NYSG RECEIVER CITIES

FINAL REPORT

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INTRODUCTION

Currently, academic teams are beginning research on climate migration in the Northeast region of the U.S. There are very few scholarly articles published that are preparing receiver cities for a massive influx of people to one region. Researchers at Cornell are collaborating with New York Sea Grant to prepare New York for a dramatic demographic change by analyzing what is needed for an increasingly diverse population and its impacts on northeastern NY cities. We conducted a high-level review of the literature on climate migration, mass migration events, and the economics of New York to determine the issues receiver cities may face. Through our research, we seek to answer the question: **What should resiliency planners consider while preparing receiver cities for a future influx of diverse migration to New York?**

Our literature review includes published articles and news journals on American climate migration patterns, existing and projected NY demographics, economic conditions of the state, and the perspective of opposition to receiver cities. After our literature review, we review our data collection methodology and pilot interview questions for the next consulting team to employ. We then discuss our findings, analysis and recommendations, including the results from three interviews we piloted with low-stakes interviewees. Within this section, we also provide a brief case study analysis on Buffalo's and Rochester's preparedness as two receiver cities. We conclude with a discussion of potential policy recommendations for a future team to build upon and validify.

LITERATURE REVIEW

Domestic Climate Migration

Why are Americans fleeing and where from?

An estimated 50 million Americans could eventually move within the country to regions such as the Atlantic Northeast or the Upper Midwest in search of a haven from severe climate impacts, according to a Yale University study (Hurdle, 2022). Coastal regions are facing sea level rise and the West is projected to increase its frequency of wildfires and droughts. Also, U.S. territories, such as Puerto Rico, are drastically losing residents as hurricane resiliency becomes more challenging and expensive (Ropeik, 2021). As cities increasingly welcome domestic migrants, we must narrow down "why" Americans are leaving their homes. Undoubtedly, climate change is the main factor (Malo, 2022).

Despite the term "climate haven" taking popularity as recently as 2021, many Americans were fleeing to more environmentally stable locations due to climate disasters well before then. Southern states, such as Florida, have historically seen an influx in residents because of its affordable cost of living and warm climate, but scientists have warned that Florida will see the opposite effect as hurricanes and flooding become more frequent (Malo, 2022). Americans leaving for more environmentally stable locations may not be by choice. For example, "as many as 13 million Americans could be displaced because of rising sea levels alone by 2100, 6 million of them in Florida (Malo, 2022). As we saw the devastating impact Hurricane Ian caused, the likelihood of mass migration is becoming increasingly plausible.

Climate change poses a liability and operational risk for insurance companies. Insurers have already begun raising premiums and deductibles in high-risk areas to offset losses. Furthermore, coverage may become more limited and insurance could ultimately become unaffordable or unavailable for disadvantaged communities, especially in climate-vulnerable areas (Cho, 2019). Beyond insurance, rising temperatures lead to increased energy bills which is another motivating factor for residents to depart for safer and more affordable places. Likewise, receiver cities should provide more affordable housing and offer more sustainable infrastructure than regions that have been ravaged by natural disasters.

Mass Migration Past and Future

Lessons from Past Examples of Rapid Population Growth

One well known example of mass migration is that which followed Hurricane Katrina. Following an influx of about 166,000 migrants in under a year, McIntosh (2008) found a slightly negative impact on the labor market for residents native to Houston, Texas, following a very rapid influx of Hurricane Katrina evacuees. The significant findings included a 1.8% decrease in wages and 0.5% decrease in the likelihood of being employed among natives to Houston as a result of the influx of Hurricane Katrina evacuees (McIntosh, 2008).

Beyers and Nelson's (Beyers & Nelson, 2000) analysis of slow-onset and substantial population growth (three times the national rate) in nonmetropolitan counties from 1990-1995 shows very different results from McIntosh's study. Beyers and Nelson analyzed data showing that personal income, earnings by place of residence, nonfarm proprietors income, and non-earnings income all increased more quickly than the national average rates while population

growth was high. Data on reasons behind the growth was gathered through open-ended interviews with one to two leaders in the economic development of each area, about thirty businesses and government officials per county, and around thirty locals from each community (Beyers & Nelson, 2000).

Six traits that were identified as relevant to each counties' economic growth Beyers and Nelson's thematic analysis also identified; first, while traditional resource-dependent sectors in each community were not expanding as much as other parts of the economy, they were still maintained in each area, and were complemented by the emergence of novel economic activities such as the growth of niche manufacturing, defined as the locationally flexible production of very specialized, often high-value goods, where products were sold in distant markets, with low transportation costs in proportion to the value of the product (Beyers & Nelson, 2000).

Within the theme of migrant characteristics and behavior, Beyers and Nelson noted that migrants were sometimes willing to accept pay cuts in exchange for environmental amenities they deemed preferable. Other important factors in the community choice of migrants were strong institutions like schools and hospitals, and the relaying of positive information about the communities through existing social networks (Beyers & Nelson, 2000). Another trend among the migrants of each community is that the majority were not retirees, they were still active participants in the labor market, and many migrated with children (Beyers & Nelson, 2000).

A positive outcome of community growth was an increase in local investment, particularly when it came to real estate, and an increase in local consumption levels (Beyers & Nelson). Beyers and Nelson also discussed a type of player in the local economies dubbed a

"Lone Eagle" whose work does not benefit local development through providing jobs, or through products, their goods are often shipped to external clients (Beyers & Nelson, 2000). Responses from locals to this type of economic player were mixed, and largely skeptical (Beyers & Nelson, 2000). The final theme Beyers and Nelson identified was the existence of "spillover" relationships with nearby communities, which tended to be seen most prominently in the work and housing markets.

When applying the findings from each of these studies to Buffalo and Rochester, it is important to note that each mid-sized city falls in between the size of the nonmetropolitan areas considered and Houston, Texas. This means that findings from both community types may provide applicable information. It is particularly relevant to consider the work of Beyer and Nelson when assessing the potential impact climate migration may have on the smaller communities around Buffalo and Rochester, given the finding that "spillover" relationships tend to exist with other communities in regard to the housing and labor markets.

The migration described in Beyers and Nelson's work, while rapid, occurred more slowly and with less urgency. The positive impacts of rapid population growth in Beyers and Nelson's study on communities, contrasted with the slightly negative labor market outcomes in McIntosh's study, could indicate that it may be important to consider the pacing of large population growth, and to plan ahead for the potential that migrants may be coming from very dire circumstances.

