# Housing Gap Analysis

Midcoast Council of Governments
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# Introduction

It's no secret there is a housing shortage in the Midcoast region, in Maine, and in the United States. However, there are further questions about this shortage. How many houses do we need to fill the housing gap? What income levels have the greatest need? Should new houses target renters or owners? This housing gap analysis aims to answer these questions by quantifying the housing shortage and suggesting distributions by income, tenure, and geography in the Midcoast region.

A housing gap analysis was conducted to determine the number of housing units needed in each labor market area (LMA), which is an economically cohesive geographic region where people typically live and work. There are five LMA's in the MCOG region (Figure 1). In addition to geography, this analysis also breaks down the MCOG region housing need into tenure and income. The methodology is based on the State of Maine Housing Production Needs Study (HPNS) from October 2023, but there are some key differences. The methodology and its similarities to the Maine State Study are described below. The HPNS and this housing gap analysis begin by quantifying the current shortage and identifying needs across renter and owner income brackets. Lastly, the two studies predict future needs for housing.



**Figure 1**. Map of the MCOG Region Towns and LMA's

# Current Shortage

The first step of this study was to calculate the current shortage, or number of units presently needed across the region and in each LMA. The current shortage is the sum of the availability deficit and the Jobs : Homes Deficit. The availability deficit is the number of units needed to create a 5% availability rate of the current occupied units and the Jobs : Homes Deficit is the number of units needed to support new workers to attain a 5% unemployment rate.

Allowing for this availability rate for both houses and jobs means that each market is at roughly an optimum –any tighter would mean there would be difficulty in switching houses or jobs when necessary, and any looser would mean there is excess housing and unemployed workers[1]. In the MCOG region, the housing availability rate is roughly 1.5% (Table 1), which indicates that there is not enough housing supply in the market. The unemployment rate in the MCOG region is roughly 2.3%, which indicates there is a shortage of workers (Table 2). There is a high probability that these two statistics are linked.

**Availability Deficit**

The availability deficit is obtained first by measuring the number of occupied units and number of available units for each LMA in the Midcoast region using American Community Survey (ACS) 5-year data. The availability deficit is the number of units needed to reach 5% of the number of occupied units. This subtraction achieves calculating the gap between the actual number of available units and the number of units needed to reach 5% availability. See Table 1 for the numbers in this calculation.

| | Availability Deficit | | | |
|---|---|---|---|---|
| **Labor Market Area** | Total Occupied Units | Available Units | Target Availability (5% of Total Occupied Units) | Availability Deficit (amount needed to reach 5% availability) |
| **Brunswick LMA** | 29,737 | 415 | 1487 | 1,072 |
| **Boothbay Harbor LMA** | 3,213 | 32 | 161 | 129 |
| **Waldoboro LMA** | 9,904 | 58 | 495 | 437 |
| **Rockland-Camden LMA** | 17,986 | 369 | 899 | 530 |
| **Belfast LMA** | 11,036 | 185 | 552 | 367 |
| **Total** | 71,876 | 1,059 | 3594 | 2,535 |

**Table 1**. Calculation of the Availability Deficit for each labor market area in the Midcoast Council of Governments region.

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[1] In economic analysis, a natural rate of unemployment ranges from 3% to 6%.

**Jobs : Homes Deficit**

The Jobs : Homes Deficit uses a similar methodology as the Availability Deficit but with unemployed workers. See Table 2 for the numbers associated with the Jobs : Homes Deficit calculation. With a tight labor market, this analysis first calculates the number of workers needed to reach a 5% unemployment rate. Once this number is obtained we calculated the Jobs : Homes ratio. The Jobs : Homes ratio is a ratio of the employed labor force divided by the number of occupied homes plus the available units (see Figure 2).

| | Jobs : Homes Deficit | | | | | | |
|---|---|---|---|---|---|---|---|
| Labor Market Area | Employed | In labor force: | Unemployed | Unemployment Rate | Number of Jobs Needed | Jobs: Homes Ratio | Number of Homes Needed |
| Brunswick LMA | 35,839 | 37,646 | 828 | 2.2% | 1,054 | 1.15 | 918 |
| Boothbay Harbor LMA | 3,173 | 3,220 | 71 | 2.2% | 90 | 0.94 | 96 |
| Waldoboro LMA | 10,397 | 10,868 | 239 | 2.2% | 304 | 1.00 | 304 |
| Rockland-Camden LMA | 20,383 | 21,229 | 488 | 2.3% | 573 | 1.08 | 531 |
| Belfast LMA | 10,956 | 11,680 | 292 | 2.5% | 292 | 0.95 | 309 |
| Total | 80,748 | 84,643 | 1,918 | 2.3% | 2,314 | 1.07 | 2163 |

