2021

city of
Columbia

City of Columbia, Missouri

Community Trend Manual Report

For the Fiscal Year Ended - Sept. 30, 2021

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June 20, 2022

Mr. De'Carlon Seewood
City Manager
City of Columbia
Columbia, Missouri 65201

The City of Columbia Finance Department has prepared a Trend Manual since the early 2000s. The purpose of this document is to aid in the understanding of factors that affect the City's financial condition. This document also gives clarity to the City's financial strengths and weaknesses for, review by the Council, City management, credit rating agencies and other stakeholders. This year's Trend Manual was prepared for FY2017 to FY2021, and some changes have been made to help make this document more accessible and engaging.

This Community Trends document is a piece of the FY2017 - FY2021 Trend Manual that focuses exclusively on historical trends for our community, including the City's demographic and socioeconomic conditions. In prior years this information was included in a singular Trend Manual document, but for this current and future periods, we feel this information is better separated. Our FY2017 - FY2021 Trend Manual will still present the City's financial strengths and weaknesses for each of our City's funds and departments, with Community Trends being a stand-alone document.

The Community Trends document is separated into four distinct sections: Demographic Data, Standard of Living, Local Tax & Government Support, and Environmental Indicators. In each section you will find a description of the metric being observed, data from the current period of FY2017 - FY2021, an analysis of that data, and sources used. By doing this, we are supporting our Resilient Economy Strategic Plan Priority Area by increasing accessibility to data relevant to economic trends. The inclusion of Environmental Indicators will help us to better track our progress toward our environmental goals outlined in the Climate Action & Adaptation Plan (CAAP).

As always, our goal with the Trend Manual is to assist policymakers, including City Council and City Management, with making informed decisions based on historical evidence. We hope that making Community Trends a stand-alone document will help make it more accessible to anyone interested in learning more about our community.

Respectively Submitted,
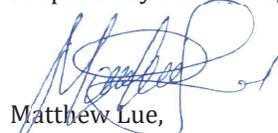
Matthew Lue,
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                      Columbia, Missouri 65205

Our vision: Columbia is the best place for everyone to live, work, learn and play.

Demographic Statistics

Total Population and Population by Race

The exact relationship between population changes and other economic and demographic factors has not yet been made clear. The evidence seems to indicate, however, that changes in population can have a direct effect on city revenues and expenditure because population levels appear to be at least indirectly related to such issues as employment, income, and property value. Sudden and substantial increases in population can create immediate pressures for new capital outlays on infrastructure, and for higher levels of service. In the case of annexations, where much of the capital infrastructure is already in place, the pressure may not be as great. However, there still may need to be an expansion of operating programs. A decline in population would, at first glance, appear to relieve the pressure for expenditures because there would be less population to service. In reality a city is rarely able to reduce expenditures in the same proportion as it is losing population, at least not in the short run. First, many of a city's costs, such as debt service, pension and governmental mandates, are fixed and cannot be reduced in the short run. Second, if the out migration is composed of middle- and upper-income households, then the City is left with a more expensive type of population to service, the poor and the elderly, who characteristically rely most heavily on government services. Finally, because of the interrelationship between population levels and other economic and demographic factors, a decline in population tends to have a cumulative negative impact on city revenues; the further the decline, the more adverse the effects on employment, income, housing and business activity.

Total Population and Population by Race				
Year	Estimated Population	White	Black	Other
2016	117,165	91,759	11,388	14,018
2017	118,620	91,851	12,344	14,425
2018	120,248	92,458	13,065	14,725
2019	121,230	93,481	13,274	14,475
2020	122,659	93,221	13,615	15,823

Analysis

The 2021 population by race information is not available; therefore, this indicator shows 2016 to 2020 as the five year period. Over this period, the City's population increase by 5,494 or 4.7%/ The City of Columbia has experienced positive, manageable population growth over the five-year period listed with an average growth of 1.17% each year.

