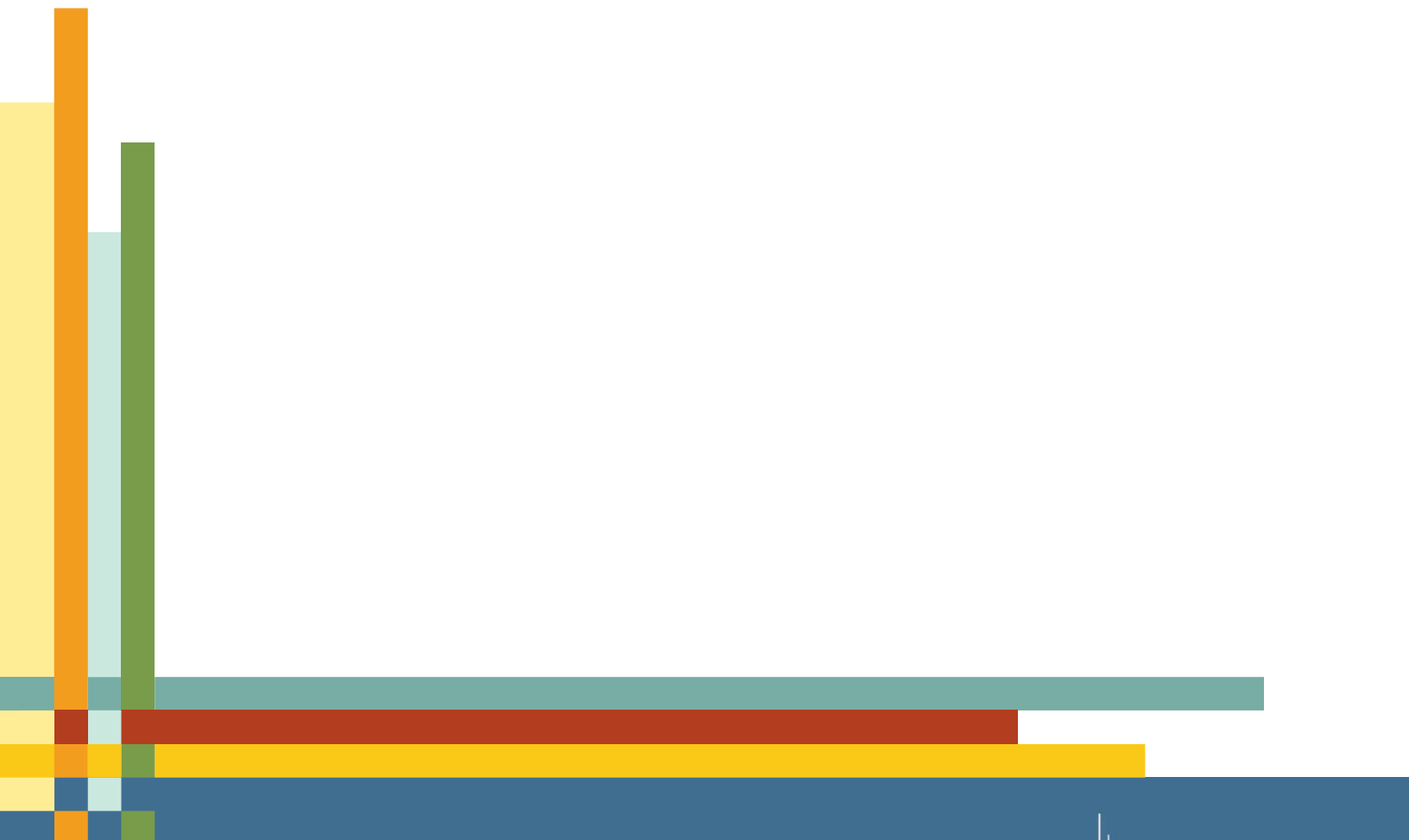# Des Moines Metropolitan Area
2019 Greenhouse Gas Emissions Report

Executive Summary

A greenhouse gas emissions inventory (GHGI) estimates fossil fuel emissions within a defined boundary throughout a calendar year. This GHGI has collected emissions data for 2019 within the Des Moines Area Metropolitan Planning Organization (MPO) boundaries and includes an individual analysis for each MPO member community.

This analysis found that in 2019, the estimated emissions in the Des Moines metro were 5,898,879 metric tons of carbon dioxide equivalent (CO_2e). Table I and Figure I show the breakdown of those emissions by sector.

Table I: CY2019 Des Moines Metro Greenhouse Gas Emissions

2019 Des Moines Metro GHG Emissions		
Sector	CO_2e Emissions (MT)	% of CO_2e Emissions
Transportation & Mobile Sources	1,540,810	26.1%
Solid Waste	435,143	7.4%
Water Production	12,005	0.2%
Commercial Energy	1,707,038	28.9%
Industrial Energy	819,709	13.9%
Residential Energy	1,384,174	23.5%
Total	5,898,879	100.0%

Figure I: 2019 Des Moines Metro Greenhouse Gas Emissions
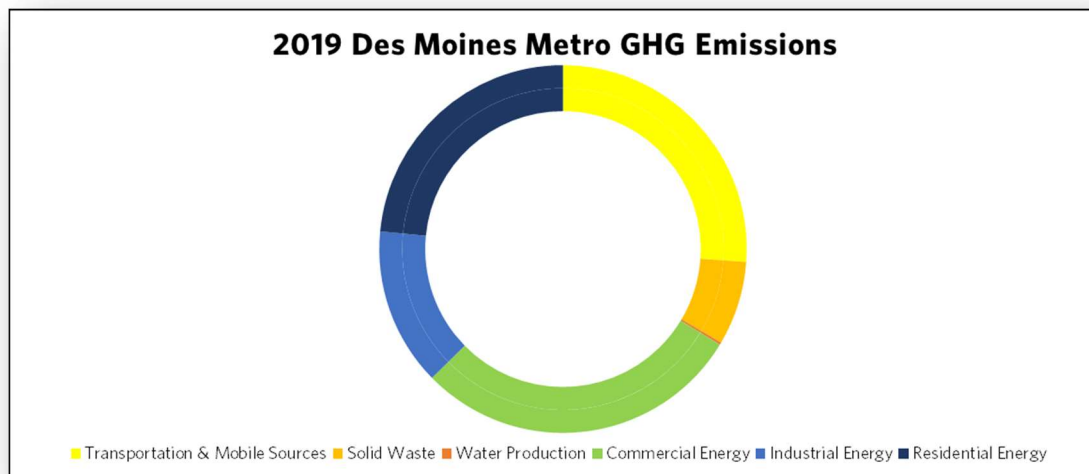
Section 1: Introduction

This Greenhouse Gas Emissions Inventory for the calendar year 2019 was prepared by the Des Moines Area Metropolitan Planning Organization (MPO) for use by its member governments and partner organizations.

A greenhouse gas emissions inventory (GHGI) is a realistic estimate of the carbon-based particulate matter released within a defined area through activities that can be confidently calculated. These reports are produced to inform decision-making to address the current impact of anthropogenic fossil fuel emissions on Earth - climate change.

No stance has been taken on climate change or the necessity of our member jurisdictions or other entities to act on climate change by the MPO. Instead, the MPO has prepared this report due to the rising need within its membership for data and information on carbon footprints and opportunities for efficiency and reductions at the city level.

As such, this report does not prescribe actions and reductions for any community. Instead, DMAMPO staff has included possible next steps and resources for entities to consider if they choose.

Carbon Dioxide Equivalent (CO_2e)

The data presented will be expressed as CO_2e, or carbon dioxide equivalent. This is a standard unit for greenhouse gas (GHG) contributions.

While CO_2 is the focus of fossil fuel discussions due to its greater proportion of emissions, it is not the only one and has a global warming potential (GWP) lower than others. CO_2e attributes the impacts of other fossil fuels emitted, such as methane (CH_4), nitrous oxide (N_2O), and refrigerant gasses, as an equivalent to CO_2 based on their GWP and is summed with CO_2 emissions. Those equivalencies can be found below in Table 1.

Table 1: Kyoto Greenhouse Gasses Global Warming Potential (GWP)

Kyoto Greenhouse Gasses	Global Warming Potential (GWP)
Carbon Dioxide (CO_2)	1
Methane (CH_4)	25
Nitrous Oxide (N_2O)	298
Hydrofluorocarbons (HFCs)	124 - 14,800
Perfluorocarbons (PFCs)	7,390 - 12,200
Sulfur hexafluoride (SF_6)	22,800
Nitrogen trifluoride (NF_3)	17,200

Source: IPCC, 2007

Therefore, this document contains these major elements: GHGI Process & Methodology (Section 2), Analysis of GHGI at the metro-wide level (Section 3), Analysis of GHGI at the community-wide level for each MPO member community (Section 4), and Next Steps & Resources (Section 5).

Section 2: Process & Methodology

The MPO conducted this inventory at the community-wide level for the year 2019 due to the availability of data and the irregularities that arose in 2020 due to COVID-19.

