CHMURA
Economics & Analytics

The Economic Impact of Population Growth in Great Falls, Montana

Prepared for Great Falls Montana Development Authority
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About Chmura Economics & Analytics

We have a data-driven culture. We are a group of published scientists contributing to innovations with big data analytics on the forefront of applied economics and technology solutions. We have a very diverse team of people with backgrounds such as PhD economists, statisticians, computer scientists and transformation strategists. We serve a cross section of decision makers from the defense, government, public, and private sectors.

As data scientists, we help our clients answer big data questions, quickly. We provide a reliable picture of economic trends to our clients from a macro to a micro level. Our clients rely on the historical, current, and predictive market reports we provide to cut through the confusing information they receive on a daily basis from the media, politicians, and industry resources.

Our clients view us as trusted economic advisors because we help them mitigate risk and prepare for growth by understanding the why, the how, and the what about their local economy. As the nation's preferred provider of labor market date, we help our clients understand both the demand for and the supply of available data. Our clients benefit from our expertise by better understanding their own bottom line costs, sustainability issues, and associated risks.

Summary[1]

While population in the Great Falls metropolitan statistical area (MSA)[2] has experienced limited growth in the past few years, Chmura's analysis indicates that an influx of population can generate significant economic impact in the region. This would benefit local businesses—especially consumer-related establishments.

Table 1 summarizes the economic impact of population growth under three scenarios in the Great Falls MSA. In the most modest scenario where the metro area grows at the state pace of 0.85%, 698 new residents would result in a $13.0 million economic impact that can support 119 jobs in the region. Under the most optimistic scenario where the region increases by 1,000 residents in a year, the spending of new households can generate $18.7 million in total economic impact and support 170 jobs in the MSA.

Table 1: Economic Impact Summary of Great Falls MSA Population Growth

Benefits	Scenario 1 Growth at state level of 0.85%	Scenario 2 Growth at Billings MSA level of 1.07%	Scenario 3 Growth by 1,000 Residents
New Residents	698	872	1,000
New Households	287	359	412
Total Household Income ($Million)	$13.4	$16.7	$19.2
Direct Spending in MSA ($Million)	$7.7	$9.6	$11.0
Direct Jobs Supported	79	99	113
Total Economic Impact ($Million)	$13.0	$16.3	$18.7
Total Jobs Supported	119	149	170

Source: Chmura Economics & Analytics

Table 2 outlines the direct spending impact on different industries in the Great Falls MSA from the population growth. Under Scenario 1, the industries benefiting the most from increased household spending is transportation ($1.55 million), housing and related expenses ($1.54 million), and food ($1.20 million). Under the other two more optimistic scenarios (Scenario 2 and 3), the top three industries remain the same, but the spending impacts are larger as more residents result in larger spending in each industry.

[1] The Great Falls Montana Development Authority retained Chmura Economics & Analytics (Chmura) to estimate the impact of population growth on the Great Falls MSA. Chmura is a full service economic research consulting and software development firm with headquarters in Richmond, Virginia along with offices in Cleveland, Ohio and Spokane, Washington.

[2] The Great Falls MSA includes Cascade County, Montana.

Table 2: Spending Impact on Great Falls Industries from Population Growth

	Scenario 1	Scenario 2	Scenario 3
Total Household Income ($Million)	**$13.39**	**$16.72**	**$19.17**
Direct Spending in MSA ($Million)	**$7.68**	**$9.59**	**$11.00**
Food	$1.20	$1.49	$1.71
Housing and Related Expenses	$1.54	$1.93	$2.21
Utility	$0.59	$0.74	$0.84
Furniture, Appliance & Household Supplies	$0.50	$0.63	$0.72
Apparel	$0.27	$0.33	$0.38
Transportation	$1.55	$1.93	$2.22
Healthcare	$0.72	$0.90	$1.03
Entertainment & Personal Service	$0.65	$0.81	$0.93
Education	$0.21	$0.26	$0.30
Cash Contribution[3]	$0.24	$0.30	$0.35
Other Spending Items	$0.21	$0.26	$0.30

Source: Chmura Economics & Analytics

Background

The City of Great Falls is the county seat of Cascade County and is the third-largest city in the state of Montana. Situated on the Missouri River in Central Montana, the city is also the principal city of the Great Falls Metropolitan Statistical Area (MSA).