Source

U.S. Census Bureau - American Community Survey estimates - Comparative Demographic Estimates
https://data.census.gov/cedsci/table?t=Counts,%20Estimates,%20and%20Projections%3APopulation%20Total&g=1600000US2915670&y=2020&tid=ACSCP5Y2020.CP05

Demographic Statistics

Percent of Population Age 17 or Under or Age 65 or Older

The percentage of individuals living in the community who are age 17 or under or who are age 65 or older is a measure of the community's needs. The indicator helps to assess the level of needs, both current and future. These population groups tend to need more services than the average individual and do not have the income to pay for those services.

Percent of Population Age 17 or Under or Age 65 or Older			
Year	Percent of Population age 17 and under	Percent of Population Age 65 and Older	Total Percent of Population Age 17 and Under or Age 65 and Older
2016	18.45%	9.40%	27.85%
2017	18.06%	9.80%	27.86%
2018	17.99%	10.24%	28.23%
2019	18.50%	9.41%	27.91%
2020	18.70%	11.00%	29.70%

Analysis

There is no American Community Survey data available for 2021. This indicator uses 2016 to 2020 as the five-year period. During the period shown, there has been both increase in percentage of the population who is age 17 or Under and who are age 65 or older by 0.25% and 1.60%, respectively. The total percentage of the population who is age 17 or under or who are age 65 or older was increased by 1.85%, which suggest that over time the City needs to spend more on both healthcare and job training.

Source

U.S. Census Bureau - American Community Survey estimates - Comparative Demographic Estimates
https://data.census.gov/cedsci/table?t=Counts,%20Estimates,%20and%20Projections%3APopulation%20Total&g=1600000US2915670&y=2020&tid=ACSCP5Y2020.CP05

Demographic Statistics

Population Density

One of the local conditions that affect the production of public goods and services is the population density or population per square miles within the community. This indicator measures the cost of providing services by a municipality or government. Some communities have compact areas with a higher population base. This makes the cost for services such as police, fire, street maintenance, etc. less costly per household.

Population Density			
Year	Estimated Population	Square Miles	Population per Square mile
2017	118,620	66	1,804
2018	120,248	66	1,823
2019	121,230	67	1,817
2020	122,659	67	1,837
2021	125,226	68	1,852

Analysis

Over the years 2017-2021, the City of Columbia's area has increased by 2 square (sq.) miles via annexation from 66 to 68 sq. miles. During the same period, the population has increased by 6,606 individuals or 5.57%, which lead to an overall increase in population density by 44 individuals or 2.46%.

Sources

Square Miles - Columbia Annexation History https://www.como.gov/Maps/documents/Annexation_History_current.pdf
Estimated Population - U.S. Census Bureau - American Community Survey estimates - Comparative Demographic Estimates
https://data.census.gov/cedsci/table?t=Counts,%20Estimates,%20and%20Projections%3APopulation%20Total&g=1600000US2915670&y=2020&tid=ACSCP5Y2020.CP05

Standard of Living Statistics

Median Household Income

Median household income is one measure of a community's ability to pay taxes: the higher the median household income, the more property tax and sales tax can be generated by the community. If income is more evenly distributed, a higher median household income will usually mean less dependency on governmental services, such as transportation and social welfare programs. Credit rating firms use household and per capita income as an important measure of a local government's ability to pay on debt. Inflation adjusted median household income is taken from the American Community Survey, 5-Year Estimates.

Median Household Income (Total and by Race) in US Dollars					
Year	Median Household Income*	Inflation Rate**	White	Black	Gap
2016	45,221	0.85%	49,475	28,826	20,649
2017	47,236	1.66%	50,954	31,454	19,500
2018	49,277	1.92%	53,330	34,247	19,083
2019	51,276	1.49%	55,581	32,331	23,250
2020	53,447	0.95%	56,331	33,237	23,094

*Annual household incomes are inflation adjusted for that particular year.
**Annual inflation rates are calculated based on the CPI's.

