This section presents the results from the citizen survey conducted in June 2024. The survey aims to capture opinions and preferences, demographic characteristics as well as interplay between these factors when it comes to their preferences for housing and location. The sample of the survey is composed of 401 citizens stratified across age, gender, and their current post-code. The number of participants per sampling framing cell is calculated using Neyman allocation based on similar earlier studies concerning the Haugelandet region. The survey is administered with the help of Norstat's panel via phone interviews. Further technical details on the survey and the sample are presented in the technical addendum.

There are a few caveats to mention before presenting the results. These points would be useful to keep in mind when interpreting the results. Cardinal among these points is the question formatting. When interviewing respondents about their housing situation, and location, the questionnaire relies on respondents’ impression. For example, when asked "where do you live today?" answer categories "Close to the city center", "suburbs close to the city center", "village", and "rural area" are presented to the respondent. While this sets a frame for the respondent to choose from, the answer by and large depends on the respondent’s own opinion. It is possible that while one respondent thinks they live in a village, another respondent from the same area may call it a rural area. Secondly, the answer categories in some questions are left somewhat vague on purpose due to the unique urbanization history of the Karmøy municipality. Today, the municipality is composed of three cities; Åkrahamn, Skudneshavn, and Kopervik where each has many suburban areas such as Bygnes near Kopervik. In addition to this unique urbanization, the municipality and its citizens have a strong historical connection to nearby municipalities. For many who live in Karmøy, it is natural to commute to nearby municipalities such as Haugesund. So, it is entirely possible that while someone living in Ferkingstad thinks of Åkrehamn as "the city" while another who lives in Avaldsnes or Torvastad thinks of Haugesund when asked. Capturing this level of variance in a discrete way with specific questions would ultimately inflate the number of questions in the questionnaire, thus reducing response rate and overall quality of interviews. Instead, we opted to keep these categories free to vary between individuals by presenting them answer categories on a more conceptual level. Since the key aim of the survey is to capture desired characteristics, such as housing location, it plays little to no role whether the respondent thinks of Åkrahamn or Kopervik when they think about "the city".

In this section, we take a look at the distribution of types of housing by different demographic factors. Specifically, we focus on the employment, family and current living area of the respondents.

Unsurprisingly, most people live in detached houses regardless of their demographic condition. The only divergence from this trend when it comes to employment is among those who are currently studying. About 50% of those who are in education have accommodation in hybel.

When it comes to the family situation as presented in figure 23, the trend for living in single detached houses is still the norm for many families. Only those who live alone without kids show some divergence in this trend. Compared to other groups, apartments and terraced houses are more common among those who live alone. Apartments are also somewhat popular among the citizens of Karmøy kommune who live with their partners without children.

Finally, when we look at the distribution of housing type by area, as presented in the figure 24, we see that alternative housings such as apartments, terraced houses and flermansboliger are somewhat more popular among those who live in cities and suburbia close to city centers in the municipality.

In the survey, we asked our respondents how important the different aspects of their current neigborhood for them. These are aspects include :

distance to their workplace,

distance to kindergartens/schools,

distance shops and services,

distance city life

distance family and friends

distance nature

Possibility to use means of transportation alternative to cars

How much it suits to their physical health condition

Figure 24 shows percentage of citizens by the level of importance for each category. Figure 25 shows the percentage share of citizens who expressed these characteristics as the most important by area. Note that sum of values in the graph per area exceeds total of 100%. This is because how the question is posed and answer alternatives. We asked the respondent to express how important one of these characteristics for their current living are on a scale from 1 to 5, where 1 indicates the response "not important at all" and 5 indicates the response "very important". As a result, a respondent could say more than one characteristic is very important for them. We examine the divisions between citizens when it comes to these characteristics in a clusting analysis later on in the report. For now, this section is only conserned with raw percentages. Finally, the columns overlappin points indicates 95% confidence intervals. In survey research, questions are presented to randomly chosen sample. This sampling process inherently carries a degree of deviation from the true population values. In the survey, the statistical precision is set 95%, meaning there is a chance that the values obtained from sample can deviate from the population values by +-5%. In other words, the tails of the columns indicate the range within whic the population value may lie.