To provide consistency across MPO member government reports, the data within this document was obtained directly from emitting agencies and high-confidence data sets from government sources. The following sources were used:

- Residential, Commercial, and Industrial Energy – MidAmerican Energy & City of Waukee
- Transportation & Mobile Sources – Iowa Department of Transportation (IADOT)
- Waste – Metro Waste Authority (MWA)
- Water Production and Transportation – Des Moines Water Works (DMWW)

MPO staff worked directly with each agency to complete this data request by adapting spreadsheet templates provided by ICLEI-USA.

However, due to data constraints and low confidence levels in extracting granular data from regional entities not yet suited for such reporting, waste and water data only be accounted for in the Metro-wide analysis.

Residential, Commercial, and Industrial Energy Emissions Accounting

MidAmerican Energy is the natural gas and electricity provider for most of the MPO's jurisdictions. The exception is natural gas provided to the City of Waukee.

Natural gas usage data was requested in therms or 100 cubic feet of natural gas. Electricity usage data was requested in kilowatt hours (kWh) or 1000 watts per hour. Additionally, MidAmerican's emissions factor was requested to complete the analysis. The U.S. Environmental Protection Agency (USEPA) defines this as "a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant." (2022)

MidAmerican reported its Iowa customer emissions factor as 656 lbs. CO_2 per megawatt-hour (MWh) for 2021. That emissions factor is applied in this data analysis based on their response. It also noted that it does not calculate an emissions factor for CH_4 and N_2O. Consequently, the MRO West eGrid default emissions factor data (CH_4 = 115 lbs./GWh; N_2O = 20 lbs./GWh) is used in this analysis.

Due to investments in renewable energy, MidAmerican Energy's reported CO_2 emissions factor is roughly 60% of the MRO West eGrid default data. As such, this reduces customers' emissions from usage throughout its service area.

Five data sectors were requested from MidAmerican: Commercial/Non-residential, Industrial, Institutional/Sales to Public Authority, Residential, and Agricultural. MidAmerican does not code for agricultural buildings, so that sector is not extractable from the data set.

MidAmerican is not required to report data upon request as a private entity. As such, it can choose to omit any data it chooses. Table 2 denotes the frequency of omitted data throughout the MPO region.

Table 2: Omitted Energy Data Points

Jurisdiction	# Omitted Data Points	Sector
City of Carlisle	3	
City of Norwalk	1	Industrial
Dallas County	4	

SOURCE: MIDAMERICAN ENERGY, 2022

Transportation & Mobile Sources Emissions Accounting

Passenger Vehicles

The IADOT tracks and reports vehicle miles traveled for each city and county in Iowa from sensors within the state's transportation infrastructure. This data is collected and analyzed based on the number of axles on a vehicle.

Due to the constraints of road sensor data, the methodology of this report looked to the U.S. Department of Transportation's Bureau of Transportation Statistics (BTS) for reference. Using National Travel Household Survey (NHTS) data, BTS estimated that 72% of heavy-duty vehicles were diesel-powered in 2013. In consultation with IADOT staff, the MPO assumes in this report that 70% of heavy trucks are diesel-powered within the Des Moines metro.

Additionally, vehicle trips within a connected metropolitan area can weave through many jurisdictions, releasing emissions within a city where they may not have originated. This is a natural accounting occurrence in GHGIs and is true in the Des Moines metro.

> _Example:_ A Pleasant Hill resident travels to Jordan Creek Mall and home. Their trip could add vehicle miles traveled to several cities, including Pleasant Hill, Des Moines, Windsor Heights, West Des Moines, Norwalk, Carlisle, and more, as their trip could include Interstate 235, Highway 163, Highway 5, or Highway 65, and more during their roundtrip.

In these cases, and this report, the emissions are reported to and accounted for in the jurisdiction they are emitted in – even if it was solely thru-traffic. MPO staff aims to develop a corridor-based methodology as an internal next step following this series of reports for MPO members and regional use.

Transit
Des Moines Area Regional Transit Authority

Des Moines Area Regional Transit Authority (DART) operates fixed-route, paratransit, vanpooling, microtransit, and shuttle services within the jurisdictions of their Des Moines metro member governments. In 2019 DART served 4,047,011 passengers boarding their services in the Des Moines metro.

These members and their proportion of DART ridership (split-allocation) are listed in Table 3.

Table 3: DART Ridership Split-Allocation

DART Member Jurisdiction	% of 2019 Ridership
Altoona	1.7%
Ankeny	3.2%
Bondurant	0.5%
Clive	1.6%
Des Moines	74.7%
Grimes	0.3%
Johnston	1.4%
Pleasant Hill	0.2%
Polk County	2.2%
Urbandale	0.9%
West Des Moines	12.1%
Windsor Heights	1.1%

SOURCE: DART, 2022

DART reported that its fleet is fueled by diesel, hybrid diesel, gasoline, and electricity. The electricity usage of the fleet is reported in the energy portion of this analysis. DARTs fuel economy in miles per gallon is listed in Table 4.

Table 4: DART Fleet Fuel Economy

DART Fleet Vehicle Type	Miles Per Gallon
Diesel	4.34
Hybrid Diesel	4.78
Gasoline	5.96

SOURCE: DART, 2022

Heart of Iowa Transit Agency

Heart of Iowa Regional Transit Agency (HIRTA) was also contacted for data within their service area in the Des Moines metro. However, HIRTA's current reporting practices do not allow for the extraction of city-specific emissions data and are not included in this report.

Water Production and Transportation Emissions Accounting

Des Moines Water Works (DMWW) provides drinking water to approximately 600,000 Central Iowa customers, including most of the Des Moines metro.

DMWW operates three water treatment plants: Fleur Drive, L. D. McMullen Treatment Plant at Maffitt Reservoir, and Saylorville Water Treatment Plant. The utility maintains 1,400 miles of buried water mains with 9,800 valves, over 80,000 water meters and automated reading devices, 10,000 fire hydrants, 10 water storage tanks, and 10 booster pumping stations.

Due to the constraints of such a complex system, DMWW data is only included in the region-wide analysis in Section 3 and not in the individual community reports of Section 4.

Additionally, DMWW operates Des Moines Water Works Park and Maffitt Reservoir Park. The recreation aspects of DMWW operations are not accounted for in this analysis portion.

Metro Waste Authority Accounting

Metro Waste Authority (MWA) provides waste management services throughout Polk County, Iowa. This includes curbside recycling, garbage, and yard waste, hazardous waste disposal, and construction and demolition recycling.

Due to the constraints of solid waste reporting, including combined collecting, Urbandale and Des Moines are the only communities with Solid Waste accounted for in their community report in Section 4. However, the total solid waste data for the Des Moines metro region is accounted for in Section 3.

Vehicles miles traveled for MWA and partners transporting the solid waste to landfills, and recovery centers are solely included in the Transportation & Mobile Sources section of both the metro- & community-wide reports.

Therefore, this accounting aims to analyze the emissions from managing waste on-site, including Landfill Gases (LFGs), flared as a by-product of the decomposition of organic material and typically comprised of 50% CH_4 and 50% CO_2.

Section 3: Des Moines Metro Inventory

Table I: Des Moines Metro Cumulative Greenhouse Gas Emissions in Metric Tons of Carbon Dioxide Equivalent for Calendar Year 2019

2019 Des Moines Metro GHG Emissions		
Sector	CO_2e Emissions (MT)	% of CO_2e Emissions
Transportation & Mobile Sources	1,540,810	26.1%
Solid Waste	435,143	7.4%
Water Production	12,005	0.2%
Commercial Energy	1,707,038	28.9%
Industrial Energy	819,709	13.9%
Residential Energy	1,384,174	23.5%
Total	5,898,879	100.0%

Figure I: Proportional Representation of Greenhouse Gas Emission by Sector for Calendar Year 2019
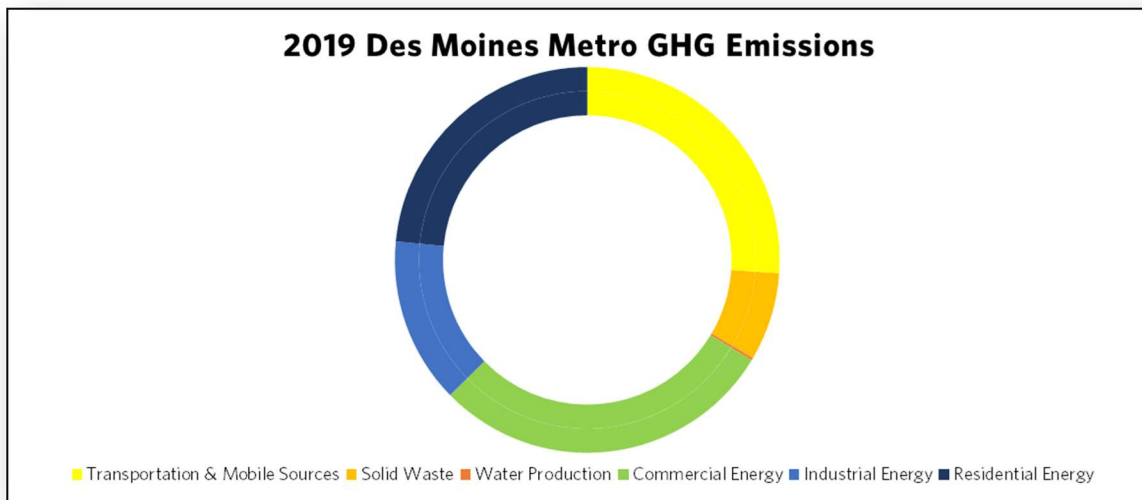
Analysis

In 2019, this analysis identified that nearly 6 million metric tons of greenhouse gases were emitted in the Des Moines metro.