Analysis

The American Community Survey information is not available for 2021. This indicator uses 2016 to 2020 as the five-year period. Overall median household income increased by $8,226 or 18.19% from 2016 to 2020. During the same period, the average annual inflation rate was 1.37%. This indicates that the growth in median household income has kept pace with the growth of inflation. Inflation adjusted median household income for white households and for black or African American were increased by $6,856 or 13.86% and $4,411 or 15.30%. While median household income for both races increased, the gap between white and black or African American median household income has risen to 11.84%. This indicator is considered to be a warning trend due to the increasing gap that exists between median incomes for white versus black households.

Sources

U.S. Census Bureau - American Community Survey (ACS) Estimates - Median household income – ACS 5-Year Estimates
https://data.census.gov/cedsci/table?q=columbia%20mo&tid=ACSST5Y2020.S1903
CPI - BLS (Bureau of Labor Statistics) -
https://data.bls.gov/timeseries/CUUR0200SA0?amp%253bdata_tool=XGtable&output_view=data&include_graphs=true

Standard of Living Statistics

Poverty Rates

An additional indicator to monitor changes in living standard is the poverty rate. Information on poverty rate are taken from the American Community Survey. These figures are calculated using five years of data. This indicator can signal a future increase in the level and cost for services because low-income households have relatively higher needs and relatively lower personal wealth.

Poverty Rates (Total, by Race, and compared to state and national poverty rates)					
Year	Columbia	White	Black	Missouri	United States
2016	23.60%	21.60%	31.30%	15.30%	15.10%
2017	22.90%	20.90%	30.90%	14.60%	14.60%
2018	22.20%	19.50%	32.70%	14.20%	14.10%
2019	21.80%	18.70%	35.10%	13.70%	13.40%
2020	20.20%	16.70%	41.30%	13.00%	12.80%

Analysis

Information is available for 2016 to 2020, as the 2021 data has not released yet. During this time, Columbia's overall poverty rate decreased by 3.4% to 20.2% in 2020. Columbia's overall poverty rate has been significantly above both the Missouri and United States poverty rates for the period shown. This is a warning trend that will need to be closely monitored as an increase in poverty rate can indicate more demand for city services with less income to pay for those services. When examining the poverty rates by race, the poverty rate among whites decreased by 4.9% and the poverty rate for Black or African Americans increased 10% for Columbia. The trend is consistent in the current years too, where from 2019 to 2020 the poverty rate for whites decreased while the poverty rate for black or African Americans increased from 35.1% to 41.3%.

Sources

U.S. Census Bureau - American Community Survey (ACS) Estimates - Poverty Rate – ACS 5-Year Estimates
https://data.census.gov/cedsci/table?q=columbia%20mo%20poverty&tid=ACSST5Y2020.S1701

Employment Statistics

Civilian Labor Force

Jobs in the community are referred to as the "employment base." Employment base is important because it is directly related to the levels of the business activity and personal income. Changes in the number of jobs provided by the community are a measure of and an influence on business activity. If the employment base is growing, if it is sufficiently diverse to protect against short-run economic fluctuation or downturn in one sector, and if it provides sufficient income to support the local business community, then it will have a positive influence on the city's financial condition. A decline in employment base as measured by the number of jobs, or the lack of employment, can be an early warning sign that overall economic activity will decline and thus, governmental revenues may decline (or at least not increase at the expected rate), particularly sales tax revenues.

Community Labor Force		
Year	Civilian Labor Force	Employed
2017	98,257	96,041
2018	98,593	96,835
2019	99,786	97,772
2020	97,780	94,518
2021	100,553	98,278

Analysis

Civilian labor force increased by 2,296 or 2.34% from 2017 to 2021. During the same period, the number of employed individuals increased by 2,237 or 2.33%. The City of Columbia's largest workforce are in service sectors, including education, health, and social services, which was affected by COVID in 2020. Due to COVID-19, both the civilian labor force participation and employed persons number significantly fell. In 2021, however, as the Columbia's economy started recovering and those numbers reached a record level.

