FOOD FOR ALL

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Piedmont Triad
Regional Food System Assessment

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A note of thanks to the team

This assessment was prepared by Carolina Creative Works of Asheville, NC with early outreach assistance from Community Food Lab of Raleigh, NC. Excellent assistance was provided by Jennifer Bedrosian, the Food System Coordinator for the Piedmont Triad Regional Council, and valuable input was shared by hundreds of individuals across the twelve-county region. In this year of change and difficulty, we are grateful for and humbled by the input and ideas that were shared.

The staff and contractors went above and beyond the highest expectations during the upheavals of 2020. Their dedication to the work of building equitable food systems, their professionalism and flexibility in the face of challenge after challenge, and their resiliency and grace under pressure are the reason this assessment project was successfully completed.

One of our top priorities in conducting the assessment was to perform an "outside-in" research approach, one that centered underserved voices first, designing the research around those communities' needs and recommendations. This process was about two months old when the first lockdowns from COVID-19 hit in March.

The economic scale of the damage from COVID-19, and the disproportionate impact it had both economically and from a public health perspective on communities of color and low-income populations, meant that we could no longer center those voices in our research in the way we had originally planned. The national rise of the fight for racial equality - one of our key tenets in building the food system assessment - also meant that we then, more than ever, did not want to over-survey or over-burden communities in a time when they already had more to manage emotionally, physically, and spiritually. Our team worked tirelessly to avoid that during the upheaval of 2020, testing new solutions, implementing creative approaches, and navigating how best to reach communities furthest from justice in the new normal.

In regional food systems, a return to normal would mean a return to structural inequities, top-down decisionmaking, and an overreliance on data to make decisions about what's best for communities. But the Piedmont Triad Regional Food Council has a real opportunity in 2021 to center the voices of underserved communities working on the ground, to empower those groups and individuals with the resources they need to address the problems that they know exist, and to create a stronger and more resilient network of partners across the Triad. We're hopeful that this assessment, our recommendations, and the county-level reports we've provided will empower council members, the regional council of governments, and local actors across the region to make sure that the regional food system doesn't go back to normal - but comes back better than it was before.

Emily Edmonds, Founder & Director, Carolina Creative Works
December 18, 2020

Project Summary

This project began in the fall of 2019 - in a world before COVID-19.

Originally, the assessment was intended to develop a comprehensive baseline for understanding the regional food system; examine economic opportunities for strategic investments; and create a sense of shared ownership and equity principles for the region and the local advocates who made up the food system.

Although the scope of the project didn't change, the world did - and the project adapted to the realities of the new normal.

One of our top priorities in conducting the assessment was to perform an "outside-in" research approach, one that centered underserved voices first, designing the research and recommendations around those communities' needs and recommendations. This process was about two months old when the first lockdowns from COVID-19 hit in March.

The economic scale of the damage from COVID-19, and the disproportionate impact it had both economically and from a public health perspective on communities of color and low-income populations, meant that we could no longer center those voices in our research in the way we had originally planned. The national rise of the fight for racial equality - one of our key tenets in building the food system assessment - also meant that we then, more than ever, did not want to over-survey or over-burden communities in a time when they already had more to manage emotionally, physically, and spiritually.

In-person outreach was canceled for the foreseeable future, and was risky to our team and to the communities we would visit once the lockdown was lifted. Communities we had identified for outreach were under unimaginable pressure from the twin stresses of the pandemic and racial inequality. A national election brought these issues to the forefront and created a difficult environment for direct surveying. And most importantly, we knew we didn't want to contribute either to the problems of inequality or to the stresses of the economic environment that people were already experiencing.

So our team decided to go back to what we knew.

We knew that, although the data we had from federal and state sources was often not fully reported at the local level, the larger problems of inequity in the food system have been documented for decades at every level. We knew that more data wouldn't immediately translate to more food for people in need, more support for farmers and small food businesses trying to stay afloat, more hours for more workers who had families to feed.

We knew that this year the systemic inequities we already knew about worsened on every front - from public health, to access to resources, to food access, to economic opportunity. The communities we had identified as furthest from justice weren't able to participate in our research the way we intended, but we knew - and could show - that they were now further from justice than they had ever been before. The gaps

in the data aren't really the problem, after all; it's the collective insistence that more data is necessary before action is taken.

So we adapted, as everyone did, to meet the needs of an engagement process in 2020 that we knew would leave out many of the communities we identified in our earliest research. We moved to an online format and tested different methods for county and topic meetings, eventually settling on a summer lunchtime series of livestreamed Facebook panels and discussions. We ran targeted social media campaigns and ads and radio and newspaper advertisements. We placed flyers in transit vans and at outdoor socially distanced events, worked with senior center volunteers to make phone calls, and eventually safely attended farmers' markets, grocery stores, and dollar stores to survey in person.

We knew this wouldn't be enough to meet our goal of designing our research from the outside in - but we also knew it would be hypocritical and insensitive to ask communities already suffering even more economic and physical harm to give us data that, in all the ways that matter, we already had. We also knew from our outreach that other agencies who would typically represent these communities in decision-making places were overwhelmed by the need they faced in responding to the changes in their communities and preferred direct assistance - not yet more data collection - to help them respond to those needs.

Given those constraints, although we continued to run our surveying, interviews, and focus groups with as many people as we could gather, we also shifted our project approach to center the existing data from pre-COVID sources and the 2020 post-COVID predictions into an identifiable baseline that could be used by the council moving forward. We also shifted away from the original return on investment approach, which we co-created with the council when all economies were in a vastly different context before 2020, to a focus on the changes and opportunities that occurred from the global and national disruptions of the year.

Our pilot testing of different community engagement strategies provides some additional insight to this baseline, but more importantly, provides the council with a roadmap for how to continue to engage communities, measure food system changes, and partner with existing local agencies to ensure regional food equity remains a priority in the era that follows the global disruption from 2020. We navigated some difficulties in the infrastructure of the council itself, and as a new regional entity, there were few existing audiences with whom we could work on outreach. The year, and the hiring of the food system coordinator position, gave us a chance to assist the council with structural, organizational, and communications recommendations, which we hope will be useful in continuing to move the council's priorities forward.

Not everything was a loss in 2020, though: we sustained three apprenticeships for students from NC A&T State University for longer than planned, allowing three students to learn and test new ways of engagement and data analysis with us throughout the year. Our team made over 575 phone calls and email contacts

with people and agencies throughout the region; hosted 380 people in online events and an additional 52 people in small focus groups; conducted 51 interviews and held or attended 31 in-person events; and received almost 600 survey responses.

We interacted with people and agencies in all twelve counties as well as several regional and statewide agencies that work in the Triad region. Altogether we made over 7,100 points of contact in eleven months of outreach, with a response rate from those contacts of 31.8%, when the industry average is around 11%. At the onset of this project, we had a goal of reaching 2,000 people in the food system through in-person community meetings. With the adaptations below, we reached 1,350 - some through online meetings, some through surveys, some through small group meetings. Although we weren't able to bring the groups we most wanted to engage into the conversation during these difficult times, we're proud of the work we were able to accomplish during the rapidly changing environment of 2020.

Summary of Findings

We centered equity in our research, guided by the council's definitions and goals. Although our engagement strategies were adapted this year, equity for communities that are furthest from justice is still a central component of this assessment. In each research area and in our recommendations, we've included equity highlights demonstrating areas of opportunity for the council to focus on, as well as partners with whom the council can work to better effect change.