Planning for Future Climate Migration

There is currently a growing body of literature on predicting the necessity of climate migration (McLeman, 2017; Hoffman et al., 2021), which may provide a starting point for receiver city planning. Preparing for when mass migration may occur, and from where it may occur, will give municipalities time to prepare for a suddenly expanded economy, an increase in housing needs, and potential cultural differences between area natives and migrants, among other things.

Hoffman et al, (2021) conducted an extensive literature review, and outlined recommendations for the best practices in researching and modeling climate migration (Hoffman et al, 2021). Hoffman et al. (2021) described the five most common challenges in climate migration research and presented them as concepts to address in climate migration research. The first challenge that Hoffman et al. (2021) state must be addressed in climate migration research, is accuracy in the measurement of migration, followed by proper conceptualization and representation of climatic events and hazards, the integration and aggregation of data, the modeling and identification of causal relationships, and the exploration of contextual influences and mechanisms. Below, a model is shown which succinctly summarizes key points to consider in addressing the common climate change research challenges.
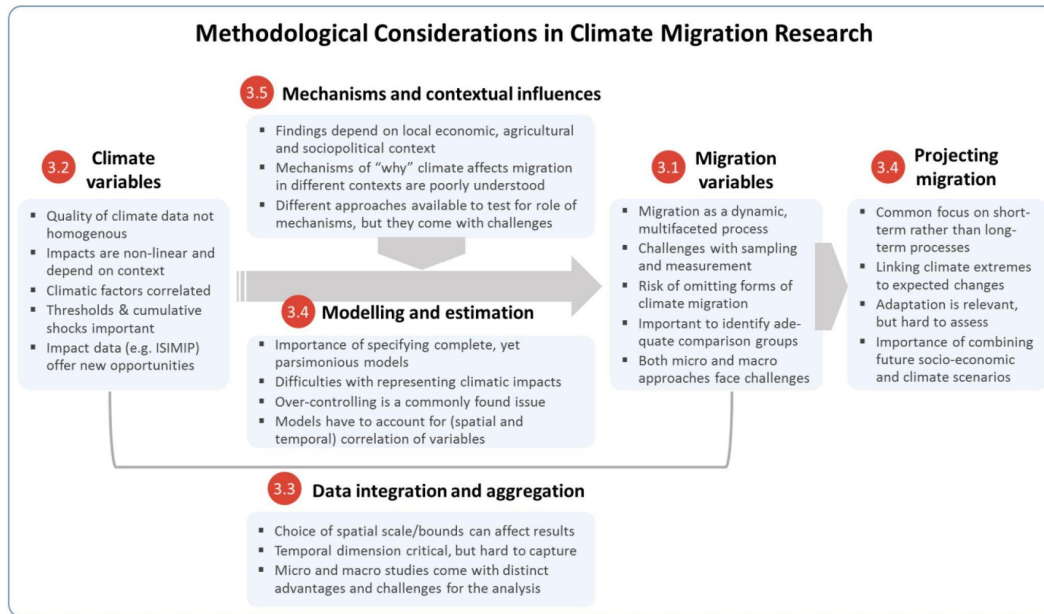
Methodological Consideration in Climate Migration Research (Hoffman et al., 2021)

McLeman (2017) created a comprehensive review of literature on climate adaptation and migration. Using the work of many researchers, McLeman (2017) was able to identify the thresholds at which a new response to climate hazards or changes must be implemented. Further, the study describes the existence of six distinct thresholds that exist in response to current climate issues in the following order: first adaptation becomes necessary, next adaptation becomes ineffective, then substantive changes in land use/livelihoods become necessary, after which point In situ adaptation fails and migration ensues, which will be followed by a phase in which migration rates become non-linear; and in the final stage, migration rates will cease to be non-linear (McLeman, 319). The establishment of these thresholds will assist in estimating the amount of time until migration must begin out of a particular area, and subsequently, the quantity of people that will need to relocate as a result of climate issues.

In providing a pathway for these thresholds to be better conceptualized, McLeman (2017) uses an example from his previous work for the first three thresholds. The first threshold may be less overt, as it is simply the requirement of a new intervention where one was not needed previously. The example listed of what the first threshold may look like is a year with below-average rainfall and above-average temperatures, in which farmers must implement new irrigation methods (McLeman, 2017). The next threshold is passed when the newly implemented adaptations no longer alleviate the issue at hand, such that more intensive and costly solutions are attempted. In the previous example, this would mean that the new irrigation solutions no longer facilitate current farming methods possible, and new crops or new types of irrigation must be the next investment (McLeman, 2017). Threshold three involves the complete restructuring of land use or livelihoods, in the farming example, this would mean farmers would begin using their land very differently, or even looking for employment entirely unrelated to the land they possess (McLeman,2017).

Threshold four is the point at which some level of migration is typically necessary, and some members of households may begin to look into temporary relocation for wage-earning opportunities (McLeman, 2017). The fifth threshold is characterized by non-linear migration that peaks in a short period, often caused by uncommon and extreme climate crises which cannot be ameliorated through even the most involved in-situ adaptation methods (McLeman, 2017). McLeman explains that perception of the future and preferences regarding the people moving from one's area may also lead to sudden surges in migration from an area, due to the negative impact of population decline on those that remain in the area. The final threshold is crossed when

migration patterns become linear, which can happen naturally if localities are able to take

advantage of new opportunities that may come with climate changes (McLeman, 2017).

McLeman concludes by emphasizing the utmost significance of advanced planning for climate

migration, looking as far forward as 20-30 years in advance of mass migration periods Finally,

McLeman states that information on climate migration thresholds is essential for policy makers,

city planners, and decision makers.

A key point to consider in receiving city planning is the extent to which international

climate migration can and should be accommodated. Smith (2007) discusses the issue of

international climate migration, and how it can and should be approached. This is an important

issue to give consideration to in the context of Buffalo and Rochester because areas that market

themselves as receiver cities could gain very widespread attention, attracting more international

climate immigrants than places that do not market themselves as receiver cities. Smith describes

that the predicted increase in Katrina-like climate events presents a serious issue when

considering the simultaneous rise in anti-immigrant attitudes globally (Smith, 2007). Rising

anti-immigrant sentiment has already led to a view of international migration as a "security

threat" among some (Smith, 2007). Smith argues that some amount of military management of

human flows is an inevitable outcome of the predicted international immigration, as this level of

migration will most likely exacerbate concerns about international security issues. Smith's

recommendation is that inevitable military responses center humanitarian or rescue operations,

rather than reactive, interdictive goals. Finally, Smith also emphasizes how important it is that

governments acknowledge the inevitability of large demographic shifts, and begin preparing, to prevent reactive responses.