Three sectors comprise nearly 80% of emissions in the metro: commercial, transportation & mobile sources, and residential energy.

Of the three energy sectors, residential energy has the highest proportion of emissions which is impacted due to the higher GWP of natural gas in the emissions.

Transportation & Mobile Sources Analysis

Table II: Vehicle Class as Percent of Vehicles Miles Traveled (VMT)

Vehicle Class	% Total VMT
Class 1 (Motorcycles)	0.2%
Class 2 (Passenger Vehicles)	66.2%
Class 3 (Trucks)	23.9%
Class 4 (Buses)	0.5%
Class 5-13 (Heavy Trucks and Other Vehicles)	9.1%
Total	100.0%

Source: IA DOT (2022)

Passenger vehicles contribute nearly two-thirds of the vehicle miles in the Des Moines metro. This is not surprising as National Household Travel Survey found that 88% of vehicle trips were taken in a personal automobile in the region. That same study showed that 48% of all passenger vehicle trips are single-occupancy vehicle (SOV) trips. This analysis found that 48% of metro-wide VMT occurred on local streets.

Table III: Street Classification as Percent of Vehicle Miles Traveled (VMT)

Street Classification	% of Total VMT
Interstates	31.9%
Primary Streets	20.1%
Local Streets	48.0%
Total	100.0%

Source: IA DOT (2022)

City of Altoona

2019 Greenhouse Gas Emissions Breakdown by Sector

City of Altoona, Iowa - 2019

Sector	CO$_2$ Emissions (MT)	% of CO$_2$ Emissions
Transportation & Mobile Sources	50,434	12.0%
Commercial Energy	55,668	13.3%
Industrial Energy	268,937	64.1%
Residential Energy	44,863	10.7%
Total	419,902	100.0%

City of Altoona - 2019 GHG Emissions

■ Transportation & Mobile Sources ■ Commercial Energy ■ Industrial Energy ■ Residential Energy
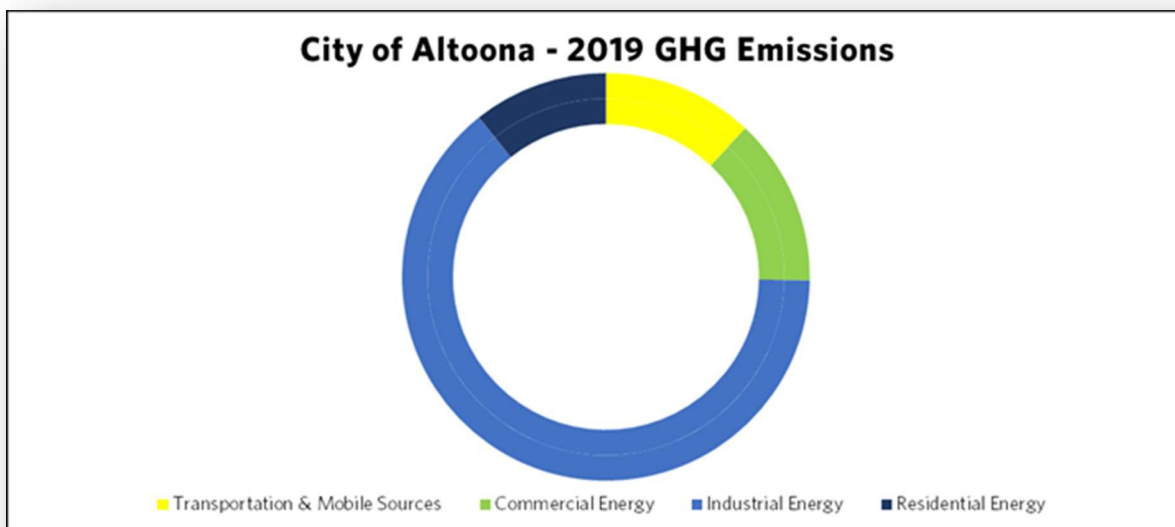
	Vehicle Class	Interstate	Primary Roads	Municipal Streets	Total City VMT (1000s)	% VMT
ALTOONA	Class 1 (Motorcycles)	65	38	127	209	0.2%
	Class 2 (Passenger Vehicles)	25,585	6,418	37,263	78,617	72.2%
	Class 3 (Trucks)	8,345	2,577	13,728	21,135	19.4%
	Class 4 (Buses)	348	76	79	484	0.4%
	Class 5-13 (Heavy Trucks and Other Vehicles)	6,127	1,392	1,786	8,488	7.8%
	Total	40,469	10,501	52,983	108,933	100.0%

City of Ankeny

2019 Greenhouse Gas Emissions Breakdown by Sector

City of Ankeny, Iowa - 2019		
Sector	CO_2 Emissions (MT)	% of CO_2 Emissions
Transportation & Mobile Sources	186,371	25.7%
Commercial Energy	111,442	15.4%
Industrial Energy	269,509	37.1%
Residential Energy	158,581	21.8%
Total	725,903	100.0%

City of Ankeny - 2019 GHG Emissions

■ Transportation & Mobile Sources ■ Commercial Energy ■ Industrial Energy ■ Residential Energy
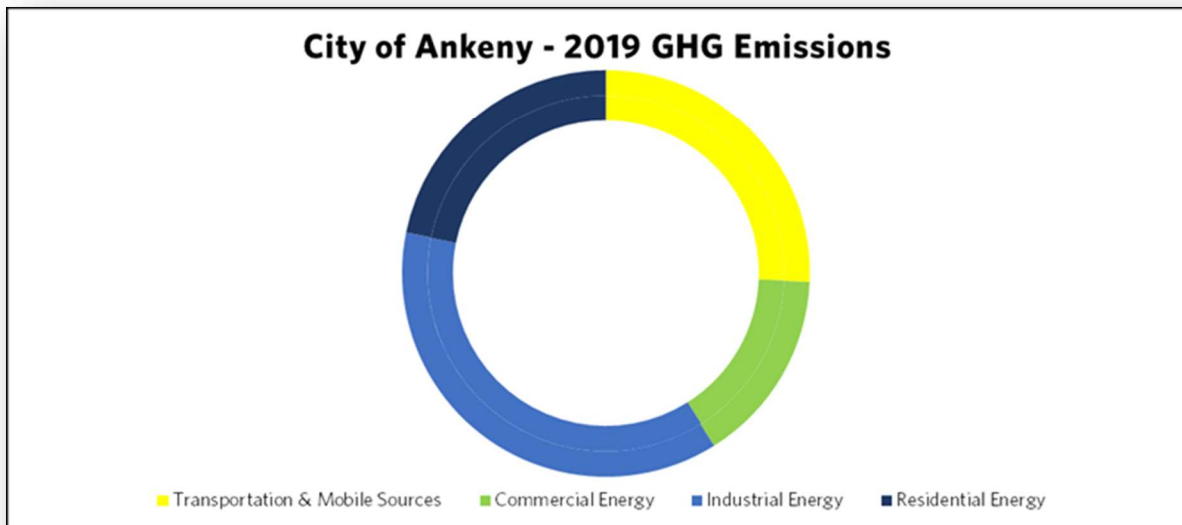
	Vehicle Class	Interstate	Primary Roads	Municipal Streets	Total City VMT (1000s)	% VMT
ANKENY	Class 1 (Motorcycles)	282	223	325	724	0.2%
	Class 2 (Passenger Vehicles)	111,579	37,876	95,306	274,221	70.4%
	Class 3 (Trucks)	36,393	15,207	35,111	76,129	19.5%
	Class 4 (Buses)	1,518	446	203	2,064	0.5%
	Class 5-13 (Heavy Trucks and Other Vehicles)	26,721	8,217	4,567	36,398	9.3%
	Total	176,493	61,970	135,512	389,535	100.0%

City of Bondurant

2019 Greenhouse Gas Emissions Breakdown by Sector

City of Bondurant, Iowa - 2019		
Sector	CO_2 Emissions (MT)	% of CO_2 Emissions
Transportation & Mobile Sources	12,680	36.6%
Commercial Energy	6,665	19.2%
Industrial Energy	0	0.0%
Residential Energy	15,341	44.2%
Total	34,686	100.0%

