

The Impact of Transportation on Air Quality in the Atlanta Region

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In sum...

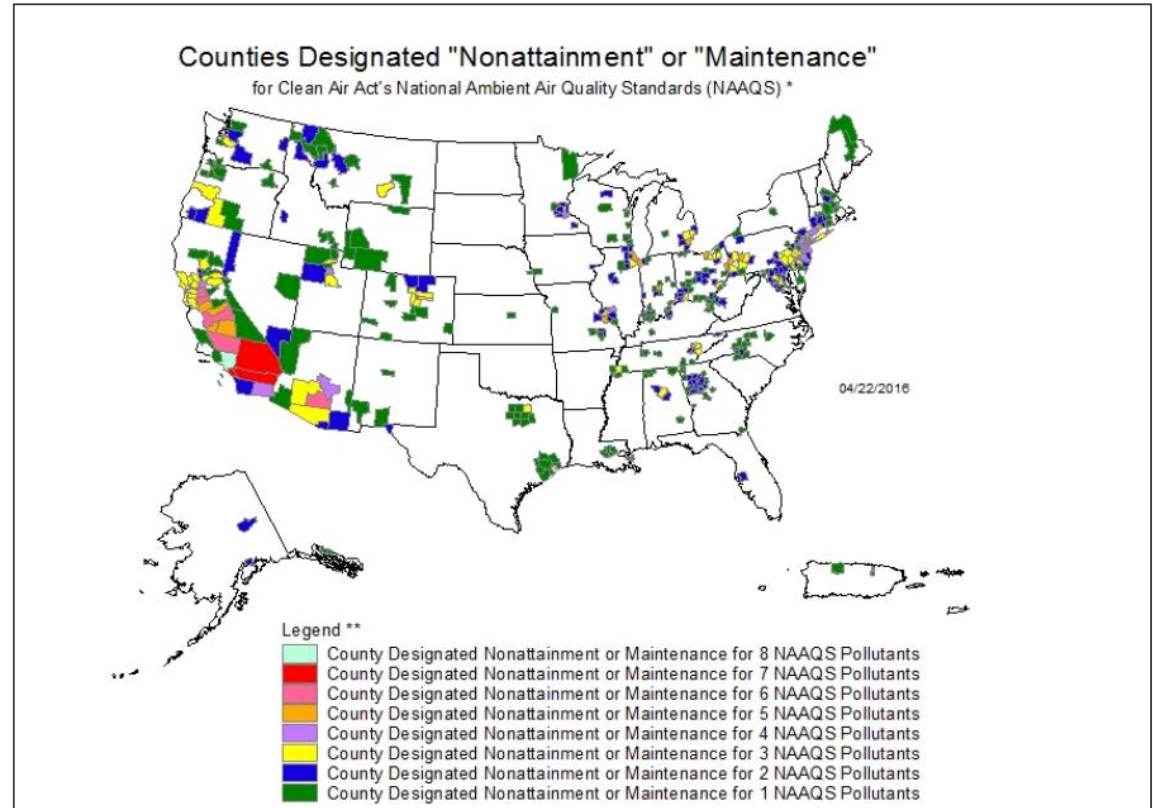
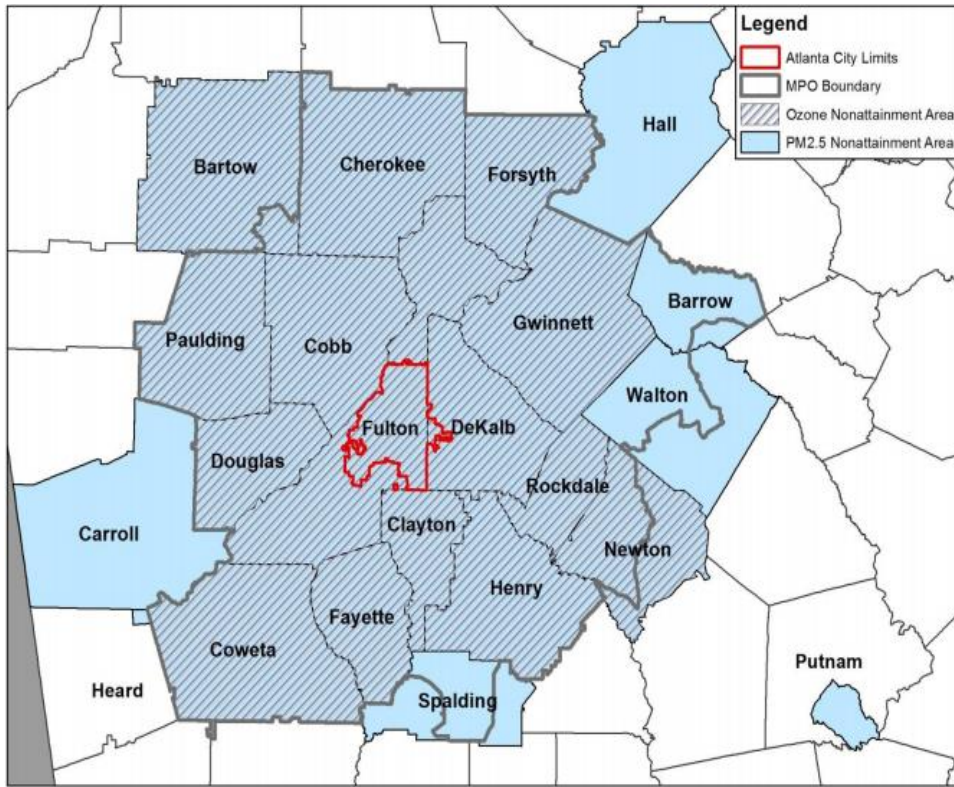
- The Clean Air Act requires areas of poor air quality (nonattainment areas) to have transportation plans that are consistent with air quality goals/ standards. Because sections of metro Atlanta fall within two nonattainment areas for Ozone and Particulate Matter (PM_{2.5}), ARC addressed the issue by creating the Atlanta Roadside Emissions Exposure Study (AREES) to assess traffic-related pollution levels surrounding roadways in the region. Areas with the highest concentrations include the downtown connector-such as Midtown, areas surrounding I-85N, and the northern portion of I-285.
- Understanding air quality at the neighborhood level is also important in addressing land use and site planning- particularly for schools where children are most vulnerable to the effects of air pollution. It can also help us identify communities that are affected, but may be underrepresented in local decision-making.
- In good news for Atlanta, Particulate Matter levels (PM_{2.5}) have fallen within the 2012 standard and the Ozone design values have also been falling over the last couple of years.

