NCTCOG

August Air Quality Health Task Force Meeting

August 20, 2021

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Regional Particulate Matter (PM) Episode

October 19, 2017 - *Recap*

Monitor Readings for PM 2.5

Orange Particulate Matter Alert
Level Orange

Particulate matter (PM) is currently at Level Orange in the Dallas-Fort Worth area. Children, older adults and people with lung disease, such as asthma, emphysema, or chronic bronchitis, should limit outdoor activity. If PM reaches Level Red, Children, older adults and people with lung disease, such as asthma, emphysema, or chronic bronchitis, should avoid outdoor activity. All other people should limit prolonged outdoor exertion if PM reaches Level Red.

For more information, visit AirNorthTexas.org.

Source of PM: Unknown

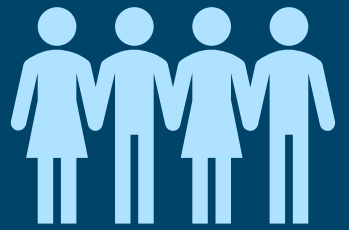
Regional PM Episode & Health Data

What

Daily or **Weekly** Health Data (COPD Hospital Discharges, Asthma Outpatient Visits)

Where/When

County-level health data for a week prior to and after October 19th, 2017, to analyze the trend



Why

Assess or correlate the health impacts on communities from pollutant exceedance days

NCTCOG Known Sources of Data

- **Texas Department of State Health Services (DSHS) Asthma Hospitalization and Outpatient Data –** *Annual Data by County*
- **Dallas County Community Health Needs Assessment –** *Annual Data for Dallas County by Zip Code*
  https://www.parklandhospital.com/Uploads/Public/Documents/PDFs/Health-Dashboard/CHNA%202019.pdf
- **DFW Hospital Council Foundation Data –** *Adults with Asthma, COPD by County, City Zip Code, Census Tract*
  http://www.healthyntexas.org/
- **Smart Growth for Dallas Tool –** *Annual Data for City of Dallas*
  https://web.tplgis.org/smart_growth_dallas/
- **Cooks Children's Hospital Data -** *Hospital Discharges for Cooks Children's Hospitals (Working to Obtain)*
- **Texas Inpatient Public Use Data File (PUDF) -** *Texas Health Care Information Collection Center for Health Statistics (Purchase Necessary)*

We are looking for Health Data!

Asthma occurrence/outpatient visits and/or COPD hospital discharge data by county/city or smaller geographic scale

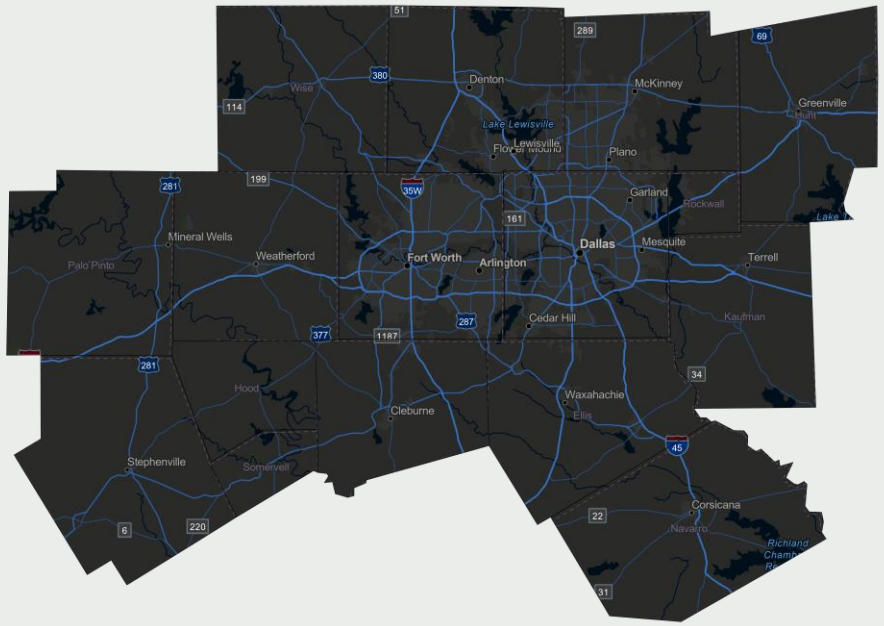
Heath Data Requirements

NCTCOG Next Steps

- Acquire health data to analyze/evaluate with data from regional PM exceedance occurrences (including October 19, 2017).
- Channel discussion towards local/neighborhood-level hotspots
- Consolidate regional interests/analysis with various cities, local governments, and communities

As we acquire health data, what do **YOU** want to see from us?

North Central Texas Council of Governments



LEADING WITH EQUITY IN THE GHG TOOLKIT

By: Lauren Johnson, MPH(c)

'21 EDF Climate Corps Fellow, ECJ Cohort

EDF ENVIRONMENTAL DEFENSE FUND | CLIMATE CORPS

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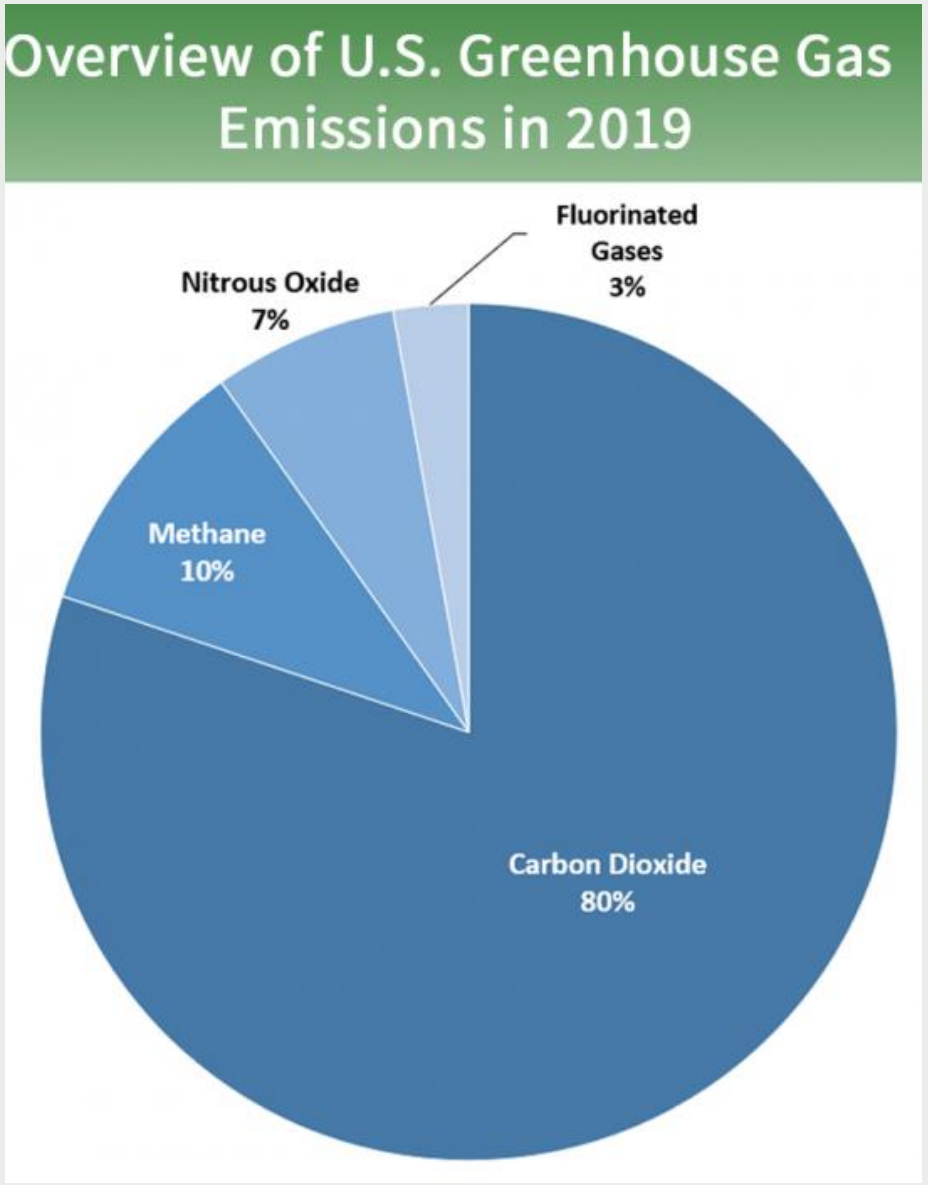
North Central Texas Council of Governments

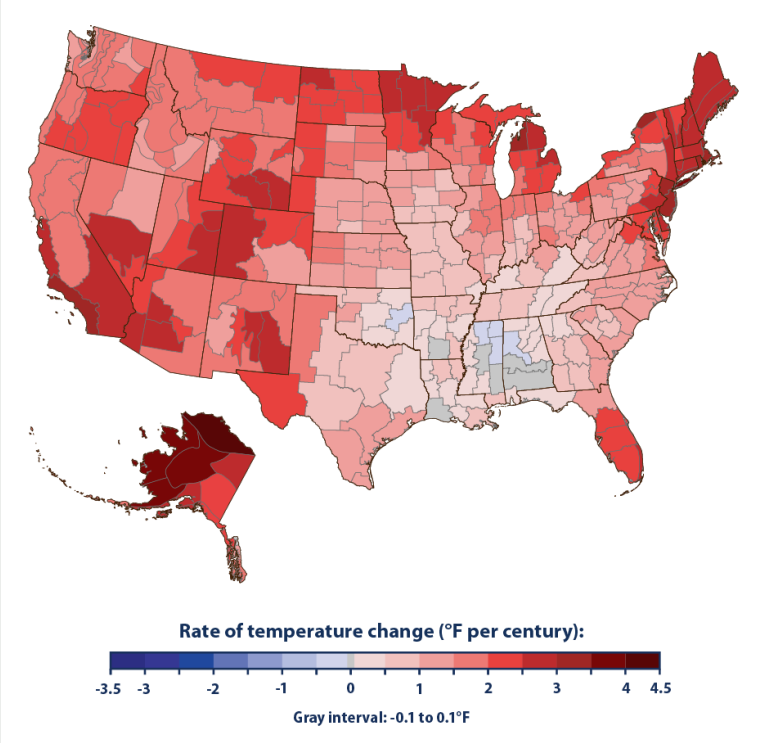
EDF ENVIRONMENTAL DEFENSE FUND | CLIMATE CORPS

Greenhouse Gases

- The U.S. Environmental Protection Agency (EPA) defines greenhouse gases (GHG) are gases that trap heat in the atmosphere.
- The main greenhouse gases in our atmosphere are carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), and fluorinated gases.

Resources Provided By: US EPA



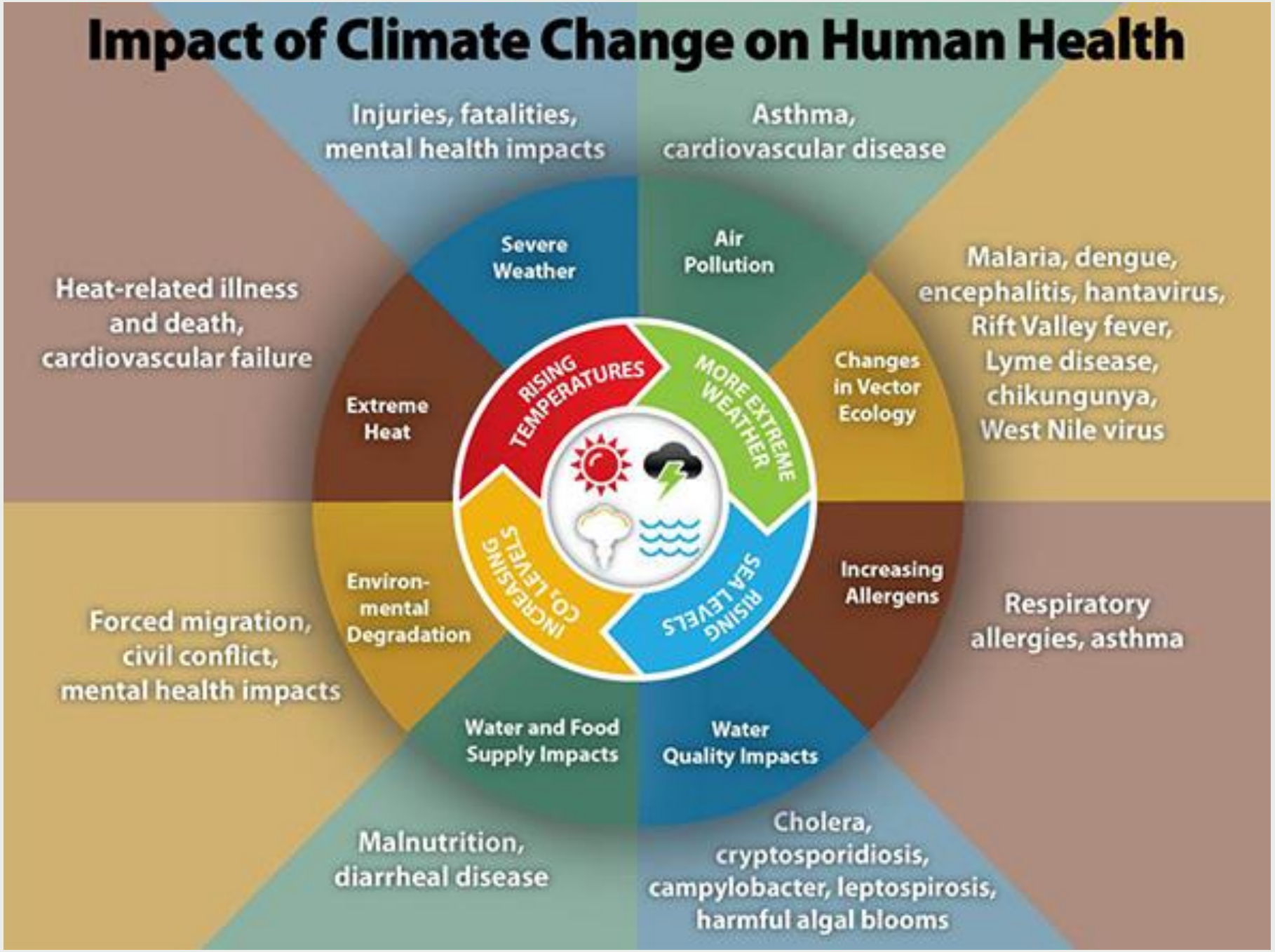


Source: U.S. EPA

Greenhouse Gases

Too much GHG in Dallas-Fort Worth means:

- Higher temperatures → hotter summers
- Extreme rainfall
  - Mean rainfall and severe thunderstorms would increase by up to 10% and 40% respectively in the spring
  - Higher flooding risk
- More tropical storms occurring in the Fall
  - Greater infrastructure damage


Impact of Climate Change on Human Health
Injuries, fatalities, mental health impacts
Asthma, cardiovascular disease
Severe Weather
Air Pollution
Heat-related illness and death, cardiovascular failure
Malaria, dengue, encephalitis, hantavirus, Rift Valley fever, Lyme disease, chikungunya, West Nile virus
Extreme Heat
Changes in Vector Ecology
RISING TEMPERATURES
MORE EXTREME WEATHER
INCREASING CO2 LEVELS
RISING SEA LEVELS
Environ-mental Degradation
Increasing Allergens
Forced migration, civil conflict, mental health impacts
Respiratory allergies, asthma
Water and Food Supply Impacts
Water Quality Impacts
Malnutrition, diarrheal disease
Cholera, cryptosporidiosis, campylobacter, leptospirosis, harmful algal blooms

Source: CDC

Key Concepts

Climate Justice

“Climate change will affect everyone, but not everyone will be affected equally—the effects of climate change will disproportionately impact communities with the least means to adapt, and who have been burdened with negative historic environmental impacts due to institutionalized discriminatory practices” (Dallas Comprehensive Environmental and Climate Action Plan, 2020)

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GREENHOUSE GAS EMISSION REDUCTION TOOLKIT

- **Inform GHG emission reduction in the Dallas-Fort Worth region**
  - GHG Toolkit Report
  - Strategy Catalogue
  - Equitable Community Engagement
- **Recommend for local government adoption in the Dallas-Fort Worth region**
- **Generate in response to the growing nature of local governments accepting and emphasizing the need to address global climate change through climate risk adaptation, mitigation, and resiliency in the public, private sector, and social sector**

Overburdened Communities

"Minority, low-income, tribal, or indigenous populations or geographic locations in the United States that potentially experience disproportionate environmental harms and risks. This disproportionality can be a result of greater vulnerability to environmental hazards, lack of opportunity for public participation, or other factors. Increased vulnerability may be attributable to an accumulation of negative or lack of positive environmental, health, economic, or social conditions within these populations or places. The term describes situations where multiple factors, including both environmental and socio-economic stressors, may act cumulatively to affect health and the environment and contribute to persistent environmental health disparities."