The population in the Great Falls MSA has changed little of the past two decades. This report estimates the economic impact that population growth would have on the metro area.

The economic impact of population growth comes primarily from new resident spending on items such as housing, health care, food, transportation, and a range of other services. As a result, local businesses such as retail stores and restaurants benefit from the household spending, which is called the direct impact in an economic impact analysis. Those consumer-related businesses subsequently purchase supplies from other local businesses, which is called the indirect impact. Finally, an induced impact occurs when the businesses hire additional workers to meet the demand of new households and they spend some of their income in the region.

Chmura used the following methodology to estimate the economic impact of population growth in the Great Falls MSA:

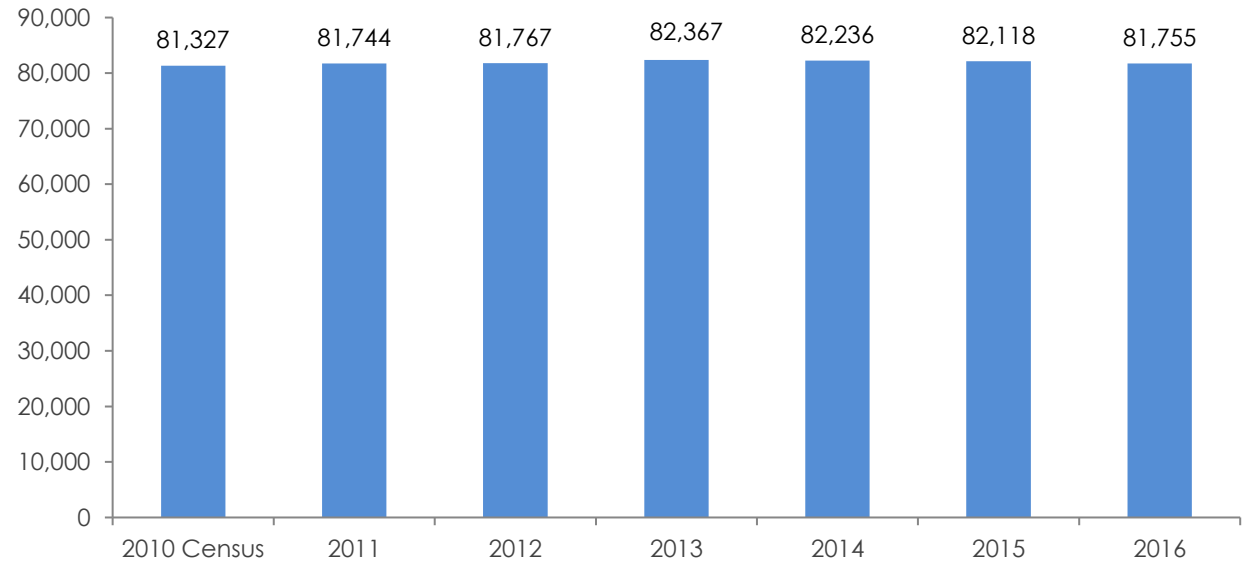
[3] Cash contribution includes cash contributed to persons or organizations outside the household, including alimony and child support payments; care of students away from home; and contributions to religious, educational, charitable, or political organizations. Source: Bureau of Labor Statistics.

1. For direct spending, the annual incremental residents and households were estimated based on three different scenarios.
2. The current household income of the region was used to calculate household income associated with population growth.
3. Using the latest Consumer Expenditure Survey,[4] total household spending was allocated into categories such as housing, food, clothing, transportation, health care, and a range of other products and services.
4. Finally, IMPLAN Pro economic impact model[5] was used to estimate the indirect and induced impact associated with household spending resulting from population growth.

Historic Population Growth

The Great Falls MSA has not added a significant number of new residents in the past sixteen years. Based on the 2000 U.S. Census, population in the metro area was 80,357. According to the 2010 Census, population stood at 81,327. Six years later, the estimated population inched up to 81,755 (Figure 1). Population peaked at 82,367 in 2013, but has declined slightly since then.