The figure below gives the percentage share of how important different characteristics as a percentage share of Karmøy's population. When it comes to distance to workplace, over 50% of the population does not think its an important aspect of their neighborhood. In terms of distance to kindergarten and school, the results are somewhat similar. For about 55% of the population, it is not really important that their neighborhood is close to a kindergarten or a school. However, the results are nearly polar opposite when we look at the distance to shops and services. Nearly 70% of the population thinks that it is important to live close to shops and services. In terms of distance to city life and culture scene, the distribution is rather even. About 25% of the population expressed that it is an important aspect for where they choose to live. Distance to family and friends is perhaps the single most important factor for many citizens of Karmøy. Nearly 80% of the citizens appreciates that where they live is in close distance to family and friends. When it comes to transportation, many citizens in Karmøy do not necessarily care about whether the location they live offers chance to be less car dependent. About 65% of the respondents, expressed that they are either indifferent or do not consider this characteristic of their neighborhood as an important aspect. Finally, for a majority of the citizens both being close to the nature and ability to live self-sufficiently are two very important factors in choosing where they live. For the former, about 70% of the citizens like to live nearby natur, while about 65% of the citizens expressed that being able to self-sufficiently in their neighborhood is important or very important for them in the latter case.

When it comes to citizens who said they live in a village, we observe that about 45% of them said the most important characteristic is the distance to nature. About 45% of the respondents also said the most important characteristic of their neighborhood is the distance to the city life. While this observation presents a contradiction on the face value, it is possible that for these respondents it might be rather easy to travel to city centers. We also see that factors such as distance from kindergartens, shops and services and distance to family are among the most important characteristics for about 40% of this group. The rest of the factors, such as distance to the workplace, are the most important factors only for about 30% of the group.

Those who live in rural areas, on the other hand, the important characteristics that are somewhat different. About 45% of the respondents living in rural areas said that the distance to kindergartens and schools as well as distance to the nature are the most important characteristic of their neighborhood. Around 40% of this group also mentioned that distance to shops and services, public transportation and family are the most important characteristics. Comparatively speaking, fewer respondents mentioned distance to workplace, city life, and suitable to function level as the most important factors.

For those who live in the cities, the distance to family and friends and shops and services are the most important factors of their neighborhood. About 55% of this group named the distance to family as the most important and 45% said it is the distance to shops and services. Other factors such distance to workplace, kindergarten and schools are important for a relatively smaller percentage of the subsample.

Finally, the majority of those who live in suburbia show similar preferences to those who live close to city centers. Distance to shops and services as well as family and friends are the most important factor for about 45% of this subsample. Distance to workplace and kindergarten/school are important for a relative minority in this group (about 25%).

When it comes to the question of what is important in a neighborhood, citizens of Karmøy kommune have some distinct answers. Based on the results of the analyses above, three factors jump to the front: close to family and friends, shops and services, and the nature. While this does not mean other factors included in the questionnaire are entirely trivial for the citizens, they tend to rank lower in a hierarchy of preferences.

In addition to preferences about housing and location, we also asked the respondents about the factors that influence their choice for mode of transportantion in reference to a personal car. These factors include:

Safety

Cost

Ease of use

Distance of travel.

Respondents are asked to express how important each of these factors are on a scale of 1 to 5, 1 being "not important" and 5 being "very important", for them to choose walking, cycling or public transportation over a personal car. Figure 27 shows the most common value attributed to each criteria per mode of transportation by respondents and percentage share of respondents who attributed this importance per criteria.

When it comes to cycling instead of driving, two criteria shows the strongest influence in respondents decision; safety and distance. About 29% of the respondents said traffic safety is very important for them to choose cycling over taking a car while 24% of the respondents mentioned the distance being very important for their decision. This means that most common considerations for a respondet to cycle to their destination rather than drive are 1) if it is safe enough to do so, and 2) if its a distance they can manage on a bicycle. Convinience factor, such as ease of use, is comparative lower on the hierarchy of factors meaning that many respondents care less about things like a convinient bicycle park when they are making a decision. About 26% of the respondents said they are neutral to the ease of use when considering between cycling and driving. Finally, the least important factor seems to be the matter of cost. While cycling is probably the second cheapest mode of transportation even without comparing it to the costs of driving, this does not necessarily play a role for the majority of the respondents. About 39% of the respondents said the cost is not very important when they are choosing between cycling and driving.