Source

Bureau of Labor Statistics Website http://www.bls.gov/eag/eag.mo_columbia_msa.htm - Obtained for the month of November (Data from December is preliminary)

CARE Program

CARE Program

The City of Columbia's Career Awareness Related Experience (CARE) program hires 14- to 20-year-olds who live in the City of Columbia, MO and/or attend a Columbia, MO school and places them at local businesses, where they gain much needed real-world hands-on work experience while getting paid. One hundred percent of the trainees' wages are paid by CARE, which is administered through the Columbia Parks and Recreation Department. CARE's goal is for Columbia's youth to be ready to enter the workforce and become productive, and self-sufficient citizens. Since 1982, the CARE program has provided comprehensive services for Columbia youth that include job readiness training, paid real-world hands-on work experience, mentoring, soft skill development, and career exploration. CARE currently has the following three programs: 1. Summer program: CARE's oldest and largest program is its summer program. It is a six-week program in which approximately 125 14- to 20-year-old trainees are hired to work up to 20 hours per week at local work sites. 2. City Utilities summer internship: CARE program also offers a ten-week internship in which approximately 20 16- to 20-year-old interns are hired work up to 28 hours per week for sewer and stormwater, solid waste, water & light, water distribution, or water production. 3. Boone County Family Resources (BCFR) collaboration: CARE provides year-round paid real-world hands-on experience with more specialized support for these BCFR clients. Approximately 10 BCFR trainees are hired to work up to 20 hours per week at local work sites. The CARE program is funded primarily from general fund sources with some funding coming from grants and Boone County Family Resources.

CARE Program								
Fiscal Year	Total Expenses	Number of Applicants	Number of Applicants Placed	Percent Placed	Minority Applicant Percent	Number of Completed Program	Percent Completed Program	Number of Work Site Partners
2017	$488,758	403	182	45%	66%	177	97%	92
2018	$546,855	506	196	39%	62%	192	98%	104
2019	$496,233	567	184	32%	58%	180	98%	86
2020	$354,897	332	144	43%	56%	143	99%	73
2021	$396,774	438	154	35%	56%	152	99%	84

Analysis

From 2017 to 2021, the total CARE program related annual expenses decreased by $91,984 or 18.82% and the number of applicants decreased by 35 or 8.68%. Of the applicants that apply, the CARE program has only had enough funding to place less than half of the applicants per summer. FY 2018 expenses increased due to the addition of two neighborhood outreach specialists which were funded by one-time general fund savings. In FY 2019, 98% of participants completed the program and 99% completed the program in FY 2020 and FY 2021. FY 2019 expenses decreased due to one-time general fund savings in FY 2018 not occurring in FY 2019. COVID-19 has impacted the CARE program substantially. In FY 2020 expenses decreased due to budget cuts by $141,336 or 28.48% which led to reduction in CARE trainees and elimination of the CARE Art Gallery Summer Program. In FY 2021 few of the CARE trainees were added back and the expenses increased by $41,877 or 11.80%.

Sources

City of Columbia Annual Comprehensive Financial Report - Required Supplementary Information - Budgetary Comparison Schedule https://www.como.gov/wp-content/uploads/2022/03/City-of-Columbia-MO-ACFR-FY21-5.pdf
City of Columbia CARE Program Information https://www.como.gov/parks-and-recreation/programs-registration/c-r-e-career-awareness-related-experience/

Employment Statistics

Unemployment Rate

The unemployment rate is directly related to the levels of the business activity and personal income. Changes in rate of employment of the community's citizens are related to changes in personal income and thus, are a measure of and an influence on the community's ability to support its local business sector. Statistics for unemployment are taken from the American Community Survey 5-Year Estimates. An increase in the unemployment rate can be an early warning sign that overall economic activity will decline and thus, that governmental revenues may decline (or at least not increase at the expected rate), particularly sales tax revenues.