For a quick background...

With the hot summer months approaching and impacting pollution levels in the region, we wanted to dive into ARC's research on air quality and assess the most impacted areas in our community because the Clean Air Act requires that transportation plans in areas with air quality challenges must “**be consistent with air quality goals**”.



Nonattainment Areas



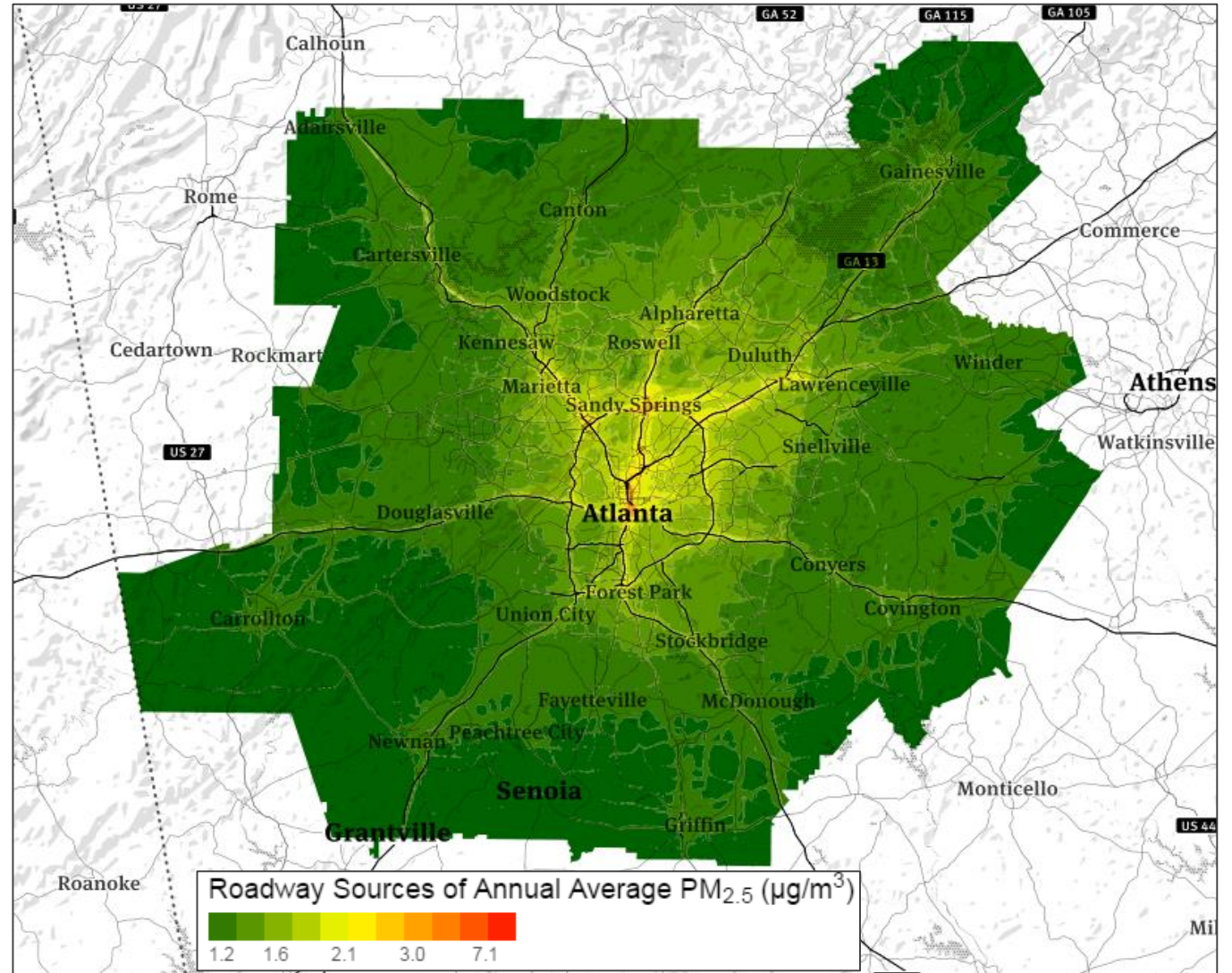
Nonattainment areas are areas that “consistently exceed national ambient air quality standards” (EPA). Because sections of metro Atlanta lie within two nonattainment areas, transportation plans must aim to mitigate the effects travel has on air pollution in both areas. The map on the left shows the different nonattainment areas by two pollutants- Ozone and PM_{2.5} (particulate matter). The striped and blue counties are in nonattainment for both Ozone and PM_{2.5}. The map on the right shows the nonattainment/maintenance areas for all pollutants in the National Ambient Air Quality Standards in the United States.



How ARC is studying Air Quality in the Region...

As a result of Atlanta’s status as a nonattainment area, ARC, in conjunction with the Georgia Environmental Protection Division, has spent the past three years developing the Atlanta Roadside Emissions Exposure Study (AREES), which seeks to explain how local-scale air quality is impacted by changes in the transportation system. By focusing on local emissions exposure at a human scale, planners can make more informed decisions about how roadway projects will impact health in their communities.

To learn how ARC measures air quality, go [here](#) for an in-depth look at the methodology.



Why Particulate Matter? (PM_{2.5})

ARC chose to focus on particulate matter emissions for the model because of their well- documented impact on human health and its stability in the atmosphere. These pollutants are liquid droplets and particles that are suspended in the air. They typically come from diesel trucks, power plants, wood stoves, and industrial processes.