**Table 2**. Calculation of the number of workers needed and housing needed to accommodate these workers.



**Figure 2**. Equation of the Jobs : Homes Ratio. Taken from the State of Maine Housing Production Needs Study.

This ratio signifies the number of workers per house in the region. The Jobs : Homes ratio is then multiplied by the number of workers needed to achieve a 5% unemployment rate. Please note that the HPNS methodology used a 3.5% unemployment rate and a 3% jobs opening rate, whereas our study used a 5% unemployment rate as jobs opening rate data was unavailable at our level of analysis. However, many labor economists agree that a 3-6% unemployment rate is a quick yet adequate metric for a healthy labor market. Also please note that MCOG is not

encouraging a higher unemployment rate through workers being laid off. Instead, we see a need for more workers in the region to create a more relaxed labor market.

Every region has a unique ratio of the number of workers that each household supports based on the region's demographics. In the overall MCOG region, that ratio is 1.07. In the coastal region of the HPNS study (York County to Hancock County), the Jobs : Homes is 1.15. It makes sense the MCOG region hosts slightly fewer workers per household because the MCOG region is somewhat older than the southern coast of Maine. Furthermore, people room together more in the greater Portland area as a means of making their households more affordable.

The process described above follows the methodology from the HPNS, but our methodology omits workers needed for the jobs listing rate. Since many of the workers in the Midcoast region are self-employed, jobs listings data does not necessarily reflect the actual jobs available. Without this information, MCOG opted to omit this section as a 5% unemployment rate fulfills the measurement of workers needed.

The final results of the current shortage are shown in Figure 3. The map in the upper lefthand corner shows the number of homes needed to accommodate the new workers needed to reach
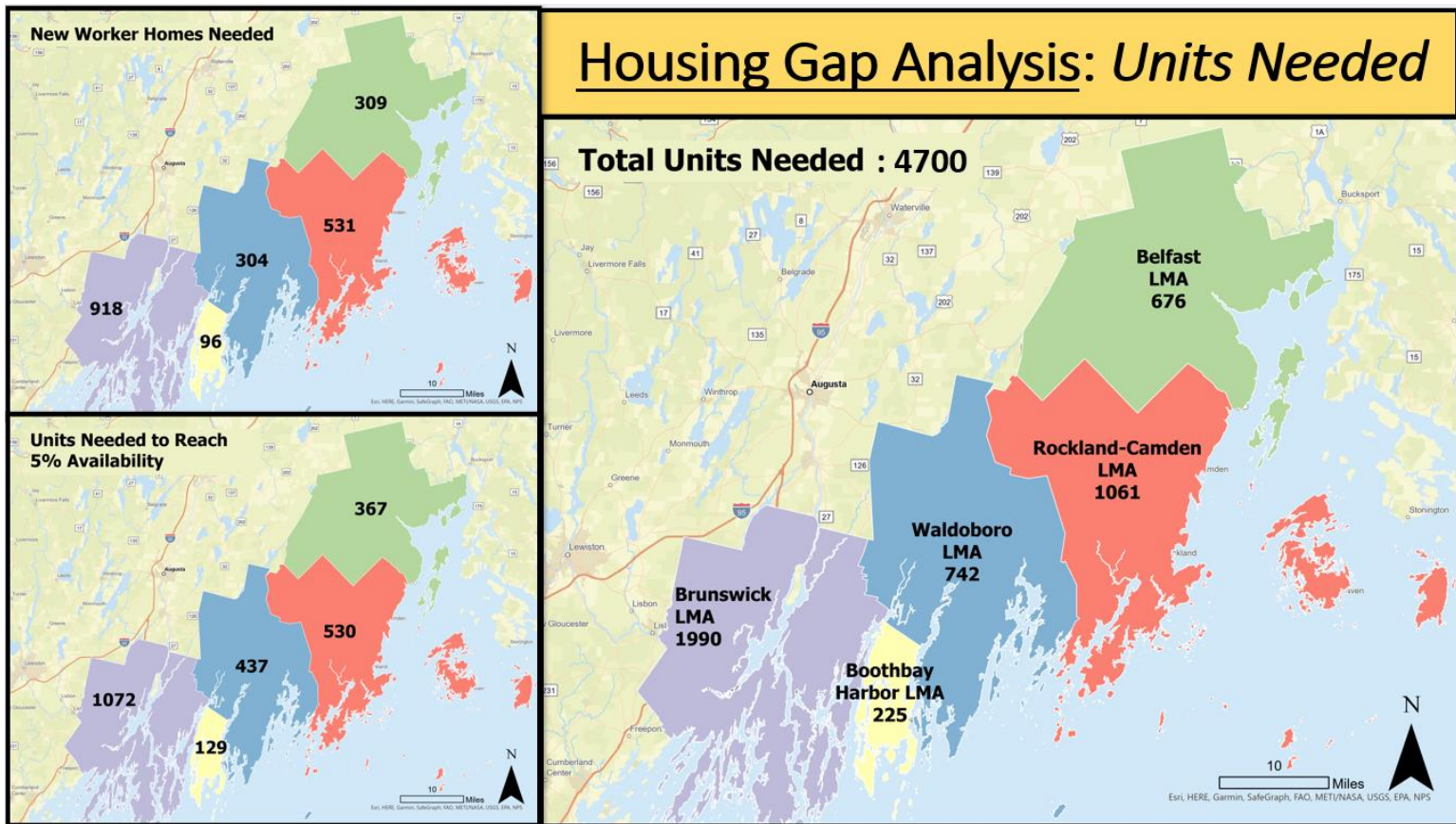


