Identifying Accessibility of Multi-Family Housing to Public Electric Vehicle Charging

Dallas-Fort Worth CLEAN CITIES

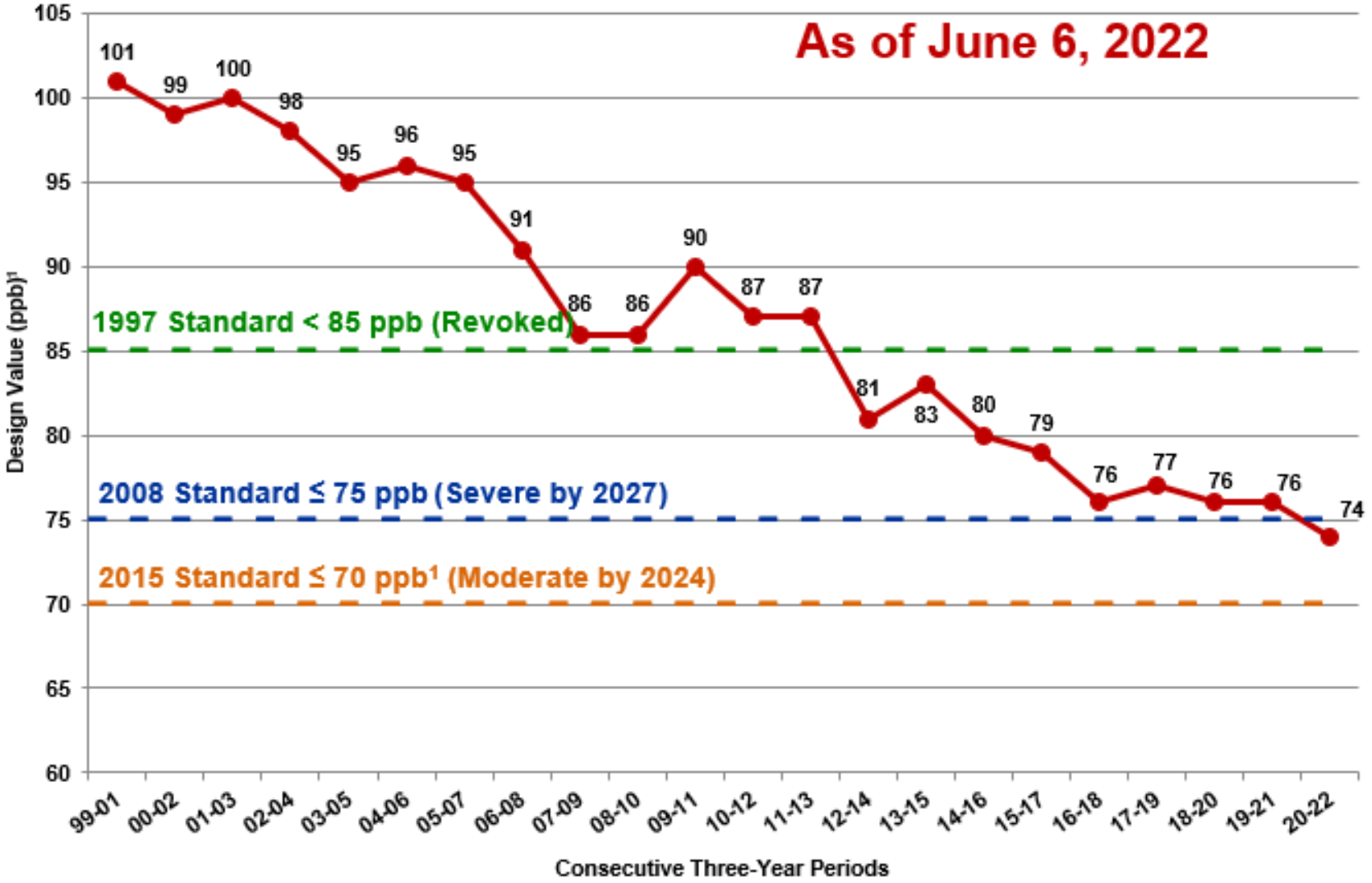
North Central Texas Council of Governments

Dallas Fort Worth Clean Cities Coalition

June 2022

8-HOUR OZONE HISTORICAL TRENDS

Electric Vehicles produce no emissions, so higher EV adoption rates can help decrease ozone trends



Attainment Goal - According to the US EPA National Ambient Air Quality Standards, attainment is reached when, at each monitor, the *Design Value* (three-year average of the annual fourth-highest daily maximum eight-hour average ozone concentration) is equal to or less than 70 parts per billion (ppb).

Source: NCTCOG TR Dept

REGIONAL AND NATIONAL ELECTRIC VEHICLE TRENDS

Regional Trends (June 2022)[1]

46,067 EVs Regionwide

32.5% Average Annual Growth in EV Registration 2015-2020

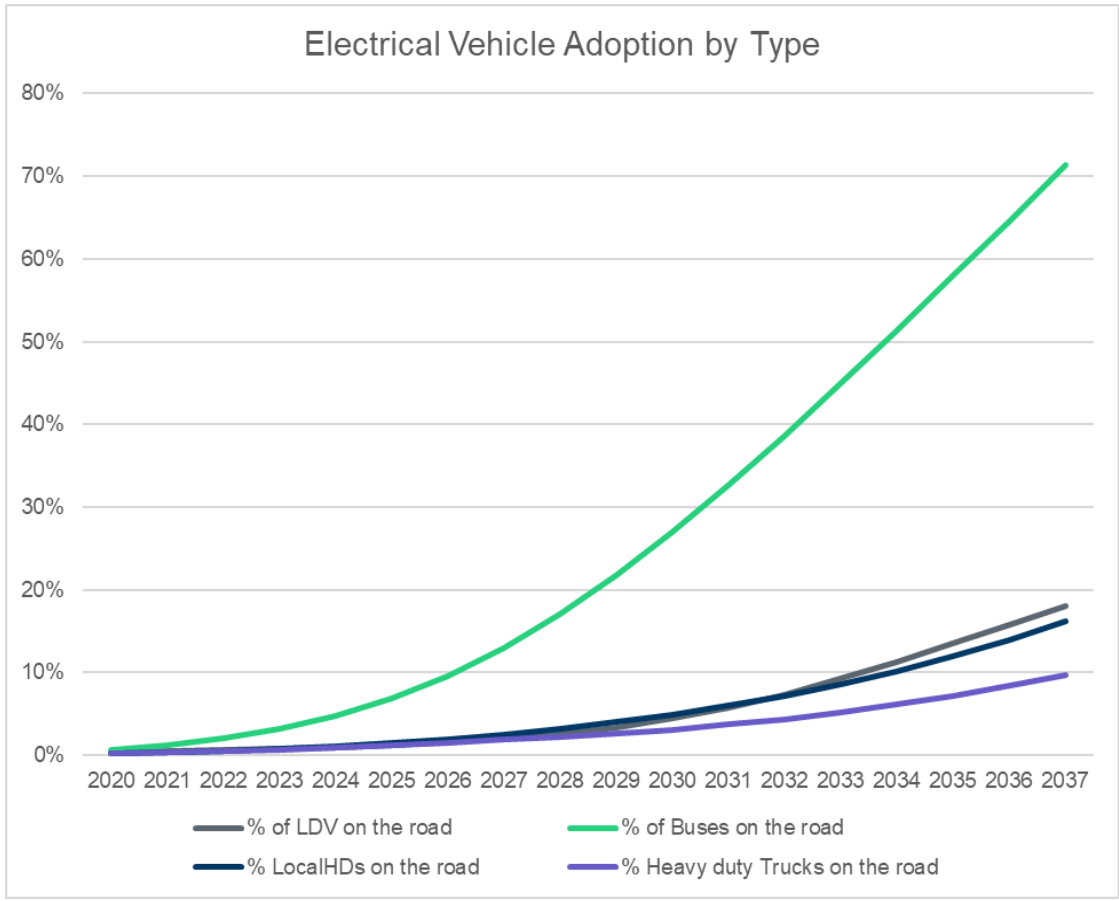
National Trends

EV Fleet Has Doubled in Past 4 Years[2]

EVs >5% of all New Car Sales in 3rd Quarter 2021[3]

Bloomberg New Energy Finance Suggests EVs ~20-30% of New Sales by 2025[4]

Executive Order Aims for Half of All New Vehicles Sold in 2030 be Zero-Emission[5]



Source: Electric Reliability Council of Texas (ERCOT) Long-Term System Assessment, https://www.ercot.com/gridinfo/planning. Uses an adjusted (delayed) forecast from Bloomberg New Energy Finance Electric Vehicle Outlook (https://about.bnef.com/electric-vehicle-outlook/).