The hierarchy of factors changes substantially when respondents decide between taking a bus or driving. The only immutable factor for choosing the public transportation for the citizens seems to be the ease of use. About 30% of the respondents mentioned that ease of use is very important for them to choose public transportation. In other words, if they were to choose between taking the bus or driving to their destination, they are mainly concerned with issues such as easy access to bus stop, frequency of busses, distance from bus station to their destination rather than the price of a ticket, travel distance, or traffic safety. In some regards, this result is not entirely surprising. Public transportation is relatively in Karmøy kommune. A single ticket for an hour costs 45 kroner, and it gets even cheaper with price-plans. Similarly, traffic safety or the distance of travel are not factors a passenger must consider in public transportation. The key result in this analysis, however, is that increasing the ease of use for public transportation can be the single most, if not the only, effective way of encouraging karmøy's citizen to use more public transportation over a personal car.

In terms of choosing to walk over driving, the pattern is quite similar to cycling. About 30% of the respondents said safety is very important while 39% of them said the distance is very important. Other factors such as cost, and ease of use seem to play a relatively minor role for about 30% of the respondents. This stands to reason to some extent since both means of transportation are physically demanding to some extent, leaves the person vulnerable to cars and weather condition and cheap to use.

These results provide us with valuable insight for potential policies when it comes to the barrier to sustainable modes of transportation. Policies that improve user safety for cyclists, such as dedicated bicycle lanes separated from the car traffic would be more productive in encouraging cycling among Karmøy's citizens. In terms of encouraging the use of public transportation, single most effective way would be to improve ease of use. This could encourage a large portion of the citizens to take a bus more often than a car. Overall, it does not seem that there is a single policy that can encourage more sustainable transportation, but it requires a multifaceted approach.

In the survey, we inquired about respondents’ plans to move, their preferences and their ideals when it comes to type of house and location in addition to what has been discussed so far. This section presents the results from these questions.

The section presents the results of three distinct analyses. First, it provides an overview with a descriptive analysis of the respondents’ answers. Secondly, it identifies distinct groups of citizens based on the characteristics they want in their ideal neighborhood as well as what differentiates these groups using cluster analysis. Finally, the ideal neighborhood of respondents is modelled as a function of their preferences while controlling for demographic factors using multinominal logistic regression. This gives us the role of various neighborhood characteristics when the citizens choose their dwelling location independent of respondents' demographic factors.

Methodology of the descriptive analyses are self-explanatory and should be intuitive for many readers without further elaboration. The algorithms and statistical models used for clustering and regression analysis are somewhat more complex. While individual subsections provide practical explanations to interpret results, the more technical details of these models are provided in the technical addendum.

Figure 28 shows the descriptive results of moving plans of the respondents. In terms of plans to move in the near future, a large portion of the citizens (\~65%) have no such plan. The remaining group, however, shows a good degree of variation as to why they are planning to do so. About 17% of the respondents said they are planning to move when they need an easy-to-maintain house. About 5% of the respondents, on the other hand, said they would consider moving when they need a more family-friendly housing. Finally, roughly about 15% of the respondents said they are planning to move in the next 5 years without further elaborating on the reason.

Based on figure 29, we see that 60% of respondents who have plans to move are likely to move to a different place within Karmøy. Conversely, 40% of respondents with the moving plan said they would like to move to a different municipality. The questionnaire did not ask which municipality they would consider as their next home, thus we cannot really say where they are planning to move to with confidence. However, based on the earlier analysis presented in figure 7, Haugesund is the most likely destination for these citizens followed by Oslo, Tysvær or another municipality within Vestland.

Location of the where these respondents would like to move is another subject in the survey. We asked the respondents to express what kind of location would be ideal for them. These types include:

- A village

- Rural area

- Suburbia close to the city center

- Urban area close to the city center

About 40% of respondents with moving plans said they would like to relocate to a suburbia close to a city center while a little over 20% of them said they would like to move to a more urban area. Conversely, about 20% of the respondents said they would like to move to a more rural area, while around 15% of them said they want to relocate to a village.

Finally, we asked them what type of housing they realistically could move to in the survey. The responses show a dichotomy between single detached houses and apartments. Among those who are planning to move in the near future, about 50% said they will move to a single detached house while about 40% of them said they are likely to move to an apartment when they move. The remaining 10% is distributed nearly evenly across other alternative types of housing.