**Figure 3**. Three maps of the MCOG region showing the worker homes needed (Jobs : Homes Ratio) , the units needed to reach 5% availability (Availability Deficit) and the total housing shortage for each LMA and the region.

a 5% unemployment rate while the map in the bottom lefthand corner shows the number of units needed to reach a 5% housing unit availability rate. The large map on the right shows a sum of the other two maps, which depicts the current shortage for each LMA. The total units needed for the entire MCOG region is 4,700.

**Connecting to Other Studies**

In the HPNS, analysts split Maine into three sections, and the MCOG region fits within the Coastal Region. The Coastal Region encompasses Cumberland, Hancock, Knox, Lincoln, Sagadahoc, Waldo, and York Counties including the greater Portland area. The total units needed for the Coastal Zone are 21,200 (see Table 3).

The 2021 population of the Coastal Region of the HPNS study is roughly 718,500, whereas the MCOG region population in 2021 was approximately 160,500. The MCOG region population consists of roughly 22% of the entire Coastal Zone. 22% of the 21,200 units needed in the Coastal Region equates to 4,750, which is comparable to the MCOG Housing Gap Analysis estimate of a 4,700-unit underproduction. The number of housing units needed aligns between the MCOG Housing Gap Analysis and the HPNS, which provides further confidence to the numbers in both studies. Note that the language used by the HPNS is Total Historic Underproduction, while the language used in this housing gap analysis is Current Shortage.

| Region | Availabilitly Deficit | Jobs : Homes Deficit | Total Historic Underproduction |
|---|---|---|---|
| Coastal | 9,300 | 11,900 | 21,200 |

**Table 3**. HPNS results of the current shortage in the Coastal region

In May 2023 Lincoln County hired Camoin Associates to produce a  housing needs assessment. In that assessment, analysts quantified the need in Lincoln County to be 879 units, broken down by income, town, and housing structure type. The population of Lincoln County consists of 22% of the MCOG region population. 22% of the 4,700 units needed in the MCOG region is 1,025 units needed if the units were to be distributed evenly across the MCOG region. This roughly thousand units is comparable to the approximately 900 units estimated needed by the Lincoln County study, providing further confidence in each study.

However, the Housing Gap Analysis breaks down needs on the LMA level. Lincoln County is essentially Waldoboro and Boothbay Harbor LMA's combined. The housing unit needs of those two areas are 967, which is also adequately similar to the 879 units needed according to the Lincoln County Housing Needs Assessment. Every analysis is going to have slightly different results based on methodology and finding that other studies have similar results is reassuring of the methodology and data in this Housing Gap Analysis.
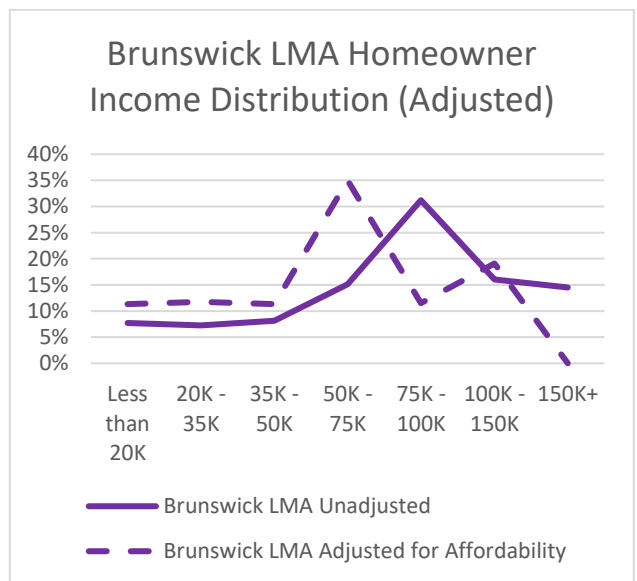
# Income Distribution