Figure 1: Great Falls MSA Population, 2010-2016



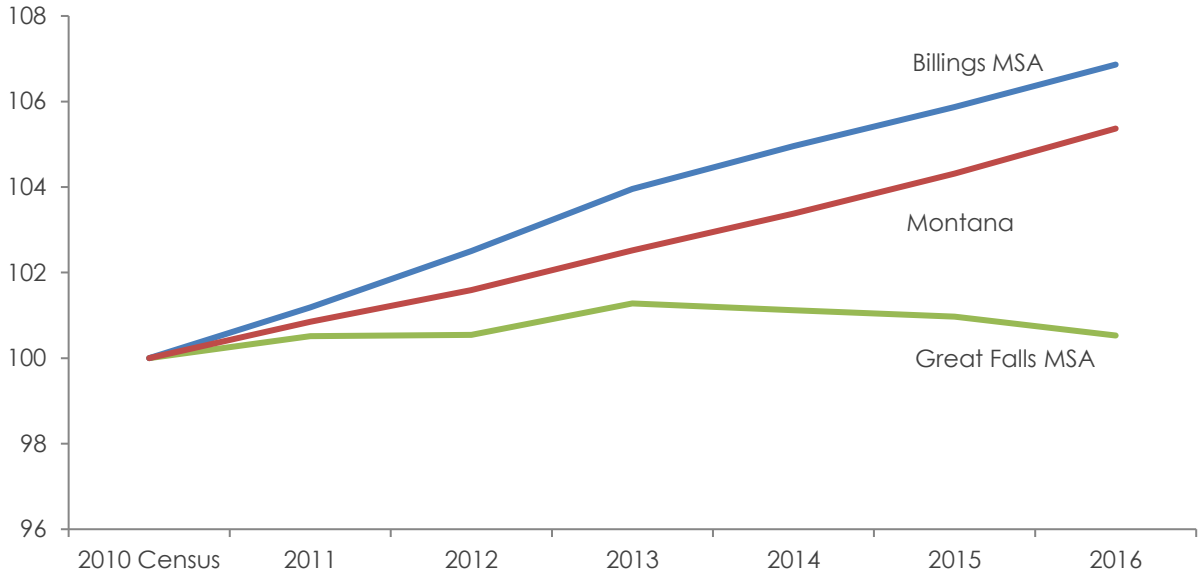
Source: U.S. Census

Figure 2 illustrates the population change in the Great Falls MSA, compared with the Billings MSA—the largest metro area in the state of Montana—and the state. Population growth in the Great Falls MSA lagged those two areas with population growth in the Great Falls MSA averaging 0.05% per year in the

[4] The Consumer Expenditure Survey is an annual survey conducted by the U.S. Department of Labor.
[5] *IMPLAN Professional* was created in the 1970s by the U.S. Forestry Service and is widely used by economists to simulate the impact of specific events on regional economies.

past six years, much lower than the state average of 0.85% per year and 1.07% per year for the Billings MSA.

Figure 2: Population Growth in Great Falls MSA, Billings MSA, and Montana (Indexed Value with 2010=100)



Source: U.S. Census

Population growth occurs as industries in the region expand. In the Great Falls MSA, while employment in the manufacturing and health care sectors expanded in the five years from 2011 to 2016, sectors such as construction and information contracted. In contrast, both the Billings MSA and the state of Montana experienced sizable employment growth in sectors such as mining, manufacturing, health care, and retail.[6]

While the Great Falls MSA experienced limited population growth since 2010, this report illustrates the economic impact that would occur if the region achieved a more rapid influx of new residents. For that purpose, Chmura adopts the following three scenarios to analyze the economic impact of population growth in the Great Falls MSA:

1. 0.85% per year (same pace as the state from 2010 through 2016)
2. 1.07% per year (same pace as the Billings MSA from 2010 through 2016)
3. By 1,000 new residents

Economic Impact under Scenario 1

Under Scenario 1, it is assumed that the population of the Great Falls MSA expands at the state pace, which is 0.85% per year. Based on the 2016 population estimate, the Great Falls MSA will add 698 residents

[6] Source: Industry Snapshot for the Great Falls MSA, Billings MSA, and Montana; JobsEQ.

in one year. The latest data from the American Community Survey (ACS) indicate that the current household size of the region is 2.43.[7] Assuming household size remains the same, 698 new residents translates into an addition of 287 new households to the region. These new residents will spend a large portion of their income in the area, benefiting many local businesses such as retail, food services, health care and other consumer-related businesses.