City of Bondurant - 2019 GHG Emissions

■ Transportation & Mobile Sources ■ Commercial Energy ■ Industrial Energy ■ Residential Energy
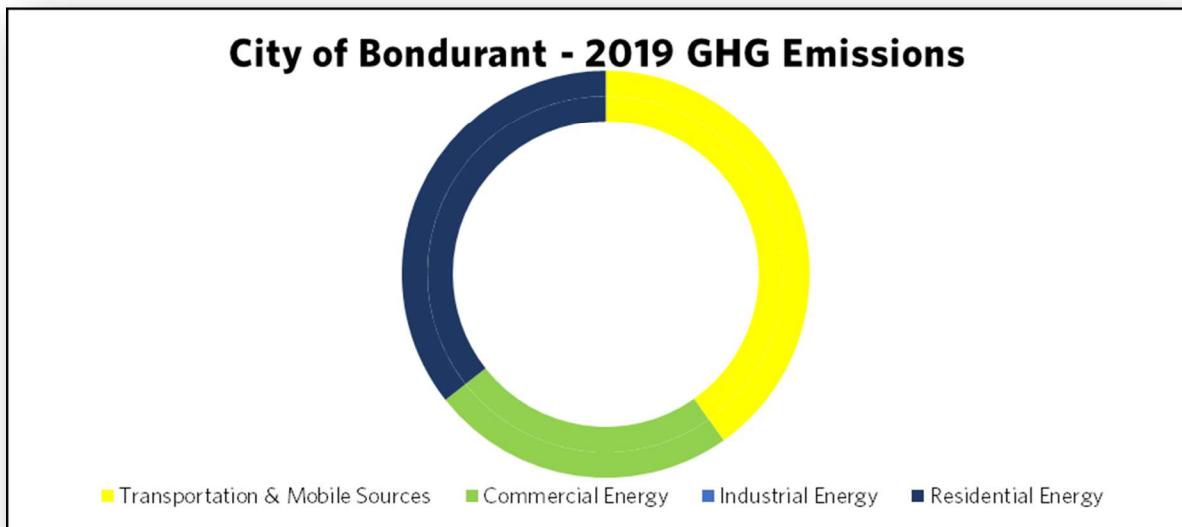
	Vehicle Class	Interstate	Primary Roads	Municipal Streets	Total City VMT (1000s)	% VMT
BONDURANT	Class 1 (Motorcycles)	-	62	21	69	0.3%
	Class 2 (Passenger Vehicles)	-	10,461	6,191	17,776	67.8%
	Class 3 (Trucks)	-	4,200	2,281	5,752	21.9%
	Class 4 (Buses)	-	123	13	138	0.5%
	Class 5-13 (Heavy Trucks and Other Vehicles)	-	2,270	297	2,486	9.5%
	Total	-	17,116	8,803	26,221	100.0%

2019 Greenhouse Gas Emissions Breakdown by Sector

City of Carlisle, Iowa - 2019		
Sector	CO_2 Emissions (MT)	% of CO_2 Emissions
Transportation & Mobile Sources	4,051	27.9%
Commercial Energy	3,113	21.4%
Industrial Energy	0	0.0%
Residential Energy	7,372	50.7%
Total	14,536	100.0%

City of Carlisle - 2019 GHG Emissions

■ Transportation & Mobile Sources ■ Commercial Energy ■ Industrial Energy ■ Residential Energy
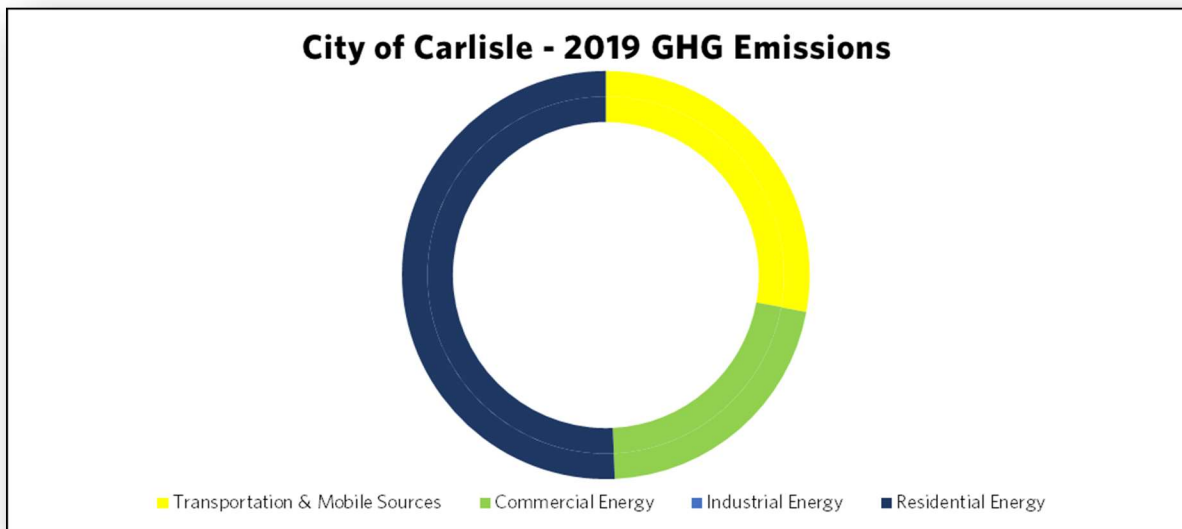
	Vehicle Class	Interstate	Primary Roads	Municipal Streets	Total City VMT (1000s)	% VMT
CARLISLE	Class 1 (Motorcycles)	-	12	13	22	0.2%
	Class 2 (Passenger Vehicles)	-	1,969	3,819	6,495	72.3%
	Class 3 (Trucks)	-	790	1,407	1,870	20.8%
	Class 4 (Buses)	-	23	8	32	0.4%
	Class 5-13 (Heavy Trucks and Other Vehicles)	-	427	183	568	6.3%
	Total	-	3,221	5,430	8,987	100.0%

City of Clive

2019 Greenhouse Gas Emissions Breakdown by Sector

City of Clive, Iowa - 2019		
Sector	CO_2 Emissions (MT)	% of CO_2 Emissions
Transportation & Mobile Sources	72,831	39.0%
Commercial Energy	47,333	26.0%
Industrial Energy	7,330	4.0%
Residential Energy	54,658	30.0%
Total	182,152	100.0%

City of Clive - 2019 GHG Emissions

■ Transportation & Mobile Sources ■ Commercial Energy ■ Industrial Energy ■ Residential Energy
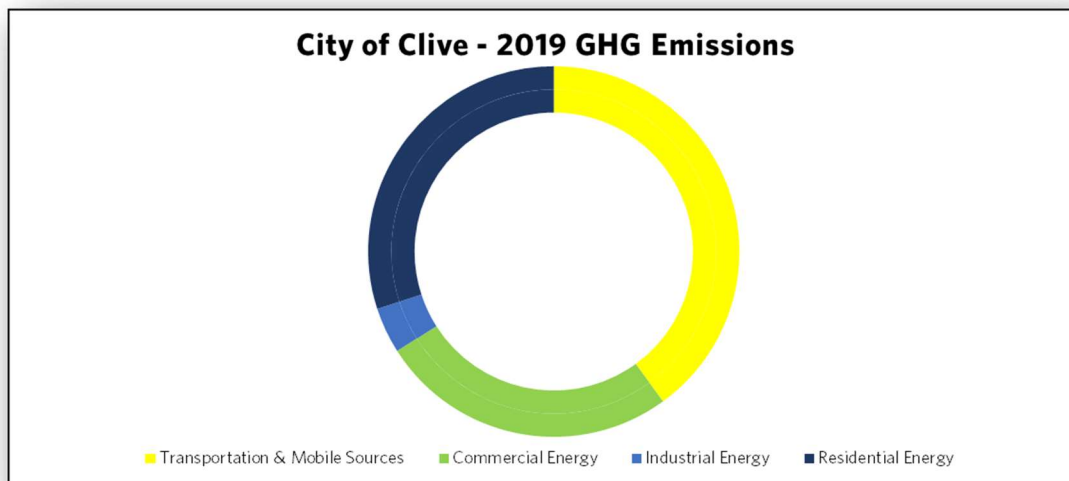
	Vehicle Class	Interstate	Primary Roads	Municipal Streets	Total City VMT (1000s)	% VMT
CLIVE	Class 1 (Motorcycles)	58	210	120	337	0.2%
	Class 2 (Passenger Vehicles)	22,786	35,599	35,268	105,274	69.3%
	Class 3 (Trucks)	7,432	14,293	12,993	31,335	20.6%
	Class 4 (Buses)	310	419	75	793	0.5%
	Class 5-13 (Heavy Trucks and Other Vehicles)	5,457	7,723	1,690	14,112	9.3%
	Total	36,042	58,245	50,146	151,851	100.0%