The report includes a description of our methodologies and data sources and a summary of our engagement strategies and testing.

Our deliverables include:

- Research design, Stage A approach and summary, all outreach and survey tools, all data collection tools, and full datasets for PTRC's use in building a data dashboard and desired maps

- This final report, which compiles all data, findings, recommendations, outputs and deliverables into a single document and appendices

- An online report, created to be interactive and understandable to those without food system training, that will be available at [PTRFC Regional Food Assessment (carolinacreators.com)](carolinacreators.com) until December 2021

- Shared graphic design, branding, and marketing materials that can be used in future outreach for both online and print media

- Six-page PDF County Profiles & Policy Toolkits for each county that include major findings from the assessment and a policy toolkit for local advocates to utilize in their work

- An update to the regional data for the NC Local Food Infrastructure Inventory

This assessment focuses on five research areas:

- Food security and food access, against the background of social determinants of health

- Food production and agriculture, both from an equity perspective and an economic perspective

- Market and economic opportunities and barriers, at both the micro and macro scales across the region

- Supply chains, including regional infrastructure, import and export data, and geographic impacts

- Community and network analysis, for both partners in this work and power structures inherent in the regional infrastructure

In each area, we've highlighted major issues and opportunities and made recommendations for ways the council can work to address challenges and build on successful innovative solutions.

We know that food security and food access are worse in the region - and will likely continue to be so as we move into 2021 with the pandemic still growing. Food banks are seeing more than double the demand from last year as we move into the winter and recent estimates show that nearly 1 in 3 North Carolinians are experiencing food insecurity this year.

Agricultural production wasn't significantly impacted this year by the pandemic, as it struck after most major operations had begun production. However, value-added production, supply chains, and small- and large-scale markets have all been affected by the pandemic and related closures, and industry experts warn that this will have long-term implications for the food industry as a whole. For 2021, projections rely heavily on the widespread availability of a vaccine and the lack of further shutdowns to contain the spread of the virus, but this is far from certain. National estimates are for nearly double the 2019 unemployment rate in

spring 2021 across all industries - and this will significantly affect food processing, distribution, storage, and supply chains, as well as the overall market value of local foods. Where possible, we included projections in these areas with significant caveats about those predictions.

The overall food supply chain impact has hit restaurants particularly hard, and this is true across the Triad region in both rural and urban markets. Despite gradual reopenings, delivery services, online ordering, and outdoor dining, many restaurants have either already closed or anticipate closing in the next few months - with some estimates of permanent restaurant closures as high as 1 in 3 nationally. North Carolina's restaurant economy totals more than $21.4 billion, and we know that local independent restaurants recirculate more money from revenue (65%) back into the local economy as compared to chain restaurant counterparts (30%). This could be a significant blow to local food economies across the region, and should be an area of major focus for the council in 2021.

We also found that even before the pandemic there was a significant gap in the Triad's markets, specifically intermediary markets that help smaller producers scale into larger and wholesale markets. The region's farmers and producers have access to local farmers markets and on-farm sales opportunities, as well as larger, wholesale opportunities, but very few options exist for farmers at an intermediary scale. Although COVID-19 has increased public interest in purchasing local products and supporting area farms, many of these businesses will need significant assistance to both pivot to different sales platforms and delivery and distribution as well as to navigate the supply chain and marketing challenges the pandemic represents.

Although the food system challenges we outline in this assessment are significant, this year has demonstrated that systemic change can come when we remove all constraints and reimagine what a strong food economy can look like. We've included case studies from across the nation to demonstrate that innovative, creative, and dedicated solutions exist and can be implemented anywhere with the right network of partners and resources. PTRFC is already doing an excellent job of representing and convening groups doing important work in their communities. In doing so, PTRFC has a real opportunity to help build a stronger, more resilient, and more innovative food economy than could have existed before. We are hopeful that this assessment will support PTRFC's efforts for many years to come.

Methodology: Research Design

Methodology Summary

One of our top priorities in conducting the assessment was to perform an "outside-in" research approach, one that centered underserved voices first, designing the research and recommendations around those communities' needs and recommendations. This process was about two months old when the first lockdowns from COVID-19 hit in March.

The economic scale of the damage from COVID-19, and the disproportionate impact it had both economically and from a public health perspective on communities of color and low-income populations, meant that we could no longer center those voices in our research in the way we had originally planned. The national rise of the fight for racial equality - one of our key tenets in building the food system assessment - also meant that we then, more than ever, did not want to over-survey or over-burden communities in a time when they already had more to manage emotionally, physically, and spiritually.

Thus, we adapted our original research design (included in the appendix) to utilize the data we already had, create benchmarking structures for the future, and test and evaluate new engagement strategies that evolved as the pandemic itself and our response to it changed over time.

We knew that this year the systemic inequities we already knew about worsened on every front - from public health, to access to resources, to food access, to economic opportunity. The communities we had identified as furthest from justice weren't able to participate in our research the way we intended, but we knew - and could show - that they were now further from justice than they had ever been before. The gaps in the data aren't really the problem, after all; it's the collective insistence that more data is necessary before action is taken.

We moved to an online format and tested different methods for county and topic meetings, eventually settling on a summer lunchtime series of livestreamed Facebook panels and discussions. We ran targeted social media campaigns and ads and radio and newspaper advertisements. We placed flyers in transit vans and at outdoor socially distanced events, worked with senior center volunteers to make phone calls, and eventually safely attended farmers' markets, grocery stores, and dollar stores to survey in person. (More on engagement methods, objectives, and outcomes can be found in the Engagement section.)

We knew this wouldn't be enough to meet our goal of designing our research from the outside in - but we also knew it would be hypocritical and insensitive to ask communities already suffering even more economic and physical harm to give us data that, in all the ways that matter, we already had. We also knew from our outreach that other agencies who would typically represent these communities in decisionmaking places were overwhelmed by the need they faced in responding to the changes in their communities and preferred direct assistance - not yet more data collection - to help them respond to those needs.

Given those constraints, although we continued to run our surveying, interviews, and focus groups with as many people as we could gather, we also shifted our project approach to center the existing data from

pre-COVID sources and the 2020 post-COVID predictions into an identifiable baseline that could be used by the council moving forward. We also shifted away from the original return on investment approach, which we co-created with the council when all economies were in a vastly different context before 2020, to a focus on the changes and opportunities that occurred from the global and national disruptions of the year.

Our pilot testing of different community engagement strategies provides some additional insight to this baseline, but more importantly, provides the council with a roadmap for how to continue to engage communities, measure food system changes, and partner with existing local agencies to ensure regional food equity remains a priority in the era that follows the global disruption from 2020. We navigated some difficulties in the infrastructure of the council itself, and as a new regional entity, there were few existing audiences with whom we could work on outreach. The year, and the hiring of the food system coordinator position, gave us a chance to assist the council with structural, organizational, and communications recommendations, which we hope will be useful in continuing to move the council's priorities forward.

Our adapted research design was not significantly different from our original research design, proposed in December 2019 and attached in the appendix. However, a few key areas were adjusted to accommodate the engagement restrictions and disproportionate impacts of both COVID-19 and other national crises in 2020.