– U.S. EPA

Source: U.S. EPA and Resources Provided By U.S. EPA

CASE STUDY: ZIP CODE 76104

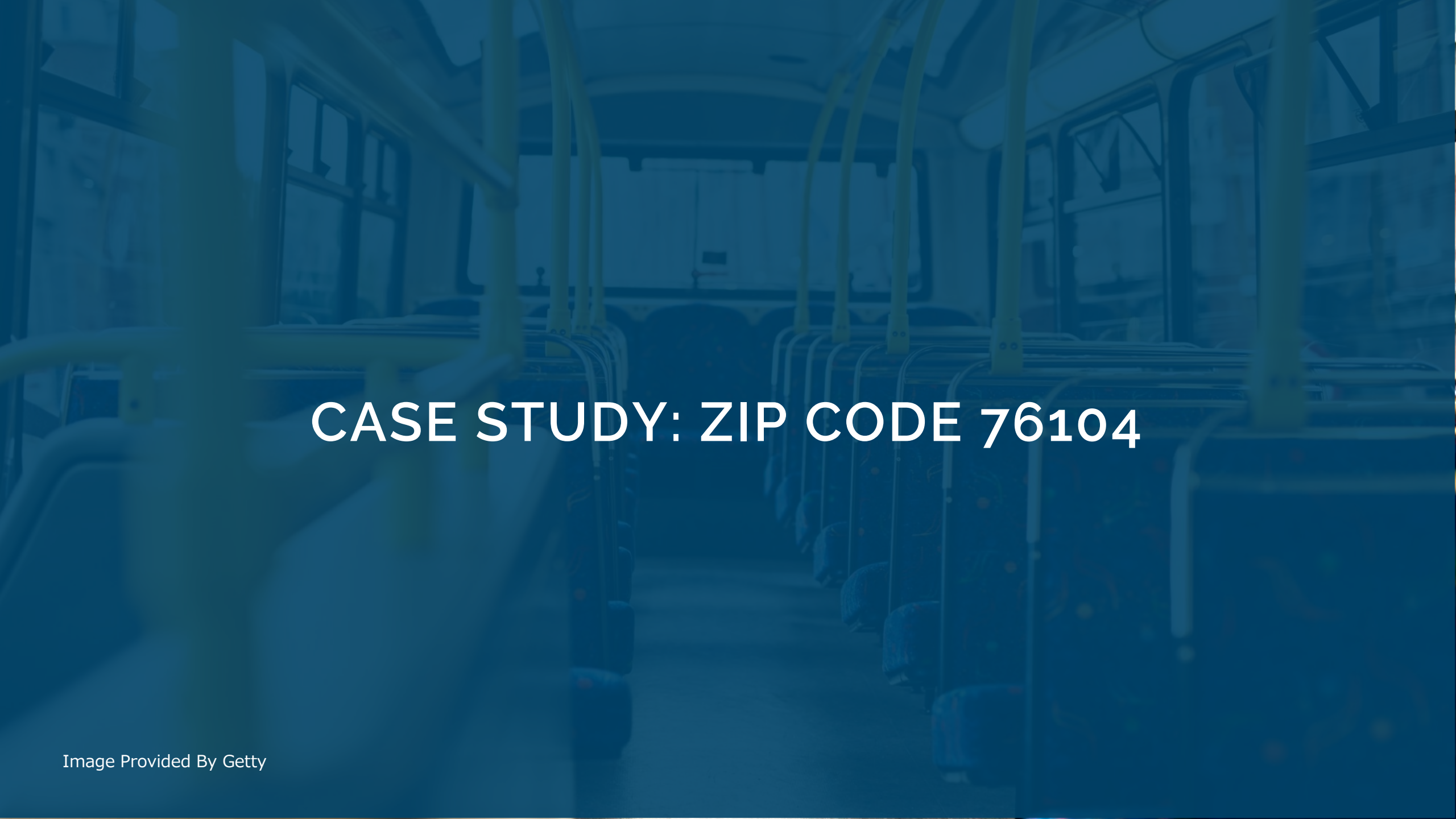
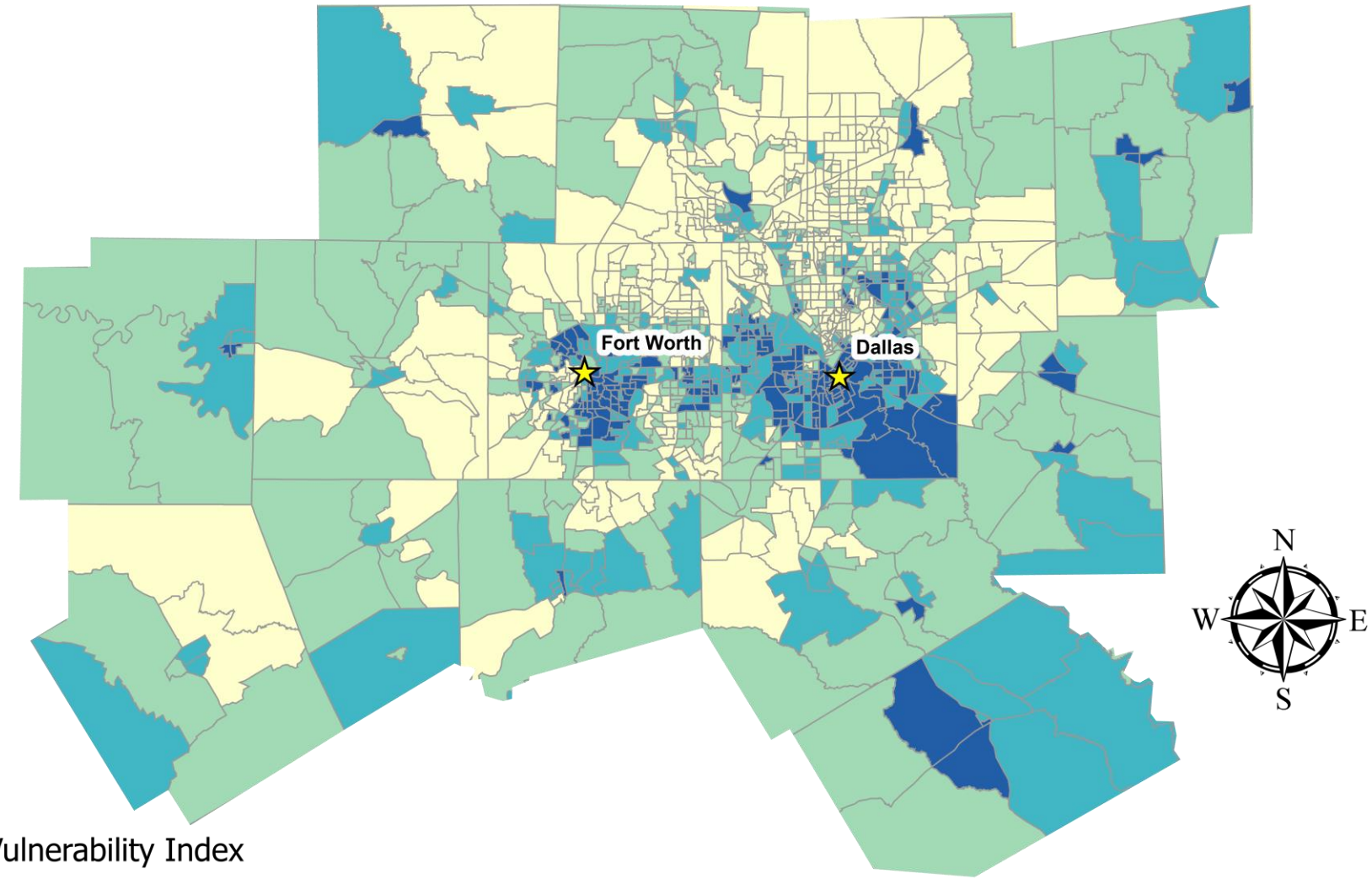
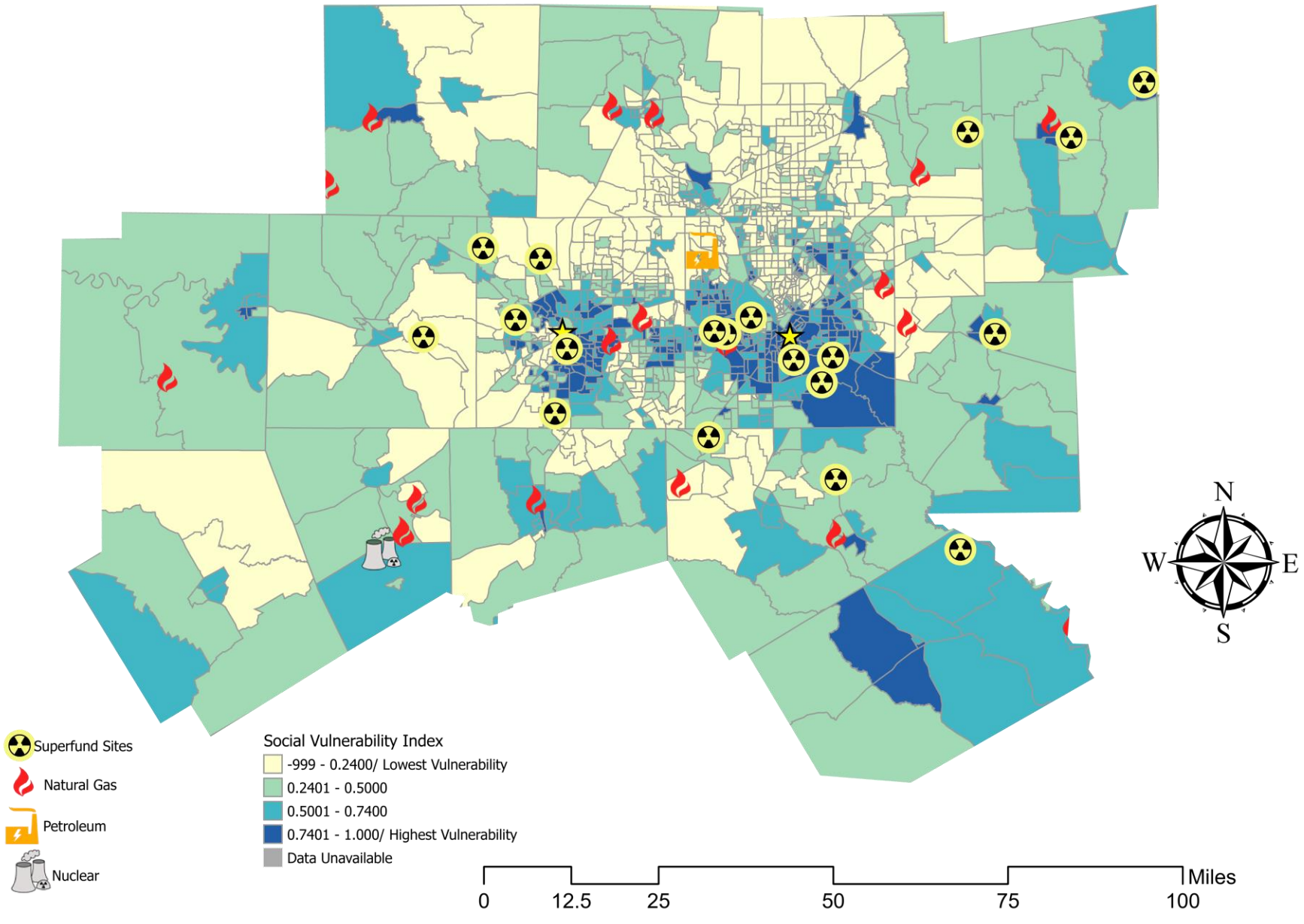


Image Provided By Getty

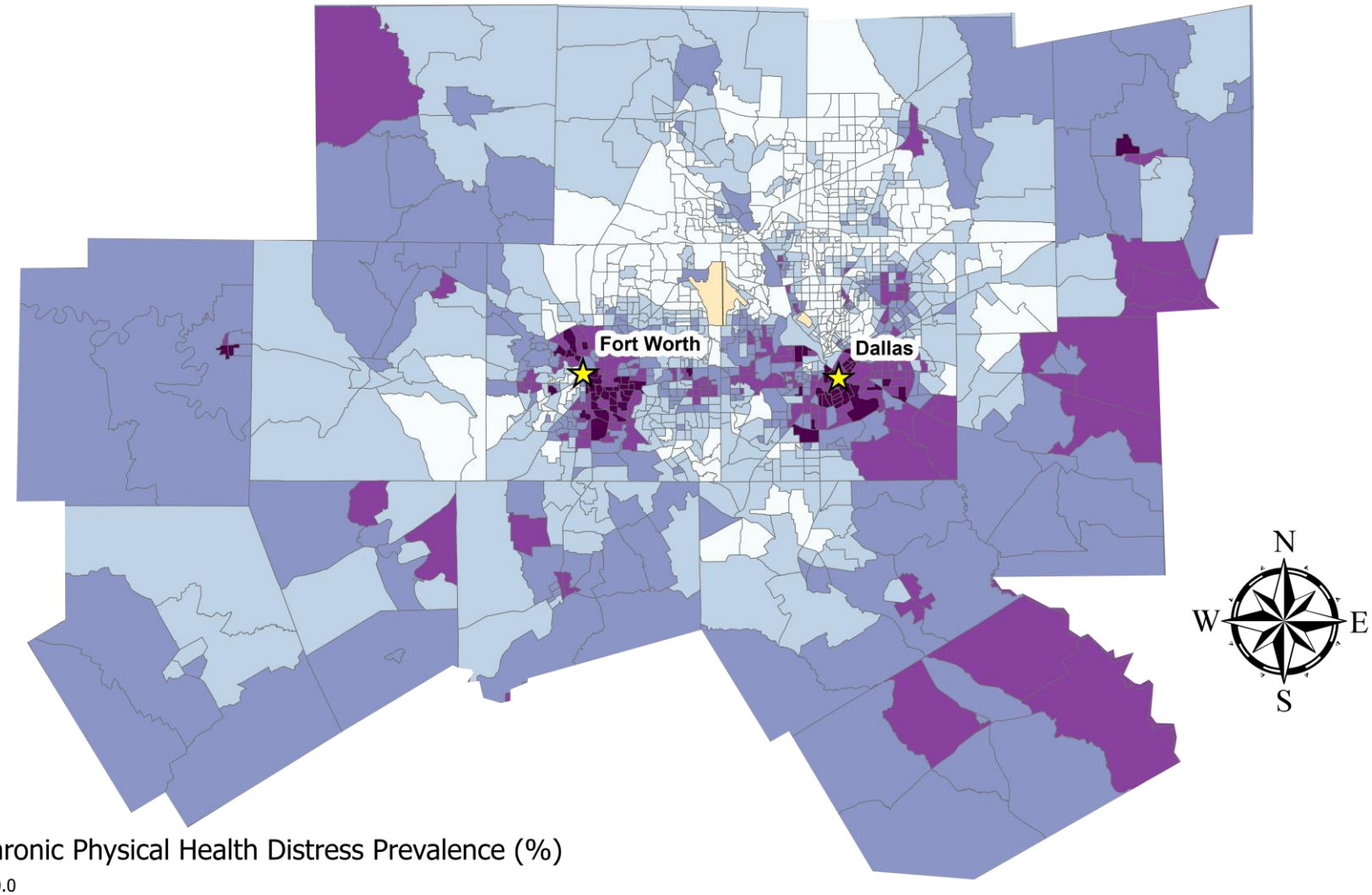
North Central Texas Social Vulnerability



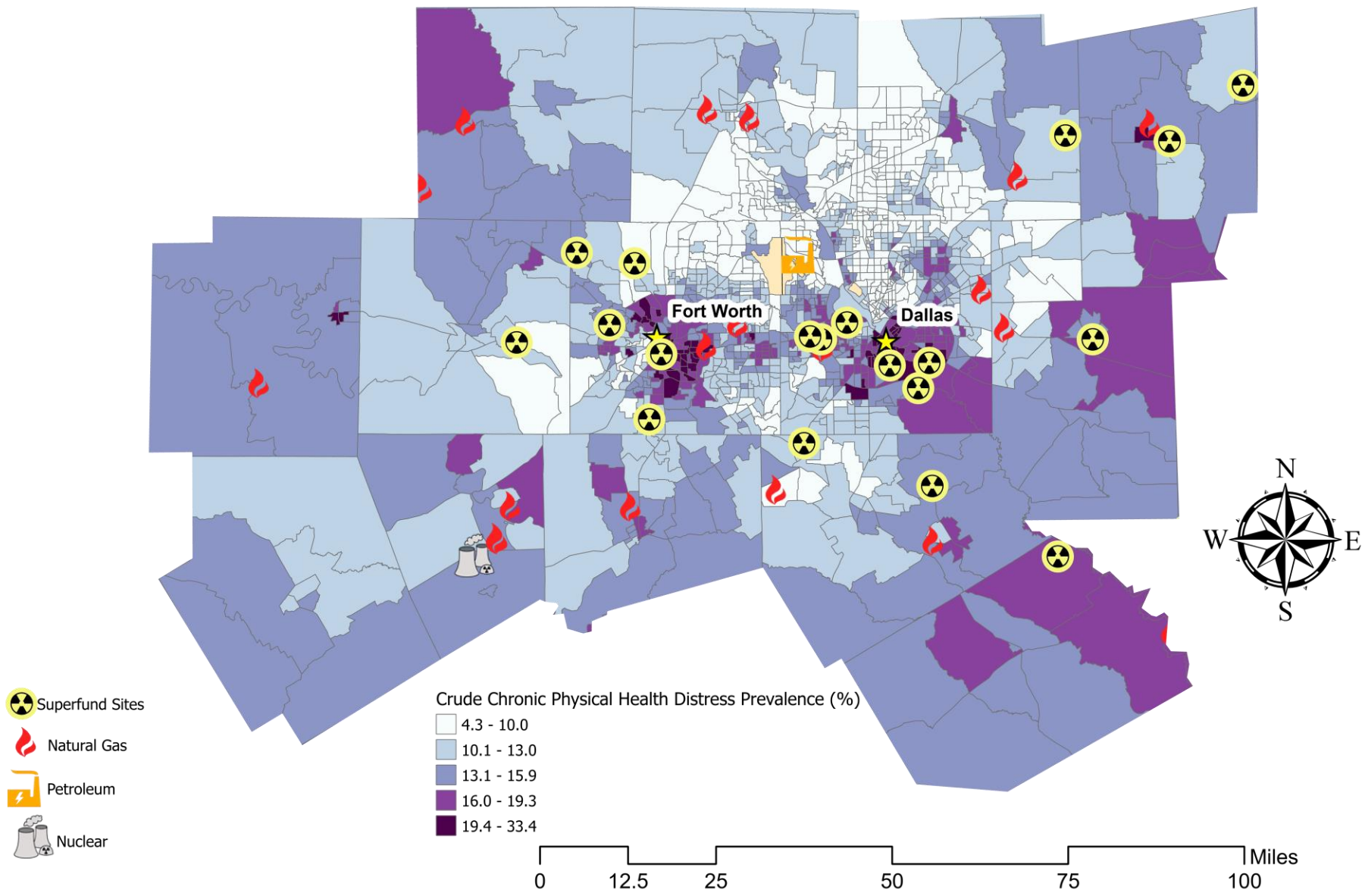
North Central Texas Social Vulnerability & Toxic Wastes