[1] NCTCOG EV Registration Data, based on DMV Registration (https://www.dfwcleancities.org/evsinnorthtexas); [2] EPA Automotive Trends Report (https://www.epa.gov/automotive-trends); [3] Atlas EV Hub (https://www.atlasevhub.com/tools-resources/quarterly-review-of-ev-market/); [4] Zero-Emission Vehicles Factbook (https://assets.bbhub.io/professional/sites/24/BNEF-Zero-Emission-Vehicles-Factbook_FINAL.pdf); [5] White House News Room (https://www.whitehouse.gov/briefing-room/statements-releases/2021/08/05/fact-sheet-president-biden-announces-steps-to-drive-american-leadership-forward-on-clean-cars-and-trucks/)

MULTI-FAMILY PROPERTIES (MFP) & EV CHARGING INFRASTRUCTURE

Lack of access to EV charging is one of the top barriers to adoption

- Most multi-family residents do not have the ability to charge their car at home

Many multi-family residents rely on workplace or public charging stations elsewhere to charge their vehicles

Local governments can increase access by strategically creating new EV charging stations near multi-family properties

18.2% **Percent of Residents in the Dallas-Fort Worth-Arlington Urbanized Area Living in Apartments**

Source: 2019 American Community Survey, 1-Year Estimates, US Census Bureau

ANALYSIS FOCUS

WHAT: Dallas-Fort Worth Clean Cities Coalition conducted an analysis for the City of Dallas, comparing accessibility of public electric vehicle charging stations and multi-family properties within the city limits.

The study was replicated with the City of Denton and a replication guide was created for other local municipalities to follow.

WHY:

To Assess Resident Proximity to Public-Access EV Charging Stations

To Identify Charging Gaps and Assess Equitability Needs

Present Findings to the City to Help Guide City Action and Future Investments

Educate Cities to Replicate & Improve Access Within Their Jurisdiction

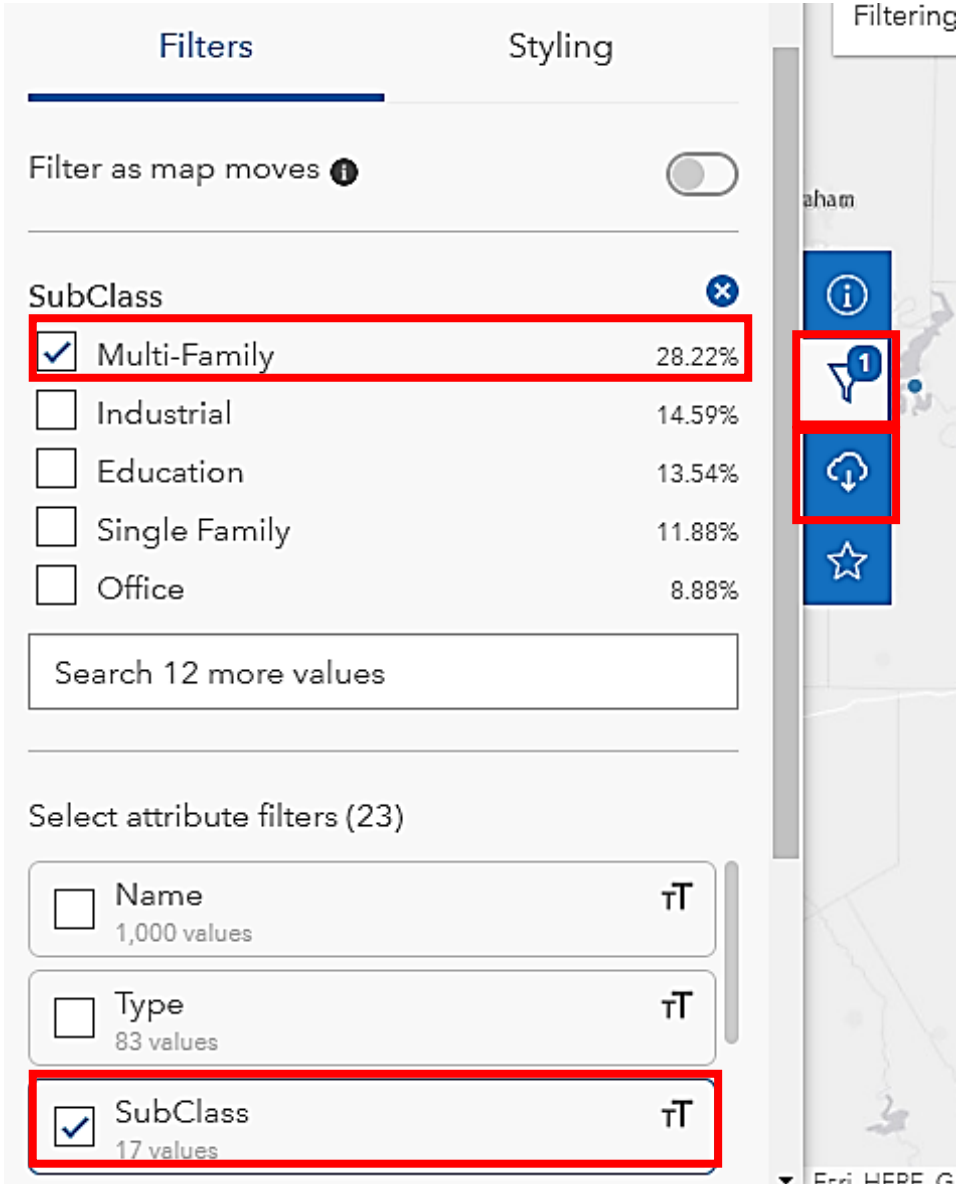
DATA NEEDS

Multi-Family Property Site Addresses and Unit Totals

Why: Identify Multi-Family Property site data for within the jurisdiction

Source: Multi-family addresses and property unit totals selected and trimmed down to the specified study area through NCTCOG Regional Data Center Developments Dataset

Tip: Filter data to only multi-family properties by selecting the Multi-Family record in the SubClass field and toggling filters in the download options