To predict international migration, Smith (2007) provides some indications of what to watch for. Smith explains that migration is a result of "push" factors that incentivize leaving an area, and "pull" factors that attract potential migrants to a new area. Examples of "push" factors listed by Smith include poverty, unemployment, criminal violence, and political instability. "Pull" factor examples included higher wages, employment opportunities, and political stability in an area, but Smith also places a strong emphasis on the importance of social or kin networks as a pull factor for potential migrants. Push and pull factors must be consistently kept under observation to address potential spikes in international immigration.

Demographic Patterns of New York

The impacts of climate change are already creating inequality for communities underrepresented by age, sex, race, and ethnicity. Bringing attention to imperative demographic patterns of New York by understanding the projected future demographic changes will allow us to make informed decisions on communities' resilient futures.

Country-level Climate Change Demographics

Sea-level rise, and in general climate change, is likely to induce American (and potentially global) migration in the 21st century. Climate-related changes to our living environments can severely alter residential mobility patterns, fertility rates, and mortality rates (Hauer et al., 2022). Current demographic trends reveal there is an increase in racial and ethnic diversity and a growing older population in coastal America. Coastal climates with frequent

tropical storms and flooding accelerate these trends compared to the rest of the country. In-land populations have a median age of 14-11 years younger than coastal areas (Hauer et al., 2022). However, there are currently no demographic data projections for what coastal areas will look like in the future. Both in-land and coastal regions are expected to become increasingly non-white and non-Hispanic, altering the demographic of the country with the non-Hispanic White population declining by 20- to 27% by 2100.

The Coronavirus pandemic has created unexpected demographic changes across the country. The population of the United States increased by 0.1% - the slowest growth rate on record for America (US Census Bureau, 2021). All projections mentioned in this section are subject to change from unexpected events and are intended for informed decision-making for climate changes and disasters (Hauer et al., 2022).

Recent New York Demographics

The Coronavirus pandemic has caused changes around the world that were not planned for or expected. These changes include, but are not limited to, the comfort of certain social functions, over 79 million reported cases, and almost one million deaths in the United States alone as of March 7, 2022. Considering this, the predictable patterns of births, deaths, and migration have been severely impacted (Cornell Population Center, 2022). Country-wide data estimates released by the U.S. Census Bureau for 2020-2021 revealed that New York lost almost 400,000 people during this time period. This was due to more people moving out than in, resulting in negative net migration. Of New York's ten regions, only the Capital region gained population due to more people moving in than moving out. More than half of the counties in

New York lost population because of migration since the last Census. However, in the most recent year, both the Capital and North Country regions experienced more people moving in than out within the U.S. (positive net domestic migration) (Cornell Population Center, 2022). New York City lost nearly 350,000 documented residents in the last year. This was a severe outflow from the city to other domestic locations. It can be expected that many former NYC residents moved to other regions of the state since the remaining seven regionals also lost population during the most recent year, however, it was not nearly as much of a drop in population as past estimates have shown (US Census Bureau, 2021). In the most recent year, net international migration decreased slightly, however, it remained positive for all regions and most counties (Cornell Population Center, 2022).
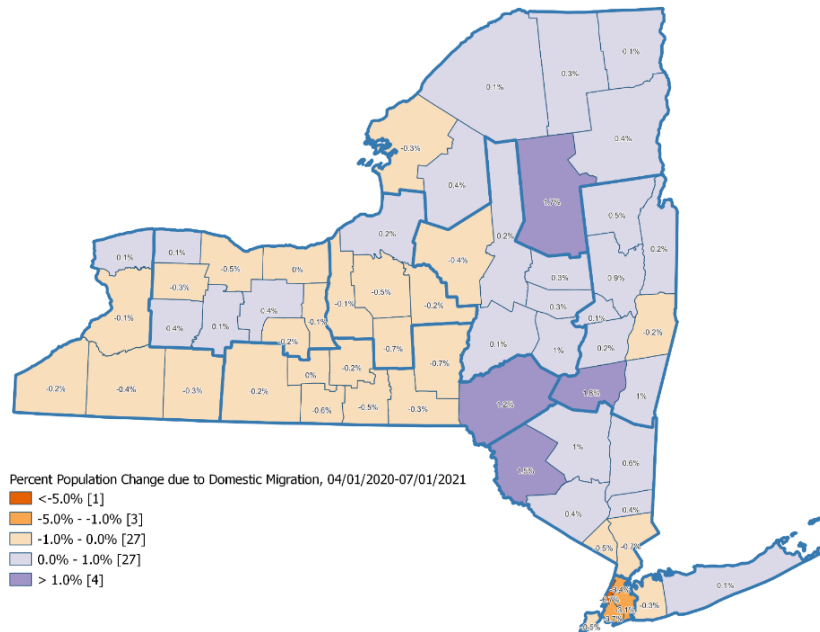
Map of Estimated Percent Population Change due to Domestic Migration between April 2020 and July 2021, by County (Cornell Population Center, 2022)

Economic Conditions of the New York

Economic Snapshot

New York has a Real GDP of US$1.49 Trillion[1] in 2021, ranking third after California and Texas. Most economic activities are concentrated in the New York City Metropolitan Area, which makes up 63% of the economy (BEA, 2022). The state's economy is highly supported by financial sectors, accounting for 32% of the economy, including insurance, real estate, rentals, and leasing (BEA, 2022). The other sectors supporting the economy of New York (excluding government services) are professional and business services, information, education, healthcare, and social services (BEA, 2022).

Real GDP data from the past two decades show that overall economic activity has increased despite two significant economic downturns. The severe recession of 2008 only modestly reduced economic growth to 1.5% on an annual basis. Covid-19 reduced economic growth by 5 percentage points year on year (BEA, 2022).