The initial research questions, developed in conjunction with the council and approved in December 2019, were:

1. What is the baseline status of the regional food supply chain in the Piedmont Triad region?

2. What economic opportunities and challenges exist for farms, food businesses, supply chain businesses, market outlets, and consumers of local and regional foods?

3. What challenges do disadvantaged communities face within the Triad's regional food system, either as consumers or as economic participants?

We had hoped to answer these questions by first collecting baseline data, then adding our own data from outreach and engagement initiatives, and then summarizing this comprehensive dataset with lived experience stories from across the Triad. The adjustments we made due to COVID-19 are outlined below.

Our initial research included conducting a survey of existing datasets at the national, state, and regional levels to determine how best to create a research design that answered these questions and met the engagement and equity goals of the project. As the council was newly established, we focused almost as heavily on building partnerships and sustainable outreach as we did on collecting data, but there were still more granular questions we hoped to answer through the assessment:

- We know that producer demographics in NC raise significant equity issues, with male producers outnumbering female producers at a rate of 2 to 1 and 95% of producers self-reporting on the USDA Ag Census reporting Caucasian ethnicity. What other modeling can we do with this demographic data to show relationships specific to the Piedmont Triad? Because this is self-reported national data, how can we refine it at the local level to make sure it is correct?

- How do the demographics of producers within North Carolina and the region impact the market value of their product?

- Within the state and the region, can we find data to determine whether there is a relationship between access to healthy foods and any of the traditional measures of public health, such as mortality rate, average life expectancy, or other data points?

- How does the location of farms in the Triad region impact their profit capacity? What is the difference in market opportunity, land cost, and access to resources for urban and rural farmers? Are some counties more financially productive farming counties than others? Why?

- What is the landscape of the food system and diet-related health impact in the region?

- Besides schools, what institutions are sourcing local food? What is the institutional purchasing capacity for the region? What are the perceived barriers for institutions buying locally?

- How are locally- and regionally-produced food and agricultural products transported and distributed in the Triad region?

- How many food policy networks and collaboratives exist in the region, and what progress have they made in identifying and implementing agendas for change?

Early-Stage Outreach & Engagement with Furthest from Justice Communities

We used these second-round questions, a survey of the council's priorities, and the existing data survey to build the first research design. We included presentations and meetings with all existing local food councils in the original research design, although only six of twelve counties were then represented by a local food council. We also spent January and February in Stage A outreach meetings with communities across the region who had been identified as furthest from justice by council members. See the Engagement section on Stage A findings for more on the results of those meetings and how they informed the research design.

COVID Research Adaptations

The final outreach plan was first approved on February 25, and we began scheduling a series of 13 in-person meetings along with 22 small group meetings in communities across the region. On March 19, North Carolina instituted its first statewide lockdown in response to the COVID-19 crisis, and all meetings were put on hold, and then canceled. In adapting the research design to the economic, public health, and racial justice crises we faced in 2020, we made the following adjustments:

- We shifted from an emphasis on the collection of original source data to the creation of a baseline and the first set of surveying tools tested in 2020, with the goal of creating a benchmarking system the region can use to determine progress in key areas. The baseline is made up of pre-COVID data from most recent public use sources.

- We shifted from our original focus on collection of lived experiences and stories to avoid over-surveying, biased surveying, and/or unnecessary data collection that could be demonstrated in different ways with existing data without adding undue burdens to communities already suffering from economic and health-related impacts. Although lived experiences and stories inform each section of the research assessment, we also make recommendations for how to better gather that data in future surveys and outreach.

- We pivoted towards a continuing national scan of innovations, case studies, and examples of creative and resilient responses to pandemic impacts in the food system, which are included throughout the document for future reference.

- We extended our apprenticeship program - for three students from NC A&T State University - to allow them to train on different engagement methods, assist with data collection and analysis, and remain employed in their apprenticeships through fall 2020.

No datasets were purchased for the assessment after discussion with PTRC. A data dashboard and mapping service were proposed, but not included, in the final contract for this assessment. As such, analysis is included in this report and the short online report, but full datasets and GIS information are given in raw format for use by PTRC.

One of the earliest deliverables was the creation of a set of project definitions that could be used by the regional council and local councils working together to identify projects based on shared parameters and knowledge. That table is included at the end of this section of the report.

Note on qualitative data collection: All interviews and focus groups were done in anonymity to encourage full participation by community residents. Responses were recorded and coded using keyword analysis through the PublicInput software and anonymized results are provided in each section.

COVID-19 Adaptations to Engagement & Outreach Plan

Given the COVID-19 closures and restrictions on public gatherings, the council agreed to move forward with remote engagement sessions and surveys in April 2020. PublicInput software was tested, researched, and eventually purchased to accommodate many of the structural equity issues with online engagement. The platform provided instant translation services to over 100 languages; allowed for easy response via text, phone, tablet, laptop, or phone call; collated views from live meetings and allowed commenting during meetings without ownership of Zoom, Facebook, or other specific platforms; and eliminated some of the manual work of data entry and data cleaning for paper surveys.

The software was tested during four online pilot meetings in May 2020 and formed the foundation of the June, July, and August outreach meetings discussed in the engagement section. The full revised engagement plan is included in the appendix with relevant statistics from test meetings and surveys.

The research design focused on collection and collation of federal, state, and regional data in each research area. Each research area included an analysis for equity issues, identifying barriers and opportunities by county and across the region.

For original data collection, the tools originally developed for surveys, interviews, focus groups, and community meetings were significantly adapted to COVID-19 restrictions and impacts. All surveys were also adapted for helping people who needed immediate access to food find resources they needed. The final tools were reviewed, edited and approved by the council in May 2020 and are included in the appendix as references for future outreach and research projects.

More information about the engagement process and outcomes is available in the Engagement section of this report.

Data Sources

Data sources, collection methods, and analysis methods are outlined below by research area. These are the primary sources we used for the baseline benchmarking recommendations in each area, although we also included a literature review and case study analysis for the trends and impacts of COVID-19 on the food system.

Food Security

Feeding America Map the Meal Gap provides county-level data for the entire country describing several indicators related to food security, including food insecurity rates and child food insecurity rates. This data represents the status of food insecurity as of 2017 and provides a baseline for our assessment.

The Economic Research Service of USDA releases the Food Environment Atlas periodically, outlining wide-ranging data regarding individual's proximity to food, the number of food sources by county, and the number of people receiving food-related assistance within counties. We focused on their measures of access to food to demonstrate food deserts in the PTRFC region. This data is available for the entire country on a county-level basis.

The American Community Survey (ACS) is one of the most utilized and most robust sources of data in the US. Each year, the ACS surveys 1% of the population on a long list of wide-ranging issues, from personal demographics and economic standing, to commuting patterns and household characteristics. The ACS also provides 5-year estimates, combining five years of survey responses to cover 5% of the population. Through this, they seek to demonstrate patterns in the entire population, down to the census block level. For this project, we looked at the 2017 ACS 5-year estimates regarding the age, sex, race, ethnicity, poverty rates, and other demographic and economic indicators, all on a county level. We focused on social determinants of health (per capita income, unemployment, education levels, and percentage at or below poverty level) that could be used to help contextualize the available food security data.

To supplement the above sources, we worked with Second Harvest Food Bank of Northwest North Carolina to anonymize and analyze a snapshot of their intake data from early summer 2020. This data allowed us to look at the number of food bank participants by zip code, including their racial identification and participation in any government-provided services, such as SNAP and Medicaid. This data is self-reported, so there are anomalies in the data that we worked to address.