The income distribution was obtained for renters and homeowners for each town, which was expanded to the LMA level. Figure 4 uses the Brunswick LMA as an example of income distribution for homeowners. Data is from the 2021 5-year ACS census. The current distribution alone is inadequate to determine what distribution of homes should be built because the current housing distribution does not match the income distribution for individual towns. To correct this misalignment, this study utilizes a housing affordability index.

Each town has a unique affordability index, a metric calculated by Maine Housing. The affordability index represents the ratio of the median income to the income needed to afford the median house, with household expenses accounting for roughly one third of household income. Most communities are considered unaffordable, so new housing units should account for the lack of affordability. To achieve this adjustment at an appropriate amount, the original income distributions were multiplied by the affordability index to essentially shift the distribution downwards[2]. This process was done for both renter incomes and rental affordability indices and homeowner incomes and affordability indices.

To demonstrate the way that the income distribution is shifted, Figure 5 uses the Brunswick LMA as an example. The affordability in the Brunswick LMA is 0.73, meaning that the median
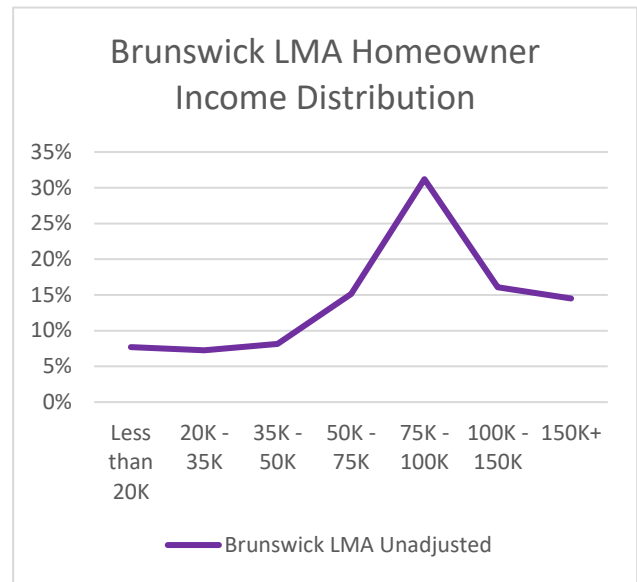


**Figure 4.** Income distribution for Brunswick LMA homeowners



**Figure 5.** Income distribution for Brunswick LMA homeowners (solid line) and income

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[2] The affordability indices for homeowners were originally at the town level and were scaled up in proportion to the towns' populations. The affordability indices for renters were on the county level and were similarly distributed to the LMA level based on population. The new income distributions obtained by the adjustment by the affordability indices were repotted into the original income categories while maintaining the new distribution as much as possible through rounding.

income can afford a house that is 73% of the actual median home price. Thus, the income distribution curve is shifted 27% to the left on the graph. In other words, the x-component of the data points are multiplied by 0.73. The income brackets remain the same on the two curves, so there are overall greater numbers at the lower income levels in the adjusted curve than the unadjusted curve. Each LMA has a different affordability index and is adjusted accordingly. This methodology was not part of the HPNS, but MCOG determined it was necessary to account for greater needs at lower income levels, as the HPNS noted this as a limitation of their study.

The total number of units needed are allocated across the adjusted income distributions. Figure 6 shows the number of units owners need to meet the current shortage, and Figure 7 shows the same for renters. In Figure 6, there is a large spike in the number of units needed in the 50k-75k range and a smaller spike in the 100k-150k range. This first spike shows the need for housing in the "missing middle," or the middle-income earners who cannot afford houses in the current inflated market. The spike at higher levels of household income is likely a dual-income household in which both earners fall into the category of the missing middle. Figure 7 shows there is a greater need at low levels of income for renters than owners. However, there is a similar spike in rental homes needed at the "missing middle" income of 50k-75k (Figure 7), though this spike is not as pronounced as the one on the homeowner's graph. Aside from the Belfast LMA, there is no such spike in the 100k-150k or dual-income missing middle.