City of Des Moines

2019 Greenhouse Gas Emissions Breakdown by Sector

City of Des Moines - 2019		
Sector	CO$_2$ Emissions (MT)	% of CO$_2$ Emissions
Transportation & Mobile Sources	650,182	32.8%
Commercial Energy	589,441	29.8%
Industrial Energy	181,276	9.2%
Residential Energy	260,160	28.3%
Total	1,981,059	100.0%

City of Des Moines - 2019 GHG Emissions

■ Transportation & Mobile Sources ■ Commercial Energy ■ Industrial Energy ■ Residential Energy
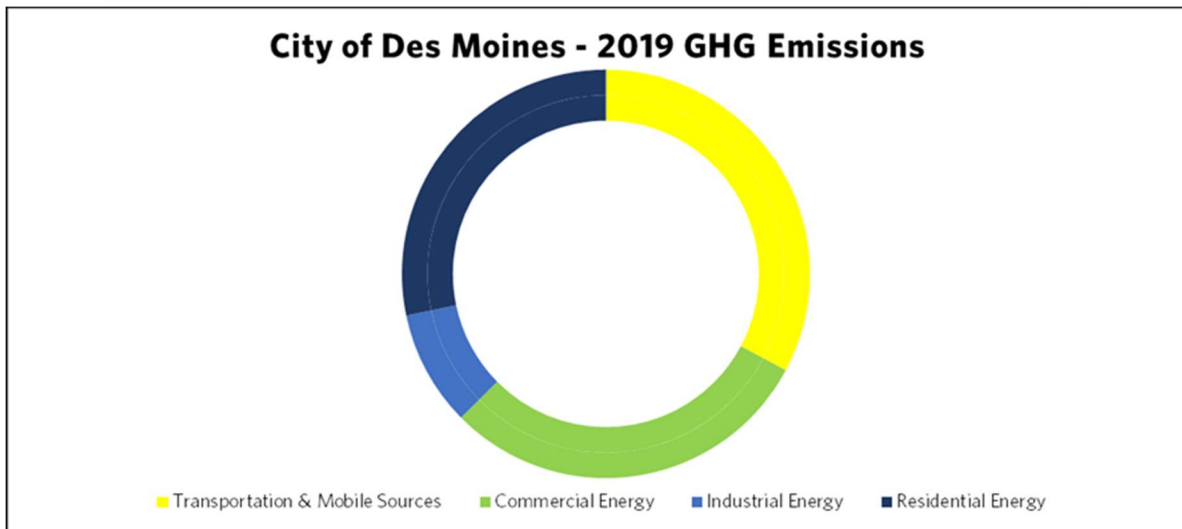
	Vehicle Class	Interstate	Primary Roads	Municipal Streets	Total City VMT (1000s)	% VMT
DES MOINES	Class 1 (Motorcycles)	470	1,160	1,748	3,047	0.2%
	Class 2 (Passenger Vehicles)	185,584	196,922	512,368	1,008,559	71.9%
	Class 3 (Trucks)	60,530	79,065	188,760	281,515	20.1%
	Class 4 (Buses)	2,525	2,320	1,093	5,832	0.4%
	Class 5-13 (Heavy Trucks and Other Vehicles)	44,444	42,722	24,551	102,893	7.3%
	Total	293,552	322,189	728,520	1,401,846	100.0%

City of Grimes

2019 Greenhouse Gas Emissions Breakdown by Sector

City of Grimes - 2019		
Sector	CO_2 Emissions (MT)	% of CO_2 Emissions
Transportation & Mobile Sources	33,996	33.9%
Commercial Energy	17,741	17.7%
Industrial Energy	32,211	32.1%
Residential Energy	16,469	16.4%
Total	100,417	100.0%

City of Grimes - 2019 GHG Emissions
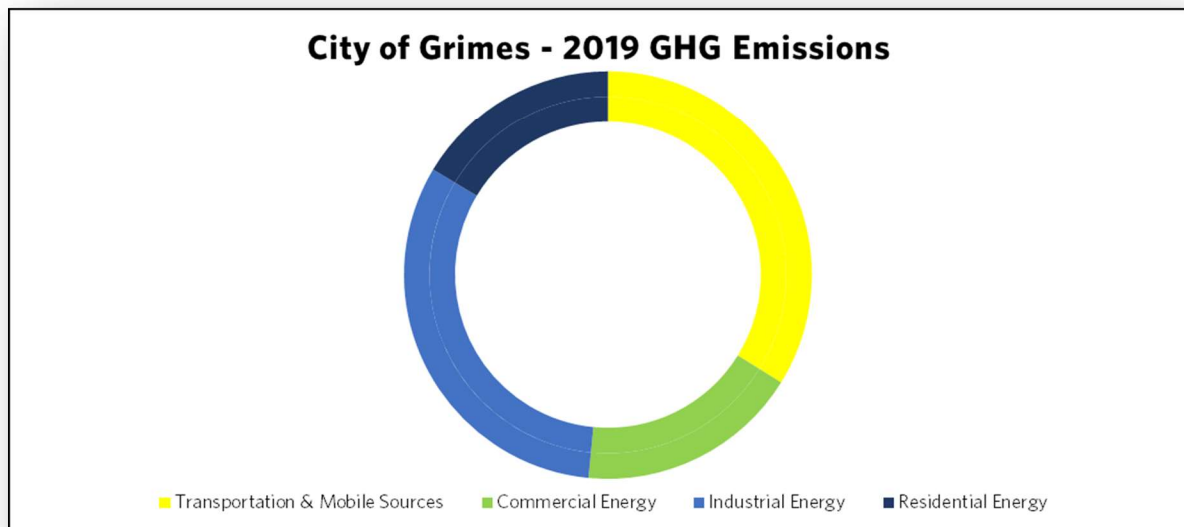
	Vehicle Class	Interstate	Primary Roads	Municipal Streets	Total City VMT (1000s)	% VMT
GRIMES	Class 1 (Motorcycles)	-	157	58	186	0.3%
	Class 2 (Passenger Vehicles)	-	26,705	16,852	48,660	68.4%
	Class 3 (Trucks)	-	10,722	6,209	15,485	21.8%
	Class 4 (Buses)	-	315	36	357	0.5%
	Class 5-13 (Heavy Trucks and Other Vehicles)	-	5,794	808	6,424	9.0%
	Total	-	43,692	23,962	71,112	100.0%

2019 Greenhouse Gas Emissions Breakdown by Sector

City of Johnston - 2019		
Sector	CO_2 Emissions (MT)	% of CO_2 Emissions
Transportation & Mobile Sources	40,010	20.6%
Commercial Energy	63,476	32.7%
Industrial Energy	27,468	14.1%
Residential Energy	63,341	32.6%
Total	194,295	100.0%
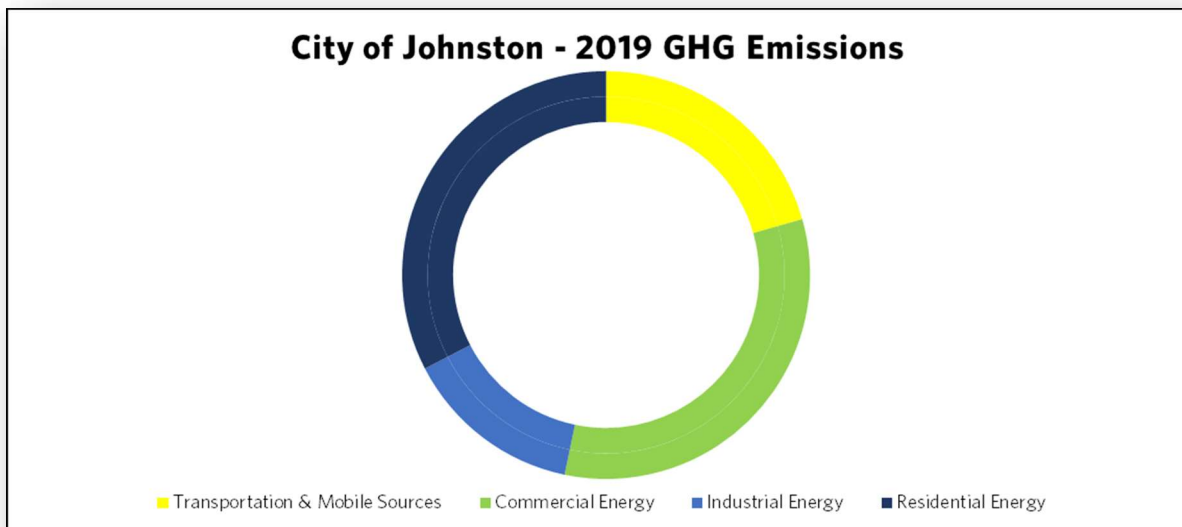
City of Johnston - 2019 GHG Emissions

■ Transportation & Mobile Sources ■ Commercial Energy ■ Industrial Energy ■ Residential Energy