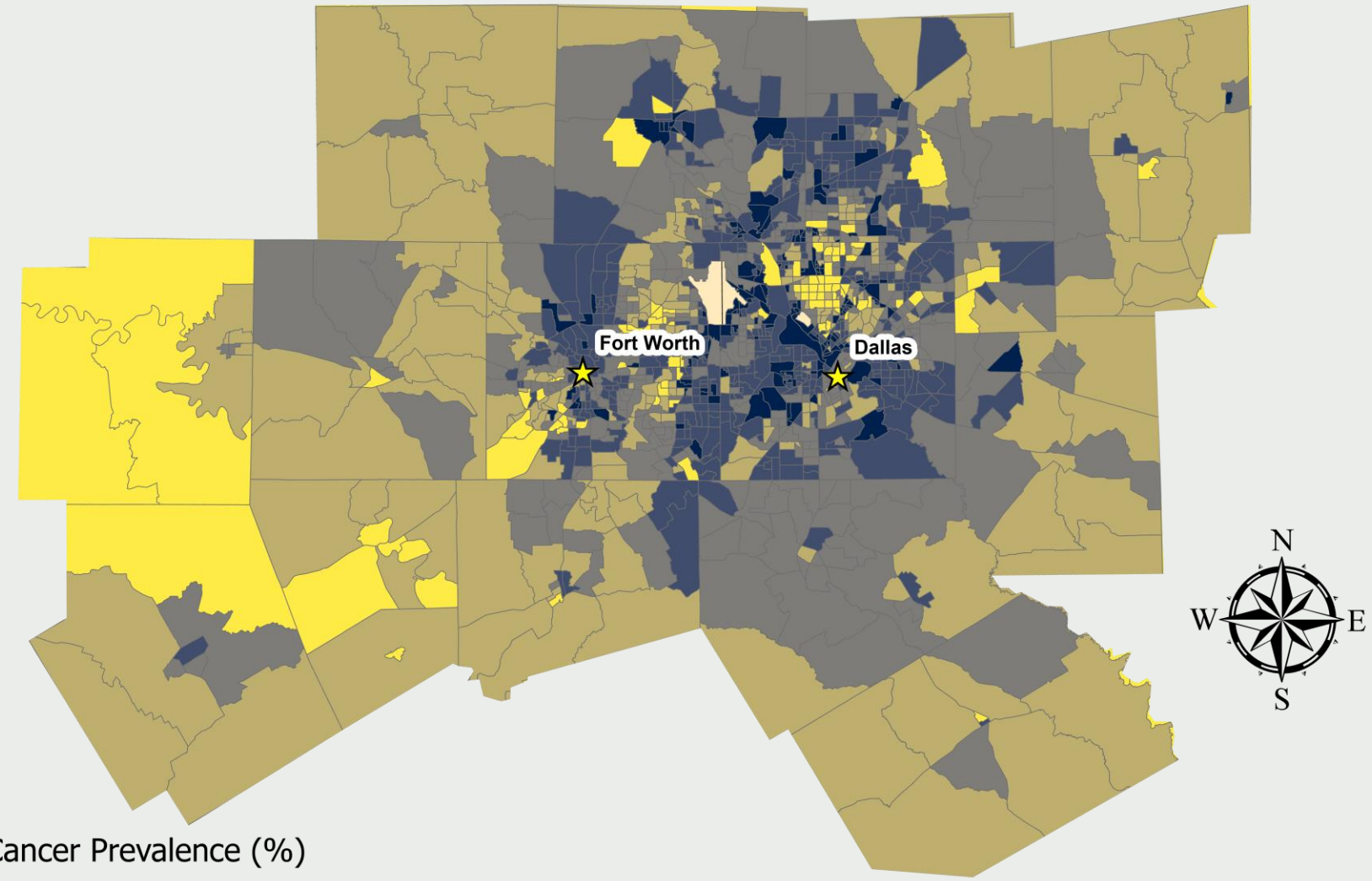
North Central Texas Crude Chronic Physical Health Distress



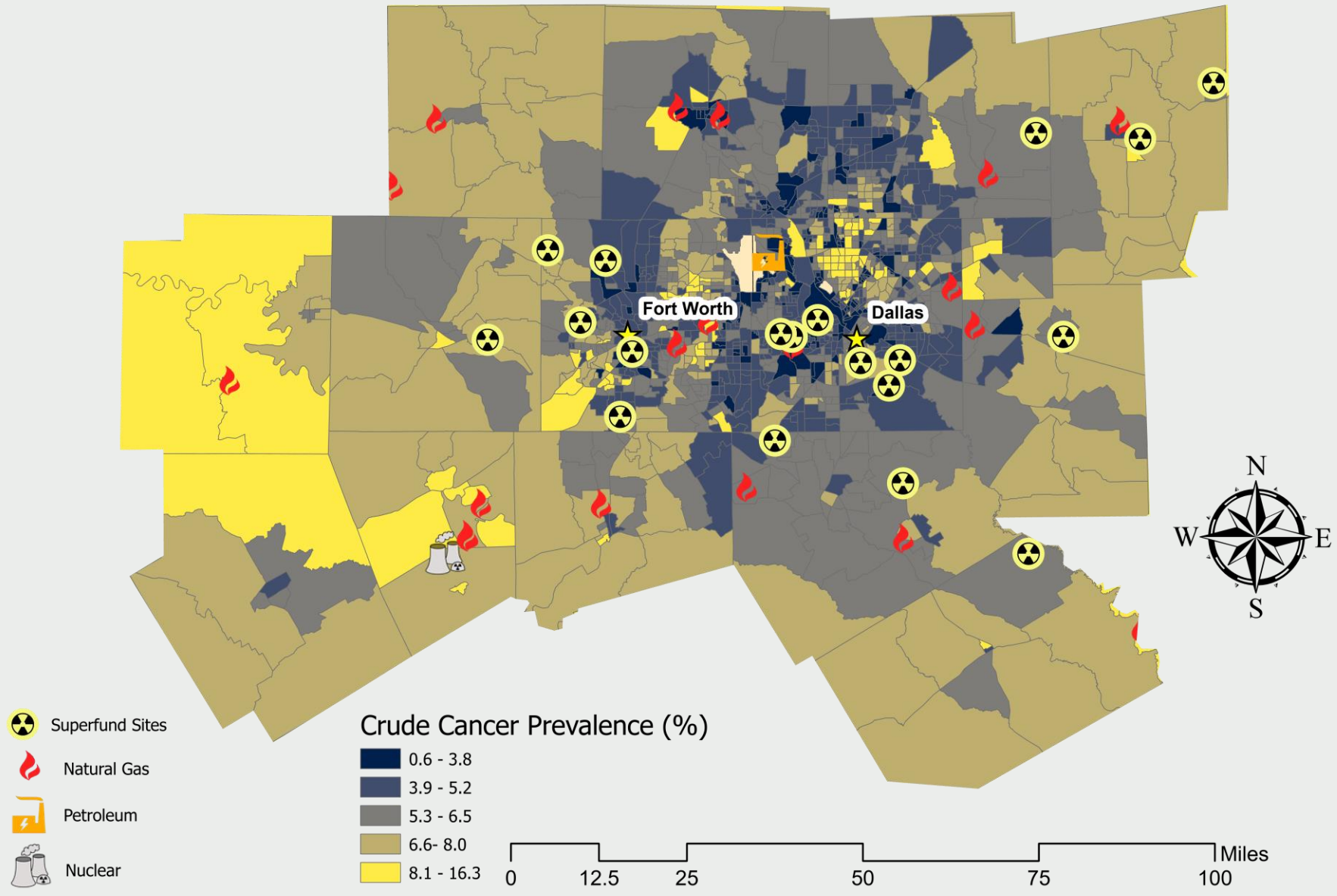
North Central Texas Crude Chronic Physical Health Distress Prevalence & Toxic Wastes



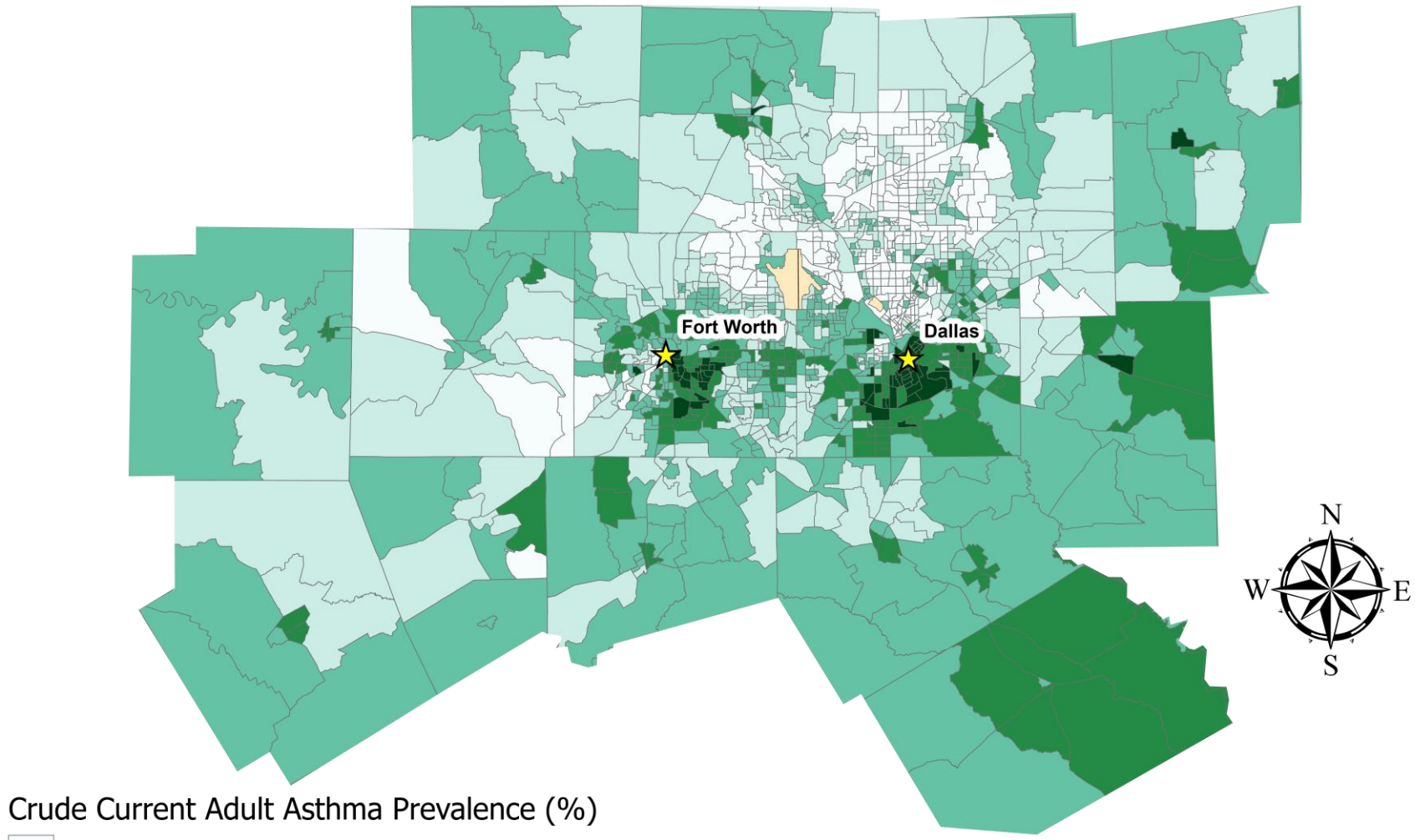
North Central Texas Crude Cancer Prevalence



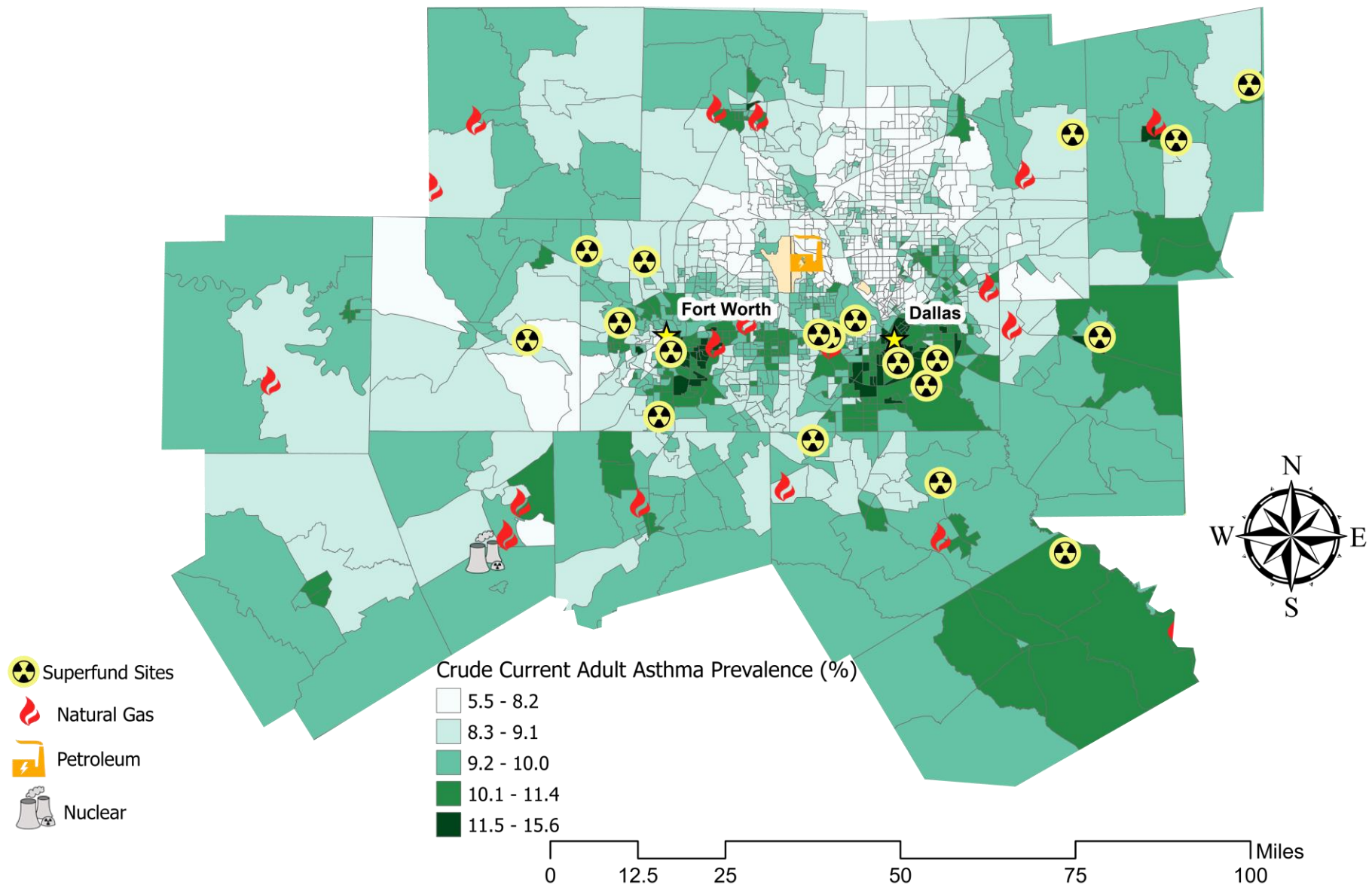
North Central Texas Crude Current Adult Asthma Prevalence & Toxic Wastes



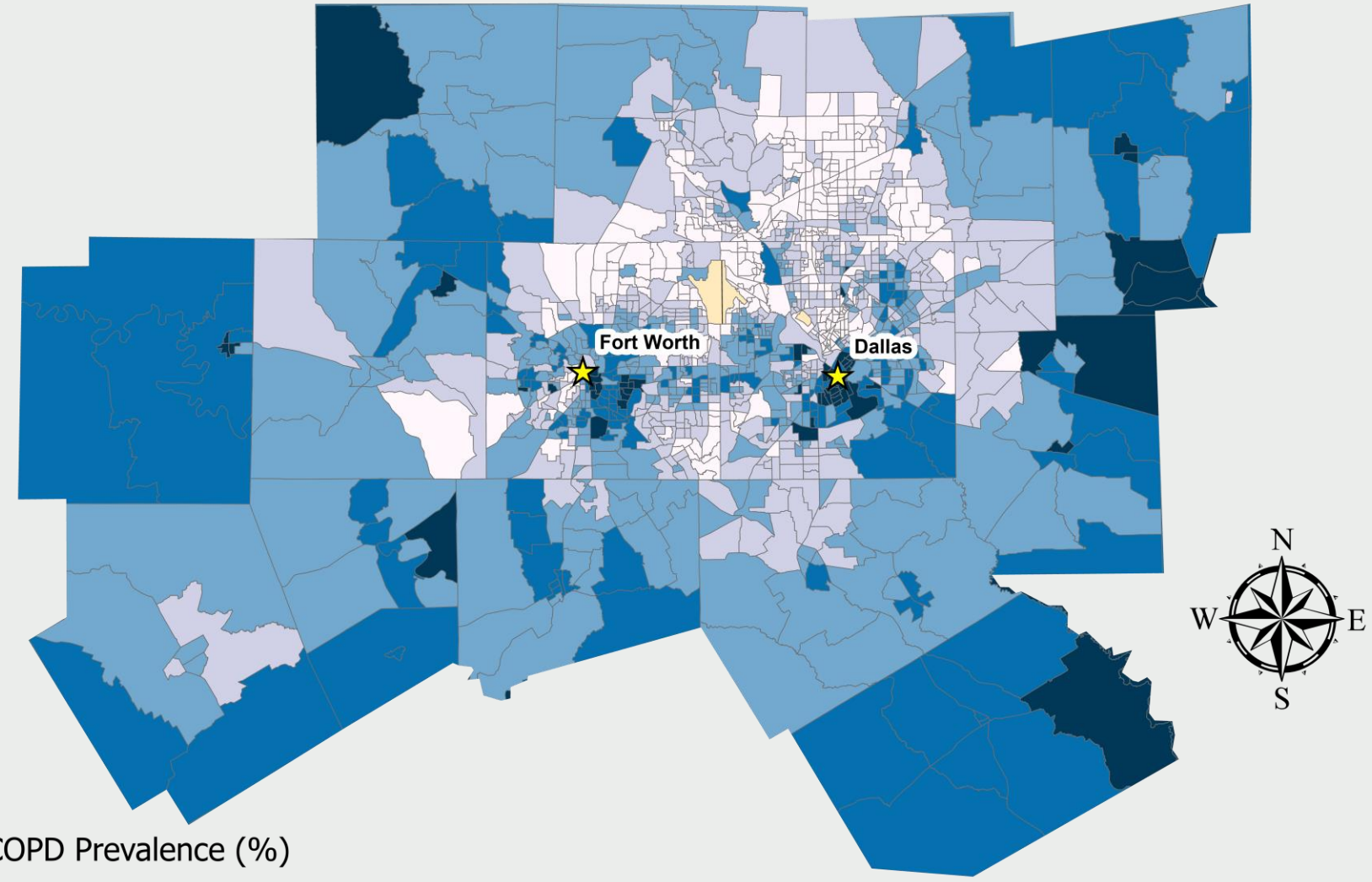
North Central Texas Crude Current Adult Asthma Prevalence