In addition to the realistic plans, we asked the respondents about their ideal housing and its characteristics such as the size, number of bedrooms, and how much extra they expect to pay to buy it if they were to sell their current house. This section presents the results from these questions.

As presented in figure 33, many citizens (over 70%) would like to live in a single detached housing when it comes to the ideal housing, . A little over 15% said an apartment in an apartment complex would be their ideal type of housing. The remaining 5% of the respondents are distributed evenly across alternative types of housing.

Figures 34 and 35 present the desired number of bedrooms and size of these ideal types of housing. 2-3 bedrooms with total usage area of 100-200 square meters are the most desired among the citizens of Karmøy. When we look at the extra money citizens think they need for their ideal housing, we see that most of them believe they could buy their ideal housing if they sell their current house as illustrated by the right pane in figure 35. There does not seem to be any statistically significant relationship between the desired size and estimated extra cost since there is a negligible correlation between responses (spearmans rho<.3, p-value>0.1).

We cluster respondents based on the respondents’ ranking of importance level of different characteristics for a living area by using unsupervised machine learning. Tests showed that the most suitable clustering is composed of two groups. The figure below shows the distinguishing factors between two clusters.

The cluster one tends to put more emphasis on the characteristics posed in the survey. Several factors, however, are essential for cluster 1 in their choice of living area. Key among them are distance to nature, distance to family and friends, distance to shops and services, and the real estate prices in the area. Compared to cluster 1, cluster 2 are more neutral to these factors when they are choosing the living area.

Following table illustrates the distribution of different demographic characteristics of respondents per clusters. The whole numbers give the total number of respondents in a cluster with a given characteristics while the percentages give the percentage share of the demographic group in a cluster. To illustrate, there are 31 respondents between the age of 30 and 39 in cluster 1 while 16 respondents of the same age group are in the cluster 2. Within the group, this age category makes up of 10% of those who are in the cluster 1 while they make up about 16% of those who are in the cluster 2. This way of representing the distributions gives the possibility to examine the results across the identified groups as well as comparing them to one another.

When we look at the shares of groups in the sample, the larger portion of the respondents are in the cluster 1, about 77%, while a smaller number of respondents about 23% is in the cluster 2. When we focus on the age of respondents, we see that in terms of age, the groups have similar structures. Comparatively speaking, a larger portion of cluster 1 is composed of older respondents (over 50 years old) while this age group constitutes about 48% of the group two. Looking at the other age groups per group, we see that group two, on average, composed of younger individuals since the share of age groups 30-39 and under 30 years old are comparatively higher. This could be an explanation as to why the cluster 2 members on average puts less emphasis on many of the factors discussed above.

In terms of the employment situation, retired make up a larger portion of cluster 1 while those who are currently working are the majority in cluster 2. This is also reflected in the workplace of the group members to some extent. Since a larger share of cluster 1 is composed of the retired, the shares of commuters and non-commuters make up of relatively smaller shares compared to the cluster 2. Non-commuters, i.e those who live and work in Karmøy, make up a larger portion of cluster 2.

Finally in terms of the family situation, the largest group in cluster 1 is those who live with their partners and kids, and the second largest group is those who live only with their partners. In cluster 2, those who live with their partners and kids is the majority and as opposed to the cluster 1, those who live with their partners without children constitutes a much smaller share of the cluster 2.

This section presents the results from the regression analysis. In order to estimate the influence of different preferences on the living area choice, we estimate a multinominal logistic regression using answer to "how important are the following characteristics of a living area for you" as the predictors and answers to the question "where would you like to live" as the predicted variable.

There are a few technical details to clarify to better interpret the results. First and foremost, the nature of the coefficients. A multinominal logistic regression gives an estimate for a ratio of probabilities of two different outcomes. This is called relative risk ratio. Relative risk is usually a rather complex concept, so instead we use a related and more intuitive measurement called odds ratio. We can illustrate this with a simple example. Imagine that we are in a restaurant, and we need to choose our meal. The menu contains 4 different alternatives: a fish gratin, lamb chops, pad thai and spaghetti. A multinominal logistic regression essentially estimates the probability of choosing one of these dishes over another (for example, fish grain as opposed to spaghetti).