Figure 8 and 9 show the same data as the two previous figures, but the x-axis has changed to house prices. The brackets are the range of houses affordable at each income bracket from Figures 6 and 7. The range is kept broad because the affordability of houses depends on a number of factors, including but not limited to interest rates, property taxes, or the amount that a buyer can allocate towards a down payment. For owners, the range is three times the income at the bottom of the income bracket to 3.75 times the top of the income bracket in the range. For renters, the range is three times the income of the bottom of the income bracket and 3.5 times the income at the top of the bracket. This methodology of finding the range of houses that the median income can afford is based on an analysis of the ratio of the house affordable at median income compared to the median income for both renters and owners. Table 3 provides more details on the breakdown of units needed at each income level for home renters and homeowners.
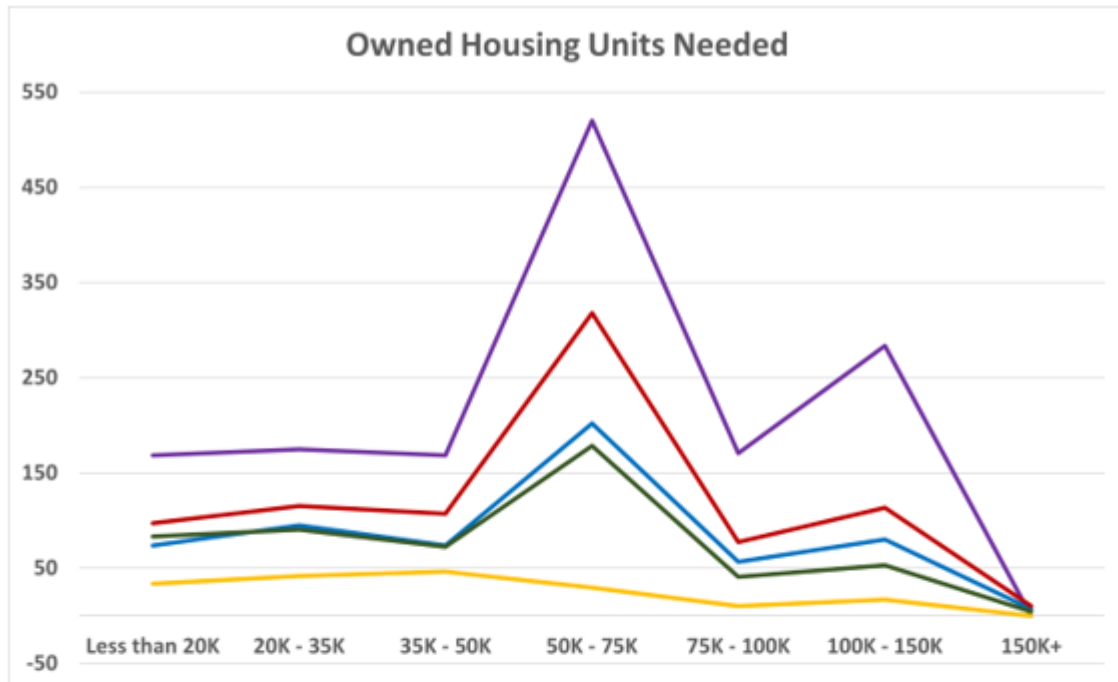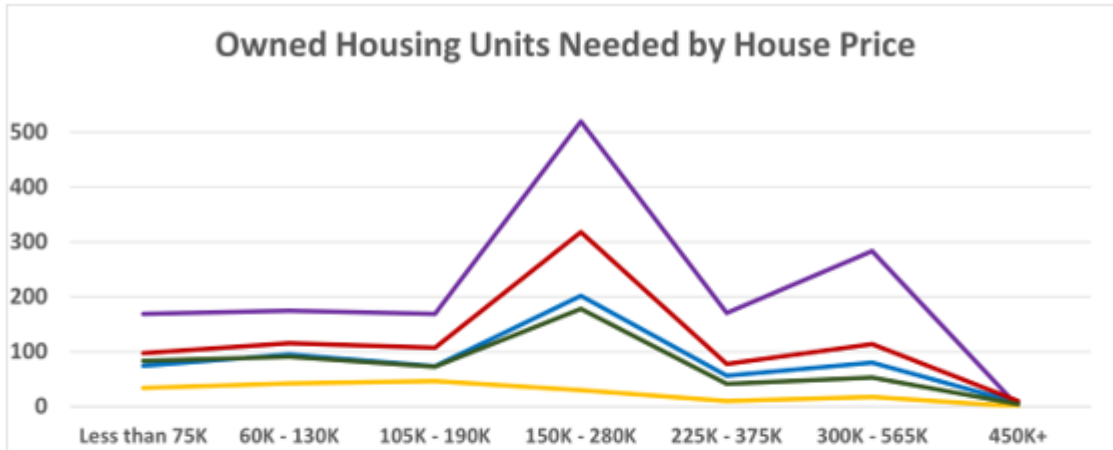
**Figure 6**. Number of units needed for homeowners in each LMA across income categories
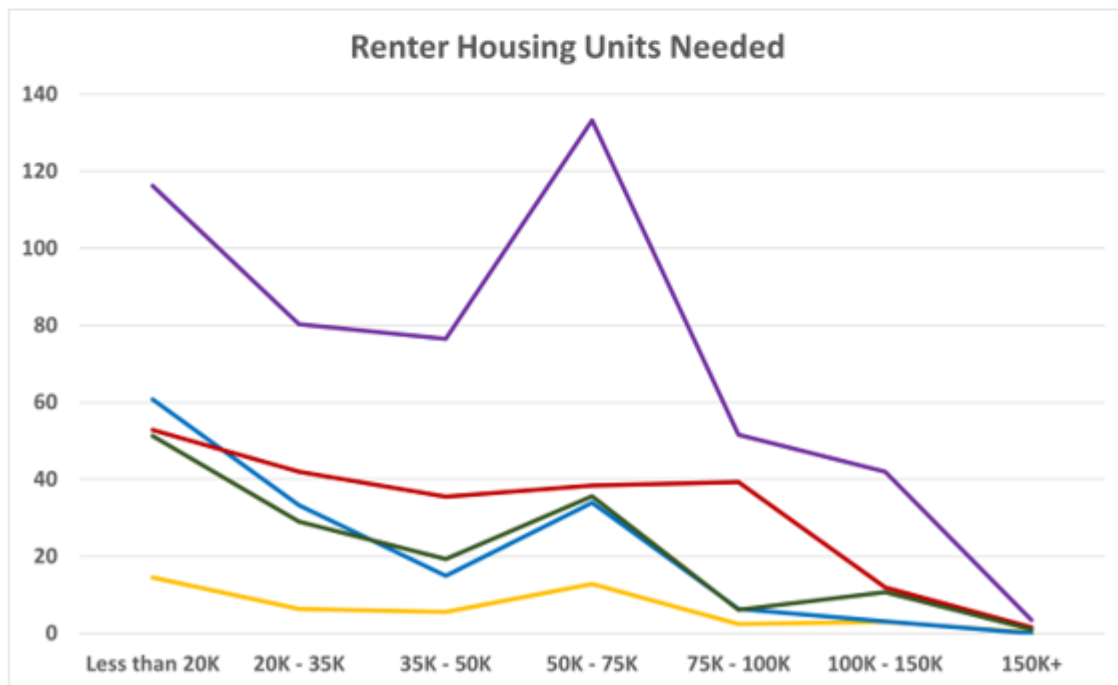