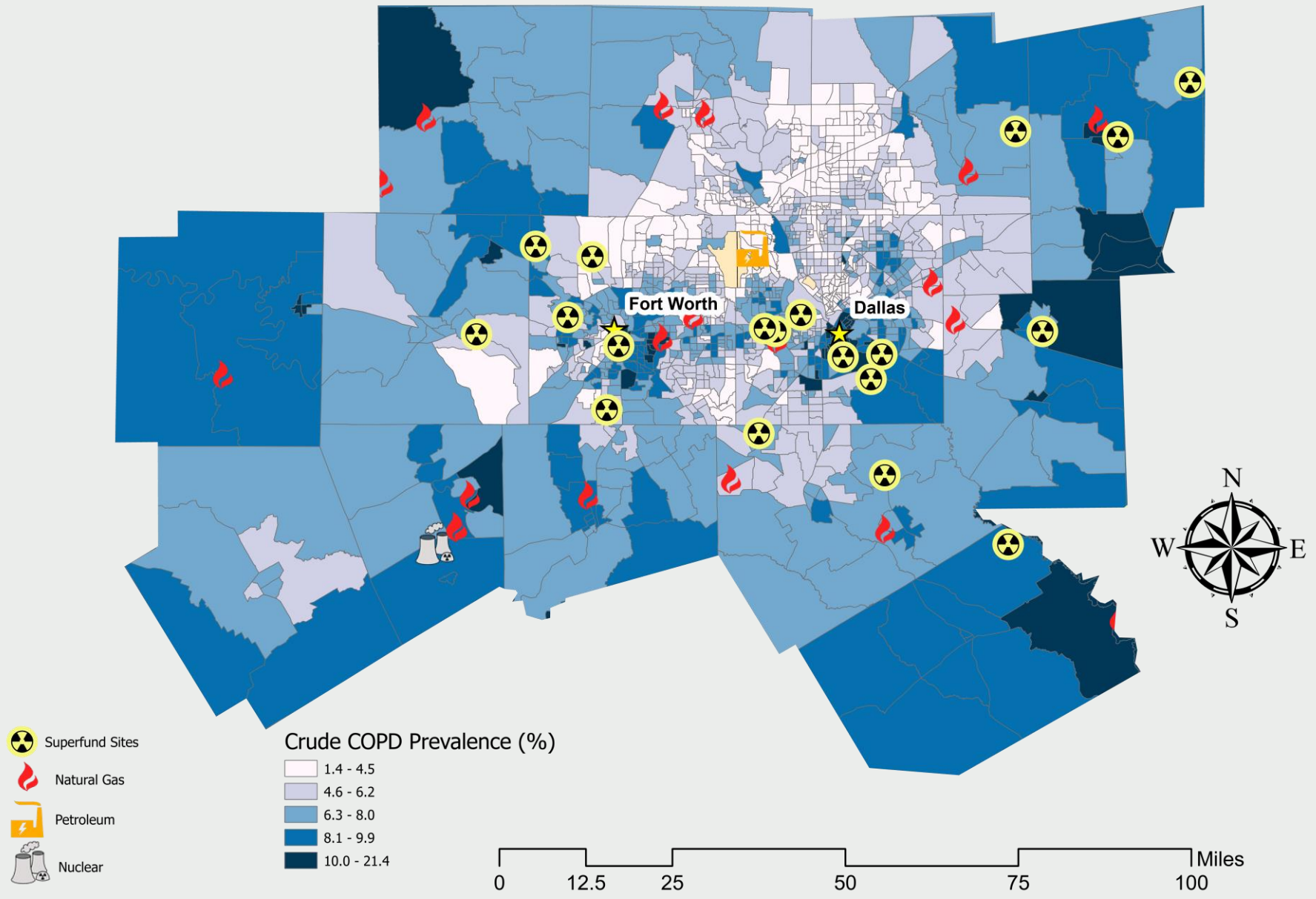
North Central Texas Crude Current Adult Asthma Prevalence & Toxic Wastes



North Central Texas Crude COPD Prevalence



North Central Texas Age-Adjusted COPD Prevalence & Toxic Wastes



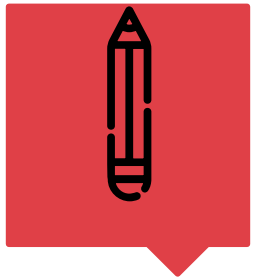
Top 25 Overburdened Communities

County	Neighborhood Name	Total Population	Social Vulnerability Index (higher value →more vulnerable)	High Blood Pressure	Cancer	Current Asthma	Coronary Heart Disease	Visits to doctor for routine checkup within the past year	COPD	Diabetes	Mental Health Distress > 14 days	Obesity	Physical Health Distress >14 days	Sleeping <7 hours	Stroke
Dallas	Cedar Crest	4101	0.9987	53.7	7.6	12.6	12.3	80	12.4	22.4	17.5	46.5	21.7	43.8	8.3
Dallas	West Dallas	4820	0.9967	44	4.7	12.9	8.9	74.9	10.1	19.1	20.5	47.3	21	45.5	6
Dallas	[illegible]	6941	0.996	44.7	6.1	12.7	9.5	75.5	10.7	18.4	19.1	45.3	20.2	43	6.5
Tarrant	Fort Worth near Central Meadowbrook	4504	0.991	41.1	5.1	11.9	8.9	71.6	10.3	18.2	21	43.6	21.6	39.7	5.1
Tarrant	Fort Worth near South Edgewood and Stop Six Sunrise Edition	4399	0.9894	51.4	6.3	13.9	11	79.2	12.1	24.8	21	48.1	23.8	43.2	7.9
Dallas	South Dallas	3033	0.9881	52.1	5.5	14.5	10.6	78.6	12.5	22.4	21.5	51	23.3	48.5	8.1
Tarrant	Fort Worth near Forest Hill and Echo Heights	3671	0.9835	41.1	6.3	11.2	8.6	73.4	9.4	16.4	17.8	39.4	18.3	36.3	4.8
Dallas	Oak Cliff	4442	0.9831	41.9	5.3	11.7	9.5	71.8	10.5	19.2	19.5	46.4	21.2	42.6	6.2
Tarrant	Fort Worth near Harmon Field Park and United Riverside	2620	0.9823	48.5	4.5	13.7	10.6	74.3	12.7	23	24.7	50.9	26.3	44.8	6.7
Dallas	South Dallas	3048	0.982	54.1	6.5	13	11.4	80.3	11.8	23.5	18.2	49.8	21.9	47	8.4
Dallas	Old East Dallas	3111	0.9808	35.8	4	10.3	8	66.8	8.7	14.7	19.1	42	18.9	41.1	4.2
Dallas	Garland	5510	0.9795	32.1	3.1	10.3	6.8	64.6	7.7	13.7	20.5	42.1	18.8	42.2	3.6
Kaufman	Kaufman	1545	0.9793	37.9	5.5	10.8	8.7	71.7	10	16.7	18.8	44.6	19	40.3	4.8
Dallas	Cedar Crest	3505	0.9756	47.4	6.1	11.3	10.2	76.4	9.7	20.5	16.5	46.5	19.2	43.2	6.9
Collin	McKinney near McKinney National Airport	8862	0.9752	38.7	6.3	10.3	9.5	72.5	9.7	16	17.1	37.9	18.8	40.5	5
Dallas	Cedar Crest near Joppa	4470	0.9739	51.5	5.6	14.2	10.8	79.1	12.1	22.3	21.2	51	22.6	48.4	8
Dallas	Dallas near Westmount Park	3456	0.9733	37.1	4.6	10.3	8.2	68.9	8.7	15.8	18	43.6	18.6	40.5	4.6
Tarrant	Fort Worth near Rolling Hills Park	6162	0.9729	37.4	3.7	10.5	8.3	68	9.1	17.2	20.6	42.6	20.5	41	4.5
Dallas	Dallas near Paul Quinn College	4847	0.9724	44.2	4.6	13.7	8.3	77.4	9.8	18.1	20.4	49.4	19.3	48	6.3
Tarrant	Stop 6	2800	0.9699	49.1	4.7	15.1	10.6	76.1	12.9	24	25.6	51.6	26.6	46	7.7
Tarrant	Hillside Morningside	3048	0.9652	47	5.3	12.1	9.8	74.8	10.3	22.3	20.2	47.2	22.4	41.8	6.6
Dallas	Dallas near University of North Texas at Dallas	6288	0.9635	45.8	5.4	12.4	8	77.9	8.8	17.7	17.3	46.8	17.3	45.4	5.8
Dallas	Cedar Crest	4400	0.9626	48.8	5.4	12.7	10.9	75.5	11.9	22.6	20	50.5	22.9	46.3	7.6
Dallas	Dallas near the Dallas Zoo	3205	0.9603	28.3	3.1	9	5.5	63.8	5.7	11.8	16.8	40.9	15	39	2.8

Top 25 Overburdened Communities within 3 miles of a Superfund Site

County	Neighborhood Names	Total Population	Social Vulnerability Index (Higher Value À More Vulnerable)	High Blood Pressure	Cancer	Asthma	Coronary Heart Disease	Visits to Doctor For Routine Checkup Within The Past Year	COPD	Diabetes	Mental Health Distress > 14 Days	Obesity	Physical Health Distress >14 Days	Sleeping <7 Hours	Stroke
Dallas	Cedar Crest	4101	0.9987	53.7	7.6	12.6	12.3	80	12.4	22.4	17.5	46.5	21.7	43.8	8.3
Dallas	West Dallas	4820	0.9967	44	4.7	12.9	8.9	74.9	10.1	19.1	20.5	47.3	21	45.5	6
Tarrant	[illegible]	2620	0.9823	48.5	4.5	13.7	10.6	74.3	12.7	23	24.7	50.9	26.3	44.8	6.7
Dallas	Cedar Crest	3505	0.9756	47.4	6.1	11.3	10.2	76.4	9.7	20.5	16.5	46.5	19.2	43.2	6.9
Dallas	Cedar Crest near Joppa	4470	0.9739	51.5	5.6	14.2	10.8	79.1	12.1	22.3	21.2	51	22.6	48.4	8
Dallas	Oak Cliff	3456	0.9733	37.1	4.6	10.3	8.2	68.9	8.7	15.8	18	43.6	18.6	40.5	4.6
Tarrant	Fort Worth near Rolling Hills Park	6162	0.9729	37.4	3.7	10.5	8.3	68	9.1	17.2	20.6	42.6	20.5	41	4.5
Dallas	Fort Worth near Paul Quinn College and Joppa	4847	0.9724	44.2	4.6	13.7	8.3	77.4	9.8	18.1	20.4	49.4	19.3	48	6.3
Tarrant	Hillside Morningside	3048	0.9652	47	5.3	12.1	9.8	74.8	10.3	22.3	20.2	47.2	22.4	41.8	6.6
Dallas	Dallas near University of North Texas at Dallas	6288	0.9635	45.8	5.4	12.4	8	77.9	8.8	17.7	17.3	46.8	17.3	45.4	5.8
Dallas	Cedar Crest	4400	0.9626	48.8	5.4	12.7	10.9	75.5	11.9	22.6	20	50.5	22.9	46.3	7.6
Dallas	Bishop Arts District	3723	0.9576	31.1	3.6	9.1	6.2	65.9	6.1	12.9	16.5	40.4	15.8	38.3	3.1
Hunt	Greenville	3649	0.948	39.1	4.5	11.8	8.6	71.7	10.3	17.7	21.3	48.4	20.8	45	5.2
Dallas	Kenwood	6953	0.9474	32.1	3.7	10.7	5.6	69.8	6.8	12	17.7	41.1	15.3	42	3.3
Dallas	West Dallas	4549	0.9449	44.7	5	12.3	9.6	73.1	10.4	19.7	19.9	47.4	21.2	44.7	6.6
Dallas	Dallas near Great Trinity Forest and Roosevelt Park	3185	0.9422	35.5	3.7	11	6.5	68.5	7.3	14.1	18.9	43.9	17.2	42.7	4.2
Dallas	Cedar Crest	3077	0.9412	48	4.6	13.9	9.3	76.5	11.1	20.3	21.6	50.7	22	48.2	6.8
Tarrant	Glencrest Civic League	4131	0.9405	47.8	6.2	11.6	9.1	77	9.3	20.7	17.2	43.3	19.2	39.6	6
Dallas	Cedar Crest	3407	0.9403	51.3	5.6	13.6	10.6	78.9	11.7	22.3	20.3	51	22	48.3	7.8
Dallas	Kenwood	9363	0.9339	33.9	4.4	9.8	6.6	68.5	7	13.6	16.6	40.1	15.9	39.4	3.8
Tarrant	Fort Worth near Texas Wesleyan University	5851	0.9297	34.9	4.1	10.9	7.1	68.9	7.9	16.3	20	41.3	19	37.6	4
Tarrant	Fort Worth near Cobb Park and Burchill	2723	0.9295	45.4	5.1	12.4	8.4	75.3	9.4	20.2	19.5	45.5	20.4	41.1	5.7
Dallas	West Dallas	3010	0.9286	35	4.1	10.8	7.9	69	7.9	16.2	19.2	43	19	40.3	4.2
Tarrant	Fort Worth near Hillside Morningside and Cobb Park	3559	0.9259	48.3	5.4	13.2	9.9	76.1	10.9	22.4	21.4	46.8	22.9	42.7	6.9

PROPOSED COMMUNITY ENGAGEMENT APPROACH



SURVEY

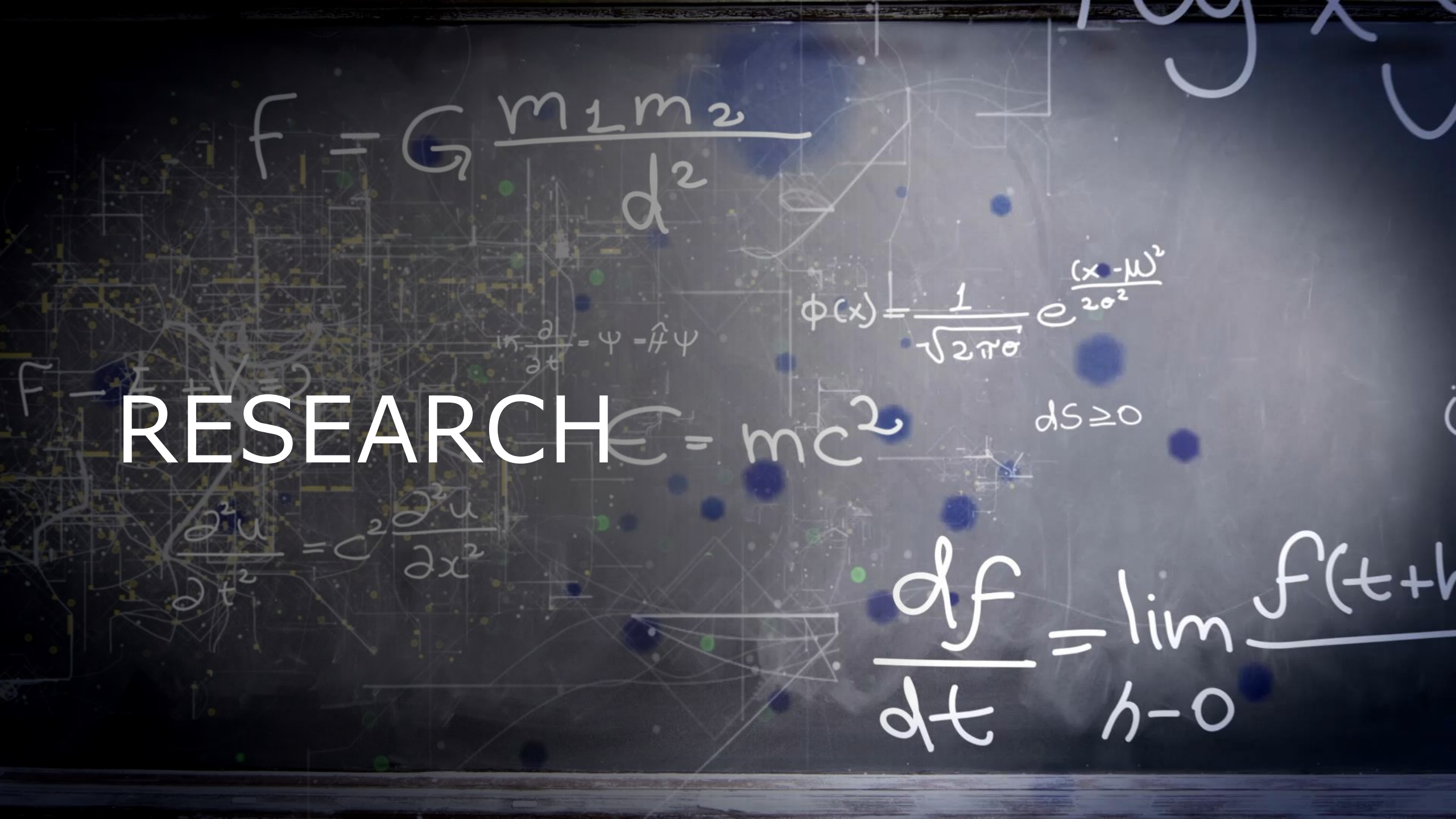
Send an online survey to capture thousands of public input on GHG emission reduction strategies

INTERNAL & EXTERNAL STAKEHOLDER MEETINGS

Have a virtual public meeting detailing GHG emission reduction strategies to gain live feedback both internally and externally

ONLINE MARKETING CAMPAIGN

Create branding and detail efforts on website while also being advertised on social media platforms