The economic impact from household spending depends on household income. Chmura used the current median household income to represent the income of additional households. Based on the latest America Community Survey, median annual household income of the Great Falls MSA was estimated to be $46,571 in 2016.

Household income is adjusted to remove taxes, savings, and investments to estimate discretionary household spending. These categories together are estimated to comprise 27.5% of income.[8]

In addition, household spending must be further adjusted to account for leakage—the percentage of spending that occurs outside the region. The IMPLAN model estimates that average consumer spending leakage is 20.1% for the region.

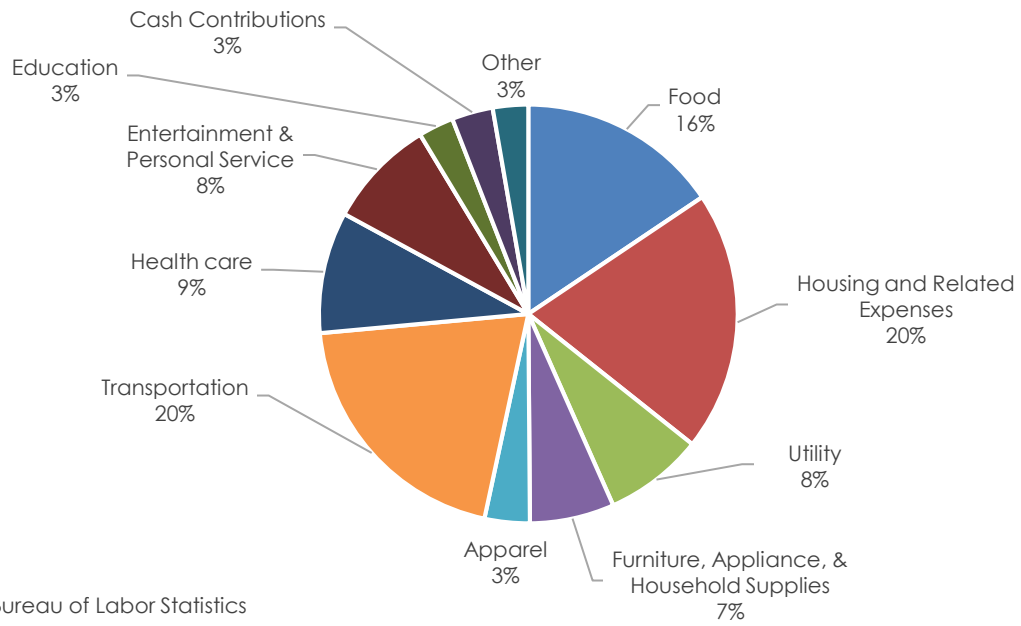
Thus, for new households in the Great Falls MSA, it is assumed that each would spend $26,717 per year within the metro area. As a result, these additional households could spend a total of $7.7 million in the Great Falls MSA over one year.

The 2015 Consumer Expenditure Survey (CES) from the U.S. Department of Labor provides estimates of household spending by major categories. It indicates that major spending items for households are housing (20%), transportation (20%), food (16%), and health care (9%). Other spending categories include: entertainment and personal service; furniture, appliance, and household supplies; and apparel.

[7] Source: U.S. Census American Community Survey 2011-2016.

[8] The latest Consumer Expenditure Survey (2015) from the U.S. Department of Labor indicates a difference between annual expenditures and after-tax income of 27.5% for the Midwest Region. Chmura chose the Midwest Region rather than the West Region, as the spending pattern in the West is heavily influenced by California's high income and rent.

Figure 3: Household Spending Categories



Source: Bureau of Labor Statistics

Each of the CES spending categories has a different impact on the economy based on the amount of supplies purchased in the region as well as the wages and salaries paid to its employees. For that reason, the economic impact of household spending was estimated by category. Then, they were aggregated into the total economic impact of household spending based on the increased population in the Great Falls MSA.

