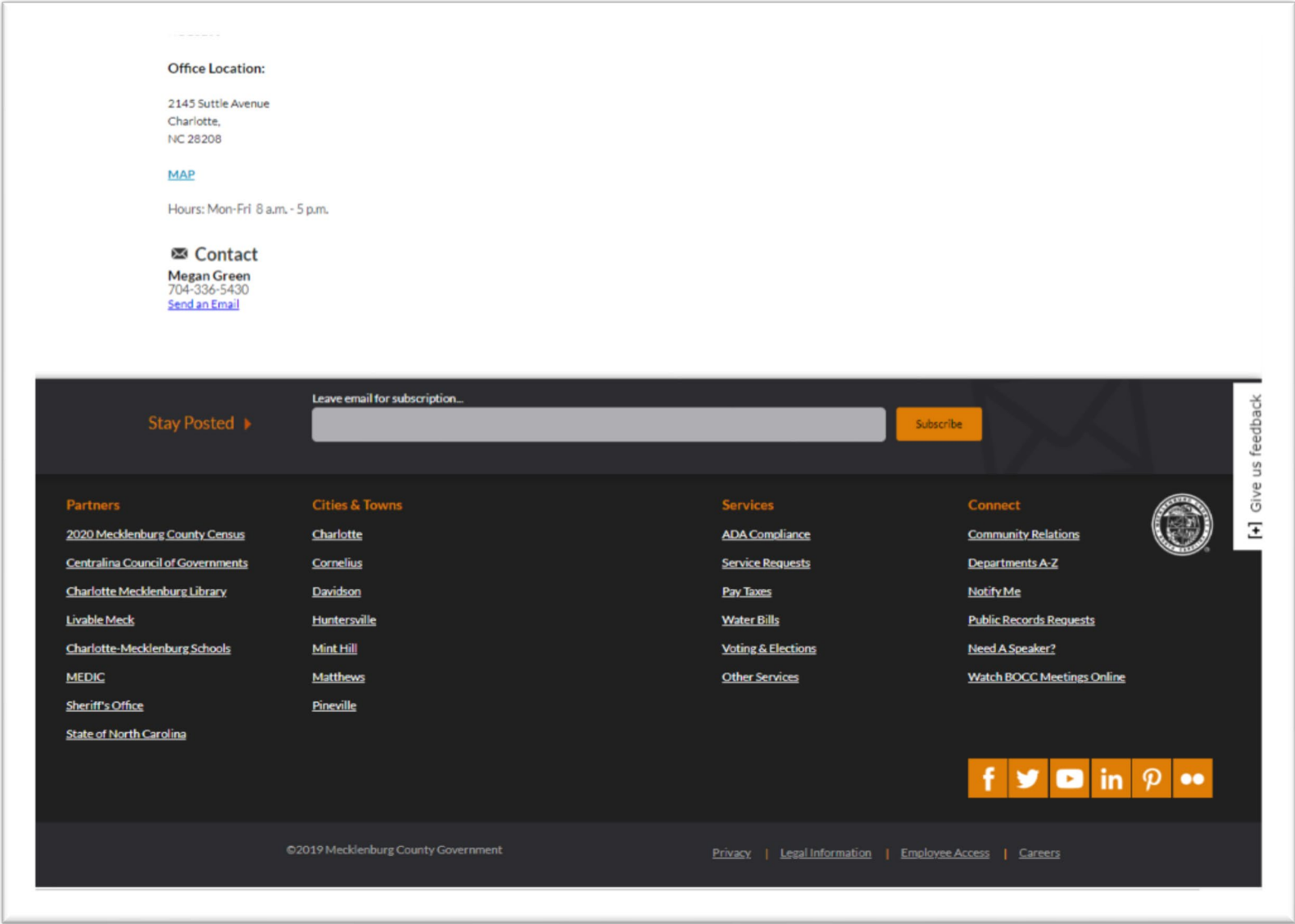
- Be a champion for one or all of the strategies in the [Path Forward](#).
- [Request a presentation](#) to your organization or community group.
- [Join the Charlotte Air Awareness Business Coalition](#) to access free, turn-key emission reduction program for your worksite.
- [Explore ways you can reduce air pollution](#) in your day-to-day life.

What to discuss other ways to get involved? Contact [Megan Green](#) at 980-314-3368



Give us feedback

“Can you help us create Breathing Room?” continued



[End of document re: Ozone Advance Path Forward for the Charlotte Region – Progress Report]