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[1] 2012 chained US dollars.
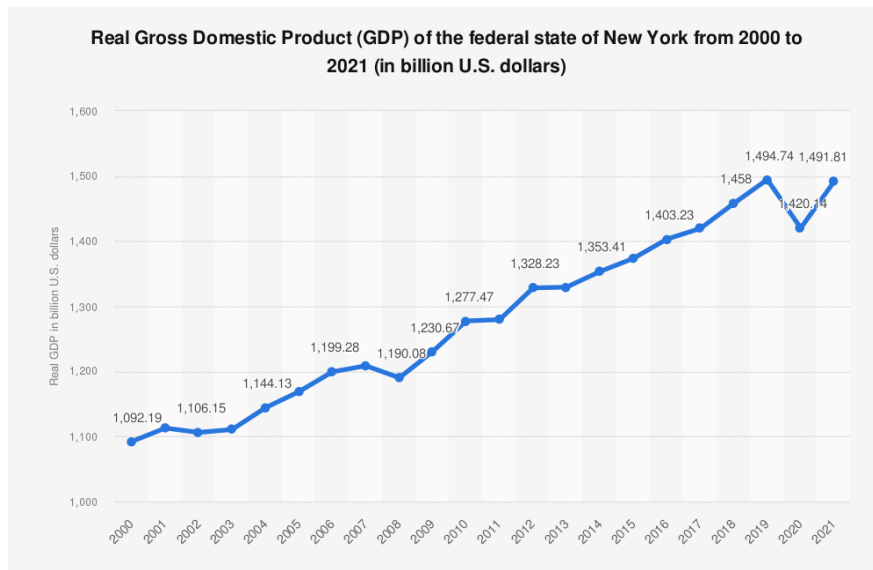
Real GDP of New York from 2000 to 2021 (2012 chained billion US dollars) (BEA, 2022)

In New York, services are the main sector of employment. In 2021, the industry with the highest employment was healthcare and social services, which accounted for 14.6% of all employment. The manufacturing sector is responsible for over 440,000 jobs. The employment rates for mining and agricultural jobs are among the lowest. As of August 2022, unemployment rate was 4.7%, which is slightly higher than the 3.7% national average for the same period. Additionally, as the civilian labor force expanded by 32,500 to 9,544,900 in August 2022, the number of unemployed New Yorkers increased from 413,400 in July to 447,000 in August (NYDOL, 2022).

Potential New Industries in New York

Different industrial focuses can be found in various New York locations. As measured by GDP contribution, financial and professional services dominate New York City's economy (Sassen, 2013). The industry clusters found within each of the Upstate New York sub-regions differ and are not merged to form an unified overall economy; rather, each has a specific focus.

Buffalo, for example, has business services, advanced manufacturing (Helper and Wial, 2011), agribusiness as dairy production (Braga, 2016), tourism, logistics, and the developing cluster of green technology (Albro, 2019). In contrast, the Rochester region is known for its advanced manufacturing (Neumann and Sherrill, 2019), optics/imaging as historically supported by local businesses including Bausch & Lomb Inc., Kodak, and Xerox (Chevreux et al, 2014), biotechnology, and agribusiness (Huallacháin & Lee, 2014). The Syracuse region's economy is primarily supported by education (Dudley, 2017), healthcare, and manufacturing.

A high technology business such as nanotechnology manufacturing is one of the possible industries that can grow in New York. Long-term officials in New York and the Capital Region hoped that their public investments in nanotechnology would attract private sector investment in nanotechnology production, which would counterbalance the employment impacts of the region's fall in traditional manufacturing (Wessner & Howell, 2020).

Rural Public Transportation

Public transportation is an integral part of urban and rural development. Zhang and Xu (2022) showed evidence of increasing public transportation ridership in urbanized areas of the United States. Investment in public transportation is vital in rural areas where infrastructure and services for public transportation are lacking while urbanization is rising (Zhang and Xu, 2022).

The urbanization of rural areas is usually related to increasing demographic diversity (Lichter and Zillak, 2017), particularly in rapidly urbanizing areas (Lee and Sharp, 2017). Such demographic diversity frequently implies growth in marginalized communities will result in more socioeconomic inequalities. In rural urbanization, marginalized rural communities are significantly more likely than the majority population to use public transportation (Zhang and

Xu, 2022). The high dependency of marginalized populations on public transportation indicates that improving a more established public transportation system is a prospective way to mitigate socioeconomic inequality and that working to develop public transportation in a rural area with poorly developed public transportation is necessary to make public transport economical and comfortable.

An explicit policy objective should incorporate a defined focus on giving public transportation access to populations who are likely to use the services. One of the influential studies on public transportation by Murray et al. (1998) shows that specific land use categories (such as high-density residences and public housing) may benefit from easy access to public transportation. Furthermore, Murray et al. (1998) proposed more flexible proximity measures, service considerations, and demographic and socioeconomic criteria might all be used to improve the evaluation of public transportation access. Increased efficiency discovered through enhanced monitoring and assessment methods will aid in providing adequate and acceptable regional public transportation services.

In Washington State, 83% of the population has access to public transportation, including urbanized and surrounding rural areas (WSDOT, 2021). Travel Washington Intercity bus service connects rural regions to major transportation hubs and metropolitan areas, bridging gaps in the public transit system and providing more accessible, reliable, and convenient travel across the state. Travel Washington regularly offers over 30,000 trips annually, covering several of the state's most remote areas. The Washington State Department of Transportation (WSDOT, 2021) contracts with private bus companies to offer intercity bus services. As funding becomes more available, WSDOT plans to continue providing the service. The program is funded by the

Federal Transit Administration and Greyhound Bus Lines in a public-private partnership for a similar program.

In the case of Buffalo and Rochester, the two cities most likely need the development of public transit in the near future since the cities are being prepared to receive more climate migrants. Urbanization of rural areas, increasing socioeconomically marginalized populations, and higher dependency on public transportation will exacerbate the issue into a more fundamental problem. Because transportation determines the interaction between urban and rural regions and arranges structural relationships within these areas, transportation networks are a fundamental component between physical space and society. A survey by Grahn et al. (2020) shows that Rochester and Buffalo showed extremely low user counts, and the authors confirm that transportation network company services in the scale of a metropolitan statistical area were unavailable in New York outside of New York City during the time of the survey. The impact of federal and state policies encouraging sprawl has been devastating in the Buffalo-Niagara area. Almost 58 percent of employment in the region is inaccessible by public transportation. Residents without reliable automobiles often struggle to find and keep jobs because public transit has not kept pace with urban growth (Yin, 2009). Public transportation development in Buffalo and Rochester will help to abate the inequality and economic stagnation in preparation for migration influx.

The Opposition

Receiver cities are facing opposition from climate activists, the community, and local legislators. As it stands today, receiver cities are not prepared for a large influx of people.