**Figure 7**. Number of units needed for renters in each LMA across income categories

**Owned Housing Units Needed by House Price**



**Figure 8.** Number of units needed for homeowners in each LMA across home prices

**Renter Housing Units Needed by House Price**
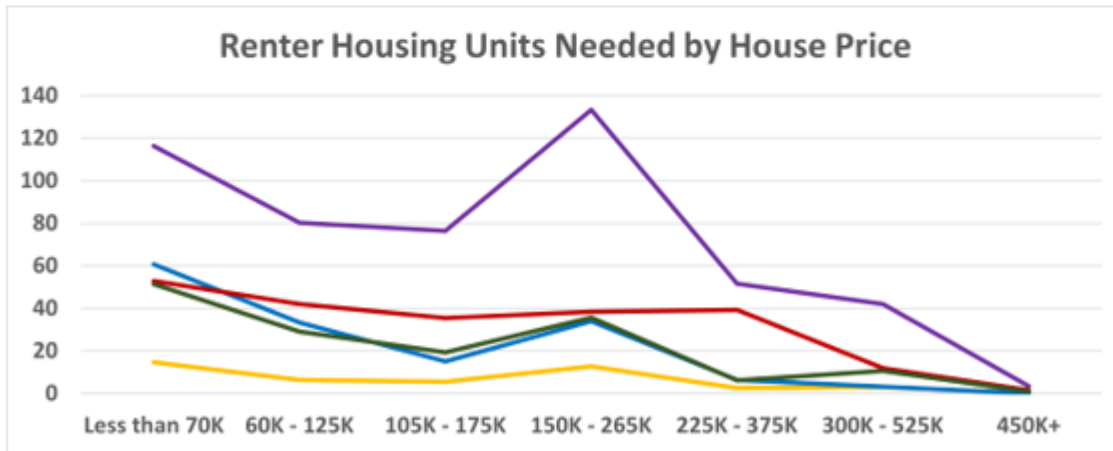


**Figure 9.** Number of units needed for renters in each LMA across home prices

| Number of Units Needed--Owned | | | | | |
|---|---|---|---|---|---|
| Household Income | House Afforded at Income | Brunswick LMA | Boothbay Harbor LMA | Waldoboro LMA | Rockland-Camden LMA | Belfast LMA |
| Less than 20K | Less than 75K | 169 | 34 | 74 | 97 | 83 |
| 20K - 35K | 60K - 130K | 175 | 42 | 95 | 116 | 91 |
| 35K - 50K | 105K - 190K | 169 | 46 | 74 | 107 | 73 |
| 50K - 75K | 150K - 280K | 520 | 30 | 202 | 318 | 178 |
| 75K - 100K | 225K - 375K | 171 | 10 | 57 | 77 | 41 |
| 100K - 150K | 300K - 565K | 284 | 17 | 80 | 114 | 53 |
| 150K+ | 450K+ | 0 | 0 | 7 | 10 | 5 |
| | Total | 1487 | 179 | 589 | 840 | 524 |
| | Percent Owned | 75% | 80% | 79% | 79% | 78% |
| Number of Units Needed--Rented | | | | | |
| Household Income | House Afforded at Income | Brunswick LMA | Boothbay Harbor LMA | Waldoboro LMA | Rockland-Camden LMA | Belfast LMA |
| Less than 20K | Less than 70K | 116 | 15 | 61 | 53 | 51 |
| 20K - 35K | 60K - 125K | 80 | 6 | 33 | 42 | 29 |
| 35K - 50K | 105K - 175K | 77 | 6 | 15 | 36 | 19 |
| 50K - 75K | 150K - 265K | 133 | 13 | 34 | 38 | 36 |
| 75K - 100K | 225K - 375K | 52 | 2 | 6 | 39 | 6 |
| 100K - 150K | 300K - 525K | 42 | 3 | 3 | 12 | 11 |
| 150K+ | 450K+ | 4 | 0 | 0 | 2 | 1 |
| | Total | 504 | 45 | 153 | 222 | 153 |
| | Percent Rented | 25% | 20% | 21% | 21% | 23% |

**Table 3**. Number of units needed for homeowners and renters in each LMA across income categories and housing costs. The range of the house afforded at the homeowners' household incomes is 3 to 3.75 times the range of the provided income. The range of the house afforded at the renters' household incomes is 3 to 3.5 times the range of the provided income.

## Future Needs

The Maine State Economist Office releases data on population projections for Maine towns and counties. In this Housing Gap Analysis, MCOG staff applied the projected population change for the entire MCOG region (1.6%) to the occupied housing, assuming that the occupied housing need would increase proportionately to the population growth.

This methodology is directly based on the HPNS, except the HPNS analysis was conducted at the county level. Due to data issues, this analysis could not be done at the LMA level and instead is a

calculation for the entire MCOG region. The Boothbay Harbor LMA has a projected decrease in growth (Table 4) and applying a negative growth to the projected housing need would imply a decreased need in housing. However, the projected population decline in the Boothbay Harbor LMA is calculated from a projection of past years' growth, which in the Boothbay Harbor region is negative likely because of a housing

| LMA | Pop 2020 | Pop 2030 | Percent Change 2020-2030 |
|---|---|---|---|
| Brunswick LMA | 69672 | 69762 | 0.1% |
| Boothbay Harbor LMA | 6840 | 6388 | -6.6% |
| Belfast LMA | 24088 | 25662 | 6.5% |
| Rockland-Camden LMA | 41764 | 42549 | 1.9% |
| Waldoboro LMA | 23349 | 23959 | 2.6% |
| Total | 165713 | 168320 | 1.6% |

**Table 4.** Projected population growth. Data from Maine State Economist

shortage. Supplying more housing would possibly alter that population decline. Thus, the analysis is not robust at the LMA level and is instead conducted for the entire MCOG region.