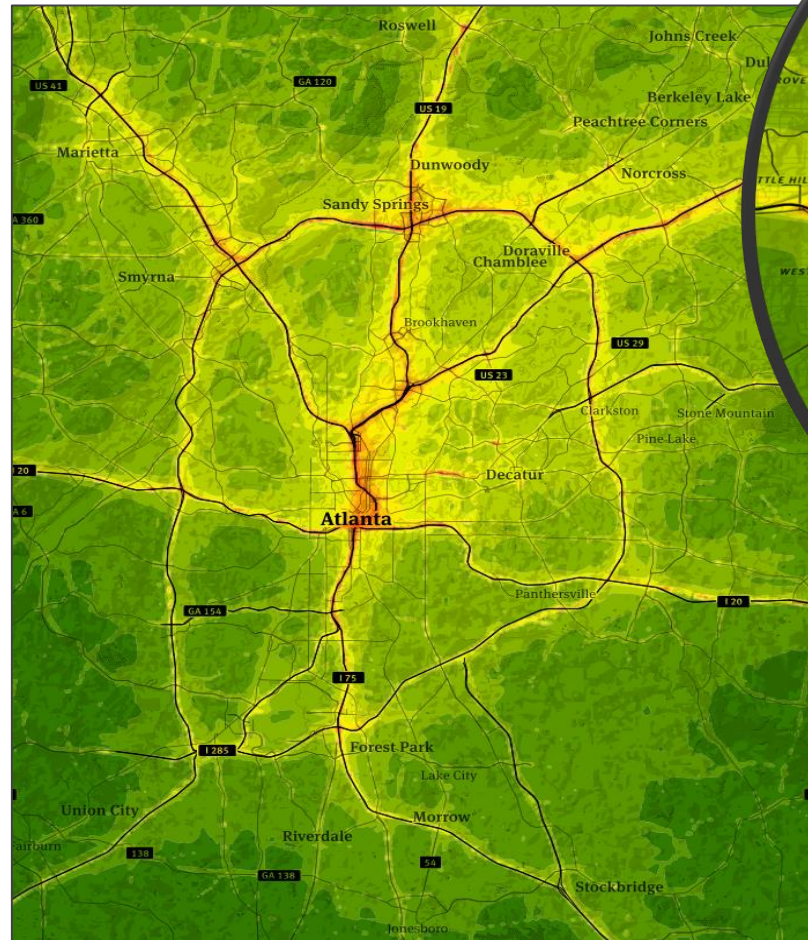
The impacts of particulate matter pollutants on human health include a variety of lung and cardiovascular effects and can even cause premature death in certain vulnerable populations.



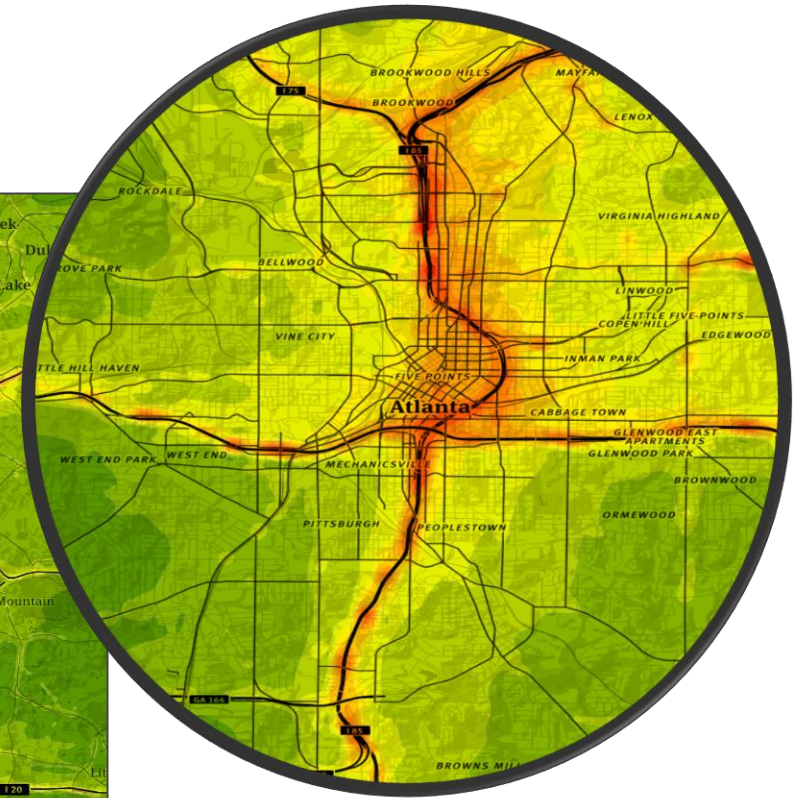
AREES Findings...