RESEARCH

NCTCOG COMMUNITIES RESEARCHED

‘21 ESTIMATED POPULATION COUNT

>50,000	50,000-100,000	100,000-250,000	250,000+
CEDAR HILL	FLOWER MOUND	DENTON	DALLAS
DECATUR	MANSFIELD	IRVING	PLANO
COPPELL	ROWLETT	GRAND PRAIRIE	ARLINGTON
ROCKWALL	NORTH RICHLAND HILLS	MESQUITE	FORT WORTH
WAXAHACHIE	EULESS	GARLAND	DFW INTERNATIONAL AIRPORT
CORINTH	DESOTO	FRISCO	
RICHLAND HILLS	WYLIE	CARROLLTON	
FARMERS BRANCH	GRAPEVINE	RICHARDSON	
		LEWISVILLE	
		ALLEN	

ENERGY-RELATED POLLUTION CONTROL SOURCES

AREA SOURCE

Ex: Emissions related to building energy usage

AREA SOURCE: OIL & GAS

Ex: Electric power grid powered by fossil fuels

POINT SOURCE

Ex: Regional landfill methane emissions

NON-ROAD

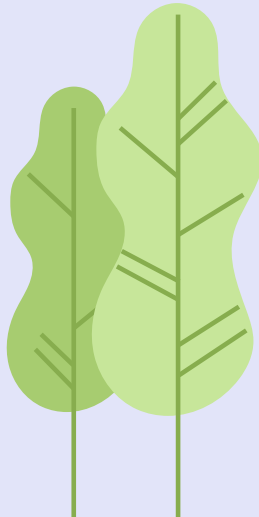
Ex: Gasoline and diesel-powered equipment

ON-ROAD

Ex: Conventional light duty vehicle fleet

BIOGENICS

Ex: Volatile organic compounds from plants



GHG TOOLKIT STRUCTURE

1. MAIN STRATEGY RECOMMENDATIONS
    a. Function as an executive summary
    b. Prioritize greatest emission reductions and equity
2. INTRODUCTION
    a. Greenhouse Gases
    b. Climate Risk Assessment in North Central Texas
    c. Equity & Overburdened Communities
    d. Health Equity Analyses
    e. Strategy Structure & Criteria
3. SECTOR-SPECIFIC SECTIONS
    a. Energy, transportation, solid waste, water, buildings, equity, food systems, wastewater
    b. Strategy emphasis areas → GHG pollution control measures
4. STRATEGY CATALOGUE
5. APPENDIX

Energy Goal 1: Mitigate Area Source Emissions

- E1.1: Building Energy Audit
- E1.2: Commercial and Industrial Building Retro-commissioning
- E1.3: Energy Conservation Ordinance
- E1.4: Residential Solar Energy Development
- E1.5: Commercial Solar Energy Development
- E1.6: Residential Weatherization Assistance Program
- E1.7: Utility Assistance Program
- E1.8: Urban Heat Island Effect Mitigation
- E1.9: Grid Flexibility and Resilience
- E1.10: Grid Reliability
- E1.11: Energy Efficiency and Renewable Energy Education
- E1.12: Tree Planting
- E1.13: Equitable Planning and Policymaking Practices

Energy Goal 2: Mitigate Oil & Gas Emissions

- E2.1: Sustainable Aviation Fuel Initiative
- E2.2: Methane & Landfill Gas to Energy Projects
- E2.3: Limited Fossil Fuel Infrastructure and Carbon-Free Economy

Energy Goal 3: Mitigate Point Source Emissions

- E3.1: Group Energy Switch & Demand Response Program
- E3.2: Renewable Energy Credits
- E3.3: Renewable Energy Infrastructure
- E3.4: Renewable Energy Policy Development
- E3.5: Air quality Data and Permitting Accessibility
- E3.6: Zip Code Emission Cap with Buffer Zones and Industrial Polluter Relocation Amortization

Energy Goal 4: Mitigate Non-road Emission Sources

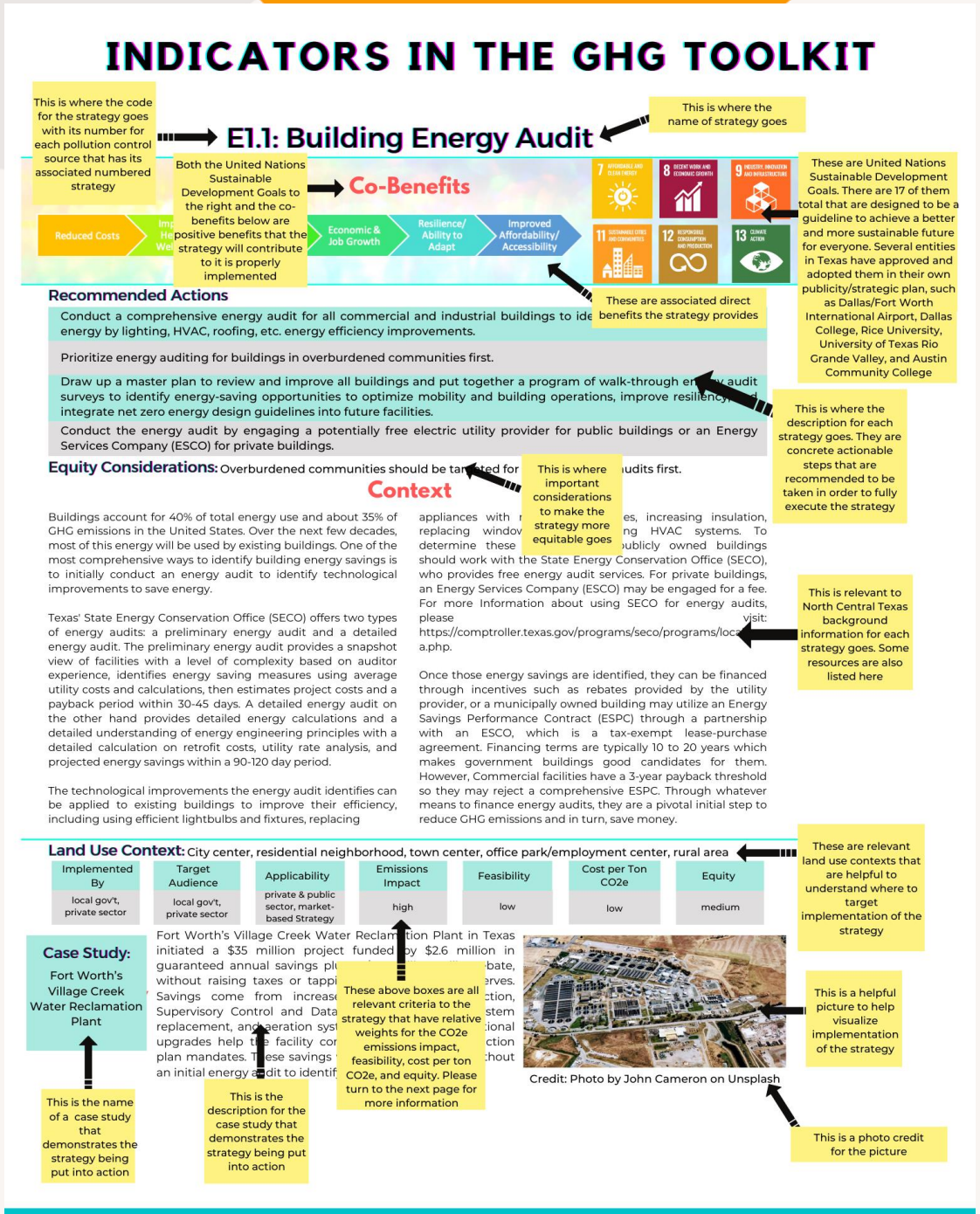
- E4.1: Ground Support Equipment Electrification
- E4.2: Electric Vehicle Charging Stations
- E4.3: Sustainable and Equitable Pedestrian Infrastructure

Energy Goal 5: Mitigate On-road Emission Sources

- E5.1: Fleet Decarbonization Transition
- E5.2: Single Occupancy Vehicle Trip Reduction

Energy Goal 6: Mitigate Biogenic Emission Sources

- E6.1: Waste to Energy Generation
- E6.2: Environmentally Conscious Building Development & Green Infrastructure
- E6.3: Public and Private Greenspace Development



Criteria	Description	Meaning
Land Use Context	These are relevant land use contexts that are helpful to understand where to target implementation of the strategy	City center/high density mixed use, residential neighborhood/medium density, town center, office park/employment center, rural area/low density
Implemented By	This is the governing entity that is meant to implement this strategy	Local government (gov't), state gov't, private sector, utilities, etc.
Target Audience	This is the audience that this strategy is meant to be implemented for	Local gov't, state gov't, private sector, homeowners, residents, utility customers, etc.
Applicability	This is who the strategy is relevant to so that it can be implemented by them in a specific manner	Private sector, public sector implemented as a market-based strategy and/or a policy-based strategy
Emissions Impact	This is a relative ranking of the amount of emissions in metric tons of carbon dioxide equivalents annually (MTCO2e/year) that is expected to be reduced by the strategy	Low: Emissions < 9x10^2 MTCO2/year Medium: 1x10^3 MTCO2e/year < Emissions < 9x10^3 MTCO2e/year High: Emissions > 1x10^4 MTCO2e/year
Feasibility	This is a relative ranking of how easily the strategy can be implemented, based upon if it has been done before and how much effort it takes to implement it	Low: Has barely been done before and takes a lot of effort to implement Medium: Has sometimes been done before but takes a lot of effort to implement High: Has frequently been done before and takes minimal effort to implement
Cost per Ton CO2e	This is a relative ranking of how much the strategy costs per metric ton equivalent of carbon dioxide (MTCO2e)	Low: cost per MTCO2e < $1000 Medium: $1000 < cost per MTCO2e < $25000 High: cost per MTCO2e > $25000
Equity	This is a relative ranking of how much the strategy will alleviate the disproportionate cumulative burdens experienced by overburdened communities	Low: no direct mention or positive influence on equity Medium: equitable outcomes are indirectly positively impacted High: equitable outcomes are directly positively impacted

E3.6: Zip Code Emission Cap with Buffer Zones & Industrial Polluter Relocation Amortization

Co-Benefits

Recommended Actions

Determine maximum air pollution burden levels at the zip code scale based on guidance from public health experts to decrease the consequent health impacts of air pollution burden.

Implement deed restrictions or zoning changes in areas zoned for industrial use near residential use.

Amortize the relocation of major industrial polluters because of threat to public health and safety so that a timeline for removal or relocation of the site to an area more appropriate for its heavy industrial use adhering to federal and state regulation.

Explore buffer zones of 500 feet from highways and 1,000 feet from rail yards or distribution centers from residential areas demarcated with either physical or ideally organic buffers.

Implement an organic or structural exposure reduction measures such as vegetive screens, raised berms, and open green space for areas with high air pollution burden where buffer zones/freight sprawl are impractical, and institute a collaborative community driven freight policy process.

Equity Considerations: Prioritize amortizing the location of industrial polluters in or near overburdened communities.

Context

Using hyperlocal stationary air quality monitor data, maximum air pollution burden levels could be determined by municipalities with a collaboration between public health experts to address adverse health impacts air pollution burden at the neighborhood or zip code level that correspond to deed restrictions and zoning changes. However, some industrial polluters that produce exceedingly high emissions near residential neighborhoods and communities are too dangerous at their current location because of the health dangers they pose to neighboring communities.

For example, the maps on page [x] demonstrate the uncanny association of industrial polluter locations (natural gas, nuclear, and petroleum power plants to chronic health conditions like frequent physical distress, asthma, COPD, and cancer where industrial polluters such as TAMKO and GAF based on their emissions per year and location are likely too dangerous for the health of neighboring communities to continue operating at their current locations.

Therefore, the only way to protect the public health of overburdened communities is to amortize the relocation of these properties to locations more appropriate for its location that do not pose a threat to surrounding communities. This is feasible because the same thing occurred in West Dallas in the 1980's for the RSR Corporation's lead smelter.

In the meantime, buffer zones between industrial polluters and is a short term remedy to minimizing adverse air pollution to surrounding residents. The exposure of residents in areas with high air pollution burdens. Therefore buffer zones of 500 feet from highways and 1,000 feet from rail yards or distribution centers from residential areas demarcated with either physical or ideally organic buffers. Implementing an organic or structural exposure reduction measures such as vegetive screens, raised berms, and open green space for areas with high air pollution burden are ideal when buffer zones/freight sprawl are impractical.

Land Use Context: City center, residential neighborhood, town center, office park/employment center, rural/low density

Implemented By	Target Audience	Applicability	Emissions Impact	Feasibility	Cost per Ton CO2e	Equity
local gov't, state gov't, private sector	homeowners, private sector, utilities, residents	public sector, policy-based strategy		medium		high

Case Study:

Freight activity mitigation

To mitigate freight activity impacts, have residential and freight on the same street, freight activity obscured by fencing and vegetation, make sure freight facilities do not empty onto a residential street, and have open green space and a raised berm act to act as a buffer with arrayed trees and a sidewalk with plenty of space on either side. During the decision-making process, it is necessary to institute a collaborative community driven freight policy process by developing a community vision for freight and industrial land use, develop a comprehensive strategy of freight facility site selection and evaluation of existing and planned transportation infrastructure, implement site design regulations in accordance with the previous two steps, and allow communities to codify the desired ordinances in order to initiate needed planning programs and execute relevant freight infrastructure development strategies.

ENERGY STRATEGY EXECUTIVE SUMMARY

Top 5 Recommended Strategies

Strategies with the Highest Emissions Impact

Strategies with the Highest Feasibility

Strategies with the Lowest Cost per Ton CO2e

Strategies with the Highest Equity

Additional Tools for State Governments, Local Governments & the Private Sector

- Strategy Catalogue
- Resource Bank

Conclusion & Next Steps

- GHG mitigation must be a priority in the Dallas Fort Worth region → co-benefits
- Finish the Regional GHG Inventory and set Science-Based Targets for regional GHG reductions → carbon law aligned
- Finish the Greenhouse Gas Toolkit with sector-specific sections
- Implement a public review process (townhalls, surveys, website) and collaborate with a HBCU or community organization to partner with overburdened communities

CONTACT US

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Thank You! Questions?

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Southwest Medical District Air Quality Monitoring

Presentation to the North Texas Air Quality Health Monitoring Task Force

August 20th, 2021

Texas A&M Transportation Institute
Texas Trees Foundation
The Nature Conservancy
City of Dallas