However, as natural disasters continue to torment millions of Americans, millions of Americans are becoming more attracted to receiver cities. Marketed receiver cities within the rustbelt lack the infrastructure to accommodate large masses and there isn't a concrete plan on how cities will handle climate migrants. Community members and legislators are concerned that their needs will not be met. For example, these places are in lower-cost locations but if middle-upper class and wealthy migrants move in, gentrification will become a cause for concern. Gentrification will result in rising housing costs and the disposal of poorer residents. Also, there are not enough classrooms to fit an uptick in migrants which will negatively impact children. Nicholas Rajkovich, urban planning, and resilience professor expressed a considerable point that the term "climate haven" is "more of an economic development slogan than a detailed and robust planning that is going to be necessary to make these places a haven from climate change" (Yoder, 2021). Essentially, Rajkovich argues that traditionally marketed climate havens lack detailed plans that would keep them a place that is safeguarded from climate change.

Climate activists have argued that the development of receiver cities does not address climate solutions (De Socio, 2021). Also, activists are concerned that profit is more important than the concerns coming from current residents. If more migrants relocate, the amount of carbon emitted from these localities will increase, the need for clean water will skyrocket, and the supply of goods will not meet the demand. Furthermore, some receiver cities have faced natural and man-made disasters. Culture clashes are another point of contention. There are a lot of hurdles that receiver cities will face, and time is of the essence.

Research Plan

The primary scope of our research is to supply NYSG with tools to best prepare climate-receiving cities to handle the mass migration of climate migrants. For resiliency planners to be best equipped to tackle a high population influx, they must consider a multitude of factors that our team will help provide.

The consulting team collaborated with the following recommended subject-matter experts:

- Dietrich Bouma- Research Area Specialist Associate at AAP Cornell University

- Elias Rodriguez- Deputy Director of Public Affairs and Chief of the Media Relations Branch of the Environmental Protection Agency

- Jane Bowman-Brady- Director of GoIthaca

Furthermore, our data could help future researchers consider a timeline of when cities should prepare for an influx of climate migrants. We tracked current natural disasters, including Hurricane Ian, and analyzed if the state's residents will relocate in fear of another disaster. Also, we researched old disasters to pinpoint where their residents are located and if the localities they relocated to were prepared and how they prepared for the influx.

Other considerations include community and legislator sentiments, job opportunities, and housing quality and prices. Our data estimated a potential increase in housing costs due to the possibility of gentrification and if community residents are able to sustain living prices in their current location. Specifically, we will hypothesize which socioeconomic levels will see positive and negative impacts.

DATA AND METHODOLOGY

Data Specification

For our sample, all participants must be 18 or older. Key informant and pilot interviews were individuals from three key populations. The first were NPO and NGO leaders focused on issues related to climate change or community economic welfare, the second were individuals that have made the decision to relocate due to a climate disaster, and the third were longtime (15+ years) community residents of Rochester, Buffalo, and neighboring areas.

Methods

Recommendations for the study were based on a literature review, semi-structured key informant interviews, and pilot interviews. The analysis of each of these methods was to emphasize how it served its intended purpose and how it was applied to this study. Together, these methods assisted in credibility and validity efforts to identify common ground and information which can be the basis for recommendations and further study.

Literature Review

Our literature review was used to compile relevant background information on climate-related migration, current research on migration caused by climate disasters, general information on receiving communities' perspectives on climate migration, political sentiments, and recent snapshots of economic and industrial development and the population influx for New York. Our literature review also helped us determine potential data collection and analysis methods for our research on climate migration.

Semi-Structured Interviews

Official interviews are used to obtain relevant details about experiences and explain how people express their feelings and thoughts, decide what to do, think about their social roles, and develop standpoints. Key informants got the chance to discuss their ideas, convey their opinions, and offer greater insight via semi-structured interviews that we might not have had access to through quantitative methods. Each key informant was asked a flexible set of questions about climate migration, the community's ability to modify its economy to accommodate climate migrants, and general information about populations that move due to the climate or events related to the climate. Because semi-structured interviews can uncover unexpected issues and information, including it in our research method is important.

Key Informant Interviews

Key informant interviews (KIIs) were conducted with individuals that are considered knowledgeable about the issues surrounding climate-induced receiving communities. In the hopes of gathering more information about the subsequent potential informants, KIIs are also designed to enable "snowball sampling." We recommend that the next research team interview individuals who are climate migrants who moved or will move to New York, NPOs and NGOs leaders related to climate migration issues, and community representatives in Rochester and Buffalo as the receiving communities. These individuals were chosen due to their close relationship with climate migrant issues or climate migrants themselves.

FINDINGS, ANALYSIS & RECOMMENDATIONS

While conducting three key informant interviews our team took detailed notes. Based on the responses we were able to record, we determined a list of questions that should be advanced to the pilot interview stage of this project. To analyze pilot and informational interview transcripts, we recommend using computer-assisted data analysis software, NVivo, to collect, organize, store, and analyze data manually for the research team which takes on our project next. This software will help to ease the analysis given its visibility of themes, data arrangement, and analysis for any relationships and recorded the result.

Interview Questions

The questions listed below for NPO/NGO leader interviews were based on a combination of work from our literature review, and questions asked in key informant interviews. We relied heavily on Beyers & Nelson's (2000) themes for guiding questions with migrants and locals, Hoffman et al.'s (2021) methodological considerations for exploring contextual influences and mechanisms, and the demographic and economic information we found about New York more generally. After our key informant and pilot interviews, we adapted our core questions further. We recommend investigating three key areas using pilot interviews: initiatives for policy change successes and failures, incentives for migrants to move to New York and how the migrants should be accommodated, and receiving communities' perspectives and concerns on population growth after migration influx. Pilot semi-formal interview questions should be similar to the draft examples in the table below, but should be adjusted for the context of each interviewee.

Example Pilot Questions

Example Pilot Questions for Climate Migrants

Did any form of home insurance coverage help you to transition to (new town)?

How long did it take you to find a job in (new town)?

When you relocated, were you willing to accept pay cuts for the difference in environmental issues?

How often do you travel to the area surrounding (town you have come to) for work and/or leisure activities?

Example Pilot Questions for Rochester and Buffalo Existing Residents

Would you be excited about the idea of new businesses coming into the Rochester/Buffalo area?

What kind of businesses do you think would be most beneficial for the area?

Are there any businesses or industries that you would not want to expand in the area?