Unemployment Rate (Overall, by Race, and compared to state and national unemployment rates)								
City of Columbia Unemployment Rate by Race			State of Missouri Unemployment Rate by Race			United States Unemployment Rate by Race		
Year	Overall Rate	White	Black	Overall Rate	White	Black	Overall Rate	White	Black
2016	4.20%	3.40%	8.00%	6.60%	5.60%	13.80%	7.40%	6.30%	13.30%
2017	4.30%	3.30%	7.50%	5.80%	4.90%	12.10%	6.60%	5.50%	11.90%
2018	4.10%	3.30%	7.70%	5.10%	4.40%	10.60%	5.90%	4.90%	10.60%
2019	4.40%	3.40%	9.90%	4.60%	3.90%	9.20%	5.30%	4.50%	9.50%
2020	3.50%	2.90%	7.30%	4.50%	3.90%	8.20%	5.40%	4.60%	9.20%

Analysis

Information for 2021 is not available. This indicator uses 2016 to 2020 as the most recent five years. The City of Columbia's largest workforce sectors are the education, health and social services areas which have enabled the City to continue to stay below the national and state unemployment rates. For FY 2020 the City's overall unemployment rate is 3.5%, compared to the state's rate of 4.5% and the national unemployment rate of 5.4%. While there has been a decrease in unemployment rates for both White and Black or African American residents, there still remains a much higher unemployment rate for Black or African American residents (7.3%) versus White residents (2.9%) in Columbia.

Sources

U.S. Census Bureau - American Community Survey (ACS) Estimates – Unemployment Rate – ACS 5-Year Estimates
https://data.census.gov/cedsci/table?q=United%20states%20unemployment&tid=ACSST5Y2016.S2

Local Tax Collection

Sales Tax Per Person

A general sales tax is levied on all persons selling tangible personal property or rendering taxable services on a retail basis within the City limits. The City's entire portion of the tax amounts to a total of 2% of gross retail receipts, of which 1% is for City General Revenues, 1/2% is a Transportation Sales Tax, 1/4% is Parks Sales Tax, and 1/4% is for Capital Improvement Sales Tax. A portion of the 1% general sales tax is allocated to the General Fund and the rest (2.0% of the 1%) is allocated to capital projects and recorded in the Capital Projects Fund. The table below shows the total 2% sales tax received by the City.

Sales Tax per Person			
Fiscal Year	Total Sales Tax	Population	Sales Tax per Person
2017	$47,546,381	118,620	$400.83
2018	$48,461,688	120,248	$403.01
2019	$47,264,643	121,230	$389.88
2020	$47,278,467	122,659	$385.45
2021	$52,611,482	125,226	$420.13

Analysis

Sales tax revenues in actual dollars increased by $5,065,101 or 10.65%, while the population increased by 5.57% for the same period. The per person sales tax during this period, however, increased by only $19.30 or 4.82%. This means that the City of Columbia's sales tax revenue collection growth rate is lower than the rate at which the population increased during the same period. This is mainly due to the increasing growth in online sales, which, until recently, were not subject to local sales taxes. At the April 2022 election residents approved an online use tax which will be equivalent to our local sales tax.

Sources

City of Columbia Annual Comprehensive Financial Report
http://www.como.gov/finance/accounting/financial-reports/
U.S. Census Bureau - Quick Facts https://www.census.gov/quickfacts/fact/table/columbiacitymissouri/RHI225220

Local Tax Collection

Gasoline Tax Per Person

There are many sources of other local taxes, including gasoline, cigarette, motor vehicle, telephone gross receipt taxes, natural gas gross receipt taxes, cable franchise gross receipt taxes and Boone Electric gross receipt taxes. Gasoline taxes are dedicated funding sources, and they provide funding for the construction and maintenance of highways.

Gasoline Tax per Person			
Fiscal Year	**Total Gasoline Tax**	**Population**	**Gasoline Tax per Person**
2017	$2,932,516	118,620	$24.72
2018	$2,905,773	120,248	$24.16
2019	$2,934,503	121,230	$24.21
2020	$2,766,311	122,659	$22.55
2021	$2,899,920	125,226	$23.16

Analysis

For the five-year period shown, gasoline taxes decreased $32,596 or 1.11% and per capita gasoline tax decreased by 6.31% during the same period. This tax revenues have not kept up with the increase in inflation and population.