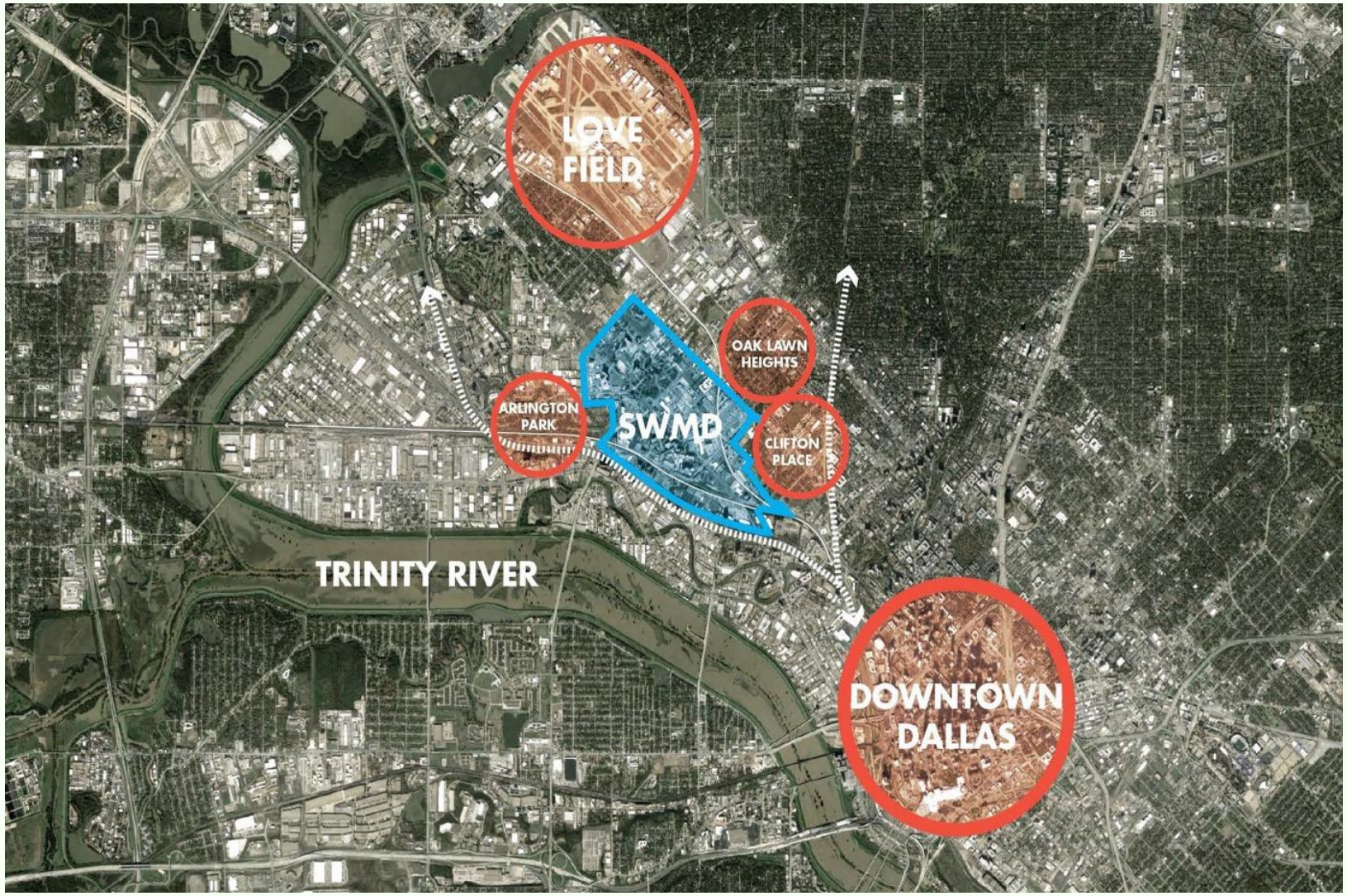
TEXAS TREES FOUNDATION

Dallas' Green Prescription

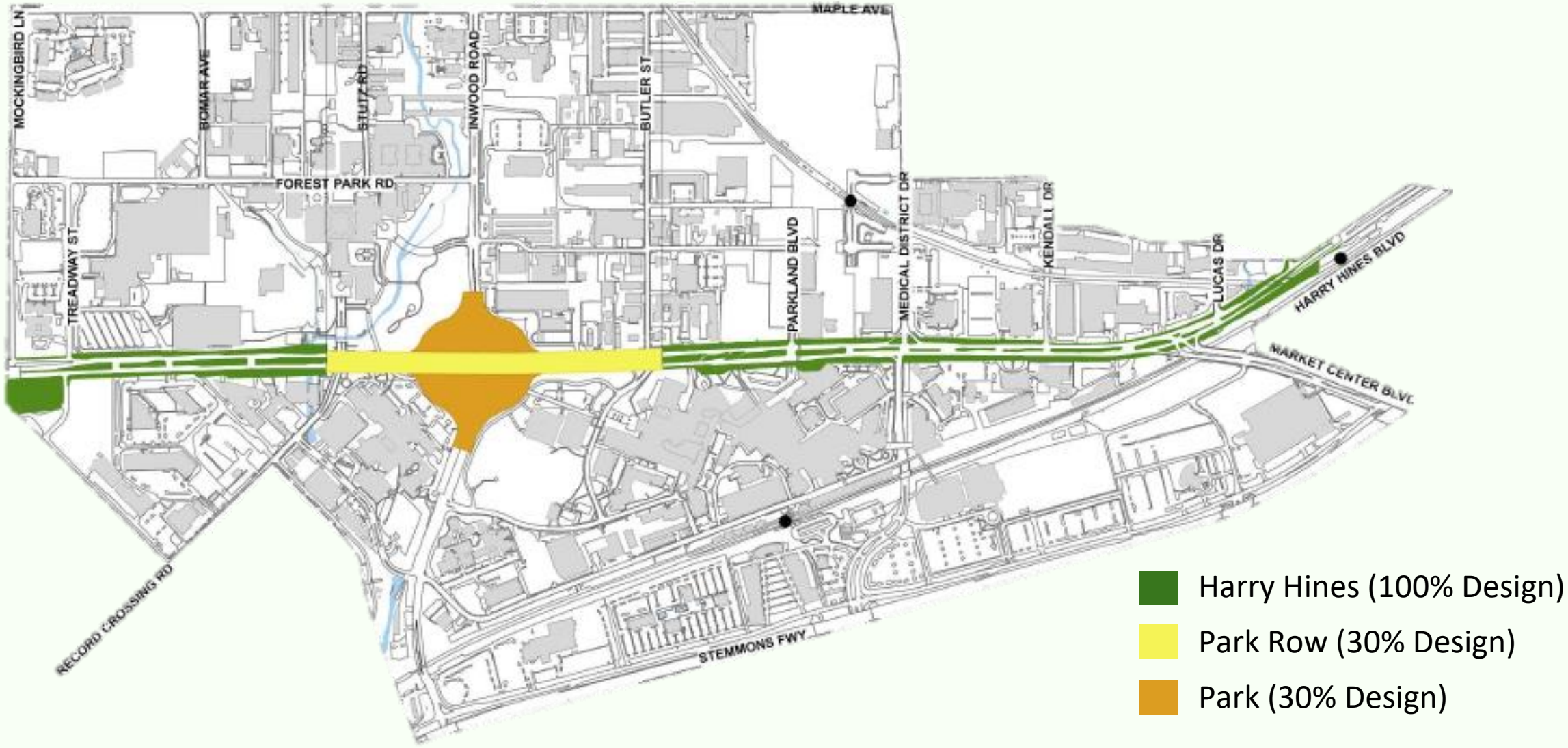
Southwestern Medical District Urban Streetscape and Park

Southwestern Medical District Context

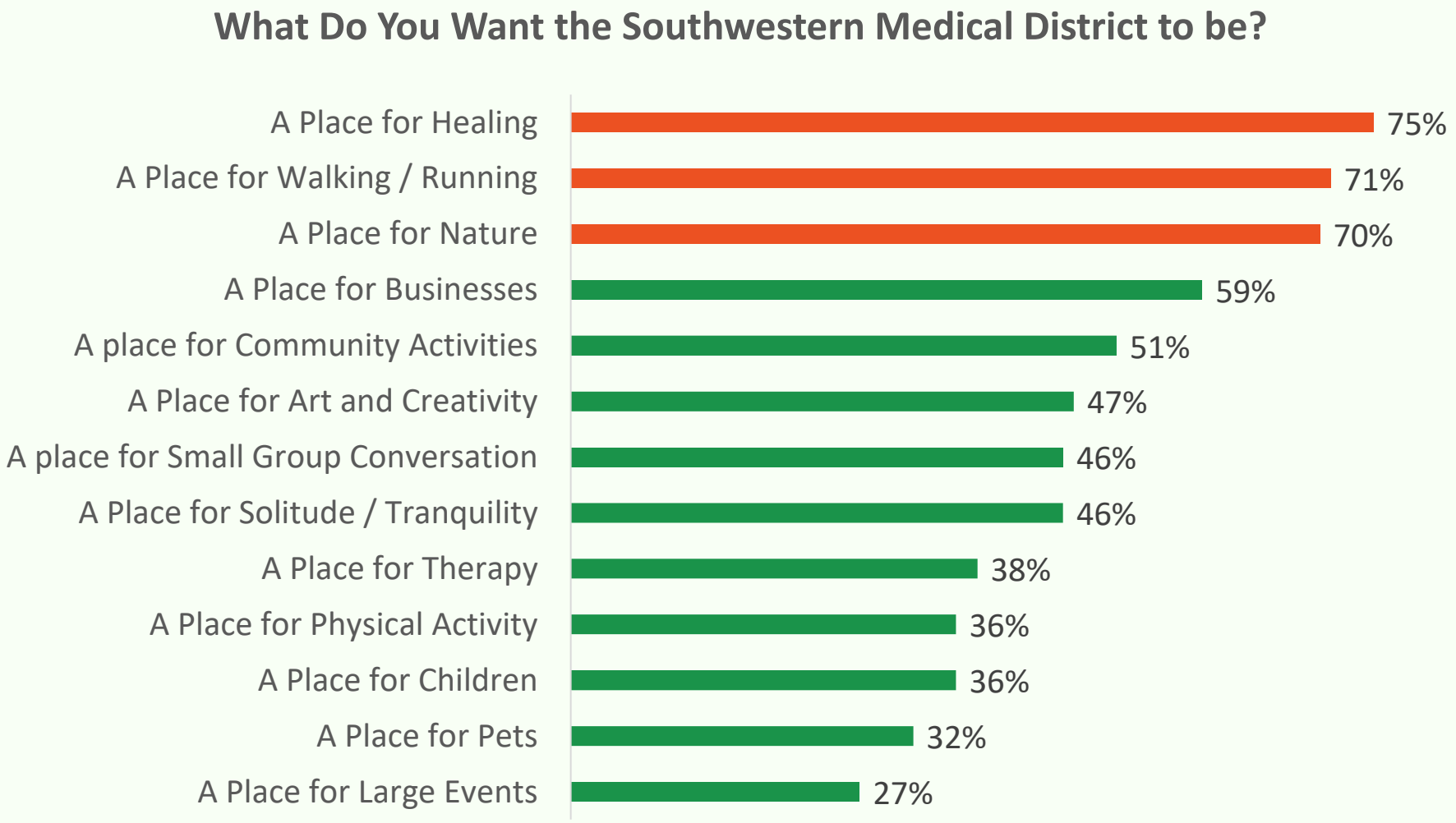
- **37,000** employees
- **2.8 million** annual visits to clinics & ERs
- **3,600** students/ residents/fellows
- **23,000** neighbors living in an around the District
- **16+ miles** of transportation corridors
- **35,000-45,000** vehicles per day projected on Harry Hines



Design and Engineering Scope of Work



SWMD District Identity



*Respondents were able to choose more than 1 answer choice

Park Existing Conditions

Park Vision

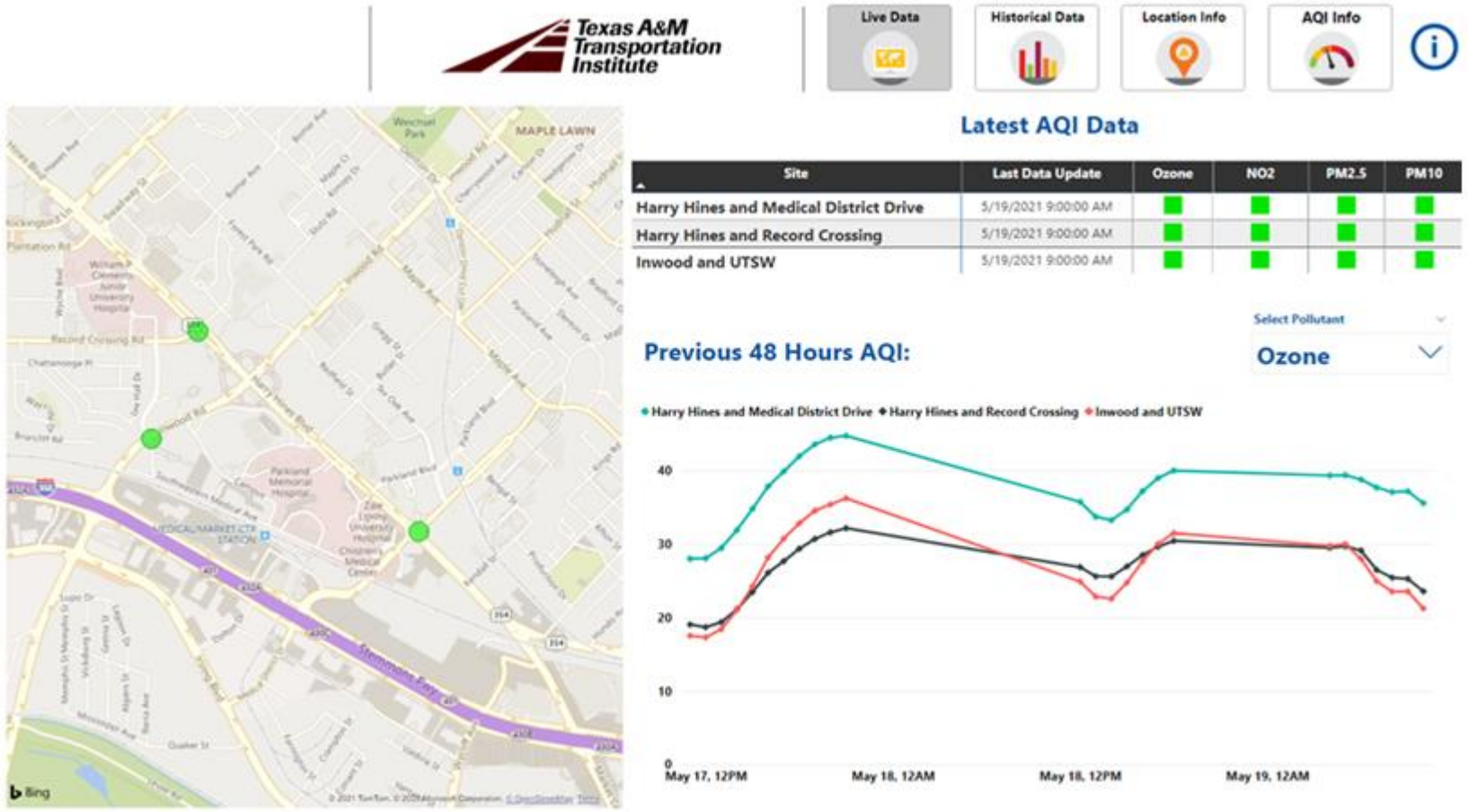
Imagine a Green, Inclusive, Safe, Accessible, and Healthy District

Ambient Monitoring

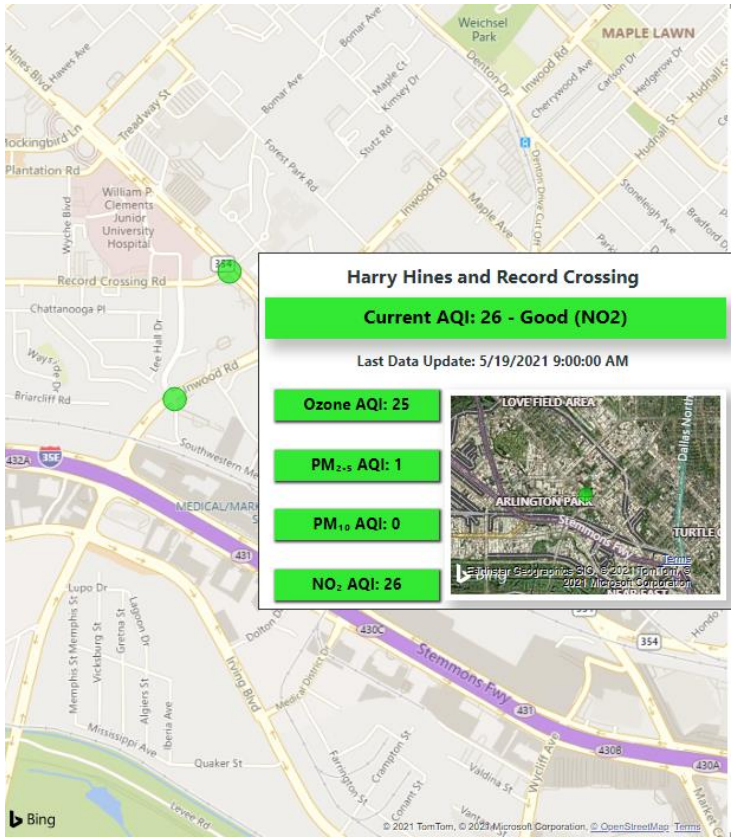
- Low-Cost sensors monitor ambient air quality conditions for Ozone, Nitrogen Dioxide, PM, and VOCs.
- Temperature and humidity also measured and recorded.
- Other pollutants can be added for short term installations.
- Possibility of adding wind speed and direction being analyzed.

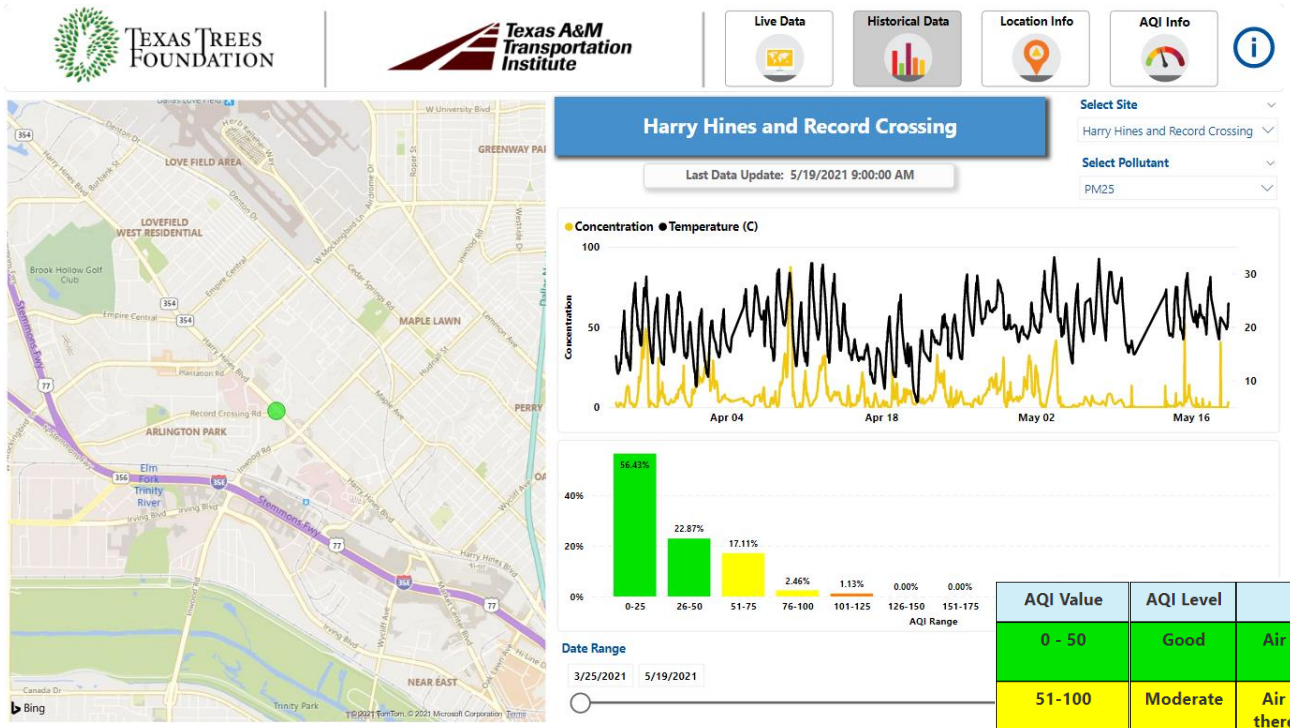
Real-Time Ambient Monitoring System

- **Real-Time ambient monitoring system reports 20-minute delayed data from field installations.**
- **System includes real-time map and historical data by site**
- **System can be customized for specific project related goals and data gathering activities.**



Real-Time Ambient Monitoring System





AQI Value	AQI Level	Description of Air Quality
0 - 50	Good	Air Quality is considered satisfactory, and air pollution poses little or no risk.
51-100	Moderate	Air Quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
101-150	Unhealthy for Sensitive Groups	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
151-200	Unhealthy	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
201-300	Very Unhealthy	Health warnings of emergency conditions. The entire population is more likely to be affected.
301-500	Hazardous	Health Alert: Everyone may experience more serious health effects.

Link to Real-Time Data

Electrifying the future of mobility

Infrastructure for green mobility

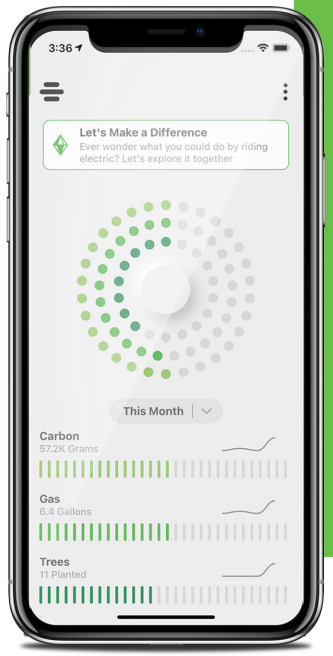
ecarra

Mission Statement

Our mission is to reduce emissions and support the utilization of sustainable vehicles.