If there were a population increase in this area, what would your main concerns be, if any? Would you be excited for any reason?

When people go to the areas surrounding (Rochester or Buffalo), where do they typically go and why?

Have you seen or heard of any businesses/industries around here that need more employees?

Example Pilot Questions for NGO/NPO Leaders Based on Key Informant Interviews

Which of your services are most commonly utilized by people from (Rochester or Buffalo)?

Which communities would you say need the most of your assistance in (Rochester or Buffalo)?

If you wanted to expand (insert type of infrastructure system), where would you start?

How would your NGO/NPO accommodate an increase in individuals needing your services?

Can you tell us about any projects (domestic and/or international) that have focused on climate migration efforts?

What risks and limitations should climate receiver cities consider during the planning phase?

Which areas do you anticipate seeing people flee from in the U.S. in the near future?

What plans are currently in place to address the fact that insurance on property in certain areas may become increasingly difficult to access?

Does your organization have recommendations in place for receiver cities and/or climate migrants?

What has your organization prioritized in strengthening or expanding your city's public transportation infrastructure and why?

What kinds of obstacles and challenges should cities look out for when expanding public transportation infrastructure?

What are some methods you have used for securing public transportation funding for your city? How is your organization funded?

What kinds of public transportation resources do you think are important for larger cities to provide?

Research Replication

To ensure the continuity of this study, we have outlined a research plan for future research teams to take over and will begin developing the snowball sample that will be necessary for data analysis in the long term. Our process involved stakeholder identification, key informant identification, and interviews to begin the development of the questions that will be most important to answer in future interviews. Finally, we identified a primary list of informants to interview through key informant interviews. As time allows, our research team developed, piloted, and refined potential interview questions for the next research team to use. Replicating

this study will require recruiting participants from the same stakeholder categories used in our study and snowball sampling.

Scope and Comprehensiveness

The research team decided on this four-step research plan based on previous research studies found during the literature review. Hoffman et al. (2021) revealed recommendations for creating accurate predictions of the areas that will see the largest losses in population due to climate migration and the scale of the population shifts that will occur. Our research team adapted these recommendations to fit the research scope by creating a research plan based upon the exploration of contextual influences and mechanisms of climate migrations. The target populations were broken down into similar categories to those used by Beyers and Nelson (2000), including migrants, locals, and economic leaders in the community. Beyers and Nelson's themes also helped to inform the content of our interview questions. Cho's (2019) discussion of issues related to insurability in areas with climate disasters also influenced our interview questions, as well as Wessner and Howell's (2020) work on the industries which may grow in the Rochester and Buffalo areas with a rapid increase in population.

New York is our target location for two primary reasons. New York Sea Grant is a leader in the research of climate migration and has assigned us the task to find contextualized policy recommendations for this location. Additionally, Jesse Keenan, an associate professor at Tulane University in New Orleans, cited in our literature review source "As climate fears mount, some in U.S. are deciding to relocate" published by Yale University in March of 2022, has utilized National Oceanic and Atmospheric Administration (NOAA) data to estimate that 50 million

Americans could eventually move within the country to regions such as New England or the

Upper Midwest in search of a haven from severe climate impacts. This finding has put New York

in a position of opportunity, given that the State has already established two in-land cities as

receiver communities: Buffalo and Rochester.

The research team's target to create qualitative data came from the decision to connect

existing quantitative data to human-emotion and story-telling of experiences. Additionally, to

create a policy recommendation briefing for NYSG, we needed to understand the impact climate

migration will have on existing and future residents of receiver cities and communities. So far,

limited quantitative data exists for this subject. Admittedly, we have learned from Hoffman

(2021) our decision to utilize qualitative data exclusively may make it more challenging to find

casualties that support our recommendations.

Our research team is under the limitation of time. Our initial research strategy with

NYSG was to utilize focus groups, however, we recognize this method will produce an

incomplete and oversimplified narrative guiding our policy recommendations. Due to time and

monetary constraints, we cannot conduct focus groups in-person in Buffalo and Rochester, which

could impact the trust residents and migrants have toward our research and their willingness to

be completely truthful and elaborate. We also considered other research methods, such as the

review and coding of Reddit threads on the topic of climate migration to New York. This method

may have allowed us to understand personal stories, however, there was not a convincing way to

verify the authenticity, and we may have missed the scope of our research. Our finalized research

methods that we have described have been verified by our NYSG client and adjacent research teams.

Case Studies of Buffalo and Rochester, New York

When we look at New York communities as climate-receiving cities, those that are often considered in the media are Buffalo and Rochester. Previous views of what it means to be a receiver city (otherwise known as a climate haven) have included attributes such as freshwater supply, land to grow, a moderate temperature, and a low cost of living (UBNow, 2021). However, what most media articles in 2021 often did not factor in is community well-being and preparedness for climate migration.

Buffalo and Rochester share similar histories. They were both significantly large cities around the 1930s with thriving economies and racialized housing. After the industrial collapse of the 1950s, these two cities lost a significant amount of their populations as residents moved for employment opportunities elsewhere (U.S. Census Bureau, 2022). Those that remained in the city were struck with poverty, decaying homes, and insufficient urban infrastructure.

New York's Resiliency Planning office launched a Smart Growth program to integrate economy, equity, environment, and energy. The goal is to promote land use planning principles that can be adopted into NY communities to make them more livable, sustainable, and equitable (New York State, n.d.). Cities can choose to not use the grant program, however, great success has been shown in cities that do implement the NYS Smart Growth framework. The way Buffalo and Rochester have implemented smart growth strategies varies, and this difference allowed us

to understand what resiliency planners may need to consider when viewing them as climate-receiving communities.

Buffalo, New York

Buffalo's history has led to its current racialized, underfunded, and underutilized conditions. This city is ridden with abandoned properties and environmental injustices. Nearly half of the city's residents (46%) are rent burdened, meaning more than 35% of their household income goes toward housing expenditures (City of Buffalo, 2017). The housing stock is the oldest in the state with deteriorating conditions that may cause long-term health concerns. Additionally, a major mortgage lender has continued racialized redlining practices up until 2010, preventing generational wealth accumulation for people of color until only a decade ago (Silver-Greenberg & Corkery, 2015).