The North Carolina Department of Health and Human Services (NC DHHS) releases data on the number of participants in Food and Nutrition Services (FNS) by county each month. We used this data to demonstrate another measure of food insecurity, looking both at baseline data from 2019 and more recent 2020 data to understand the impacts of Covid-19 on FNS participants.

The Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute use data from the American Community Survey (ACS) and Feeding America to construct a Food Environment Index. This involved taking multiple indicators related to food access and combining them into one value that provides an overall assessment of access to food. More details about the methodology and access to the data can be found on the County Health Rankings and Roadmaps website.

Additional Reports and References
- Forsyth County Community Food System Plan (2013)
- Greensboro Fresh Food Access Plan (2015)
- PolicyMap, USDA, and reinvestment.org data

Markets and Economic Impacts Research

The U.S. Cluster Mapping Project is an initiative done in collaboration between Harvard Business School's Institute for Strategy and Competitiveness, the U.S. Department of Commerce, and the U.S. Economic Development Administration. Together, they developed a dashboard that measures regional industry clusters based on economic areas. Clusters are combinations of industries that are closely related regarding the products and services they produce. Economic areas are geographic regions defined by the connection between the local economies within them. In other words, counties that are tightly connected economically comprise economic areas. We used this data to look at how the PTRFC region performs in several of these industry clusters.

Businesses are classified by industry codes under the North American Industry Classification System (NAICS). Each industry code ranges from two to four digits, with more digits meaning greater detail. For example, NAICS 11 includes all Agriculture, Forestry, Fishing, and Hunting industries, and NAICS 1111 is Oilseed and Grain Farming, which is included in NAICS 11. We requested data on businesses in the NAICS sectors related to farming. This provided us with information about where businesses were located, what industry they are in, their total sales, and number of employees. With this information, we were able to demonstrate which counties have stronger business infrastructure in food-related industries and which counties hold the most capital by business type.

Note for future research purposes: When we ran this analysis, we removed the tobacco-related industries which automatically are included in the NAICS analysis in Agricultural. These include Cigar Cigarette & Tobacco Manufacturers, Tobacco Stemming & Redrying (mfrs), Cigarettes (mfrs), and Tobacco Products - Manufacturers.

The Bureau of Labor Statistics (BLS) releases Occupational Employment Statistics (OES) annually, highlighting employment and average and median wages by occupation. Occupations are organized by the Standard Occupational Classification (SOC) system, which is organized differently than the NAICS system

described above. The essential difference is that NAICS codes look at the activity of businesses and categorizes all employees under a specific industry, whereas SOC codes look at what individuals are doing within their workplace to determine their category. The BLS only releases OES data on a metropolitan and micropolitan statistical area, so some counties may be left out of the data and granularity is hard to come by without proprietary data. For our assessment, we looked at OES data for the Winston-Salem and Greensboro-High Point metropolitan areas.

Additional Reports and Resources
- Economic Development Reports (Regional/Local)
    - Triad Tomorrow: Building Our Communities for Tomorrow's Jobs (PTRC, 2016)
    - Piedmont Together: Comprehensive Regional Plan (Piedmont Together, 2014)
    - Suitable Growth Pattern of the Piedmont Triad Region (Piedmont Together, 2014)
- Transportation (Regional/Local)
    - PTRC Commuting Patterns (2015)
- Economic Development/Infrastructure Reports (State)
    - State-level not done by county
- Labor and Workforce (State)
    - BLS and NC Labor Force data
- 2017 Rankings Market Value of Ag Products Sold (State)

Farm and Food Production Analysis

The National Agricultural Statistics Service (NASS) of USDA releases the Agricultural Census every 5 years. The Agricultural Census has varying levels of information depending on the geography. For this project, we focused on county-level data regarding the demographics of principal farm operators, the number of acres farmed, the amount of production by county, and the number of acres leased versus owned. We used the 2017 Agricultural Census, which served as the baseline year for much of our data.

Businesses are classified by industry codes under the North American Industry Classification System (NAICS). Each industry code ranges from two to four digits, with more digits meaning greater detail. For example, NAICS 11 includes all Agriculture, Forestry, Fishing, and Hunting industries, and NAICS 1111 is Oilseed and Grain Farming, which is included in NAICS 11. We requested data on businesses in the NAICS sectors related to farming. This provided us with information about where businesses were located, what industry they are in, their total sales, and number of employees. With this information, we were able to demonstrate which counties have stronger business infrastructure in food-related industries and which counties hold the most capital by business type.

Additional Reports and References
- Business Types and Revenues (State)
    - NAICS data from AGCensus
- State Agriculture (State)
    - Local Foods Infrastructure Inventory
    - NC Manufacturing Report

- Business Employments Dynamics (all of NC) (National)

Supply Chain Analysis

Our supply chain analysis relies on two primary sources of data: first, import/export data compiled by the University of Illinois, and second, on the existing infrastructure mapped in the region through the 2017 NC Growing Together Project.

The UI data is based on the Freight Analysis Framework (FAF) version 4. FAF is comprised of regions that do not align with traditional geographic boundaries, such as counties. Because of this, UI used several other datasets, including data from the Bureau of Economic Analysis, the US Census Bureau, and USDA, to connect the FAF regions to counties. They then used the Food Flow Model to map the flow between FAF regions to counties. Their model included techniques such as machine learning and other algorithmic methods.

There is robust literature to support these methods, however it is still worth keeping in mind the potentially significant gaps in the dataset that are managed by modeling and algorithms. Their detailed paper describing this method is available on [IOPScience](). FAF also uses algorithmic-based methods similar to the Agriculture Census. More about the modeling process for FAF is available at the Oak Ridge National Laboratory Data Sources and Estimation Methodologies Report [here]().

The NC Local Foods Infrastructure Inventory was originally compiled by NC Cooperative Extension through the NC Growing Together Project and was updated in 2017. The inventory covers the entire state and is hosted by the GIS department at Piedmont Triad Regional Council. Our team pulled the regional infrastructure nodes in all categories and updated them with new information from supply chain interviews and survey responses.

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Community Assets and Network Analysis

Most of our data for this sector came from local resources and stakeholder knowledge about the major assets of the region. We provide an overview of these detailed sources under "Additional Resources and References" and will briefly discuss the more institutionalized data sources we used. Additional data notes are provided in the Network Mapping & Directories spreadsheet provided in the appendix.

The U.S. Department of Agriculture (USDA) had twice conducted the Farm to School Census which seeks to understand K-12 school's relationship with the food network, specifically looking at if they have a

farm-to-school program and how those programs are built out. Responses are collected on a school district level, and in North Carolina are only available for public schools. We used this data to overview which counties have active farm-to-school programs. Randolph and Rockingham counties did not respond to the Farm to School Census.

All community assets, potential partners, and networks are geocoded and included in the appendix for mapping and sharing by the Council. (A data dashboard and mapping service were proposed, but not included, in the final contract for this assessment. For more information, see the Community Assets & Network Analysis section.)