Sources

City of Columbia Annual Comprehensive Financial Report - Required Supplementary Information - Budgetary Comparison Schedule https://www.como.gov/wp-content/uploads/2022/03/City-of-Columbia-MO-ACFR-FY21-5.pdf
U.S. Census Bureau - Quick Facts https://www.census.gov/quickfacts/fact/table/columbiacitymissouri/RHI225220

Emergency Service Statistics

Police Per Thousand

Personnel costs are nearly 80% of total expenses for this department. The sworn officers per thousand population is an important indicator when looking at the increases in positions over time. If employees per thousand population is increasing significantly, it may indicate the operation is becoming more labor intensive, demands for services are rapidly increasing, or productivity is declining. If the number of employees per thousand population is declining significantly, it may indicate the City has not been adding sufficient police staff to handle the increased demand for services and the level of service may decline as a result.

Police per thousand							
Fiscal Year	Total Number of Sworn Officers	Sworn Officers Per Thousand Population	Change in Number of Positions	Positions Added	Positions Deleted	Positions Reassigned Between Depts.	Explanation
2017	173	1.46	0	0	0	0	
2018	173	1.44	0	0	0	0	
2019	173	1.42	0	0	0	0	
2020	184	1.49	11	11	0	0	From other depts.
2021	187	1.49	3	3	0	0	

Analysis

For the five-year period shown, the total number of sworn positions increased by 14.00 FTE. Sworn officers per thousand population increased 2.05% while population increased 5.57%. This indicates the growth of the sworn police department staff has not kept up with the growth in the population for this period. The City has not been able to add positions to keep up with population growth due to lower growth in revenues and significant increases in pension costs and health insurance rates.

The Police department has added sworn positions over this period to create a Community Outreach Unit and increase community policing efforts. The increase of eleven (11.0) sworn officers in FY 2020 was for Airport Safety officers (9.0) and Park Rangers (2.0). These were moved from other City departments. This did not increase the number of officers on the street as they are dedicated to their respective assignments (Airport and Parks).

Sources

City of Columbia Annual Budget Document
http://www.como.gov/finance/accounting/financial-reports/
Population Estimates: U.S. Census Bureau - American Community Survey (ACS) population estimates
https://data.census.gov/cedsci/table?t=Counts,%20Estimates,%20and%20Projections%3APopulation%20Total&g=1600000US2915670&y=2020&tid=ACSCP5Y2020.CP05

Emergency Service Statistics

Firefighters Per Thousand

Personnel costs are 88% of total expenses for this department. The employees per thousand population is an important indicator when looking at the increases in positions over time. If employees per thousand population is increasing significantly, it may indicate the operation is becoming more labor intensive, demands for services are rapidly increasing, or productivity is declining. If the number of employees per thousand population is declining significantly, it may indicate the City has not been adding enough staff to handle the increased demand for services and the level of service may decline as a result.

Firefighter per thousand							
Fiscal Year	Total Number of Employees	Employees Per Thousand Population	Change in Number of Positions	Positions Added	Positions Deleted	Positions Reassigned between Depts.	Explanation
2017	145	1.22			0		
2018	145	1.21	0	0	0	0	
2019	145	1.19	0	0	0	0	
2020	148	1.20	3	3	0	0	ADDED: (3) Firefighters - SAFER Grant
2021	148	1.18	0	0	0	0	

Analysis

For the period shown, the total number of positions increased by 3.00 FTE. Employees per thousand decreased by 3.28%, while the growth in population was 5.57%. This indicates that the number of employees added has not kept up with the growth in the population for this period. The City has not been able to add positions to keep up with population growth due to lower growth in revenues and significant increases in pension costs and health insurance rates.

Sources

City of Columbia Annual Budget Document
http://www.como.gov/finance/accounting/financial-reports/
Population Estimates: U.S. Census Bureau - American Community Survey (ACS) population estimates
https://data.census.gov/cedsci/table?t=Counts,%20Estimates,%20and%20Projections%3APopulation%20Total&g=1600000US2915670&y=2020&tid=ACSCP5Y2020.CP05

Federal and State Support

Federal/State Government Funding Per Person

Grant revenues shown here include federal grants and state grants. Federal grants consist of mass transit grants from the Department of Transportation, non-motorized grants, police grants, and stimulus grants. State grants cover diverse local service needs and provide funding for health, transportation, conservation, and police needs. Federal and state grants are often received for a one to three year period with the City having to absorb the costs after the grant timeframe has expired.