Mayor Byron Brown's initiatives for turning the city around have been supported by the State's Smart Growth grant program as well as the 2012 Buffalo Billion state funding grant. His initiatives include diversity and inclusion, economic development, job growth readiness, innovative government, and strong neighborhoods (City of Buffalo, n.d.). His success in recent years can be attributed to his engagement with community-led organizations that have integrated programs advancing inclusiveness in neighborhoods citywide. However, most strong neighborhood initiatives are on a volunteer basis which has led to the instability and shortened longevity of some programs (City of Buffalo, n.d.).

We propose the resiliency planners moving forward work closely with existing community leaders and organizations to ensure their voices are represented during

decision-making and to prevent time and resources wasted on the reproduction of existing

progress and knowledge. Organizations that the future research group may consider contacting

include talent attraction agencies, resident mobilization, and migration services.

Rochester, New York

Similar to Buffalo's deteriorating conditions, Rochester suffers from abandoned

properties, disinvested neighborhoods, rent burdens, and environmental injustices. Rochester

hasn't utilized state funding to its fullest extent. The only two state-sponsored Smart Growth

initiatives they have engaged with are the Rochester Land Banks and Rochester Complete Street

Policy (New York State). Land banks have the potential to allow underinvested communities to

grow wealth and affordable housing security, however, this initiative on its own will not be

enough for Rochester to accommodate its existing residents today nor in the future with a

population influx.

Mayor Malik Evans's initiatives are encouraging the city to grow while supporting

existing residents. His initiatives include equity, inclusion, justice, economic empowerment,

building toward a prosperous future, strengthening neighborhoods, youth development, and

public safety. Rochester is a city that may just be getting started in its efforts for a healthier

quality of life, but for now, it is far from that reality.

We propose resiliency planners to establish partnerships with community organizations

and support community-led initiatives to allow for the expansion of their community-support

programs. Existing community groups of Rochester seemingly do not have agency toward the

City's planning process. The few groups that do exist are not collaborating on smart growth strategies and seem disconnected from one another and the City's plans.

Job Losses and Opportunities

As more climate migrants relocate to Buffalo and Rochester, career opportunities must be addressed. Unless a migrant is allowed to work anywhere nationwide, there is a risk that migrants will lose their jobs. Working class jobs including but not limited to, construction, farming, and fishing will be obsolete because the environmental conditions may become hazardous (International Labour Organization, 2018). Historically, blue-collar jobs such as construction and manufacturing, are disproportionately male-dominated. If the government expands its infrastructure workforce, that might increase female applicants. Therefore, "Gender-responsive approaches can contribute towards enhancing the participation of women and furthering gender equality" (International Labour Organization, 2018).

As migrants lose their jobs, companies will face a major decline in their workforce and if companies lose an abundance of employees, the company could close. Sustaining a sizable workforce while ensuring migrants are employed is possible. For example, in Nairobi, Mukuru, the city is facing severe climate disasters which will displace hundreds of thousands of residents (Lopez and Blake, 2020). As residents face an uncertain future, the Resilience Force addressed inequities through a variety of workforce development projects. "By including diverse stakeholders in the solution, local economies have a better chance of thriving," (Lopez and Blake, 2020). If Buffalo and Rochester fund workforce development projects, there will be a

spike in job opportunities which can help migrants and current residents as well as advance equity and inclusion.

Workforce development projects could entail providing companies with tax incentives contingent on relocating to Buffalo and Rochester and/or allowing employees to work remotely. For blue-collar jobs, Buffalo and Rochester can hire those workers to assist in infrastructure efforts, therefore, workers can transport their skills. Evidence suggests that climate migrants can lead to positive employment gains. For example, due to climate migrants relocating to Europe, the country estimates that approximately 500,000 new jobs will be available by 2050 (International Labour Organization, 2018). Buffalo and Rochester's economy would benefit from a boost, and as more companies relocate and employment increases, the economy will advance.

Recommendations

Investing in workforce development projects can maintain a stable workforce. As more migrants relocate to Buffalo and Rochester, the need for sustainable infrastructure will increase. Then, the receiver cities can employ blue-collar migrants and current residents to assist in infrastructure expansion efforts. Also, providing tax incentives to companies located in climate-impacted cities will incentivize companies to either relocate and/or permanently allow remote work. Finally, we recommend Buffalo and Rochester collaborate with local companies to develop workforce development initiatives.

Background on Housing Issues

After reviewing the literature on the economies and demographics of the areas

surrounding Buffalo and Rochester, lessons learned from past instances of large-scale migration,

and the problems faced by individuals in high-risk climate disaster areas, we have identified

issues that can be partially assuaged by one common solution. Upon further investigation into the

ways that economic issues manifest themselves in the areas around Buffalo and Rochester after

widespread population loss, we found that one of the current issues faced in these communities is

the problem of abandoned, vacant, or "zombie" properties. Last month, ATTOM Data Solutions,

a provider of real estate and property data, released a report that quantified the growing issue of

zombie properties at 1.3 million homes, or one in 79 homes across the country, and predicted that

the number of zombie homes will rise even further with the lifting of the eviction moratorium

(ATTOM Data Solutions, 2022). New York has the highest number of zombie homes in the

country.

In 2018, facing threats to local property values, and even public safety, the city of

Rochester attempted to implement a program allowing residents to purchase zombie properties

for a nominal fee of $1.00, along with associated transaction fees (Rochester First, 2018). The

issue of zombie properties has persisted in Rochester, and in April of this year, local officials

issued a press release about a new vacant and zombie property-minimizing initiative that the city

would be diverting funding towards; a county-sponsored website (MCvacants.com, n.d.) that

provides stakeholders with resources for addressing the issue of vacant properties (Bello, 2022).

In nearby Erie County, home to the city of Buffalo, the County Clerk has gone even further in

attempting to address the issue of Zombie properties statewide by partnering with the Western

New York Law Center and Columbia Law school to establish another website providing information on minimizing the number of vacant and zombie properties for local officials and community members and even allowing community members to report likely zombie properties (Desmond, 2022). This initiative is modeled after the Clerk's own ZOMBIES initiative and work in Erie County calling attention to the persistent and growing threat posed by Zombie properties through the website eriecountyclerkzombies.com. Also reported by Tan (2022), was the fact that the suburbs surrounding Buffalo are facing the issue of vacant properties at a proportionate scale to the city of Buffalo itself. While the growing scale and threat of vacant and zombie properties is gaining the attention necessary to begin moving towards solutions, there is more that must be done to reduce the number of zombie properties in Western New York and throughout the state.

As discussed earlier in the literature review, those across the country in areas at high risk of climate disaster will increasingly face extremely high premiums for housing insurance or may live in homes that insurance companies deem entirely uninsurable. This issue has devastating implications for the finances of those homeowners.