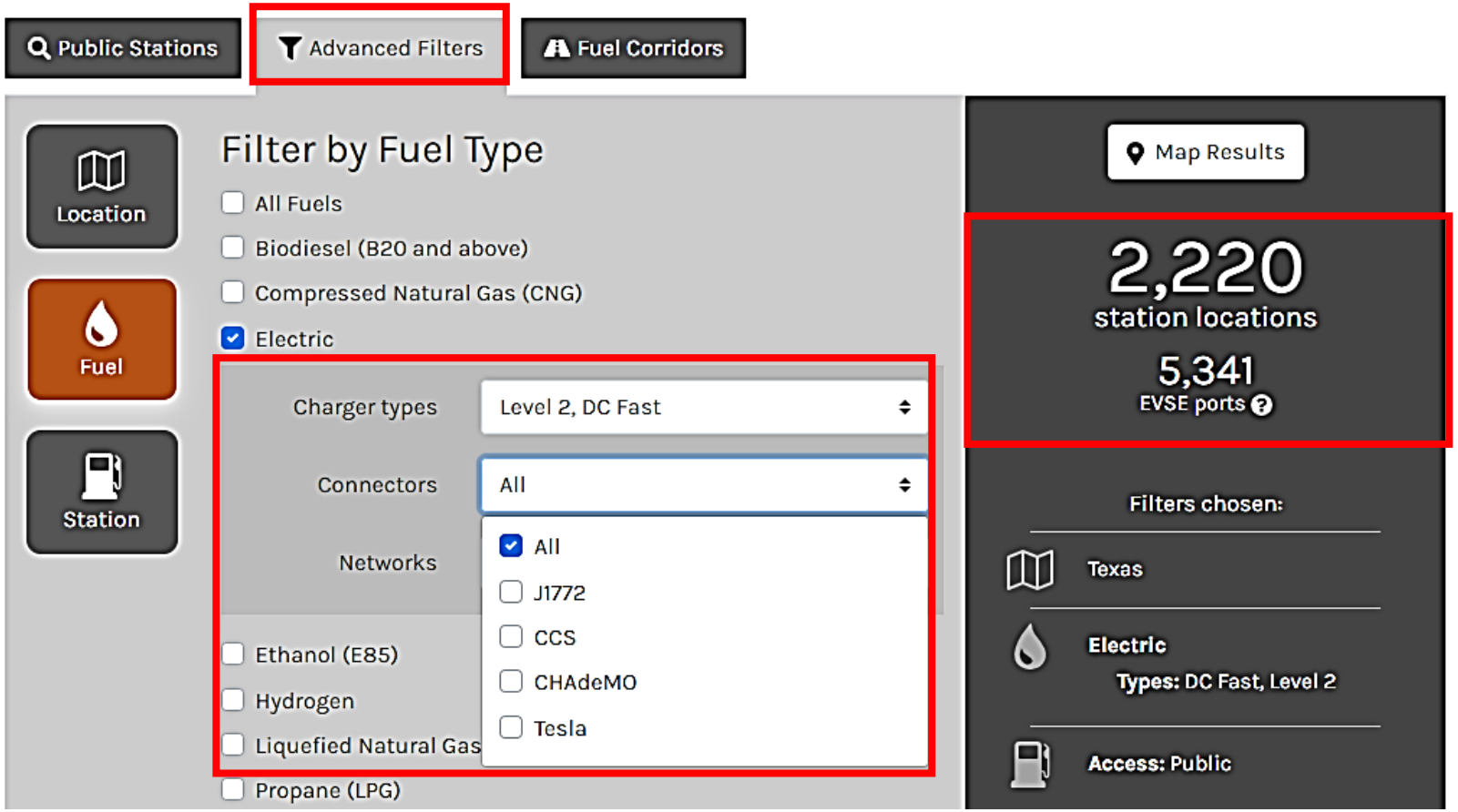
DATA NEEDS

Public EV Charging Sites

Why: Identify all publicly available electric vehicle charging station locations in the jurisdiction

Source: Alternative Fuel Data Center Station Locator

Tip: Collect any private on-site charging property data and submit to AFDC. Additionally, contact NREL to see if there are any existing multi-family private stations listed in the area being analyzed



DATA NEEDS

Electric Vehicle Registration Data (Optional)

Why: Identify where electric vehicles are currently residing in any of the multi-family properties across the jurisdiction.

DFW Clean Cities, through NCTCOG, purchases Texas Department of Motor Vehicle's vehicle registration data and performs EV queries to obtain an up-to-date list of registered vehicles and their addresses.

Source: Electric Vehicles North Texas EV Registration Tools

Tip: DFW Clean Cities can identify individual multi-family property addresses that have an EV registered in your study area. If your organization wants to utilize this aspect of the analysis, please email your organization's name, study area, and points of contact to cleancities@nctcog.org

DATA NEEDS

Environmental Justice/Equity Data

Why: To determine if there is an inequitable distribution of existing publicly available infrastructure to multi-family residences in areas with higher proportions of lower income or minority populations compared to higher income multi-family properties

Source: NCTCOG North Texas Environmental Justice Data

Tip: Click top right corner to download environmental justice data

Alternative Source: Electric Vehicle Charging Justice40 Map

United States Census Geography Boundary Data

Why: To analyze and map within the jurisdiction on smaller scales to give more insight on infrastructure accessibility gaps

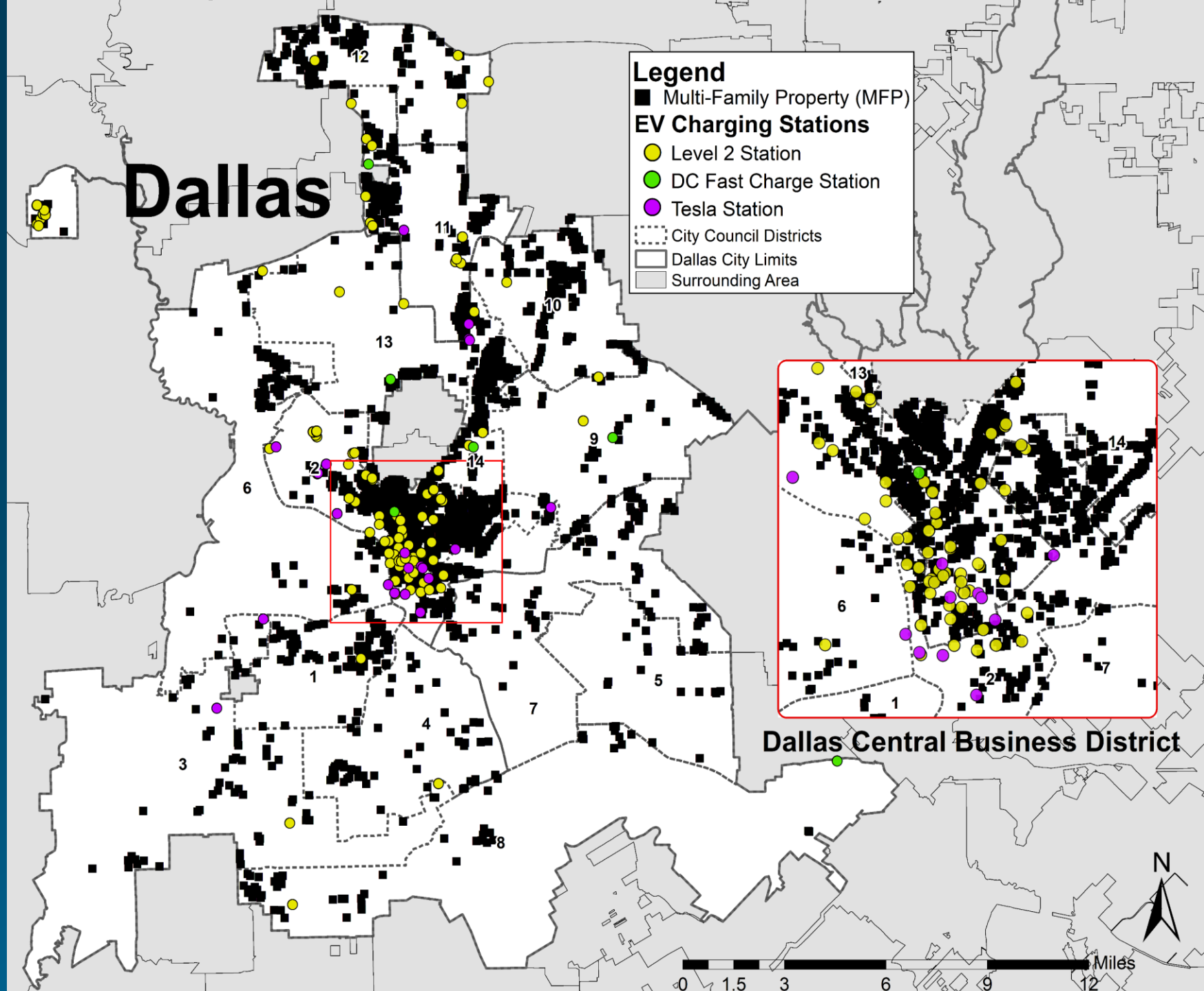
Special Study Area Boundaries, As Appropriate

Why: Add additional geographic breakdowns of study area boundaries (Ex: City Council Districts) to better understand and educate of increased opportunities in areas represented.