Federal/State Government funding per person			
Fiscal Year	**Total Grants**	**Population**	**Grants per Person**
2017	$16,763,923	118,620	$141.32
2018	$13,072,553	120,248	$108.71
2019	$16,553,469	121,230	$136.55
2020	$14,325,231	122,659	$116.79
2021	$29,695,702	125,226	$237.14

Analysis

For the period shown, grant revenues increased $12.93 million or 77.14%. From FY 2020 to FY 2021, federal and state grant revenues increased by 107.30%. This increase is largely due to Coronavirus Aid, Relief, and Economic Security (CARES) Act funding. Originally, grant revenue per person decreased from $141.32 in FY 2017 to $116.79 in FY 2020. However, in FY 2021 the City received additional $15 million federal grant under the ARPA and the per person grants revenue increased to $237.14.

Source

City of Columbia Annual Comprehensive Financial Report - Required Supplementary Information - Budgetary Comparison Schedule https://www.como.gov/wp-content/uploads/2022/03/City-of-Columbia-MO-ACFR-FY21-5.pdf

Emission Statistics

Community Greenhouse gas (GHG) emissions

The total community greenhouse gas (GHG) emissions metric includes emissions from residential, commercial, and industrial energy use; transportation; solid waste and wastewater; and process and fugitive emissions from natural gas within Columbia city limits. Emissions are measured in metric tons of CO_2 equivalent (MT CO_2e). The City of Columbia's Climate Action and Adaptation Plan (CAAP) outlines goals to reduce community greenhouse gas emissions to 1,548,783 MT CO_2e by 2035, and to under 476,548 MT CO_2e by 2050.

Per capita emissions are used to measure changes in emissions in relation to population. Factors such as improved energy efficiency in buildings, increased supply of renewable energy, and lower-emission transportation can decrease per capita emissions. As Columbia's population grows, per capita emissions will need to decrease to achieve the emission reduction goals outlined in the CAAP.

Community Greenhouse gas (GHG) emissions		
Year	Total Community GHG Emissions (MT CO_2e)	Per Capita Emissions (MT CO_2e)
2016	2,432,111	20.76
2017	2,235,087	18.84
2018	2,333,508	19.41
2019	2,299,708	18.97
2020	2,125,721	17.33

Analysis

GHG emissions are influenced by changes in weather (e.g., colder winters or hotter summers), energy efficiency, and citizen's behavior. Total community emissions reduced by 12.6% between 2016 and 2020, however 84% of that reduction took place between 2019 and 2020, largely due to pandemic-induced transportation changes. Between 2016 and 2019, total community emissions reduced by 5.4%. While Columbia's population increased by 4.7% between 2016 and 2020, per capita emissions decreased by 3.5%.

Sources (link not active)

Total Community GHG Emissions: City of Columbia Greenhouse Gas Emissions Inventory
https://www.como.gov/sustainability/areas-of-focus/climate-action/
Population Data: ACS 5-Year Data; U.S. Census Bureau – American Community Survey estimates – Comparative Demographic Estimates
https://data.census.gov/cedsci/table?q=columbia%20missouri&tid=ACSDP5Y2020.DP05

Emission Statistics

Community Greenhouse gas (GHG) emissions by Sectors

The residential energy, transportation, and waste sectors are all directly influenced by population size. Per capita emissions in these sectors are used to understand how emissions per sector are changing in relation to population changes. For each sector, the CAAP outlines plans and goals to reduce emissions. Successful implementation of the CAAP will result in decreased overall and per capita emissions in each of these sectors over time. The residential energy sector represents emissions from natural gas and electricity use for homes in the community. Increased renewable energy generation and improved building energy efficiency are both necessary to reduce residential energy emissions per capita. The transportation sector includes emissions from vehicle travel within Columbia city limits. Over time, transportation emissions can be lowered by transitioning to lower-emission vehicles, increasing transit use and improving infrastructure for active transportation.