Secondly, it does so based on a category we decide beforehand. This is called a reference category. So, if we say that our reference category is spaghetti, then the model will estimate the probability to choose fish gratin over spaghetti, lamb chops over spaghetti, and pad thai over spaghetti. In terms of odds-ratios, if we were to observe odds-ratio of 1 between the reference category and the outcome category, this means they are equally likely to happen. For example, if the statistical model shows that the odds ratio between fish gratin and spaghetti (reference category) is 1, then whether we choose fish gratin or spaghetti is completely by chance, we might as well flip a coin to choose between them. However, if the model says the odds ratio between the categories is higher than 1, then we are more likely to choose fish gratin over spaghetti. In order to simplify this concept further, we present the results as standardized odds ratio. This moves the tipping point for odds ratio from 1 to 0. To illustrate, if the model says the standardized odds ratio between fish gratin and spaghetti is 2, we are at least 2 times more likely to choose fish gratin over spaghetti.

The third important point is what the coefficient values indicate. In a few words, coefficients give us the estimated increase in the probability of one outcome over the reference category for one unit increase in the predictor variable. We can illustrate this with our restaurant example as well. Now imagine that there is a friend with us, and we are asked to tell the waiter how much we like fish on a scale of 1 to 5. We say 2 whereas our friend says 3. We then look at the multinominal logistic regression and the coefficient for liking fish is 2. This means that our friend. who likes fish about one unit more than us, is at least two times more likely to choose fish gratin over spaghetti than us.

The final concept we need to mention is p-value, represented with "\*" sign in the analysis. Statistically speaking this is a rather complex and controversial concept but it can be an intuitive tool. In a crude sense, p-value of a result indicates the probability of the result by being due to random chance rather than a pattern. For example, a p-value lower or equal to 0.05 indicates that the observed results have 5% or lower probability to be due to random chance. In the literature, there are three commonly used, but rather arbitrary, cut off points for p-value. These are 0.001, 0.05 and 0.1. Each of them indicates, in a way, the level of probability that the results are due to by chance. These values also inform us how likely it is that we observe the same pattern of results in the larger population. So, if a coefficient has a p-value equal or smaller than 0.001, we can also imagine that there is a 99.999% probability that we will see the same result in the wider population beyond our analysis sample.

In our analysis, the reference category is set to "rural area" so that the model predicts the probability of someone choosing rural area or suburbia or city instead of a village as their living area. In order to estimate these probabilities, we use how important they think different factors, such as distance to shops and services or schools and kindergartens. Coefficients for them are presented as standardized odds ratios and p-value of each coefficient are presented next to them in the figure. The model also controls for the influence from demographic factors as well. This way, it provides the influence of location characteristics on preferences independent of demographic factors. Single star indicates a p-value equal or lower than 0.1, two stars indicate a p-value equal or lower 0.05 and three stars for p value equal or lower than 0.001.

On the left most pane, the comparison between choosing a village over rural area is presented. Four factors seem to positively influence citizens’ decision to move to a village rather than a rural area in Karmøy; real estate prices, distance to schools and kindergartens, distance to work and distance to family. The strongest positive influence among them is the distance to schools and kindergartens. 1 unit increase in how important this factor is to a citizens almost doubles their likelihood to move to a village rather than a place in a rural area. The same pattern holds for cheaper real estate prices. While the distance to family and workspace plays a positive role to choose a village over rural area, they are not as strong as distance to schools and real estate prices. In terms of factors with negative influences, locations suitability to function level and distance to shops and centers plays a negative role in choosing a village over a rural area. In other words, people who value these factors more are more likely to choose housing in a rural area than in a village. However, among all the factors suitability to function level is the only one with a reasonable p value. Only for this pattern can we say that it is generalizable to the wider population of Karmøy.

In terms of choosing an urban area over a rural area, two factors stand out: distance to city life and distance to shops. For each unit increase how much a respondent values distance to the city life, the probability that they will choose an urban location over a rural area increases by eight folds. This probability increases about three times for every level of increase in how much they value the distance to shops and services. Beyond the magnitude of these effects, we can also see that both of them are rather generalizable to the general population. In both cases, we can see that there is at least 90% chance that this pattern will hold for general population of Karmøy based on the associated p-values. While it is a small effect in terms of magnitude, the suitability to function level shows a negative influence on a statistically significant degree as well.