Map Your Data

MULTI-FAMILY PROPERTIES AND LOCATION OF PUBLIC ACCESS EV CHARGING STATIONS

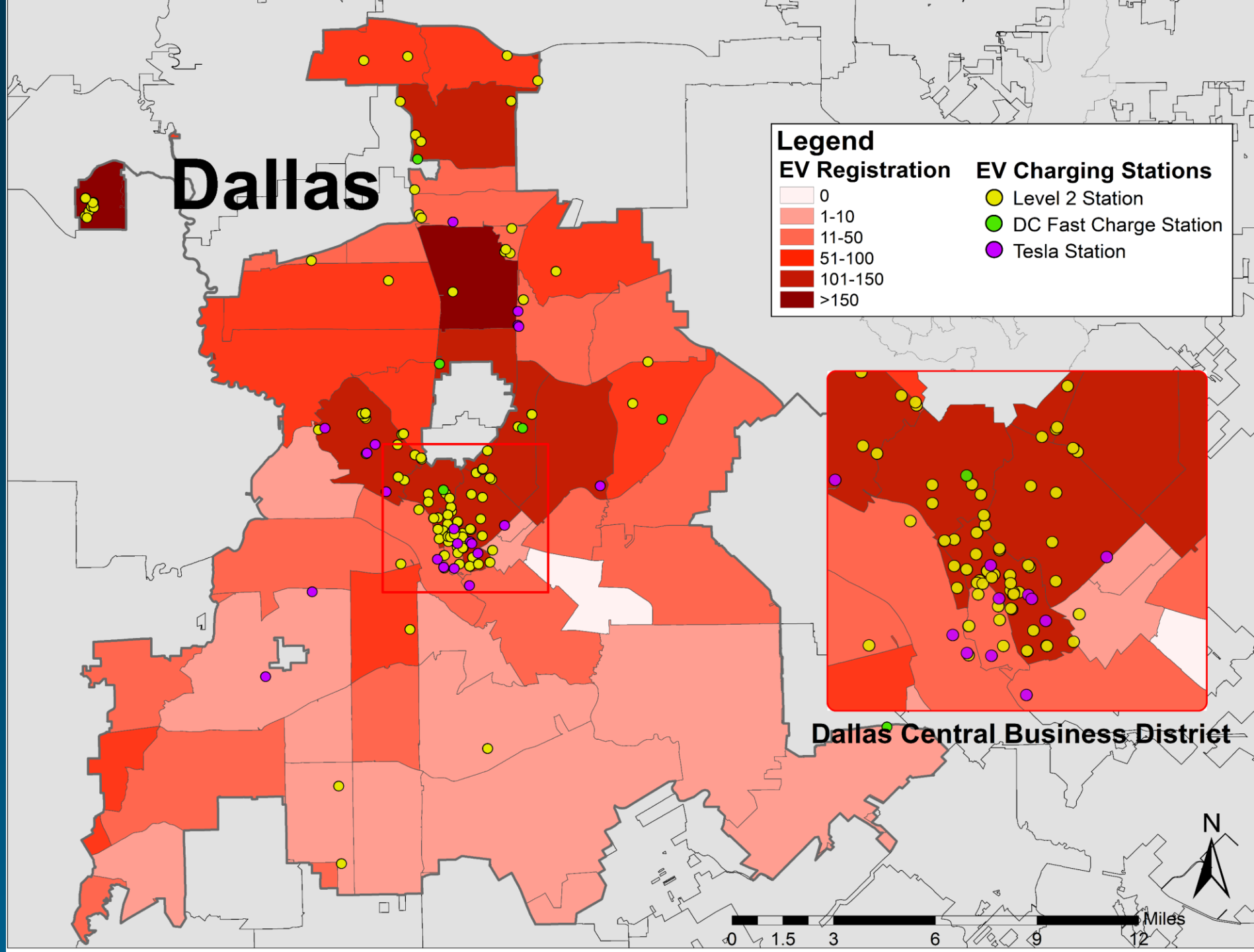
Map EV charging stations based on station type



Source: NCTCOG Data (from Texas DMV Registration), U.S. DOE, Alternative Fuels Station Locator

EXISTING EV REGISTRATION BY ZIP CODE & PUBLIC EV CHARGING STATIONS

Join EV registration to zip code boundaries

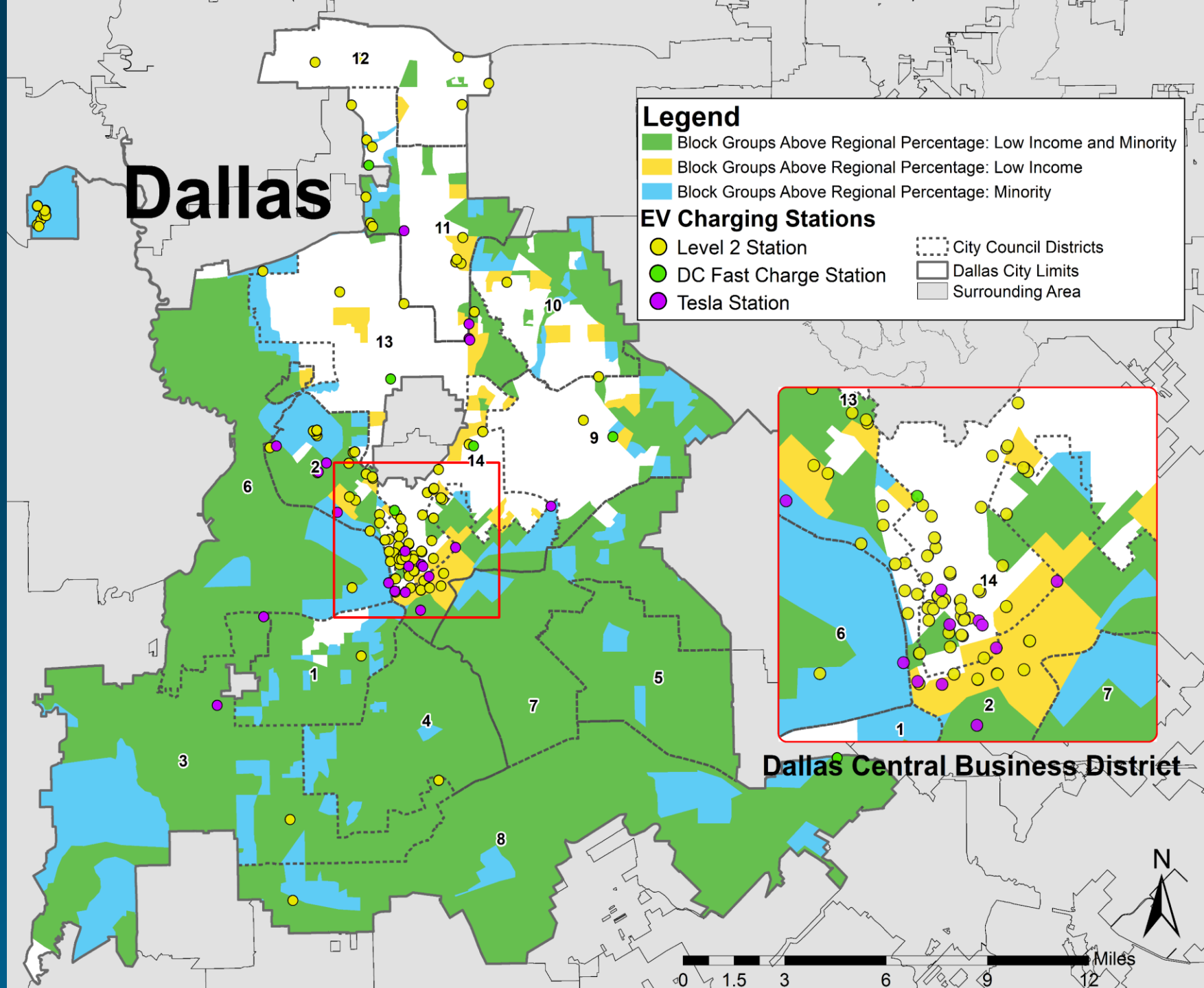


NCTCOG ENVIRONMENTAL JUSTICE INDEX AND PUBLIC EV CHARGING STATIONS

Relatively few EV charging stations are located in environmental justice areas.

The NCTCOG Environmental Justice (EJ) Index identifies block groups that are above the region's percentage for low-income (below poverty) individuals (16.11% of population), minority (54.67% of population), or both.

Source: NCTCOG Environmental Justice Index



ANALYZE YOUR DATA

DFW Clean Cities staff evaluated two major elements to EV charging accessibility:

1. **Proximity** (EV chargers were located nearby, based on a distance buffer). That is, an EV driver can reasonably find a publicly available charger nearby.

2. **Availability** (ratio of EV charger plugs to multi-family housing units within a given Census geography). In other words, while a charger may be available across the street, if 500 EV owners are competing to use the same plug, that charging station may not really be as 'available' as one further away with less demand.

PROXIMITY ANALYSIS

Define what accessibility means for your community

DFW Clean Cities used a ½ mile radius from each multi-family property to assess walkability to existing charging stations to be consistent with transit walkability parameters.