The waste sector includes emissions from solid waste decomposition in landfills and wastewater processing. The active cells at the City of Columbia Sanitary Landfill are bioreactors, meaning they are designed and managed to quickly decompose and stabilize the waste. This also produces methane gas at a faster rate, some of which is used to generate electricity at the landfill site.

Community Greenhouse gas (GHG) emissions by Sectors			
Year	Residential Energy Emissions Per Capita (MT CO2e)	Transportation Emissions Per Capita (MT CO2e)	Waste Emissions Per Capita (MT CO2e)
2016	4.88	5.71	0.47
2017	4.34	5.37	0.40
2018	4.83	5.30	0.35
2019	4.59	5.26	0.36
2020	4.57	3.89	0.42

Analysis

Residential energy emissions per capita decreased by 6.4% between 2016 and 2020. This change was caused in part by a decrease in residential electricity consumption along with a decrease in the amount of emissions generated per unit of energy produced. While progress has been made, residential energy use will need to decrease at a faster rate to meet emissions reduction goals.

Transportation emissions per capita have decreased each year. Vehicle miles traveled dropped significantly in 2020 due to the pandemic, skewing the 2020 data. Between 2016 and 2019, transportation emissions per capita decreased by 7.9%. The rate of transportation emissions reductions will need to increase in order to meet emissions reductions goals. Waste emissions per capita have reduced by 11% between 2016 and 2020. The emissions in this sector are on track with GHG reduction goals.

Sources (Link missing)

Waste emissions: https://ghgdata.epa.gov/ghgp/service/facilityDetail/2020?id=1003969&ds=E&et=&popup=true
Transportation & residential energy emissions: https://www.como.gov/sustainability/areas-of-focus/climate-action/
U.S. Census Bureau - American Community Survey estimates - Comparative Demographic Estimates
https://data.census.gov/cedsci/table?t=Counts,%20Estimates,%20and%20Projections%3APopulation%20Total&g=1600000US2915670&y=2020&tid=ACSCP5Y2020.CP05

Emission Statistics

Greenhouse gas (GHG) emissions per job

Commercial energy, industrial energy, transportation, and waste emissions per job compare GHG emissions with economic activity. Increased economic activity can indicate commercial or industrial growth, and can cause more emissions related to energy use, transportation activity and waste generation. Jobs in the community, referred to as the "employment base," is used as the number of jobs as it directly relates to economic activity.

Greenhouse gas (GHG) emissions per job				
Year	Commercial Energy Emissions per Job	Industrial Energy Emissions per Job	Transportation Emissions per Job	Waste Emissions per Job
2016	8.68	2.77	6.79	0.56
2017	7.69	2.75	6.47	0.49
2018	8.23	2.52	6.46	0.42
2019	8.00	2.50	6.38	0.44
2020	7.83	2.60	4.86	0.52

Analysis

For each of these metrics, a reduction was observed between 2016 and 2020. However, the trends are inconsistent as there are increases between some years and decreases between others.

The Commercial energy emission per job decreased by 9.8%. Industrial energy emissions per job decreased by 6%. Transportation emissions per job decreased by 6.1% between 2016 and 2019, and by 28.5% between 2016 and 2020. The latter metric is skewed by pandemic-induced transportation changes. Waste emissions per job decreased by 7% between 2016 and 2020. Further analysis of the relationship between emissions and economic activity could include comparisons with other similarly sized cities over the same time period.

Sources

U.S. Census Bureau - American Community Survey estimates - Comparative Demographic Estimates
https://data.census.gov/cedsci/table?t=Counts,%20Estimates,%20and%20Projections%3APopulation%20Total&g=1600000US2915670&y=2020&tid=ACSCP5Y2020.CP05
Jobs in the Community: Bureau of Labor Statistics: http://www.bls.gov/eag/eag.mo_columbia_msa.htm
Emissions data: Community Greenhouse Gas Inventory
https://www.como.gov/sustainability/areas-of-focus/climate-action/

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