Additional Reports and References

- Infrastructure (Regional/Local)
  - Health Departments (12 county, geocoded)
  - Medical Facilities (12 county, geocoded)
  - Colleges (12 county, geocoded)
  - Public Schools (12 county, geocoded)
  - Non-public schools (12 county, geocoded)
  - Community gardens (NCCGP, 12 county, geocoded)
- Budget (Regional/Local)
  - 12 County Budget 2018-2019
  - 60 Municipalities Budget 2018
- Transportation (State)
  - Regional interstates, secondary and state roads and freight flows

Data Tools

To analyze and visualize the data, we used Datawrapper and R. Datawrapper is a data visualization platform used by major companies such as the New York Times. We used their free version that allowed us to import data and create visualizations, including maps, bar charts, and other useful graphs. R is an open source computer language used by many data scientists to both analyze and visualize datasets. R is especially useful with large datasets, where Microsoft Excel may be challenging to utilize, and with unique file types, such as JSON and KMZ files. R also has Geographic Information System (GIS) mapping capabilities, demonstrating its versatility.

Definitions of Terms & Identification of Regional Project Types

These were reviewed by the council and approved for use in the project in January 2020.

Definitions Used in Engagement Meetings
- Food Consumption - The total amount of food available for eating in a household
- Food Desert - An urban area in which it is difficult to buy affordable or good quality fresh foods

within 0.5 miles of any given point within the neighborhood
- Food Insecurity - being unable to find or afford enough nutritious food
- Food Access - a household's ability to get and buy enough nutritious food (includes transportation access, availability of items, income, and other factors)
- Production - usually, agricultural production of crops or the production of foods for consumption (sometimes called value-added)
- Harvesting - the process of gathering crops that have been planted
- Processing - The physical, chemical, and biological changing of agricultural products in order to keep them fresh for future use
- Packing - The method by which food grown or processed on farms is physically covered and protected to be transported to stores
- Transporting - To take or carry goods from one place to another
- Marketing - The action or business of promoting and selling any product or service
- Food supply chain - Everything involved between production (creating food) and consumption (eating food); includes processing, storing, packing, distributing, and selling food items
- Food system assets - Anything that serves your neighborhood or community, such as gardens, shared kitchens, food pantries, etc.
- Community garden - Formal, managed small plots of land that are shared by community members and rotated seasonally
- Urban gardening - Typically smaller garden and farm activities taking place within city neighborhoods in metro areas
- Micro-farming or Micro-gardening - Small community-based "leftover" plots of land, including backyards, parking areas, undeveloped parcels (usually under 0.5 acres) on which food is grown

Other Terms Used In Food System Planning

Food Insecurity	The state of being when one does not have reliable access to a sufficient quantity of affordable, nutritious food at the household level.
Food access	The ability for a household to obtain high-quality food. Typically depends on the access a person has to stores with these foods; areas with low access are often referred to as "food deserts" or "food swamps."
Equity	Equity is just and fair inclusion into a society in which all can participate, prosper, and reach their full potential."
Public health	Consideration of the overall health of a population within a given area. This impacts government intervention, based on what may be best for the population. When analyzing public health in terms of food systems, this is typically seen through food access.
Food supply chain	All of the steps that are involved in getting food to a household. This includes the distribution of food through growth, transportation, and eventual transition to individuals.
Community food assets	Neighborhood-level assets that serve a specific portion of a given population; some examples include community gardens, neighborhood food pantries, food banks, or school gardens.
Micro-gardening	Informal but intensive farming on a small, personal level within containers on personal property. Usually done in a space efficient, and sustainable way.
Community gardening	More formal, structured gardening efforts that allow more members of an area to participate. It is a single plot of land that can be utilized by individuals or groups looking to grow their own food, or provide food for an organization.

Urban gardening	Typically done by people living together in a densely populated area. As people are searching for healthier foods with less access, urban gardening serves as a way for someone to grow their own food.
Mid-scale farming	Form of producing livestock or crops on medium-sized farms, and typically selling within regional distribution systems. Tend to be in the earlier stages of producing, and vary in types of produce grown.
Micro-farming	Often done on the urban and suburban level, and are sometimes created in rural regions, on a smaller scale.
Small-scale farming	Form of producing livestock and crops on a smaller piece of land. This usually consists of intensive labor without much advanced technology. It is usually a sustainable practice and increases food access for households.

Equity Philosophy & Goals

Equity Philosophy

The issues surrounding equity and equitable outcomes in the Piedmont Triad's food system were identified as key priorities for the project in late 2019. In order to create a final product that includes a thoughtfully considered equity lens, we created a set of "Equity Guidelines" with the help of PTRFC's Equity Subcommittee. The guidelines were intended to help steer all phases of the project and reinforce equitable processes and relationships - from early stage outreach, to deep data analysis, to the synthesis of results and presentation of findings. These guidelines were used as a regular check on the work of the project team, and within larger conversations with the PTRC and the Regional Food Council.

These guidelines helped us to frame the assessment work around an equity lens, leading to a final product that incorporates the experiences and ideas of different perspectives, cultures, and worldviews from the bottom up. These guidelines are not, however, the same as doing the work of building equitable practices and policies across the region. That is a much larger and intensive goal that the Food System Assessment may ultimately help set on its way forward, but must be undertaken by committed community members with the guidance of equity experts and supporting institutions and organizations.

The Council's Equity Definition & Goals

After discussion and full council approval, PTRFC agreed to utilize PolicyLink.org's definition of equity as the guiding definition for this project:

Equity is...just and fair inclusion into a society
in which all can participate, prosper, and reach their full potential.

From this foundational definition, we defined the following equity goals for this project:

- Understand and center racial equity within a wider equity vision
- See and honor the multi-layered history of inequities and injustice in the region
- Recognize and name the bias and privilege that those leading this project may hold

- Foster inclusive engagement, without judgement, treating all participants with dignity and respect
- Treat all voices as expert voices to be valued
- Include voices from those most affected by food policy and food system changes
- Stay connected to stakeholders and participants during and after outreach; keep people engaged
- Keep all counties in focus
- Ensure that marginalized voices are included
- Work to build trust in-process and outcomes from all stakeholders and participants
- Offer spaces and conversations where all are welcome and feel safe to share
- Have courage to reach difficult, uncomfortable conclusions

Research & Engagement Equity Approaches

- Meet people where - and how - they are: Adopt a diverse set of engagement methods to allow for a broad range of voices to be included, and build 'safe spaces' that recognize needs and comforts of different people and communities

- Welcome all to the conversation: Develop research methods that support non-judgemental dialogue, inclusion of marginalized voices, and accessible language and technology

- Stay in touch: Build outreach communications that keep participants looped into progress of the project as a reflection of how their input is valued

- Stay reflective: Maintain self-reflective dialogue with Equity Sub-Committee within the Regional Food Council, allowing for expansion of equity approach as we go

- Find those farthest from justice: Use multiple forms of investigation to uncover marginalized communities and work to include their voices

- Look for partners and resources in unusual places: Keep open minds about who may be an 'unusual partner' capable of expanding the project's success

- Seek the gaps: Identify inequities, or gaps, in how the regional food system serves the whole community, through multi-level research and a constant application of questions about equity

Shared Equity Approaches within the Regional Food Council

- Create a shared position: Work towards a common understanding of equity and racial equity within the Regional Food Council

- Recognize intersecting lenses: Build awareness of the intersecting nature of racial, health, income, geographic (urban-rural), and other equity lenses

- Allow a slow approach: Recognize the parallel and sometimes competing needs to grow equity awareness, educate ourselves and others on the importance of equity, and the urgency to make

change collectively - and adapt expectations and speed to allow for shared learning and shared progress

Stage A Early Themes: Shared by Furthest From Justice Communities

In Stage A, our first engagement phase in January and February, we co-created objectives and activities with the regional council, with local food councils, and with representatives and stakeholders from all of the 14 communities identified as furthest from justice in the food system. More information about this process is available in the Engagement Methodology and Outcomes section of this report, but the primary themes we incorporated into our research design were:

- There is a lack of diversity and chronic under-representation in local food by people of color, making the local food system less welcoming and less accessible to these groups.