Problems we solve

eCarra is a mobility platform provider for carsharing, ridesharing, and fleet management for sustainable vehicles. eCarra empowers new mobility operators, including auto manufacturers, car rental companies, auto clubs, cities, transit agencies, dealer groups, and private fleets to launch, expand, and maximize the utilization of their own ridesharing and carsharing services with the goal of reducing pollution and road congestion.



Headquartered in Texas, eCarra provides an intelligent end-to-end integration platform that enables eCarra customers to launch mobility services quickly, operate efficiently, and scale revenues. Founded in 2018, eCarra has already processed thousands of rides and over 20,000 downloads.

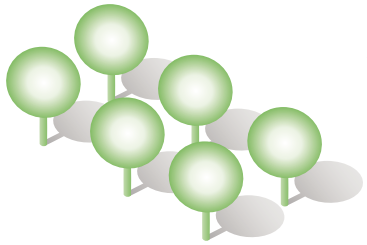
1. **Lack of sustainable transportation:** The average ICE (Internal Combustion Engine) vehicle on a ride-hailing, food delivery or other service platform produces approximately 12 tons of deadly carbon per year. Sustainable vehicles represent less than 1% of the market.

2. **Health issues related to air pollution:** More than 82 million Americans live in communities with air quality that is considered harmful to breathe based on a 2019 survey by the Environmental Protection Agency, and these numbers are growing. The World Health Organization states: “Children are vulnerable to adverse health effects from air pollution which causes an estimated 7 million deaths per year.”

3. **Inconsistent experiences:** While other platforms offer last minute, impersonal solutions, the eCarra platform allows riders and operators to fully customize every aspect of their experiences, down to the desired mood, music, pricing and stops along the way.

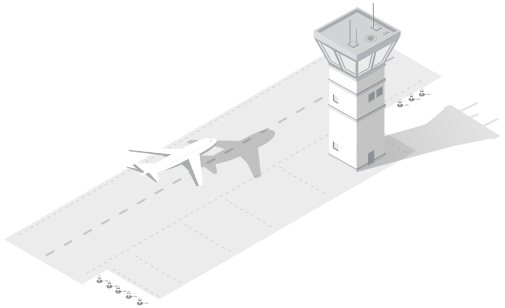
ecarra

We create consistent, eco-guided mobility experiences, plant trees and harvest data

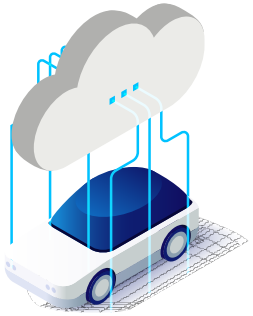


We plant a tree for every movement to **deepen our impact on the environment**

eCarra focuses on **health** and **safety** for passengers and operators



Works collaboratively with airports to meet the demanding **emission goals**



Each vehicle services passengers and provides valuable tools for **public education** and **awareness opportunities**

As a full fleet of electric vehicles, we serve as a critical anchor for much-needed **high speed public charging options**, which would enable rapid deployment in more underserviced parts of cities

Partners with commercial developers and corporatoins to **reduce parking and city congestion**

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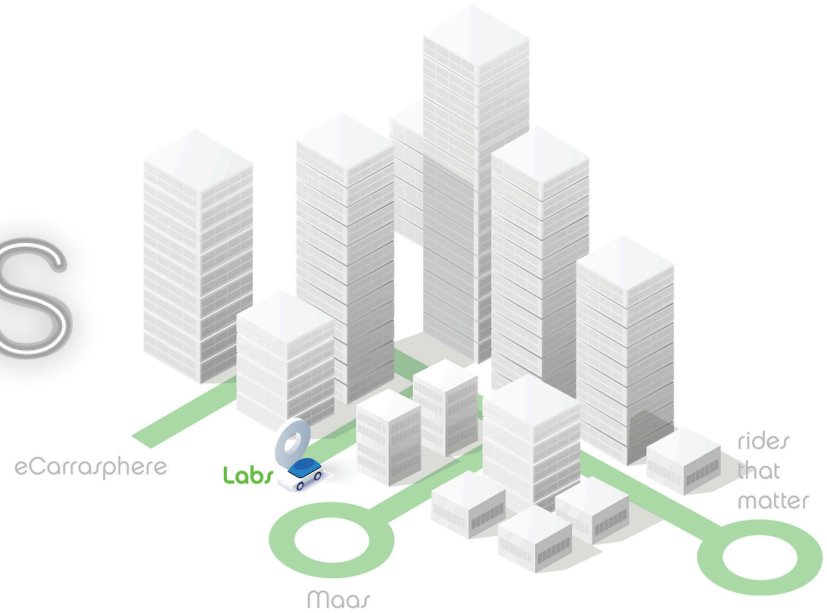
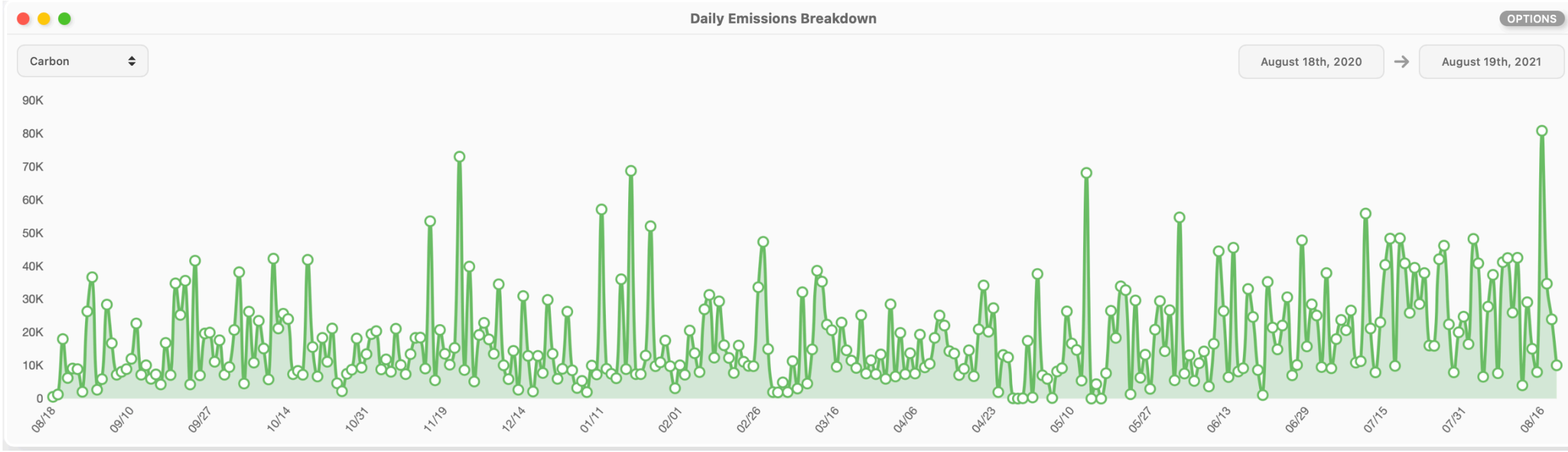
ecarra labs



We eCarra offset pollution, increase reforestation and produce market intelligence on problematic environmental issues throughout communities. We realize there are many challenges we face in the emerging market of electrification. We collects millions of data points to help inform universities, cites and government agencies.

ecarra

ecarra labs



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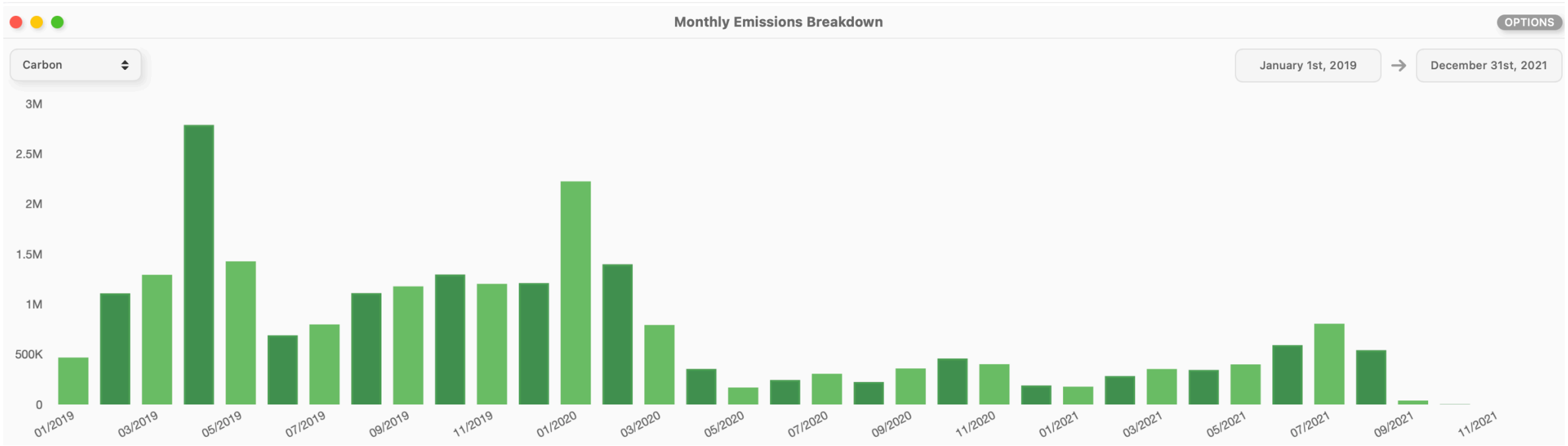
ecarra labs



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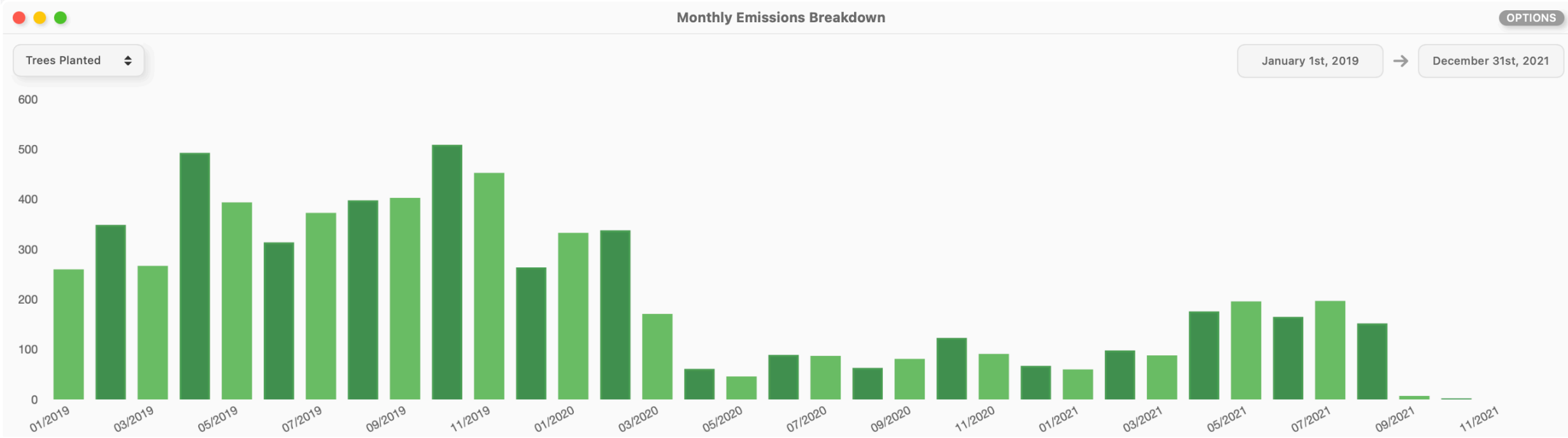
ecarra labs



ecarra

SeedPod (Hyperlocal Mobile Sensor Modules)

Seedpod is a highly scalable air quality sensing platform that provides real-time, hyper-local air quality data. Our vision is to combine and correlate this data with health outcomes and human cognitive behavior to unlock the vision of healthy and equitable communities and sustainable cities.

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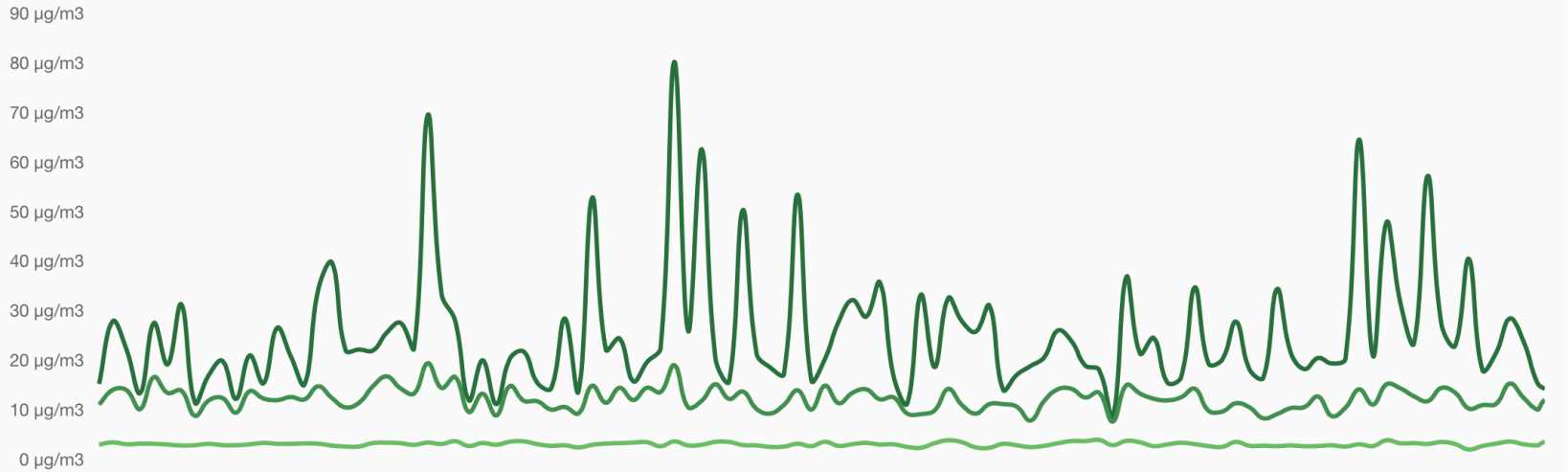
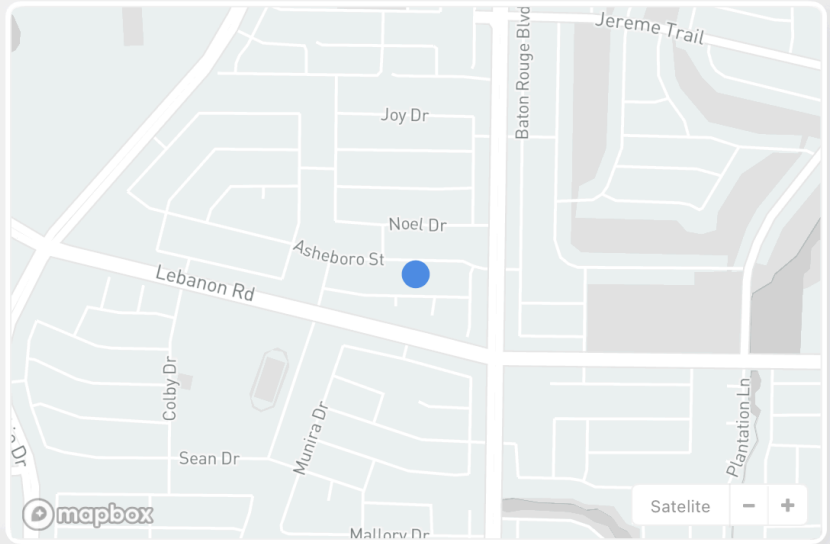
SeedPod
10000000f74d9b85
podOS 2.1





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12:38:13	2.8338193893432617 µg/m3
12:37:58	3.0640673637390137 µg/m3
12:37:43	3.618173599243164 µg/m3
12:37:29	3.1877124309539795 µg/m3

PM2.5
12.01 µg/m3

12:38:28	12.005434036254883 µg/m3
12:38:13	10.042774200439453 µg/m3
12:37:58	12.436164855957031 µg/m3
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PM10
14.25 µg/m3

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12:37:58	23.780988693237305 µg/m3
12:37:43	28.440296173095703 µg/m3
12:37:29	21.5414981842041 µg/m3

Bluetooth
0 clients connected

12:38:14	No client sensor subscriptions found
12:38:00	No client sensor subscriptions found
12:37:45	No client sensor subscriptions found

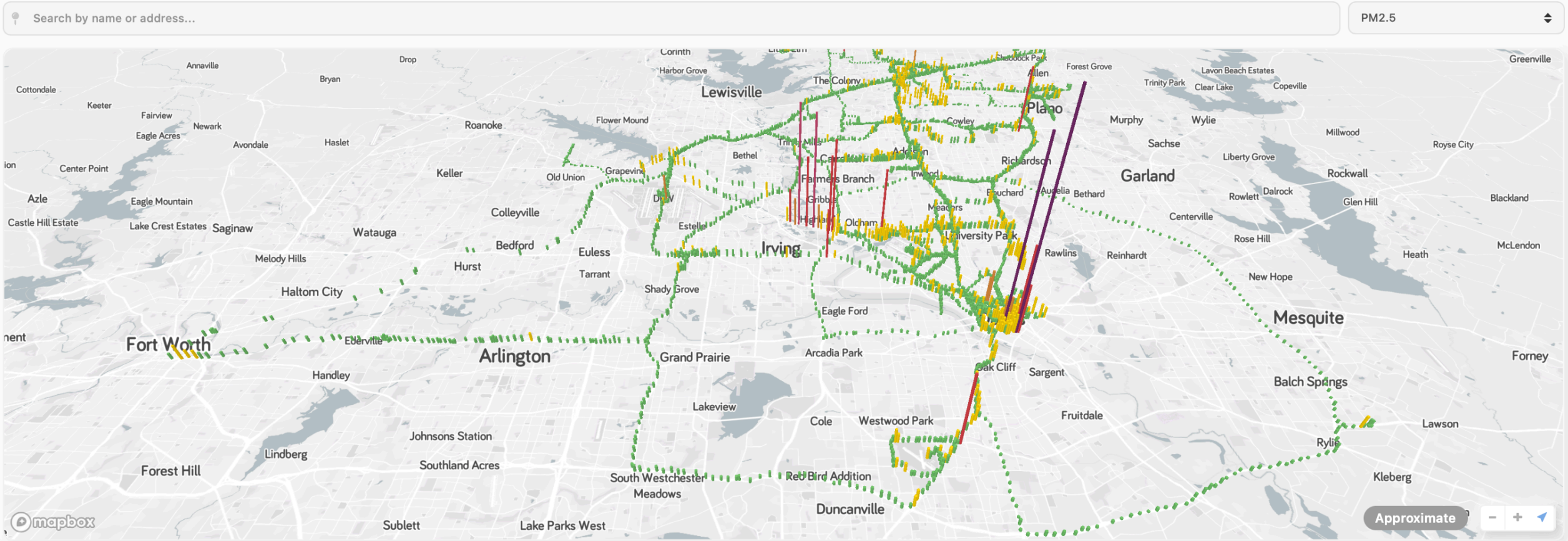
Locations
60 GGA locations logged

Date	Latitude	Longitude	Altitude	Quality	Satelite Count
12:38:28	33.118104	-96.79033	216.9	2	12