Set Accessibility Buffer

Set walkability distance from public EV charging sites by creating a buffer (1/2 mile)

Identify Accessible Properties

Identify multi-family properties that are within each buffered zone

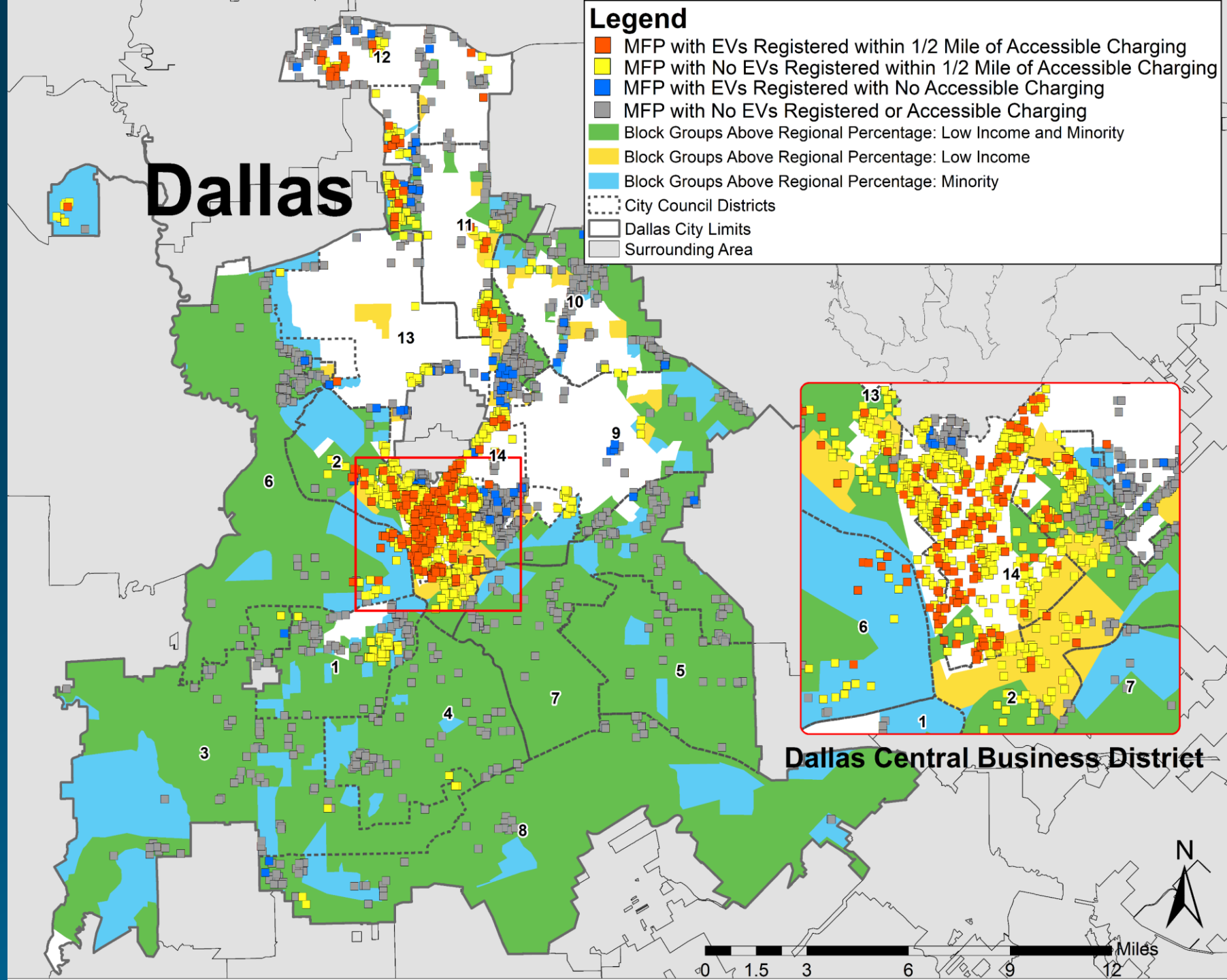
Determine Equity Gaps

Count multi-family properties that are within EJ areas

To get a list of properties within your jurisdiction that have EVs registered, contact DFW Clean Cities

MULTI-FAMILY PROPERTIES WITH AND WITHOUT CHARGING STATION ACCESS OR REGISTERED EVs

CITYWIDE	
MFPs Without Nearby Charging	**MFPs in an EJ Area Without Nearby Charging**
54%	67%



AVAILABILITY ANALYSIS

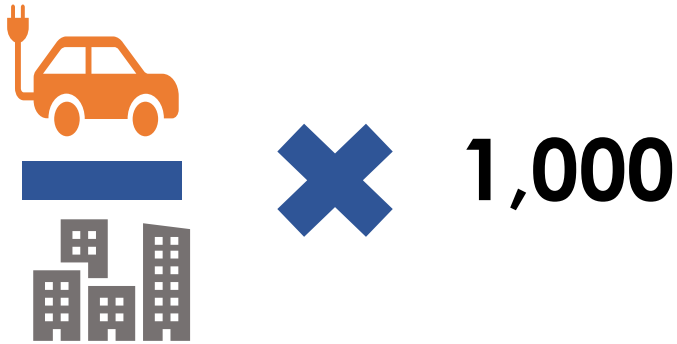
Create Metrics to Comprehensively Understand Regions

Make sure to only use the total number of plugs for each EV charging station and number of units at multi-family properties

Join Plugs and Units to Census Geography

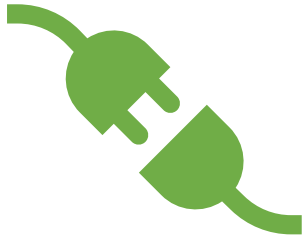
Sum number of plugs and units from charging sites and multi-family properties to census geography

Calculate Plugs Per 1,000 Units



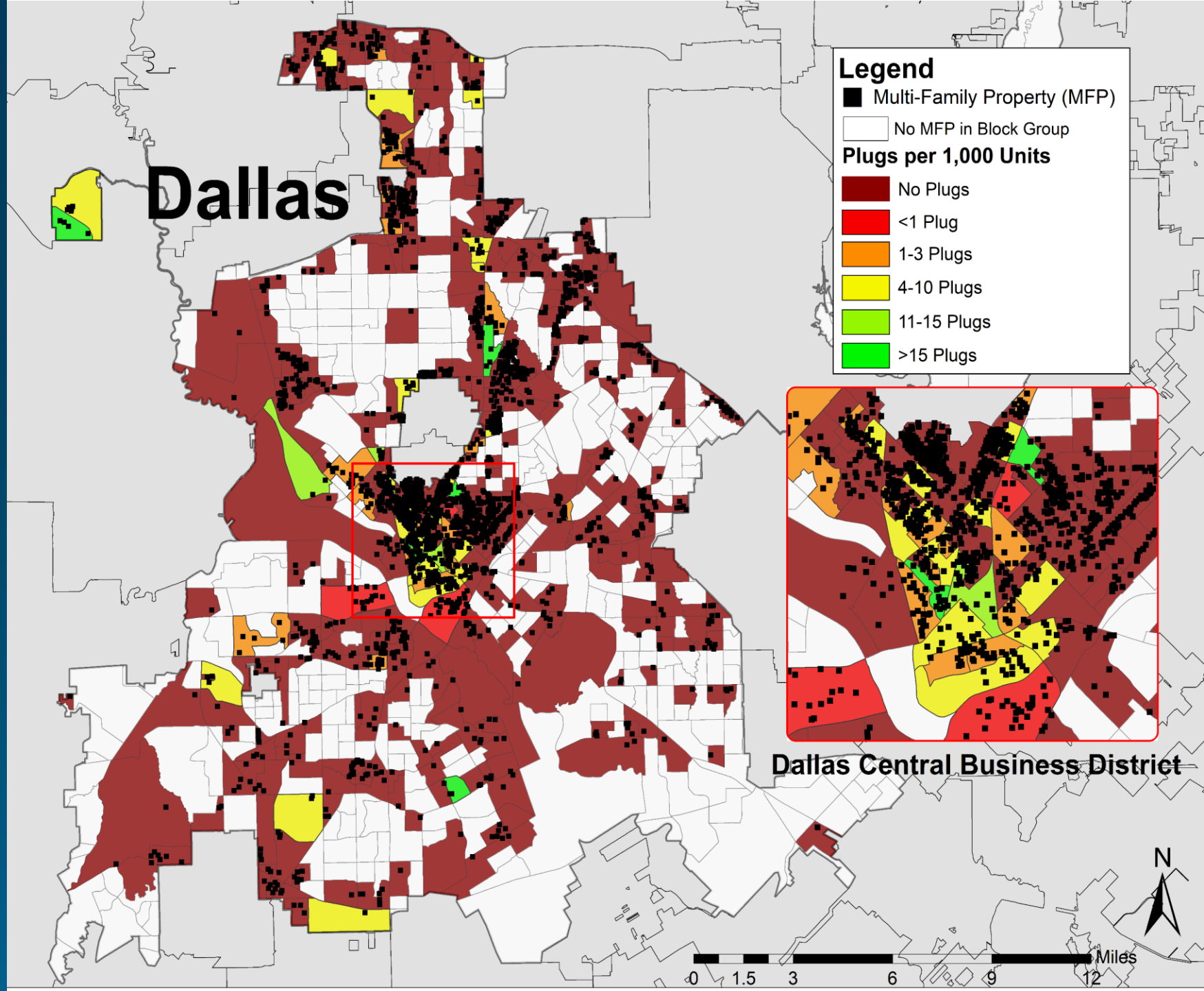
Divide number of plugs by number of units and multiply by scaled value