- A major need is to create effective channels for local produce to move from farm to consumer - includes needs for marketing, education, and middle infrastructure.

- The regional food system should look at BOTH regional policy, coordination, and decisions, and also at local/grassroots organizing and ways to support these hyper-local movements.

- Urban and rural areas have different needs and assets.

- Food - growing, cooking, eating, sharing - can help heal generational trauma among people of color, especially African-Americans and Indigenous people. Thus, barriers to healthy participation should be reduced.

- Access to land must be addressed if inclusion in food production is to be achieved.

Equity-Focused Adjustments due to COVID-19

The greatest equity concerns due to COVID-19 have been impacts on engagement that prohibit the centering of marginalized voices in the research and engagement process. Our primary barriers to equitable engagement were:

- A lack of connectivity and lack of access to technology and broadband impacted many communities, especially in rural areas and in urban areas with higher poverty rates.

- Communities we identified originally as furthest from justice were simultaneously suffering disproportionate economic impacts from COVID-19 and the pandemic's public health impacts on communities of color. When health and economic security are at risk, a bias towards collecting additional data rather than adjusting to respond to crisis can create further negative impacts to those communities.

- The national rise of the fight for racial equality - one of our key tenets in building the food system assessment - also meant that we then, more than ever, did not want to over-survey or over-burden

communities in a time when they already had more to manage emotionally, physically, and spiritually during a national crisis.

- We did not have project funds to provide significant stipends to volunteers or incentives to large groups of survey participants, which become larger barriers in times of economic crisis.

Given the barriers in online engagement that arise from inequitable internet access and knowledge, the engagement team continued to pursue nontraditional outreach, work with partners, and identify key stakeholders that the council could work with once the worst of the pandemic impacts had passed.

Some of the methods we adopted to increase equitable access to the process included:

- Social media campaigns with county-specific focus and demographics
- Online survey available via website and social media platforms, translatable into more than 100 languages
- Local newspaper and media advertising, namely local radio in rural areas, with a call-in line for non-online input and survey responses
- Print postcard and flyer advertising in transit agencies, grocery stores, and markets across the region
- Outreach to and interviews with agencies representing the communities identified as furthest from justice
- Partnering with local leaders and organizations to meet community members when and where safe

We knew this would not be enough to meet our goal of designing our research from the outside in - but we also knew it would be hypocritical and insensitive to ask communities already suffering even more economic and physical harm to give us data that, in all the ways that matter, we already had. (There are 50 years of documented racial lending practices, for example, that mean Black farmers still can't access capital for farming businesses in the same way; there are 40 years of documented data on how food insecurity has grown among communities that live in poverty, work in low-wage households, or are from communities of color. We knew we could pull this baseline data and use national trends to project what was happening in the region.)

We also knew from our outreach that other agencies who would typically represent these communities in decisionmaking places were overwhelmed by the need they faced in responding to the changes in their communities and preferred direct assistance - not yet more data collection - to help them respond to those needs.

Given those constraints, although we continued to run our surveying, interviews, and focus groups with as many people as we could gather, we also shifted our project approach to center the existing data from pre-COVID sources and the 2020 post-COVID predictions into an identifiable baseline that could be used by the council moving forward. We also shifted away from the original return on investment approach, which we co-created with the council when all economies were in a vastly different context before 2020, to a focus on the changes and opportunities that occurred from the global and national disruptions of the year.

From the focus groups and individual interviews, we learned that equity is just now becoming a focal point and integral in the decision making process of many organizations in the Triad. Organizations are at varying stages of incorporating equity into their organizational framework, with some reporting changing mission statements to include equity, while others are using equity as a guiding principle in discussing health and hunger, and still others at the beginning stages of their equity conversations.

One constant theme from the resulting focus group and interview data was the need to better serve furthest from justice communities. A significant impediment for many organizations, including local leaders, was the ever-present language barrier. The lack of Spanish and other language speakers within organizations causes a breakdown in providing services seamlessly, be they food delivery, nutrition programs, or Cooperative Extension and Small Business Center seminars.

Our team held regular meetings with the food system coordinator and PTRC leadership to determine the best way to move forward. We explored the possibility of whether this year's assessment should focus solely on data analysis and outreach and engagement should be shifted to 2021 once the impacts of the pandemic were more understood and communities already furthest from justice were, hopefully, not in times of crisis.

At each decision point, the team agreed to pursue new strategies and test new methods for outreach, with the understanding that the survey, focus groups, and interviews would likely not reach as many people in underserved communities as we originally planned in the research design. This continual adaptation is outlined in the Methodology section of this report.

Equity Strategies for Council Implementation

In the new economy of a post-COVID world, many of the tests, pilots, and experiments that we conducted with public outreach can be useful in informing the council's future community outreach and engagement.

In acknowledging the access issues forced by COVID-19 to shift people to online information sharing, we also developed an interactive online report that is accessible to those not trained in food system terminology or data analysis. The online report focuses on zip codes, for example, rather than census-tract data when possible, as most readers wouldn't know their census tract number and would be less likely to engage with the report if they couldn't find a relatable set of data to utilize. We shifted the more in-depth datasets to the raw data to be used by PTRC to provide the data dashboard that was not included in our scope of work. (Census-tract level data is provided wherever possible, and when it was not provided, we manually filtered for zip code data and included that level of granularity in the raw data.)

We have included lessons learned from this process and recommendations for equity-centered strategies in the final section of the report and hope that the council finds these useful for continuing their equity-focused food systems work, as designed in the equity philosophy and goals that we co-created early in this process.

"In order to achieve an end result that is comprehensive and represents the entire Triad region, we must ensure that underserved and under-resourced communities are included - to understand the resources lacking in these communities and what assets have formed and are thriving in these communities. Without equitable access to a local food economy, future change and progress will have limited growth. If we were to proceed by only listening to and assisting the communities in the "majority", we risk repeating mistakes from the past and missing out on opportunities for innovation."

- PTRFC council member

Outreach & Engagement

Engagement & Outreach Process: Adaptation

Engagement with community members and organizations was a fundamental pillar of the regional food assessment. Prior to the COVID-19 closures and restrictions, the engagement goals centered around in-person meetings with hopes of congregating with community members where they meet most often, visiting farms and farming operations, working directly with farmers markets and area nonprofits working in the food system, and supporting local businesses. The core components of the original and remote engagement plans included identifying "farthest from justice" communities and active, local food councils and utilizing these networks to both inform the research design and to fold our outreach within existing community projects & events.

Engagement Objectives & Outside-In Research Approach

The council first identified communities that are "Furthest from Justice" and worked to ensure their participation in the process, by identifying community champions who could support outreach efforts and receive stipends, by holding small group meetings to help shape the research and engagement design, and by seeking guidance from experts across the region. We also performed a scope and analysis of local food councils in the PTRC region and created a list of contacts for our first rounds of engagement.