Finally, we see that similar factors are also important for the choice between a rural area and suburban area. Even though they are smaller in magnitude compared to choosing an urban area over a rural area, both distance to the city life and distance to shopping center have statistically generalizable positive effect. In terms of negative influences, two factors show dampening influence on the probability to choose suburban area over a rural area; suitability to the function level and the distance to work. Similar to previous considerations, these factors have a negative influence albeit in small magnitudes but statistically generalizable.

Based on the results we can draw two conclusions. When it comes to restructuring Karmøy's urbanization to a more centralized structure, two factors play integral role to nudge citizens to relocate. Chief among them is how much they value a living city life and the distance to the shops and services. Encouraging more lively city centers would be strongly attractive for Karmøy's citizens to relocate closer to the city centers. Similarly, relocating shops and services or establishing them more centrally would be a very strong incentive for citizens to move closer to city centers. Secondly, it should also be noted that such areas should be designed to accommodate those with limited bodily mobility as it has been a consistent pull factor towards rural areas rather than sentralized areas in the analysis.

This report broadly aims to answer one of the key questions in the Karmøy area plan: "How and where will we live?". In order to answer this question, the report follows a four-pronged approach on two levels to four different themes: the population development in Karmøy, real estate market in Karmøy, citizens current conditions and their future plans and preferences.

Chapter one in the report focuses on the population changes in Karmøy on municipal level and examines changes over time as well as projections. Chapter two, in turn, maps out the current real estate market and its key characteristics. Finally, chapter 3 zooms in on micro levels and analyses the citizens’ current living conditions, their preference and future plans when it comes to their choice for living area and housing.

For the analysis in chapter one and chapter two, the main data source is different tables from SSB with some additional data from Skattetaten. In these chapters, the datasets are mainly analyzed with a descriptive approach in order to map the current situation and historical changes. For the analyses in chapter 3, we conducted a survey among Karmøy citizens focusing on their current housing and living area as well as their preferences when it comes to living area, housing and transportation. These factors are analyzed using descriptive statistics, supervised and unsupervised machine learning algorithms to tease out the statistical pattern. Details on the data sources and methods used for analyses are presented in the technical addendum.

The result from these analyses presents several important insights into Karmøy's situation and its future. The population analysis shows that Karmøy is facing a serious decline in working age and young population while accumulation ever more elderly population. While birthrates in the municipality are somewhat steady, the regular sources of population increase such as relocation from other parts of Norway and immigration have been slowing down. The only factor that offsets this pattern is the influx of refugees from Ukraine. Furthermore, results show that Karmøy's population live rather locally. In terms of internal movement, most people relocate within their own postcode. In terms of external moves, most people move out of Karmøy to a different municipality in Haugelandet, mainly Haugesund and Tysvær.

When it comes to the real estate market, Karmøy does not have a very diverse market. An overwhelming majority of the available housing is single detached housing. Patterns in real estate development also show that this pattern will continue for the near future. This is also reflected in square meter prices of the real estate. Karmøy has the cheapest single detached houses in the region. Real estate prices within Karmøy do not show a significant variance. In other words, except for a few specific regions, real estate prices are more or less comparable anywhere in Karmøy.

In terms of citizens’ housing and living location preferences, there are several strong patterns. Based on the descriptive analysis, most people prefer a single detached housing. When it comes to what characteristics matter most for citizens, descriptive analyses show 3 factors as the most important: distance to family, distance to shops and services and distance to nature. However, the actual impact of these factors is somewhat different when it comes to choosing an area to move to. Distance to city life, shops and services are the most important factor for the citizens to relocate to a more urban area. Conversely, whether an area is accommodating of their mobility level the main factor for the citizens to choose a more rural area. Based on these preferences, we identify two distinct groups of citizens. While these groups show similar demographic characteristics, the dividing line is how much importance they attribute to different characteristics. The first cluster of citizens, also the larger one, put more emphasis on factors such as distance to schools, nature, city life, family, possibility to choose an alternative means of transportation and cheaper real estate prices when they think about their next living area. Conversely, the second cluster of citizens are either neutral about these factors or do not care about them at all.