Utilize Results



Results in total ratio amount of accessible EV charging plugs per 1,000 units within each census geography

MULTI-FAMILY PROPERTIES AND AVAILABILITY OF PUBLIC ACCESS EV CHARGING BY BLOCK GROUP



Source: NCTCOG Data (from Texas DMV Registration), U.S. DOE, Alternative Fuels Station Locator

CHART AND SHOWCASE YOUR MAP DATA

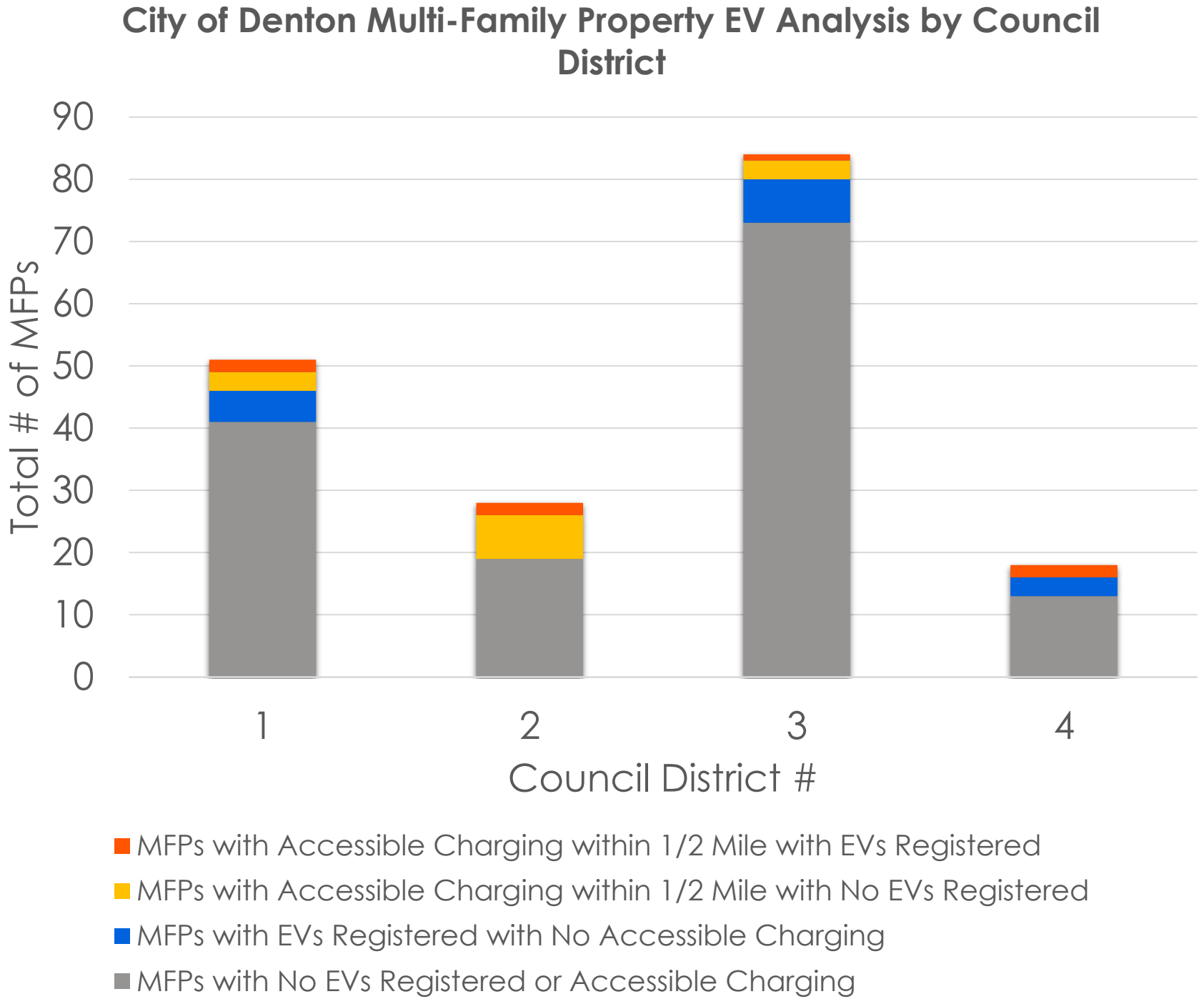
Once data is mapped, its important to take the results and input into differing tables, charts, and graphs

Export map data into Excel and create different visualizations to help solidify the messaging of the map itself

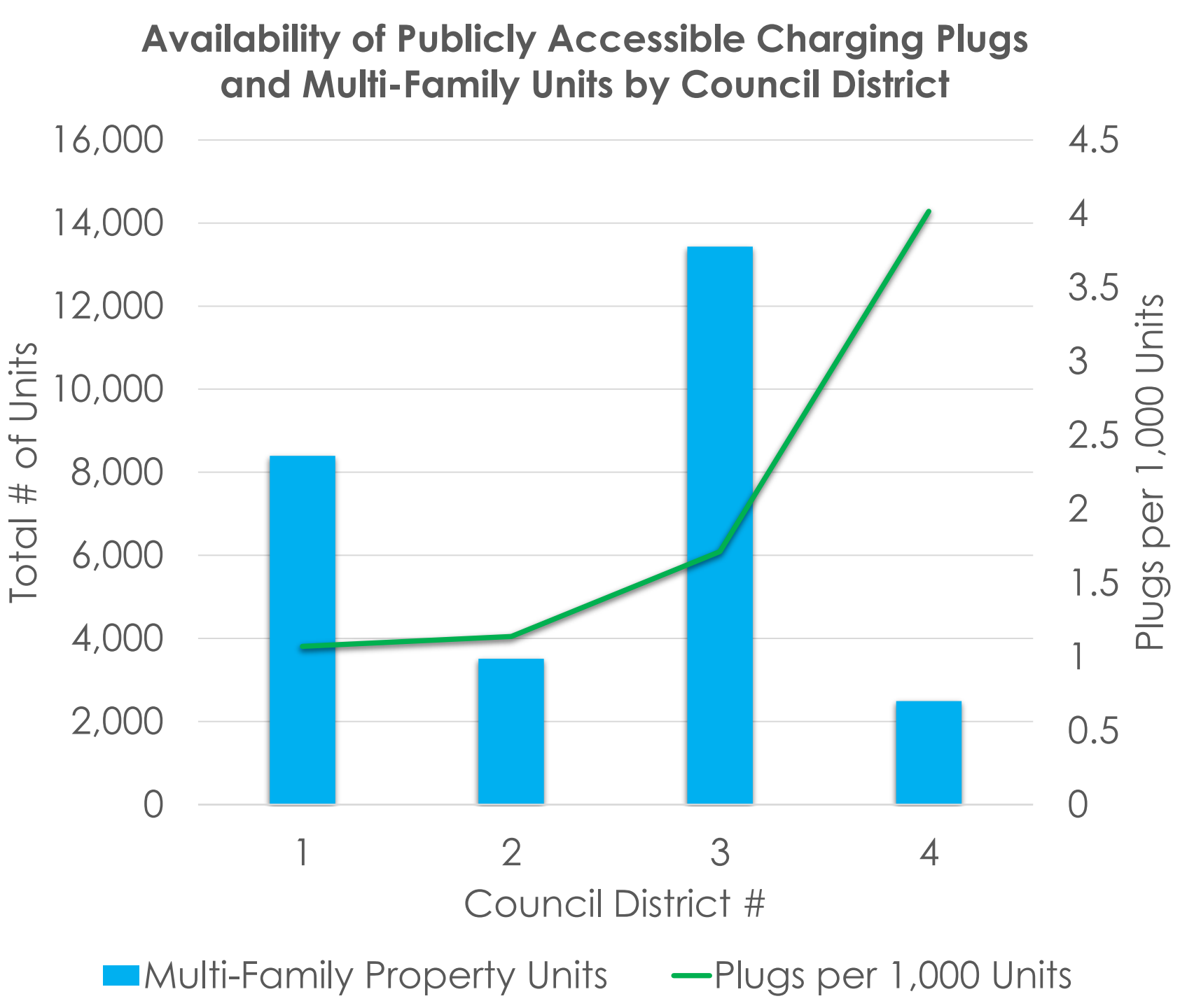
Cater Data to Audience

Visualizing data in different ways can help achieve a message and guide the audience to better understand the driving forces behind the analysis