System
338 system logs

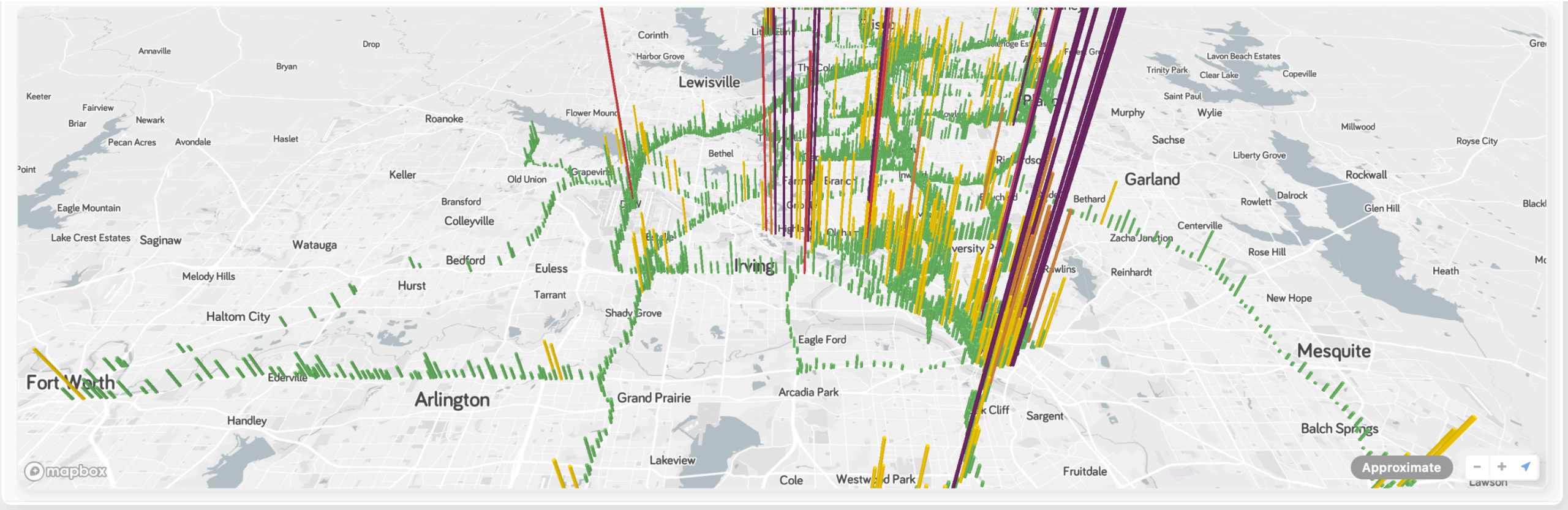
[10s] aq update: payload received from sensor	12:38:28
aq update: payload sent to socket server	12:38:15
[10s] aq update: payload received from sensor	12:38:13

PM2.5


Search by name or address...
PM2.5
Lewisville
Plano
Garland
Irving
Fort Worth
Arlington
Mesquite
Grand Prairie
Carrollton
Farmers Branch
Richardson
Rowlett
Rockwall
Balch Springs
Duncanville
Approximate
mapbox

ecarra

PM10


Annaville
Drop
Bryan
Keeter
Fairview
Briar
Newark
Pecan Acres
Avondale
Haslet
Roanoke
Corinth
Harbor Grove
Lewisville
Flower Mound
Bethel
Keller
Old Union
Grapevine
Bransford
Colleyville
Eagle Mountain
Lake Crest Estates
Saginaw
Watauga
Bedford
Euless
Hurst
Tarrant
Melody Hills
Haltom City
Irving
Shady Grove
Eagle Ford
Arcadia Park
Grand Prairie
Arlington
Fort Worth
Ederville
Handley
Lakeview
Cole
Fruitdale
Sargent
Balch Springs
Mesquite
Garland
Bethard
Reinhardt
Rowlins
Zacha Junction
Centerville
Rose Hill
New Hope
Heath
Rowlett
Dalrock
Glen Hill
Rockwall
Millwood
Royse City
Liberty Grove
Sachse
Murphy
Wylie
Saint Paul
Trinity Park
Clear Lake
Lavon Beach Estates
Copeville
mapbox
Approximate

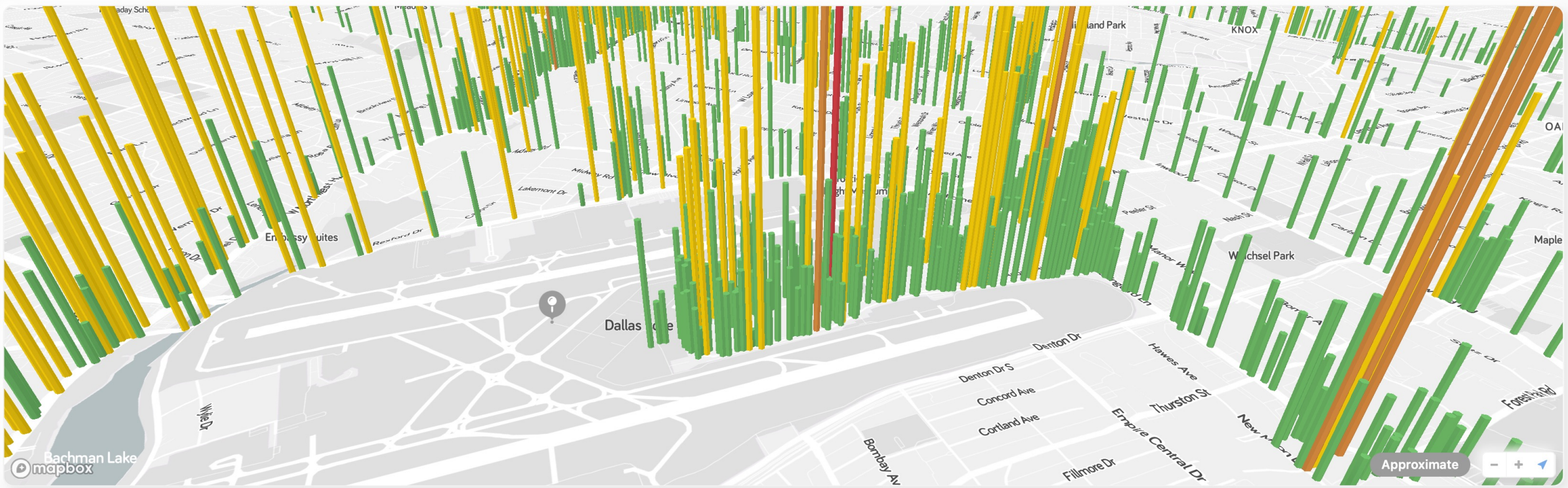
ecarra

PM2.5


University Park
Highland Park
Meaders
Hockaday School
UPTOWN
OAK LAWN
Kroger
Lemmon Ave
Denton Dr S
Thurston St
Mohawk Dr
Webb Chapel Rd
Calvary Hill Cemetery
Denton Dr
Burbank St
Harry Hines Blvd
Pine Creek Medical Center
Prudential Dr
Shorecrest Dr
Gilford St
Langdon Ave
W Amherst Ave
Inwood Rd
Approximate
mapbox

ecarra

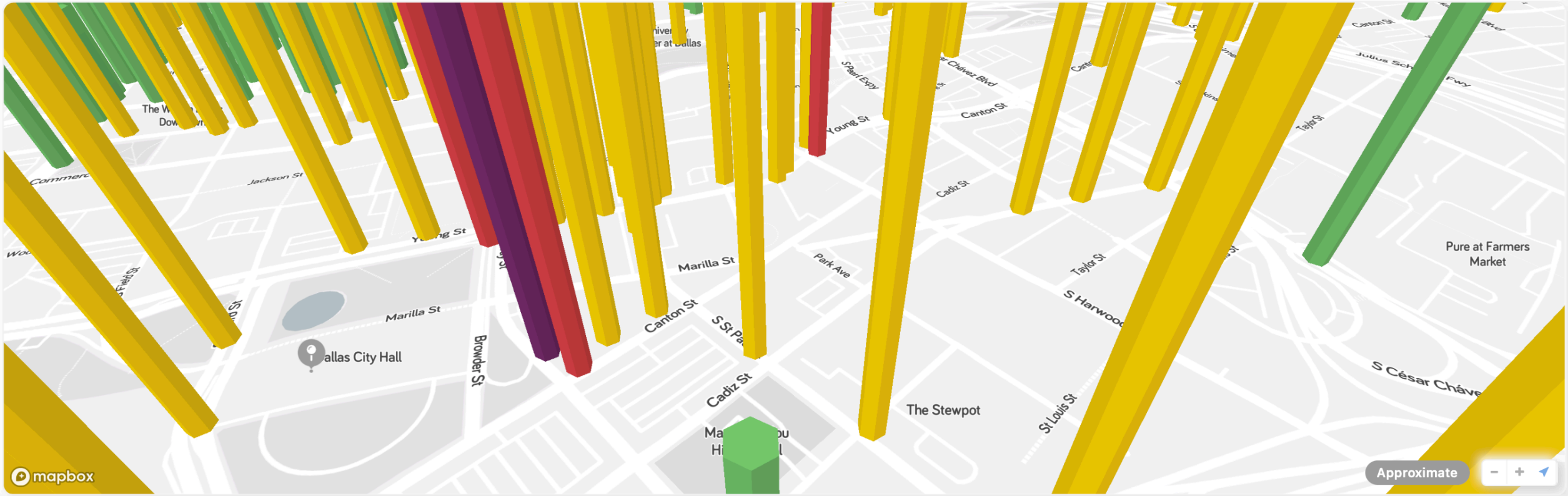
PM2.5


Lakemont Dr
Denton Dr
Denton Dr S
Concord Ave
Cortland Ave
Hawes Ave
Thurston St
Empire Central Dr
Fillmore Dr
Bombay Av
Maple
Approximate
Bachman Lake
mapbox

PM2.5

Dallas City Hall, 1500 Marilla St, Dallas, TX 75201, USA

PM2.5



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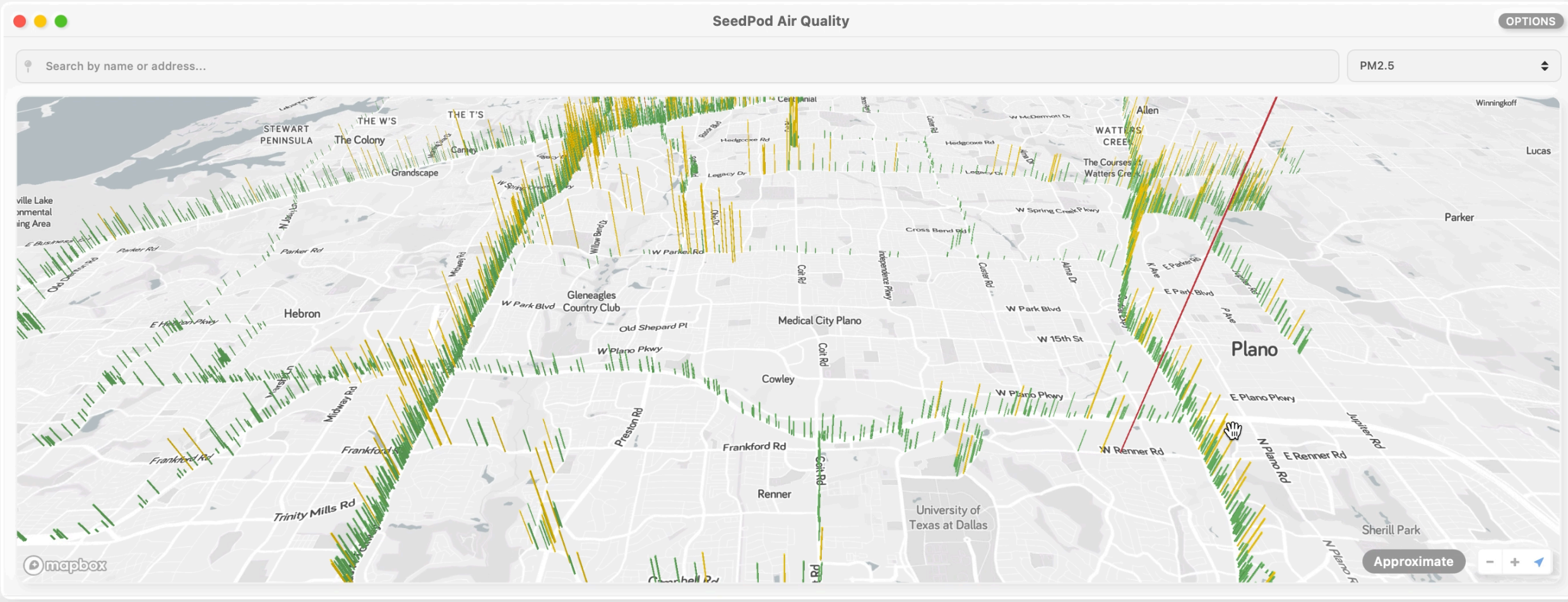

SeedPod Air Quality
OPTIONS
Search by name or address...
PM2.5
STEWART PENINSULA
THE W'S
THE T'S
The Colony
Carrollton
Grandscape
Hebron
Gleneagles Country Club
Medical City Plano
Cowley
Renner
Frankford Rd
Trinity Mills Rd
Midway Rd
Preston Rd
Coit Rd
W Park Blvd
W Plano Pkwy
Old Shepard Pl
Legacy Dr
Hedgcoxe Rd
W Spring Creek Pkwy
Cross Bend Rd
Independence Pkwy
Alma Dr
W 15th St
W Renner Rd
E Plano Pkwy
N Plano Rd
E Renner Rd
Jupiter Rd
Allen
Winningkoff
Lucas
Parker
Plano
Sherill Park
University of Texas at Dallas
Approximate
mapbox

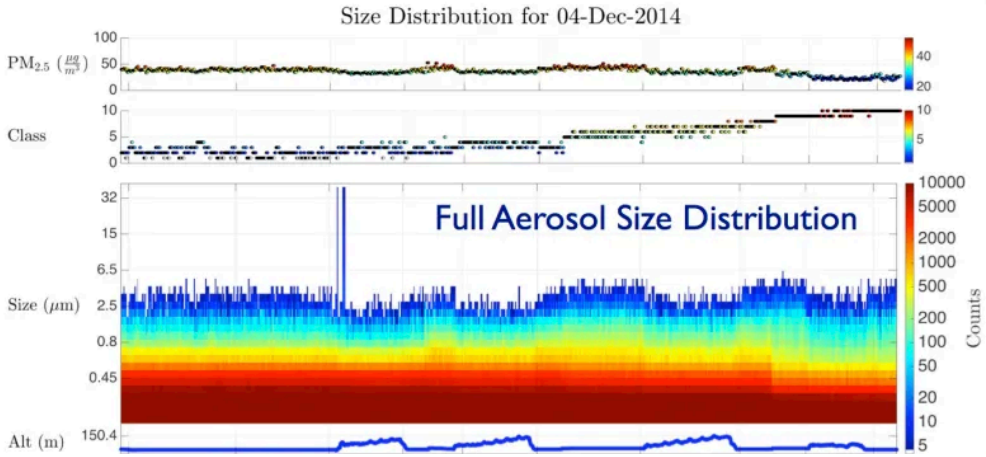
ecarra

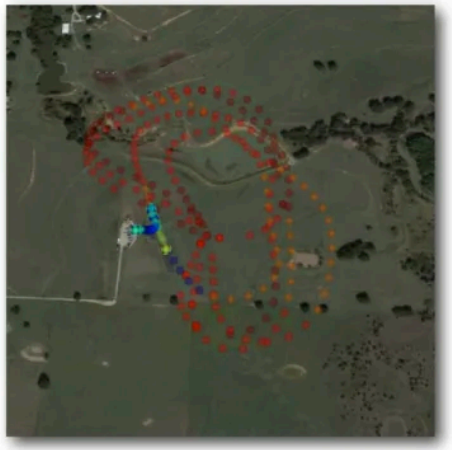
Professor of Physics
Hanson Center for Space, UTD
David Lary

Accomplishments

To the best of our knowledge the *first time* the **full sub-pixel aerosol size distribution has been characterized at high spatial resolution** (sub meter) **and high temporal resolution** (every second) using:

- A zero emission, low cost, electric remote control model aircraft at multiple vertical levels in the lower most 100 m of the atmosphere.
- A car driving daily across a 10 km pixel over an extended period.





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200 VEHICLE ROLLOUT IN DFW

252
Jobs created

3.2m
Rides given

78m
Data points generated monthly

3b
Data points

3m
Gallons of gas saved

1m
Pounds of Carbon saved monthly

35m
Accumulated pounds of Carbon saved

38m
Accumulated revenue

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Future of Seedpod

- Historic AQ readings from street level.
- Detect Possible harmful contaminates in real time.
- Examine associations between asthma morbidity and local ambient air pollution in areas with relatively high levels of pollution.
- Build out calibration infrastructure for fleets.
- Add other sensors of interest for mapping health outcomes.
- Perform air quality sensing experiments in idle fleets under eCarra Labs.
- Utilize drone sensing platform for providing Sensing As A Service (SAAS).
- Improve rider and driver health via smart, in-cabin, air purification control.
- Provide benefits to people with disabilities and respiratory issues.

thank you

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For more information contact Rock Robinson

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Questions about how to invest in us?

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