The research strategies and resulting "gaps" in knowledge further influenced the project's engagement strategies. With equity as a guiding principle for engagement, we set out a plan for engaging with stakeholders, including community members, food system advocates, members of municipal, county, and state-level government agencies, as well as area nonprofits and health organizations. We hired three apprentices from NC A&T State University who were grounded in local food system efforts and gathered a team of county-level experts who could provide guidance and direction to specific research areas of the project. Although we continued to work with our apprentices and adapt their role from engagement to research through fall 2020, we only relied on a few of the original experts, as the pandemic impacted their availability to assist on the project.

The following communities were identified as potential "farthest from justice" groups by the food council through its equity subcommittee, and were the first participants to whom the Engagement Team reached

out prior to COVID-19 restrictions. As COVID-19 progressed throughout 2020, we found limitation in gathering qualitative data from many of these groups due to quarantine restrictions and disproportionate economic, racial equity, and health impacts on some populations:

- Inner City Youth
- Low-Income Rural Citizens
- Black Landowners and Farmers
- Senior and Aging Citizens
- Persons with Disabilities
- Individuals Receiving Public Assistance
- Inmates in Correctional Facilities
- Individuals on the 'Benefits Cliff'
- Students in Schools without Agricultural CTE programs or gardening
- Latinx Farmworkers
- Low Wage Restaurant and Processing Employees
- LGBTQ+ farmers and food producers

While we did not receive survey input from all of the above groups, our interview and focus group outreach to these communities and the agencies who represent them resulted in at least two or more inputs from each of these populations. In some categories, those numbers are much higher, and in some categories, we've used agency representation (such as the Triad Restaurant Association, for low-wage restaurant workers, or marketing association data, for food processing employees) to discuss the impacts of COVID-19 on those industries and make projections for the Triad and its constituent counties. More information about how we attempted to overcome the barriers of online and non-personal engagement can be found in the outcomes section below.

The following groups were identified by the council and the engagement team as key county-level food council and other collectives, and were engaged in January and February 2020 to provide direction and input on the research and engagement approach:

- Alamance Food Collaborative
- Guilford Food Council
- Greater High Point Food Council
- Caswell County Local Foods Council
- Forsyth Foodworks
- Davidson County Local Food Network
- Piedmont Progressive Farmers Group
- Island Culturez
- Montgomery Black Farmers
- Eat Well Rockingham
- Winston Salem Urban Food Policy Council

Despite the adaptations we made to COVID-19, the engagement objectives from the original design remained the guiding principles for remote and socially distanced outreach:

1. Gather place-based and community-specific insights, needs, and opportunities associated with barriers to enhancing and strengthening the food system in the Piedmont Triad region.

2. Use equitable approaches, as defined by the client, that lead to best outcomes for least-served communities and those furthest from justice.

3. Develop a diverse set of qualitative data to help inform the ongoing Research Plan.

4. Build visibility of PTRFC within the region, and expand opportunities for PTRFC capacity building and relationships.

5. Explore multiple dimensions of the regional food system through individual, community, and organizational lenses, including such relationships as those between supply chains and markets, food access and food security, and community and collective networks.

6. Contextualize and ground-truth larger data sets and quantitative research findings.

7. Support development of buy-in among all partners and participants for process and deliverables.

Council Approval of Pivot to Online Engagement

When the council decided to pursue engagement in online formats in April 2020, the following statement was drafted and approved for marketing purposes and to guide the new engagement strategies:

In light of recent closures and impacts due to COVID-19, the Piedmont Triad Regional Food Council has decided to continue its regional food system assessment utilizing remote engagement tools.

This global public health crisis has highlighted the significant issues about food production, food access, supply chains, and inequities that we were hoping to analyze with this assessment process. As a result, we feel it is more important than ever to continue this important work - both so that we can serve the needs of our communities now, during the direct impacts of this crisis, and so that we can better position our communities and resources to build a stronger and more equitable food system in the years to come.

Why this work is important:

- *PTRFC can identify immediate and longer-term needs in every community in the Triad.*
- *People can connect with resources, agencies, organizations, and knowledge that they need.*
- *PTRFC can share the results of the assessment with local governments, nonprofits, hospitals, and others working to address both long-term food system needs and immediate needs from COVID-19 impacts.*

- *There are ways for people to become involved now, while the crisis is unfolding, to help make sure that as we rebuild and recover, we don't revert to an old and broken food system but focus instead on building a food system that works for everyone in the Triad region.*

Engagement Outcomes: Stage A | January-February 2020

In Stage A, our first engagement phase in January and February, we co-created the following objectives and activities with the council. This resulted in the Stage A "What we heard" reports included in the appendix and formed the original research design.

Stage A Objectives

- Find out what matters in those communities who may be "farthest from justice"

- Connect with and understand the needs and status of county-level food councils and similar organizations

- Identify individuals who may serve as longer-term participants with stipends

- Collect a key set of data on the needs, barriers, and experiences faced by those farthest from justice in accessing and participating in the region's food system

- Grow data for our Context Map

Stage A Activities

1. Key Informant Interviews

    a. 4-8 key informant interviews with people able to provide deep insights on the nature of food system networks in the region.

    b. Gather leads on community groups to target for further outreach

2. Small Group Community Meetings

    a. 3-4 small group meetings with people from identified communities that we feel represent groups that are "farthest from justice."

    b. Goal of uncovering food system needs and opportunities seen and experienced by marginalized groups

    c. Provide greater understanding of what equity means in the region

3. Small Group Food Council Meetings

    a. 4-6 discussions with county food council representatives and other collective food organizations

b. Gather details on local councils' status, capacity, focus areas, activities, and connections to Regional Food Council

c. Gather insights on regional food systems needs and opportunities

The key findings from this initial outreach phase are included below, and a full summary report of Stage A outreach is included in the appendix. Themes we found from the initial outreach phase included:

- There is lack of diversity and chronic under-representation in local food by people of color, making the local food system less welcoming and less accessible to these groups

- A major need is to create effective channels for local produce to move from farm to consumer - includes needs for marketing, education, and middle infrastructure

- The regional food system should look at BOTH regional policy, coordination, and decisions, and also at local/grassroots organizing and ways to support these hyper-local movements

- Urban and rural areas have different needs and assets

- Food - growing, cooking, eating, sharing - can help heal generational trauma among people of color, especially African-Americans and Indigenous people. Thus, barriers to healthy participation should be reduced

- Access to land must be addressed if inclusion in food production is to be achieved

One the primary purposes for conducting this Stage A process was to help define a successful assessment methodology for Stages B and C of our Phase 2 data gathering work. Many of our interviewees and contributors offered insights on the dynamics of the region or of the communities they were most knowledgeable about. Below is a list of what we felt were most vital insights to help guide our next steps.

- Invite, include, and value all voices

- Build comfort and welcome for all people in choice of event spaces and design of process

- Gather details about history of food planning and organizing in the region

- Investigate pragmatic barriers that exclude POC, rural residents, and low-income people from participating in food system change, such as regulatory awareness, access to capital, access to land, lack of examples in their community, etc.

It is worth noting, however, that as with any community-based research efforts, we knew we would uncover additional blind spots as the process continued. These recommendations framed our work in the right direction, working towards better understanding and conclusions, but we approached the research by remaining flexible.