The final AREES model output, shown on the right, tells us the highest concentrations of particulate matter (shown in red) are clustered around major roadways—specifically around the downtown connector, I-85N, and the northern half of I-285, where traffic volumes are typically heavy.

This is important for equity and public health in our region. Typically, areas within 500 to 600 meters downwind of major roadways are affected and, according to the EPA, are more susceptible to health problems such as asthma, cardiovascular diseases, impaired lung development in children, pre-term and low-birthweight births, among other conditions.



Roadway Sources of Annual Average PM_{2.5} (µg/m³)

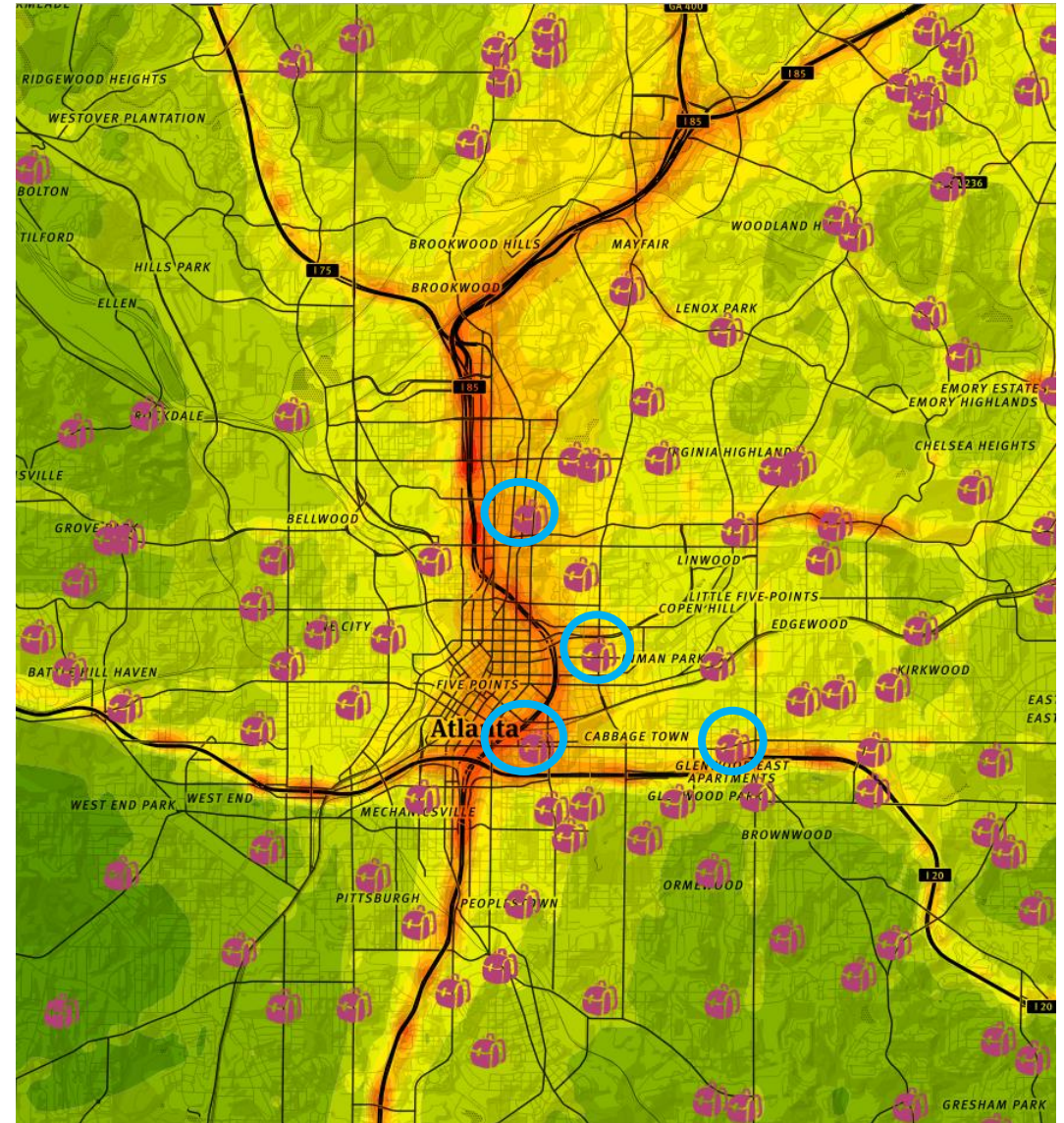


*Zooming into the most prominent area for air pollution in Atlanta, we can see downtown and midtown Atlanta are bearing a large portion of the burden of transportation pollution. Additionally, the model shows us that wind does play a role- the pollution doesn't hover evenly over both sides of the interstate. Instead, it usually blows to the East, leaving the west side clear.

Want to explore the AREES Model? It can be accessed as an interactive map [here](#).

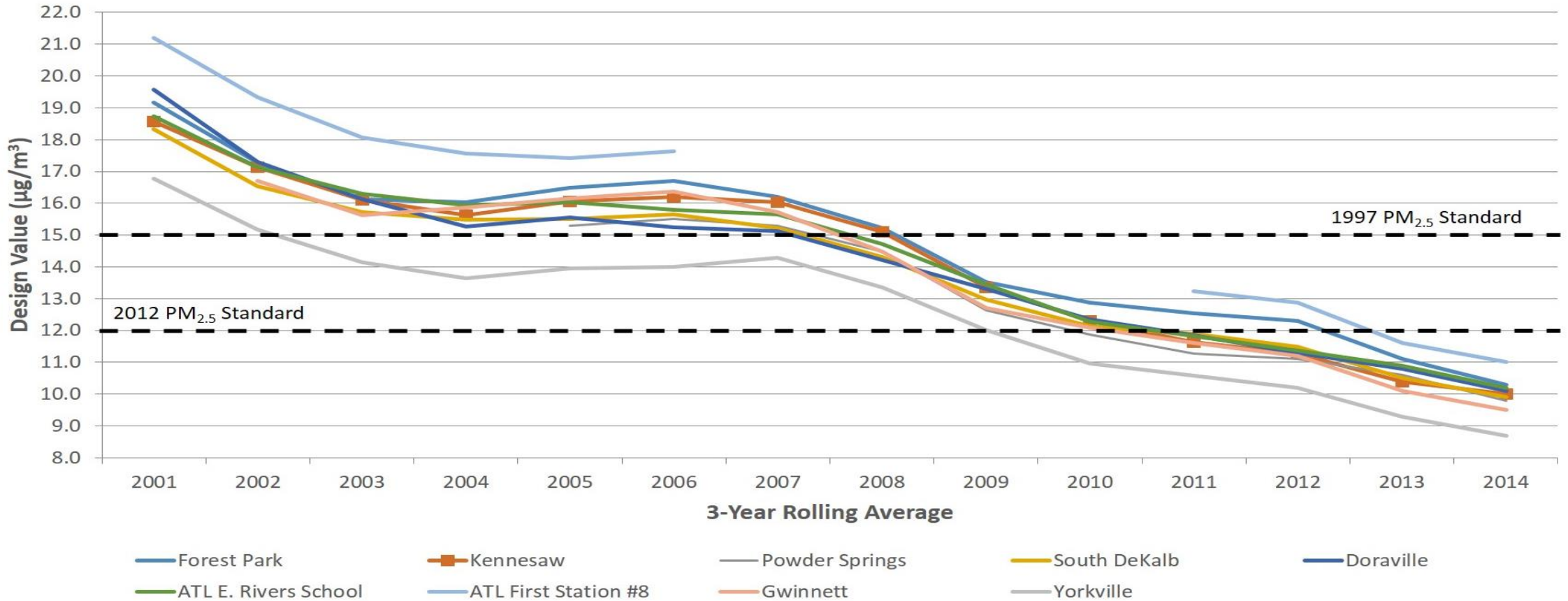
AREES and vulnerable populations...