	Vehicle Class	Interstate	Primary Roads	Municipal Streets	Total City VMT (1000s)	% VMT
	Class 1 (Motorcycles)	-	38	189	221	0.2%
	Class 2 (Passenger Vehicles)	-	6,474	55,391	71,405	76.0%
JOHNSTON	Class 3 (Trucks)	-	2,599	20,406	18,665	19.9%
	Class 4 (Buses)	-	76	118	201	0.2%
	Class 5-13 (Heavy Trucks and Other Vehicles)	-	1,404	2,654	3,471	3.7%
	Total	-	10,592	78,758	93,963	100.0%

2019 Greenhouse Gas Emissions Breakdown by Sector

City of Mitchellville - 2019		
Sector	CO$_2$ Emissions (MT)	% of CO$_2$ Emissions
Transportation & Mobile Sources	1,789	16.0%
Commercial Energy	5,341	47.9%
Industrial Energy	605	5.4%
Residential Energy	3,424	30.7%
Total	11,159	100.0%

City of Mitchellville - 2019 GHG Emissions

■ Transportation & Mobile Sources ■ Commercial Energy ■ Industrial Energy ■ Residential Energy
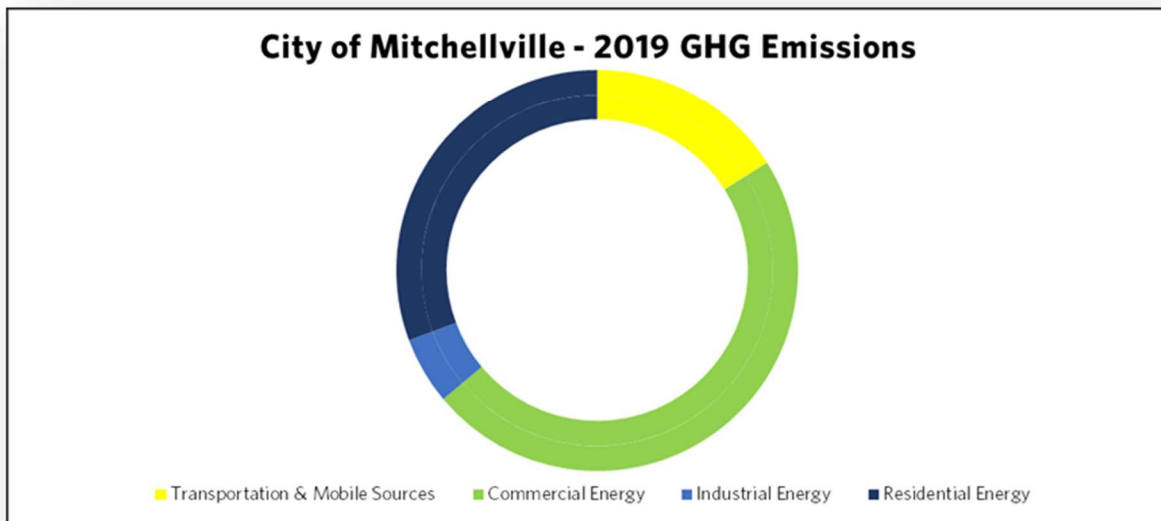
	Vehicle Class	Interstate	Primary Roads	Municipal Streets	Total City VMT (1000s)	% VMT
MITCHELLVILLE	Class 1 (Motorcycles)	-	-	6	6	0.2%
	Class 2 (Passenger Vehicles)	-	-	1,831	2,092	77.7%
	Class 3 (Trucks)	-	-	674	523	19.4%
	Class 4 (Buses)	-	-	4	4	0.1%
	Class 5-13 (Heavy Trucks and Other Vehicles)	-	-	88	67	2.5%
	Total	-	-	2,603	2,693	100.0%

2019 Greenhouse Gas Emissions Breakdown by Sector

City of Norwalk - 2019		
Sector	CO$_2$ Emissions (MT)	% of CO$_2$ Emissions
Transportation & Mobile Sources	16,506	22.8%
Commercial Energy	25,317	34.9%
Industrial Energy	0	0.0%
Residential Energy	30,685	42.3%
Total	72,508	100.0%

City of Norwalk - 2019 GHG Emissions

Legend: Transportation & Mobile Sources, Commercial Energy, Industrial Energy, Residential Energy
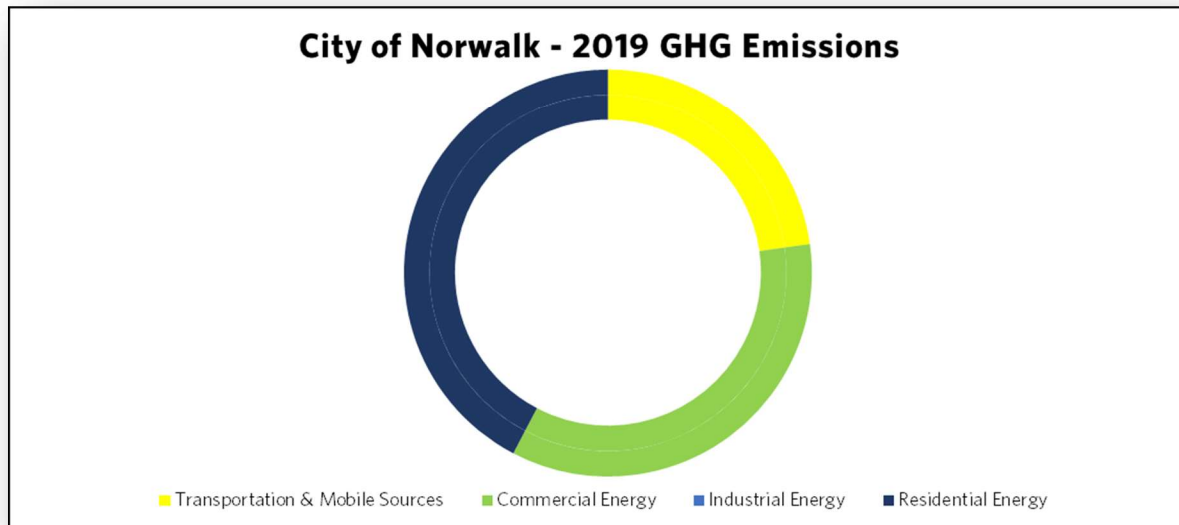
	Vehicle Class	Interstate	Primary Roads	Municipal Streets	Total City VMT (1000s)	% VMT
NORWALK	Class 1 (Motorcycles)	-	67	37	90	0.3%
	Class 2 (Passenger Vehicles)	-	11,355	10,865	24,572	69.7%
	Class 3 (Trucks)	-	4,559	4,003	7,555	21.4%
	Class 4 (Buses)	-	134	23	159	0.5%
	Class 5-13 (Heavy Trucks and Other Vehicles)	-	2,464	521	2,856	8.1%
	Total	-	18,579	15,448	35,233	100.0%

City of Pleasant Hill

2019 Greenhouse Gas Emissions Breakdown by Sector

City of Pleasant Hill - 2019		
Sector	CO_2 Emissions (MT)	% of CO_2 Emissions
Transportation & Mobile Sources	43,437	44.3%
Commercial Energy	22,180	22.6%
Industrial Energy	6,715	6.9%
Residential Energy	25,679	26.2%
Total	98,011	100.0%

City of Pleasant Hill - 2019 GHG Emissions

■ Transportation & Mobile Sources ■ Commercial Energy ■ Industrial Energy ■ Residential Energy
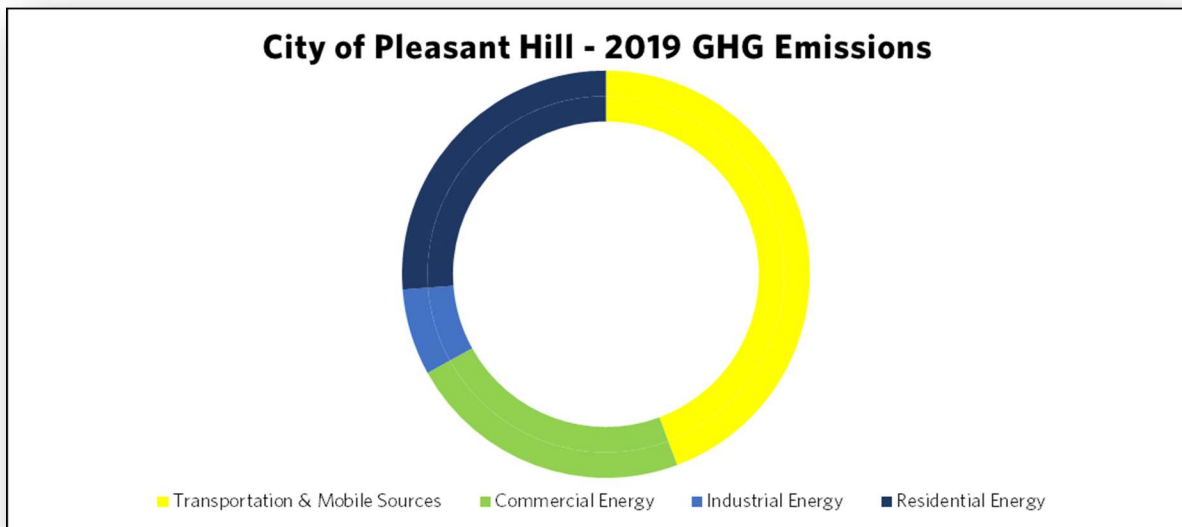
	Vehicle Class	Interstate	Primary Roads	Municipal Streets	Total City VMT (1000s)	% VMT
PLEASANT HILL	Class 1 (Motorcycles)	-	241	44	236	0.3%
	Class 2 (Passenger Vehicles)	-	40,919	12,804	58,192	66.1%
	Class 3 (Trucks)	-	16,429	4,717	19,666	22.4%
	Class 4 (Buses)	-	482	27	519	0.6%
	Class 5-13 (Heavy Trucks and Other Vehicles)	-	8,877	614	9,366	10.6%
	Total	-	66,948	18,206	87,979	100.0%