CITY OF DENTON PROXIMITY ANALYSIS VISUALIZATION



CITY OF DENTON AVAILABILITY ANALYSIS VISUALIZATION



CITY OF DENTON PROXIMITY AND AVAILABILITY ANALYSIS VISUALIZATION

Council District	Multi-Family Properties Without Nearby Charging		Public Charging Plugs per 1,000 MFP Units
	Overall	In an EJ Area	
1	90%	93%	1.1
2	68%	64%	1.1
3	95%	100%	1.7
4	89%	100%	4.0

CITY AVERAGE		
Multi-Family Properties Without Nearby Charging		Public Charging Plugs per 1,000 MFP Units
Overall	In an EJ Area	
89%	92%	1.7

PROPOSE NEXT STEPS FOR ACTION

In order to see results and changes based on the analysis, encourage action using the data as a foundational support to help further increase EV charging accessibility for your residents.

EXAMPLE:

Continue Existing City Efforts

Coordination with the apartment associations, direct outreach to multi-family properties, applications for new city-owned charging stations

Identify and Fill Charging Gaps

Identify locations that would fill a charging gap. Encourage property owners to install public EV charging or consider additional chargers on city-owned property

Consider Adopting a Multi-Family Charging Policy/Ordinance

Requires minimum EV charging readiness/ installation for existing or new construction multi-family housing

Partner for Available Funding

Pursue and promote funding incentives

Educate property owners on the benefits of EV charging at their property

ACTION PLAN

Gather Data Sources

Contextualize data to study area

Run Proximity and Availability Analyses

Understand impact of charging stations and environmental justice areas

Visualize Results

Show severity of impact for residents in multi-family properties

Make Relevant to Jurisdiction and Propose Next Steps

Determine solutions to plan for the future

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North Central Texas
Council of Governments

City of Denton Multifamily Electric Vehicle Charging Initiatives

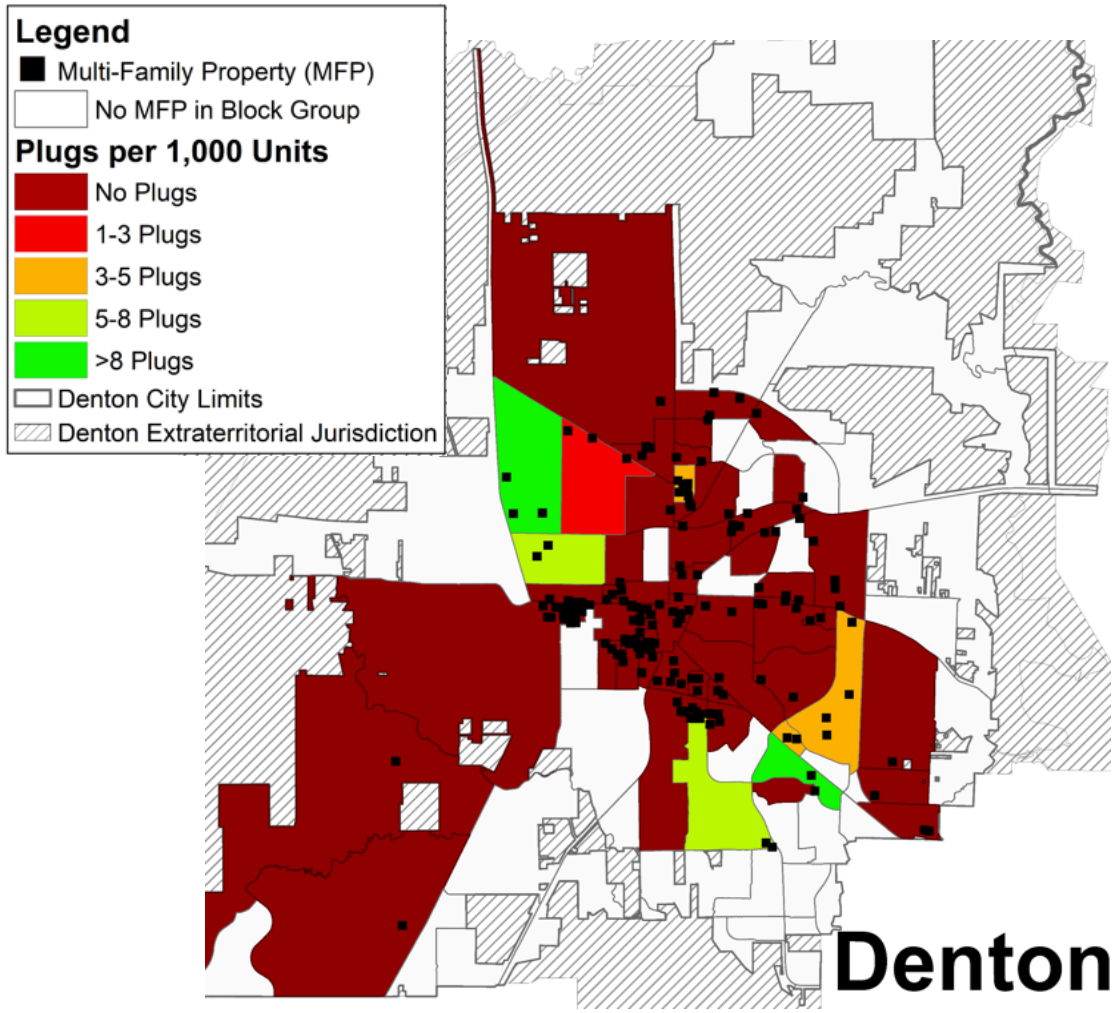
James (JT) Douglas

Conservation Programs Coordinator

Environmental Services & Sustainability

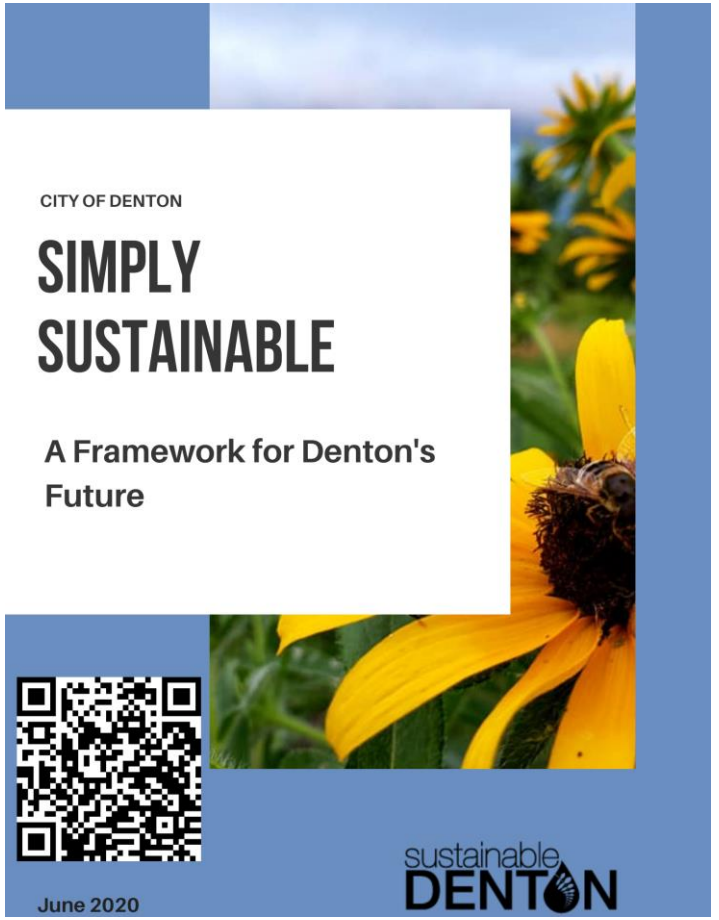
EV Analysis Highlights

- Current state of EV trends nationwide
- Current state of public charging and EV adoption to date
  - Correlation of adoption and charging infrastructure
- Environmental Justice analysis at census block level
- Public charging infrastructure and multifamily (11% within half a mile of public charging)