In terms of schools and vulnerable populations, the interactive AREES map has located all of the schools in the metro Atlanta area. ARC’s research emphasizes that the siting of schools, especially where children use playgrounds at recess, should be more sensitive to children’s potential exposure of air pollution because of the roadways nearby. AREES results can help local governments make better-informed decisions on siting schools and other important land uses in relation to transportation emissions. We have circled four schools that are within the most polluted areas.



Air Quality Has Been Improving

PM_{2.5} Design Value by Monitor

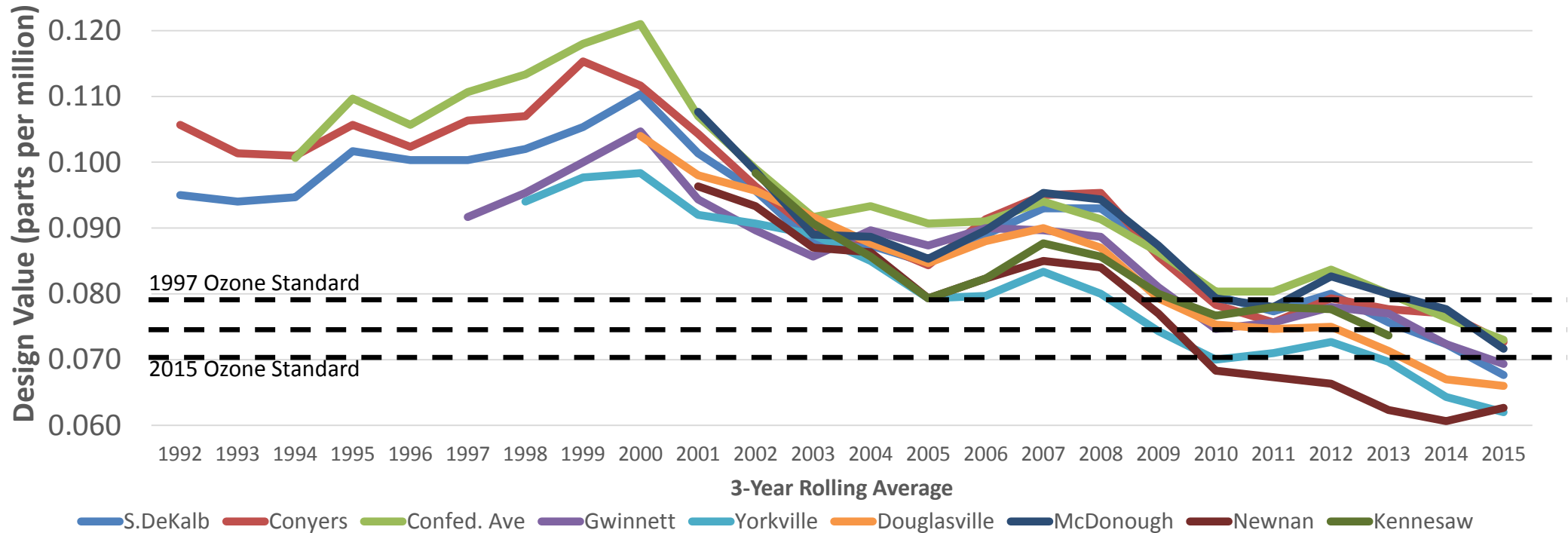


Although the AREES maps show relatively high particulate matter concentrations near major roadways, overall, air quality has been improving. This chart shows that despite the more stringent PM_{2.5} standard instituted in 2012, making conformity more difficult, **all nine monitoring stations had fallen within the 2012 standard by 2013 and have been on the decline since 2007.**



And for more good news...

8-Hour Ozone Design Value by Monitor



Although we're focusing on particulate matter for this Snapshot, it's difficult to talk about air pollution without mentioning Ozone, another well-documented pollution. Like the PM_{2.5} graph before, this graph shows Ozone Design Value by monitor station. We can see that Ozone design values are also on the decline.

As the graph indicates, the new 2015 Ozone standard is even lower making conformity more difficult. So while pollution levels have been improving, there is more work to be done to ensure our region has clean air in the future.