Under Scenario 1, if the MSA added 698 new residents in 2016, the total annual economic impact (direct, indirect, and induced) of increased household spending is estimated to have been $13.0 million, which could support 119 jobs in the MSA (Table 3). Of this spending, $7.7 million is associated with direct spending made by new households in the area, which could support 79 jobs in the MSA. The indirect impact is estimated at $2.6 million in spending and 18 jobs while the induced impact is estimated at $2.7 million in spending that could support 22 jobs in the Great Falls MSA.

Table 3: Annual Economic Employment Spending in Great Falls MSA, 2016-Scenario 1

	Direct	Indirect	Induced	Total Impact
Spending Impact ($Million)	$7.7	$2.6	$2.7	$13.0
Employment Impact	79	18	22	119

Note: Numbers may not sum due to rounding

Source: IMPLAN Pro 2015 and Chmura

Economic Impact under Scenario 2

Under Scenario 2, it is assumed that the population in the Great Falls MSA expands at the Billings MSA pace of 1.07% per year. Based on the 2016 population estimate, the Great Falls MSA would add 872 residents, which is equivalent to 359 new households.

The same assumptions were used for Scenario 2 regarding household income and household spending patterns. If 359 new households were added, it is estimated that direct spending would total $9.6 million in the Great Falls MSA (Table 4). This direct household spending could support 99 jobs in the MSA. The indirect impact is estimated at $3.3 million in spending and 22 jobs, while the induced impact is estimated at $3.4 million in spending that could support 28 jobs in the region. Combined, the total annual economic impact (direct, indirect, and induced) of increased population is estimated to be $16.3 million in 2016 which could support 149 jobs in the Great Falls MSA.

Table 4: Annual Economic Employment Spending in Great Falls MSA, 2016-Scenario 2

	Direct	Indirect	Induced	Total Impact
Spending Impact ($Million)	$9.6	$3.3	$3.4	$16.3
Employment Impact	99	22	28	149

Note: Numbers may not sum due to rounding

Source: IMPLAN Pro 2015 and Chmura

Economic Impact under Scenario 3

Under Scenario 3, it is assumed that the population of the Great Falls MSA increases by 1,000 residents. This is equivalent to 412 new households being added to the region.

Using the same assumptions used in the previous scenarios regarding household income and household spending patterns, it is estimated that if 412 additional households were added in 2016, they could directly spend a total of $11.0 million in the Great Falls MSA (Table 5). This direct household spending could support 113 jobs in the MSA, benefiting many local businesses such as retail, food services, health care and other consumer-related businesses. The indirect impact is estimated at $3.8 million in spending and 25 jobs, while the induced impact is estimated at $3.9 million in spending that could support 32 jobs in the region. Combined, the total annual economic impact (direct, indirect, and induced) of 1,000 new residents is estimated to be $18.7 million in 2016 which could support 170 jobs in the Great Falls MSA.

Table 5: Annual Economic Employment Spending in Great Falls MSA, 2016-Scenario 3

	Direct	Indirect	Induced	Total Impact
Spending Impact ($Million)	$11.0	$3.8	$3.9	$18.7
Employment Impact	113	25	32	170

Note: Numbers may not sum due to rounding

Source: IMPLAN Pro 2015 and Chmura

Appendix: Impact Analysis Glossary

IMPLAN Professional—an economic impact assessment modeling system. It allows the user to build economic models to estimate the impacts of economic changes in states, counties, or communities. It was created in the 1970s by the Forestry Service and is widely used by economists to estimate the impact of specific events on the overall economy.

Input-Output Analysis—an examination of business-business and business-consumer economic relationships capturing all monetary transactions in a given period, allowing one to calculate the effects of a change in an economic activity on the entire economy (impact analysis).

Direct Impact—economic activity generated by a project or operation. For construction, this represents activity of the contractor; for operations, this represents activity by tenants of the property.

Overhead—construction inputs not provided by the contractor.

Indirect Impact—secondary economic activity that is generated by a project or operation. An example might be a new office building generating demand for parking garages.

Induced (Household) Impact—economic activity generated by household income resulting from direct and indirect impacts.

Ripple Effect—the sum of induced and indirect impacts. In some projects, it is more appropriate to report ripple effects than indirect and induced impacts separately.

Multiplier—the cumulative impacts of a unit change in economic activity on the entire economy.