Recommendations

Our recommendation is to begin researching a solution that will alleviate the issues of both New York zombie properties, and uninsured family homes. Our team proposes researching a plan that branches off of New York's Land Bank program, to identify how municipality-purchased zombie properties can and should be used (Empire State Development, 2021). Our recommendation would be to begin research into a public assurance program allowing families living in areas with unaffordable, or entirely inaccessible housing insurance, to

pay into and be guaranteed a home on the other side. The idea behind this would be that funds raised through the public assurance program could allow for the revival of zombie properties in western New York, and would eventually fill them with families that are able to both maintain these homes and bring larger economic value to the areas in and around Buffalo and Rochester. Future research should determine if a public assurance program that is implemented with a component that allows for future residents (climate migrants) to connect with those in the area, will facilitate a smoother transition for both migrating families and community residents, and a more manageable rate of economic expansion. Research on ways to manage migration rates at a reasonable speed, prepare communities to receive an influx of migration with a more positive perspective, and would allow future climate migrants to begin building a mutually beneficial network in Western New York before moving becomes urgent is important, and should be centered around a tangible solution like a public assurance program. Our team established these three policy goals after examining the literature on positive and negative outcomes following past instances of large-scale migration, and on the trajectory that climate migration may follow. Another important facet of our recommendation, and our goals more generally, is that we wanted to identify climate-conscious solutions for resiliency planners, which can be found in the public assurance plan, as it minimizes the total amount of new property construction that will be necessary.

In order to implement a program like the one we have suggested, it is first necessary to identify the exact number of repairable zombie properties in Western New York in order to create a cap for the number of future migrants enrolled in the program. It will also be necessary to establish how much repairs will cost and how much those living in homes that they cannot insure

are able to pay in order to determine public assurance rates. Finally, researching a program like this one will require extensive work on establishing how to reach the families that would benefit most from this policy, while also providing economic benefits to the areas of Rochester and Buffalo.

Expanding Public Transportation Infrastructure

Our research team conducted an interview with GoIthaca Director, Jane Bowman-Brady (November 20, 2022), where she discussed possible steps for developing reliable public transportation in Buffalo and Rochester. A shift in mindset on climate change in the communities might promote policies to increase investment in public transportation. However, moving to different modes of transportation after decades of reliance on individual cars will be a considerable challenge and a big undertaking. Another challenge is to hire public officials who know the problem, which needs a systemic change within public administration and takes time to develop. Buffalo has community-led movement projects to promote public transportation, meanwhile Rochester has no active organization but some collective actions are being formed. Community-led projects help the government understand and prepare for increased needs in public transportation. New York is also providing a considerable amount of grants through its Smart Growth program for the development of municipal transportation infrastructure.

Recommendations

We recommend that Buffalo and Rochester revisit their transportation planning strategies in response to climate change and climate migration. An increased population due to interstate migration will increase the demand for public transportation such as increased funding for the

bus and train systems in the surrounding areas. The two cities may also consider establishing

new cooperation with private entities and community-led organizations to provide a short-term

solution in managing grants from New York and the federal government in developing the public

transportation system. In response to an increased need of climate-related regulations and policy

responses, Buffalo and Rochester may consider making a long-term partnership plan in

municipal government.

Community Response

Buffalo and Rochester should plan on community opposition. Current residents can be

weary about a high influx of new residents, especially since their existing basic needs are not

being met. Concerns including workforce competition, gentrification, differing political opinions,

racism, and infrastructure already exist and will be exacerbated. As more residents relocate into

these metropolitan areas, land developers should prepare to build new homes. If demand

increases but the supply cannot meet the demand, home prices can soar and push current

residents out of their homes. Also, if housing prices increase, current residents must have the

income to sustain a livable lifestyle. If companies do not expand, workforce competition will

intensify (Vock, 2021). In order "to extract social benefit from this environmental tragedy, we

must return to responsible regional planning before major migration begins. Should we take the

normal route and wait, current patterns will continue, perpetuating growing metropoles and

mega-regions," (Steuteville, 2022). If the city grows too quickly, the community can struggle to

adapt to a "new" city. Rapid urban sprawl will contribute to increased energy use, congestion,

and pollution, however, vigorous regional planning could prevent the disruption of Buffalo's

existing cultural benefits. Also, the community may value their current culture and prefer to avoid living near a larger city and suburbs. Therefore, a vigorous regional plan must be in place before allowing masses of new residents.

Differing political opinions and racism could negatively impact the community's perspective on migrants. For example, political ideology in Florida greatly differs from political opinions in New York. Clashing political values can increase discrimination and encourage legislators to fight against climate-receiving efforts. Furthermore, migrants come from diverse backgrounds which can further divide current residents and migrants.

Recommendations

To avoid community conflict, the government could promote job opportunities specifically tiered toward current residents. For example, more infrastructure-related jobs will be required, and current residents could benefit from those opportunities. Similarly, if more companies relocate or allow remote work, current residents can benefit from new job openings. If more jobs open, current residents could receive monetary benefits. Also, to reduce the risk of gentrification, abandoned homes and factories could be retrofitted into suitable affordable housing. Finally, Buffalo is prepared to expand, and "the changes make it easier to add density in residential areas and to increase flexibility for how to use industrial areas — especially the large, daylit factories that have long been abandoned. That has led to the revitalization of areas like the Larkin District (Buffalo), which is now home to law firms, banks, and apartments" (Vock, 2021). The government should put a heavy emphasis on community opportunities and encourage a more inclusive environment.

Next Steps & Conclusion

After thorough research, our team has created several draft recommendations that will need to be backed by interviews and additional background research the future research group will conduct. Our findings came from trusted academic and reputable sources and discussions of topics pertaining to our literature review with key informants. In doing this, we have outlined current conditions and strategies that can be adapted for a more resilient and prosperous future. Through the New York Smart Growth program and similar local programs, we believe municipal and community-led organization actions can prepare these two cities for stronger economic growth, community cohesion, housing stability and affordability, and regional transportation services. Even though we weren't able to complete as many interviews as we all planned for, we hope our work will give the interviewers more background and context which will be needed for sensitive conversations with climate movers and community members.

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Appendix

Acronyms

NYSG   New York Sea Grant

NPO   Non-profit organization

NGO   Non-governmental organization

WSDOT   Washington State Department of Transportation

KII   Key Informant Interviews