Applying a growth rate of 1.6% from 2020 to 2030, the total change in households is projected to be 780 in the entire MCOG region. The projected population growth has some uncertainty, so the analysis includes a high scenario of +0.5% and a low scenario of -0.5% applied to the growth rate. The Future Needs analysis also applies the concept of a 5% housing availability needed for future housing. Furthermore, roughly 17% of houses in the MCOG region are seasonally occupied. Thus, the prediction for future needs must account for new houses that would be taken up as seasonal homes. All these steps are in accordance with the HPNS. Results are shown in Table 5.

The results from the future need analysis of the HPNS is proportionately much higher than the estimated future need from the MCOG Housing Gap Analysis. The HPNS analysis of future needs suggests that the Coastal Region requires roughly 24,200 to 28,000 housing units by 2030. Scaled down proportionately by population to the MCOG region, that number would be roughly 5,400 to 6,300. However, this Housing Gap Analysis of the MCOG region suggests that the region needs roughly 950 to 1850 housing units to support population growth. One reason for this disparity is that the

| Total | High Scenario | Low Scenario |
|---|---|---|
| Occupied Housing | 1490 | 771 |
| Available Housing | 74 | 39 |
| Seasonal Needs | 268 | 139 |
| Rented | 1429 | 740 |
| Owned | 403 | 209 |
| Total Need | 1832 | 949 |

**Table 5.** Future housing needs

MCOG region has not experienced the past growth as have the more populous York and Cumberland Counties, so the future units needed in the HPNS would be concentrated in those

counties. However, we may take our results as a low-end estimate of the number of housing units that the MCOG region requires to maintain a healthy housing market.

# Study Limitations

This study utilizes a robust methodology to quantify the number of housing units needed for renters and owners at different income levels and at different geographic regions on the LMA level. However, no quantitative analysis is 100% accurate, so this section discusses the limitations of the study. First, the majority of this data was obtained from the US American Community Survey 5-year census. This data is notorious for being inaccurate at the town level. The data is not available at the LMA level, so town-level data was aggregated to get to the desired geography. Compiling the data to reach the larger LMA level helps to decrease the relative margin of error, but the results are subject to the accuracy of the original data. The HPNS also used ACS 5-year census data.

The second issue with the analysis lies in the distribution of homes recommended for renters versus owners. The number of units needed are distributed to renters and owners based on the existing proportions of the population that fit into those categories. However, there might be a different ratio of renters to owners if housing was not so constrained. Since there is no way to know the ideal proportions of renter-occupied versus owner-occupied units in each LMA, this study utilizes the existing ratio. Follow-up discussions with communities must address this limitation to fully understand the needs of the communities.

Another issue this study faces is that the affordability index is calculated for the median income. With the data used in this study, there is no way to know the entire distribution curve of the affordability index. In other words, people with lower levels of income may have an affordability index different from people at the median income. The same is true for households with higher levels of income. This study instead applies the affordability index of the median income to all levels of income. Community discussions are necessary to fully understand the need at lower and higher levels of income.

Lastly, there are some limitations within the Future Needs section. First, the future housing units needed in this study do not align with the results from the HPNS. This study predicts a much lower need for future units than the coastal region in the statewide study. The likely reason for the discrepancy is that the number of people and population growth in York County are both much higher than the population growth of the Midcoast area. Furthermore, this study does not break down future needs by LMA. Future needs are difficult to project at the LMA level, because the population projections at the town are based on past population shifts. In some LMA's there was a decrease in population, likely because of the increased cost of housing. If more housing were to be supplied, the population may actually increase in the area instead of decrease. Thus, population projections accompanied with housing counts can be inaccurate. However, the quantitative data serves its purpose as a baseline assessment, and any alterations can be made in community engagement sessions.

# Conclusion

The HPNS pioneered a robust methodology for measuring the current housing shortage and future needs. MCOG recreated and expanded upon this study on a smaller scale for its own region, including the LMA's that make up the Midcoast. The current shortage comes to 4,700 units in total across five LMA's. Among homeowners, the greatest need for housing occurs at the "missing middle" of 50k-75k income levels followed by "missing middle" dual-income households of 100k-150k. Among renters, the greatest needs are at the lower end of the income continuum and at the "missing middle" of 50k-75k.