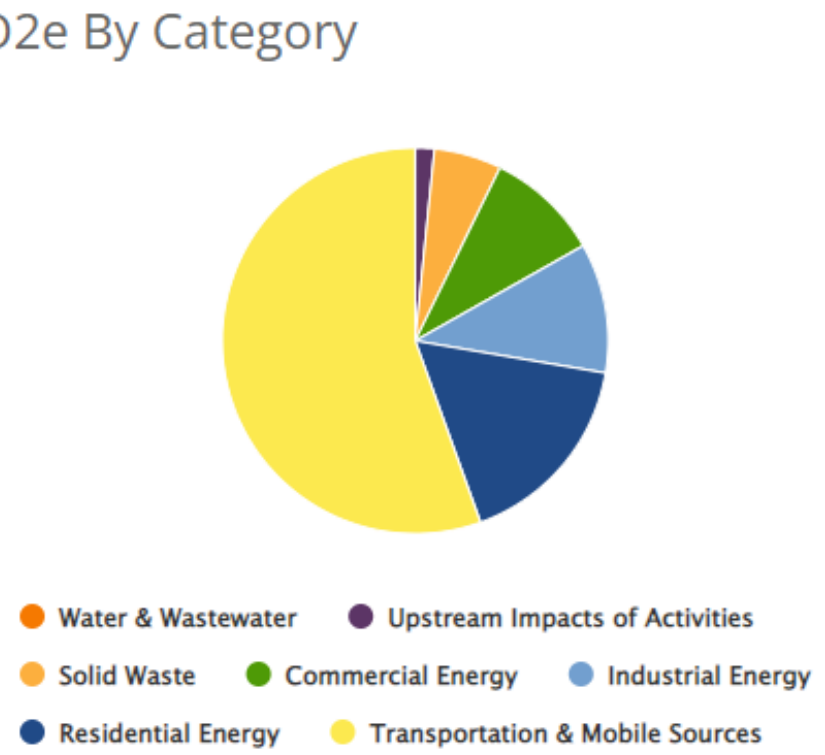
Current Uses

- 2020 Simply Sustainable Framework
  - Implement Sustainable Fleet Program
  - Improve regional air quality and take actions to improve non-attainment status
  - Promote public transportation ridership and the use of alternative fuel vehicles
- Current state analysis gives a baseline for improving the goals listed above in an equitable way
- This analysis aids in applying goals to over a third of Denton's population that may be left out of more traditional EV planning efforts



Future Uses & Next Steps

- April 19th 2022 Denton City Council passed a Science Based Target to reduce GHG emissions 46.3% by 2030 and achieve net zero by 2050
- A large portion of Denton Community emissions are from transportation sources
- Climate Action Plan (2023)



Denton Community Baseline Emissions 2018

Questions?

James (JT) Douglas

Conservation Programs Coordinator

Environmental Services & Sustainability

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City of Dallas

City of Dallas Multifamily Electric Vehicle Charging Initiatives

June 15, 2022

Pharr Andrews, Sr. Climate Coordinator
Office of Environmental Quality and Sustainability

GOAL 3: DALLAS' COMMUNITIES HAVE ACCESS TO SUSTAINABLE, AFFORDABLE, *TRANSPORTATION* OPTIONS.

Objectives

- Shift the surface transportation system to move people and goods in fuel-efficient vehicles.
- Reduce trips where people drive alone.
- Synergize jobs and housing with transportation infrastructure to increase access to walking and biking options, and public transit.
- Ensure that walking, biking, public transit, vehicular transportation infrastructure is reliable and safe.

Targets

Publicly available EV charging

- 1,500 outlets to support 39,000 vehicles by 2030

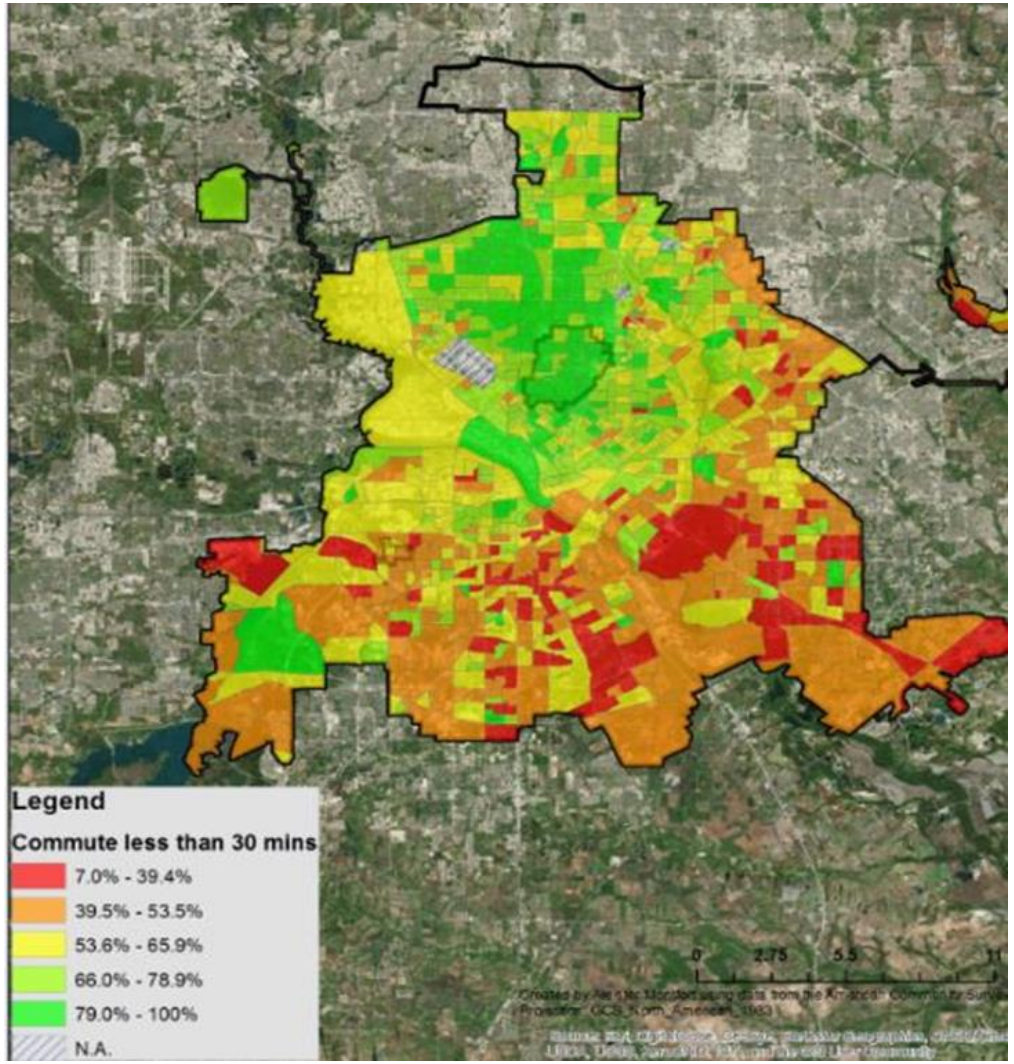
Electric fleets

- All new transit vehicle purchases by the City, DISD, DART fully electric by 2030
- 100% electrified fleet by 2040

Single occupant vehicle travel mode shift

- 88% to 79% in 2030
- 88% to 62% in 2050

GOAL 3: *TRANSPORTATION* UNDER AN EQUITY LENS



"Climate change affects all, but not all people are affected equally."

- Jacqueline Patterson, Director of the NAACP Environmental and Climate Justice Program

TARGETED MULTIFAMILY EV CHARGING INITIATIVES

- Direct mail TxVEMP grant announcements
- Collaborated with Apartment Association of Greater Dallas
- Worked with City of Dallas Housing Department
- Engaged Environment and Sustainability Committee
- Collaborated with British Consulate
- Annual Apartment Association Trade Show

NEXT STEPS MULTIFAMILY EV CHARGING INITIATIVES

- Engage Environmental Commission
- Work through Council Offices
- Partner with Zero Waste team
- Identify funding opportunities
- Highlight best practices
- Collaborate with Dallas Housing Authority

Questions?

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