2019 Greenhouse Gas Emissions Breakdown by Sector

City of Polk City - 2019		
Sector	CO_2 Emissions (MT)	% of CO_2 Emissions
Transportation & Mobile Sources	7,416	25.4%
Commercial Energy	4,115	14.1%
Industrial Energy	0	0.0%
Residential Energy	17,649	60.5%
Total	29,180	100.0%

City of Polk City - 2019 GHG Emissions

■ Transportation & Mobile Sources   ■ Commercial Energy   ■ Industrial Energy   ■ Residential Energy
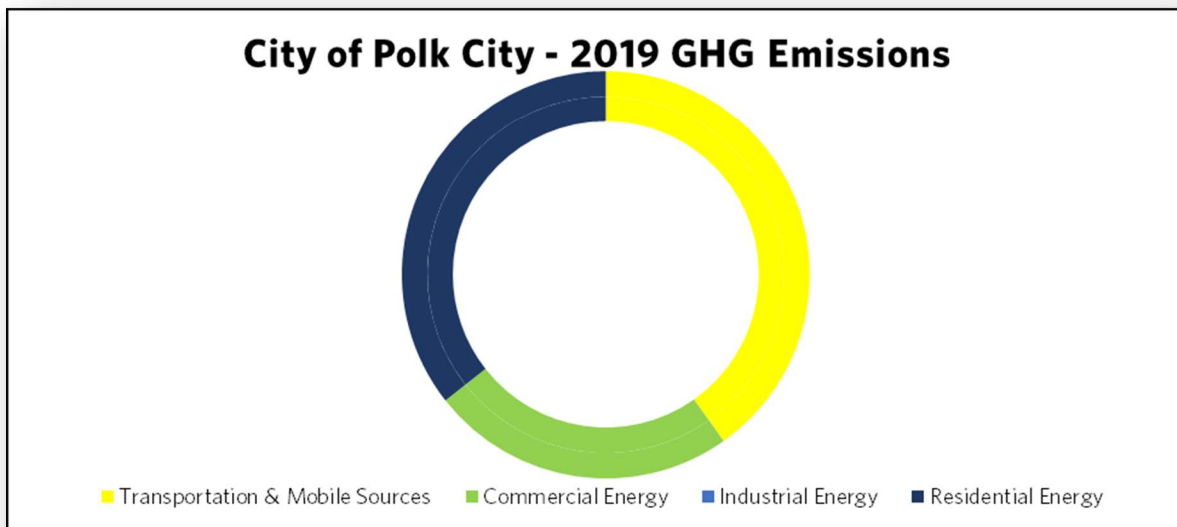
	Vehicle Class	Interstate	Primary Roads	Municipal Streets	Total City VMT (1000s)	% VMT
POLK CITY	Class 1 (Motorcycles)	-	28	19	41	0.3%
	Class 2 (Passenger Vehicles)	-	4,684	5,548	11,260	70.4%
	Class 3 (Trucks)	-	1,881	2,044	3,402	21.3%
	Class 4 (Buses)	-	55	12	68	0.4%
	Class 5-13 (Heavy Trucks and Other Vehicles)	-	1,016	266	1,220	7.6%
	Total	-	7,663	7,888	15,991	100.0%

City of Urbandale

2019 Greenhouse Gas Emissions Breakdown by Sector

City of Urbandale - 2019		
Sector	CO_2 Emissions (MT)	% of CO_2 Emissions
Transportation & Mobile Sources	183,464	35.8%
Commercial Energy	138,802	27.1%
Industrial Energy	26,123	5.1%
Residential Energy	164,609	32.1%
Total	512,998	100.0%

City of Urbandale - 2019 GHG Emissions

Legend: Transportation & Mobile Sources, Commercial Energy, Industrial Energy, Residential Energy
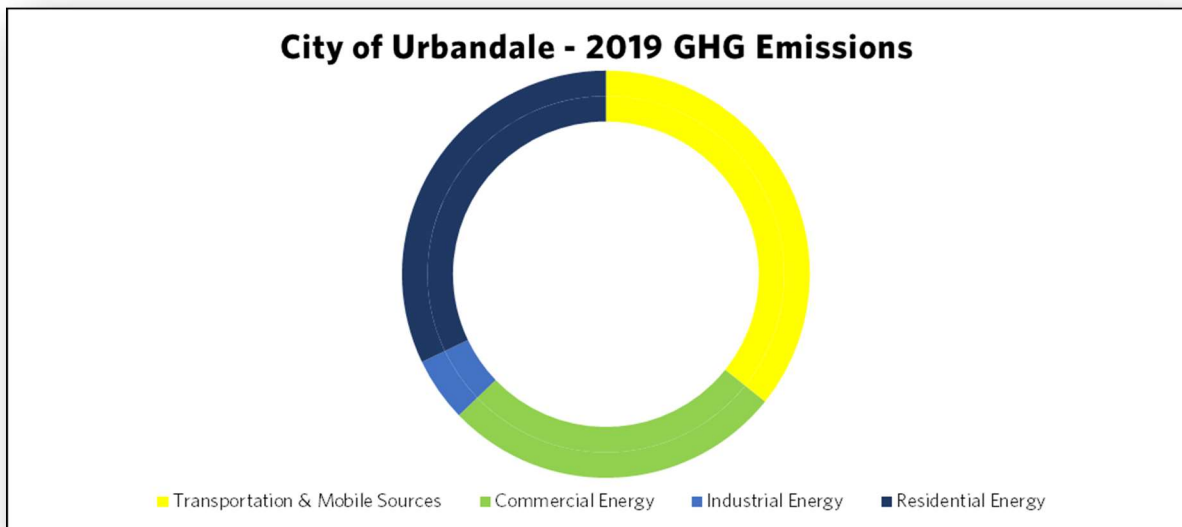
	Vehicle Class	Interstate	Primary Roads	Municipal Streets	Total City VMT (1000s)	% VMT
URBANDALE	Class 1 (Motorcycles)	317	12	415	671	0.2%
	Class 2 (Passenger Vehicles)	125,409	1,978	121,670	281,983	72.0%
	Class 3 (Trucks)	40,904	794	44,824	74,037	18.9%
	Class 4 (Buses)	1,706	23	259	1,886	0.5%
	Class 5-13 (Heavy Trucks and Other Vehicles)	30,033	429	5,830	32,988	8.4%
	Total	198,369	3,237	172,999	391,565	100.0%

2019 Greenhouse Gas Emissions Breakdown by Sector

City of Waukee - 2019		
Sector	CO_2 Emissions (MT)	% of CO_2 Emissions
Transportation & Mobile Sources	38,894	24.6%
Commercial Energy	31,366	19.8%
Industrial Energy	10,026	6.3%
Residential Energy	77,864	49.2%
Total	158,150	100.0%

City of Waukee - 2019 GHG Emissions

■ Transportation & Mobile Sources   ■ Commercial Energy   ■ Industrial Energy   ■ Residential Energy
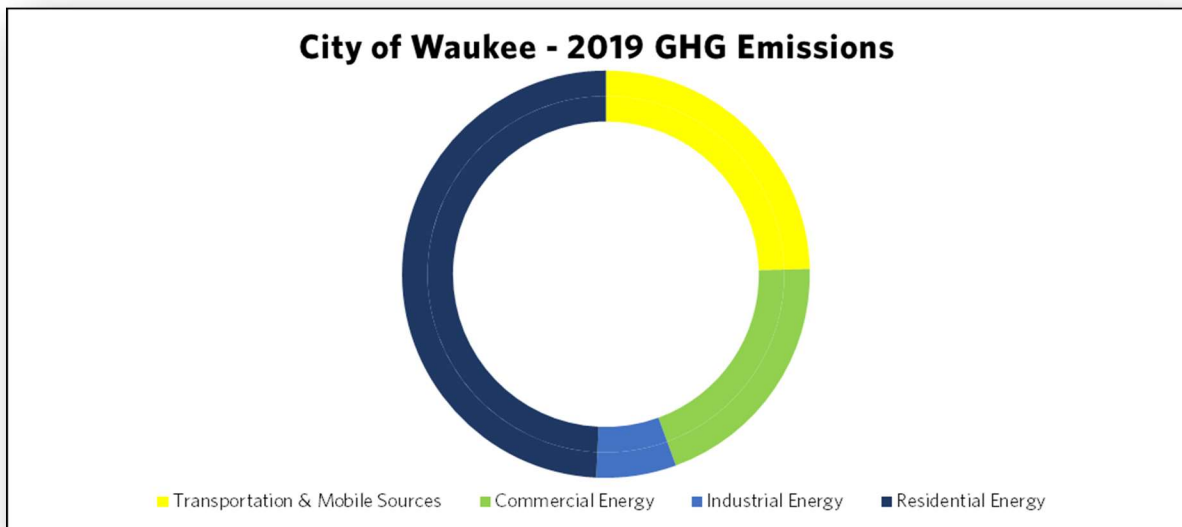
	Vehicle Class	Interstate	Primary Roads	Municipal Streets	Total City VMT (1000s)	% VMT
WAUKEE	Class 1 (Motorcycles)	19	125	96	199	0.2%
	Class 2 (Passenger Vehicles)	7,311	21,297	28,101	58,455	70.3%
	Class 3 (Trucks)	2,384	8,551	10,353	17,399	20.9%
	Class 4 (Buses)	99	251	60	377	0.5%
	Class 5-13 (Heavy Trucks and Other Vehicles)	1,751	4,620	1,347	6,724	8.1%
	Total	11,564	34,845	39,956	83,155	100.0%

City of West Des Moines

2019 Greenhouse Gas Emissions Breakdown by Sector

City of West Des Moines - 2019		
Sector	CO_2 Emissions (MT)	% of CO_2 Emissions
Transportation & Mobile Sources	338,156	28.0%
Commercial Energy	272,836	22.6%
Industrial Energy	351,751	29.1%
Residential Energy	245,617	20.3%
Total	1,208,360	100.0%
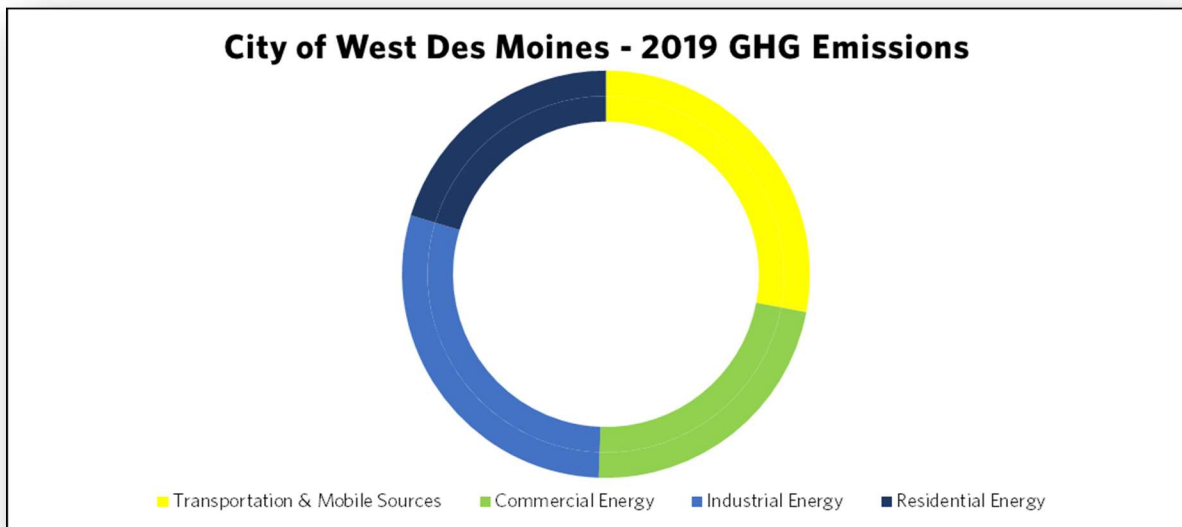
City of West Des Moines - 2019 GHG Emissions

■ Transportation & Mobile Sources ■ Commercial Energy ■ Industrial Energy ■ Residential Energy

	Vehicle Class	Interstate	Primary Roads	Municipal Streets	Total City VMT (1000s)	% VMT
	Class 1 (Motorcycles)	522	159	765	1,303	0.2%
	Class 2 (Passenger Vehicles)	206,384	26,914	224,256	517,875	71.8%
WEST DES MOINES	Class 3 (Trucks)	67,315	10,806	82,617	138,204	19.2%
	Class 4 (Buses)	2,808	317	478	3,425	0.5%
	Class 5-13 (Heavy Trucks and Other Vehicles)	49,425	5,839	10,746	60,045	8.3%
	Total	326,454	44,034	318,863	720,851	100.0%

City of Windsor Heights

2019 Greenhouse Gas Emissions Breakdown by Sector

City of Windsor Heights - 2019		
Sector	CO_2 Emissions (MT)	% of CO_2 Emissions
Transportation & Mobile Sources	23,359	40.2%
Commercial Energy	14,048	24.2%
Industrial Energy	0	0.0%
Residential Energy	20,676	35.6%
Total	58,083	100.0%

City of Windsor Heights - 2019 GHG Emissions

■ Transportation & Mobile Sources ■ Commercial Energy ■ Industrial Energy ■ Residential Energy
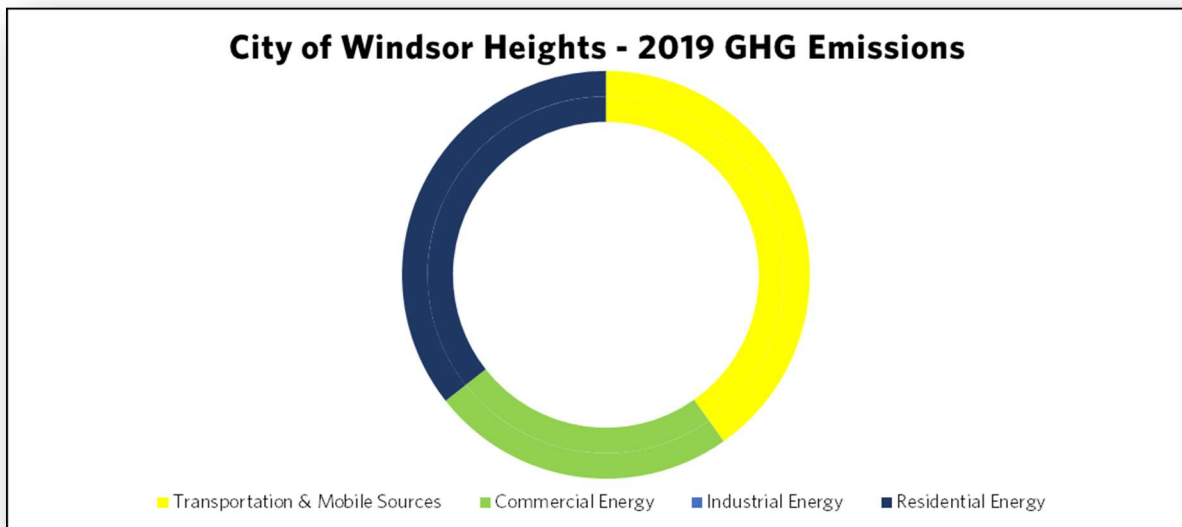
	Vehicle Class	Interstate	Primary Roads	Municipal Streets	Total City VMT (1000s)	% VMT
WINDSOR HEIGHTS	Class 1 (Motorcycles)	48	-	39	77	0.2%
	Class 2 (Passenger Vehicles)	19,025	-	11,547	34,470	71.0%
	Class 3 (Trucks)	6,205	-	4,254	9,112	18.8%
	Class 4 (Buses)	259	-	25	266	0.5%
	Class 5-13 (Heavy Trucks and Other Vehicles)	4,556	-	553	4,655	9.6%
	Total	30,093	-	16,418	48,580	100.0%

Section 5: Next Steps & Resources

This report is information only and not prescriptive.

However, if a community should choose to move forward with reducing emissions, ICLEI has a simplified planning process it could consider taking.

The good news is that Step 1: Conduct Emissions Inventory is already more than half done. If an MPO community would like to produce a forecast, please contact MPO staff to discuss the additional inputs needed, such as growth rate and potential for reductions.

While a reduction target is not mandatory if a community chooses to set one, this document can help inform the pathways to have the greatest impact.

MPO staff encourages using this data and document to aid in applying for grants and technical assistance programs. If any community requires additional information or letters of support, please contact MPO staff.

Resources
ICLEI-USA: Local Governments for Sustainability

American Planning Association Climate Resources

Guidebook to The Inflation Reduction Act's Investment in Clean Energy & Climate Action

USDOT Bipartisan Infrastructure Law Competitive Grant Programs

FHWA's Federal Funding for Electric Vehicles on the National Highway System

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DES MOINES AREA

MPO

METROPOLITAN PLANNING ORGANIZATION

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