Engagement Outcomes: Stages B & C | March-November 2020

At the onset of this project, we had a goal of reaching 2,000 people in the food system through in-person community meetings. With these adaptations, we reached 1,350 - some through online meetings, some through surveys, some through small group meetings.

With the outbreak of the COVID-19 pandemic and in-person meetings no longer safe, the engagement team pivoted to online engagement. The national public health, economic, and racial justice crises meant we'd no longer be able to ask communities to help direct our research from the outside in - but our team knew it would be hypocritical and insensitive to ask communities already suffering even more economic and physical harm to give us data that, in all the ways that matter, we already had.

We also knew from our outreach that other agencies who would typically represent these communities in decisionmaking places were overwhelmed by the need they faced in responding to the changes in their communities and preferred direct assistance - not yet more data collection - to help them respond to those needs.

In order to meet our original equity goals in other ways, we strategically designed a multi-faceted online survey to help gain knowledge for the previously identified research areas, as well as capture the voices and experiences of individuals in the role they play in the food system. The survey was made available through an online platform in over 100 languages, as well as easily accessible through PTRC's social media platforms.

In addition to the survey, the team also piloted four types of remote meetings and then created an eight-week Food Talk Series. Each Wednesday through the summer, the engagement team facilitated a Food Talk centered around an important theme to the local food system. Experts and leaders from various industries were invited to be panelists and share their knowledge and experiences with viewers, who were then encouraged to interact with the panelists and ask questions. These were delivered via Facebook Live, YouTube, and through our online surveying platform, PublicInput, which allowed for watching on mobile with no other accounts required and also offered a call-in line for voice comments. A total of 375 people attended these meetings.

The topics for the PTRFC Food Talks included:

1. What is a Food Council?
2. What can real food equity look like in the Triad?
3. Land Access for Beginning Farmers
4. The In-between: What's next after farmers' markets?
5. Community Gardening as Community Development
6. Agritourism in the Triad
7. Meat and Poultry Processing in the Triad
8. Food System Planning 101

In order to continue engagement with an emphasis on equity, without losing potential input that could be collected, the team continued outreach for individual interviews with local food advocates, farmers, nonprofit leaders, health workers and physicians, farmers markets, and other individuals interested in creating a more equitable food system. The engagement team had a goal of 100 individual interviews of key stakeholders between May and August 2020, to account for accessibility and equity issues in the survey outreach. In order to meet this number, we requested and compiled the names and contact information for over 600 key stakeholders in the PTRC region. The initial interview contacts were produced from input and suggestions from PTRFC members, Emily Edmonds, and Chanel Nestor.

During each interview, we closed with an ask for the interviewee to share the public survey with their networks and to connect us with other experts or interested individuals for further interviews. We sought to directly interview supply chain actors and at least one municipal government representative(town/county managers and/or economic developers) in each of the 12 counties and all 26 municipalities. The apprentices were trained on interview techniques and appropriate note taking before conducting interviews. They also shadowed a CCW staff member before conducting interviews on their own. Responses from these interviews were entered into a form and compiled with other survey data to allow for both qualitative and quantitative data collection.

Part of our outreach included late-stage direct interviews and outreach to organizations representing communities we have identified as furthest from justice in the Triad food system. These are included in the Network Map & Directories spreadsheet included in this report (see Partners List, Champions Table, and county tabs). It is recommended that PTRFC engage these organizations over the next several years to co-create the plan of work for future projects and work with them to leverage resources and projects that support the communities they serve.

After completing 79 individual interviews that met our goal of providing data for all 12 counties, the team further specified areas of expertise and invited individuals to participate in targeted focus groups, with a total of 52 small focus group participants representing all twelve counties and focusing on public health and food banks, farmers' markets, agriculture experts, and small business centers. Local governments did not respond to survey or interview requests, as most were incredibly busy with CARES Act implementation and pandemic response; instead, we focused on county and city agencies, such as departments, who could participate in interviews and focus groups.

We also worked with PTRC on social media outreach on Facebook and Instagram, including a paid ad campaign on Facebook to increase participation from all counties and demographics; ran press releases and radio announcements in 15 outlets across all 12 counties; provided 500 copies of paper surveys to be distributed through farmers' market tabling by our team, on transit and aging meal delivery vans, and at the offices of community partners; set up a phone line to accept phone comments rather than only offering online interaction; and worked with partners to share the survey, make phone calls to survey participants, and provide survey incentives.

ENGAGEMENT BREAKDOWN
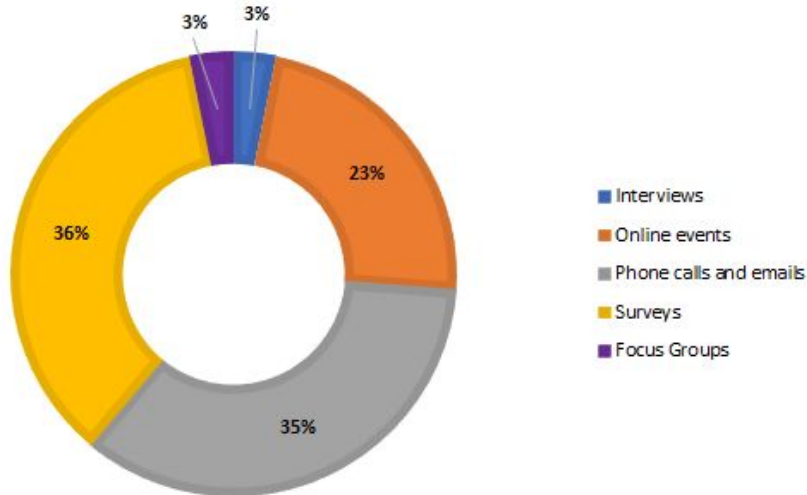
Given the barriers in online engagement that arise from inequitable internet access and knowledge, as well as the council's relative newness to the region and lack of established social media channels, the engagement team continued to pursue nontraditional outreach, work with partners, and identify key stakeholders that the council could work with once the worst of the pandemic impacts had passed. A full map of potential partners, including specific agencies and organizations working with the communities the council identified as furthest from justice, is included in the appendix and in the online report.

Survey, Interview, and Focus Group Results

The engagement team made over 575 phone calls and email contacts with people and agencies throughout the region; hosted 380 people in online events and an additional 52 people in small focus groups; conducted 79 interviews and held or attended 31 in-person events; and received almost 600 survey responses. We interacted with people and agencies in all twelve counties as well as several regional and statewide agencies that work in the Triad region. Altogether we made over 7,100 points of contact in eleven months of outreach, with a response rate from those contacts of 31.8% in all combined outreach methods, when the industry average is around 11%.

One reason that survey responses in particular tended to be uneven across locations and demographics is that only certain agencies in certain counties were able to participate in survey dissemination and collection. (Most of the survey respondents filled it out online - 73% - while our team and PTRFC staff did some limited in-person outreach in late summer/early fall for paper surveys.) For example, Caswell County's Aging Services Department was an excellent partner, using volunteers to call aging residents and engage with them in filling out the survey, but we did not have similar inputs from other aging services in all counties; only two counties' transit agencies placed postcard flyers and surveys on board their vehicles during the engagement period. Strategies for mitigating this kind of uneven representation are included in the benchmarking section of the recommendations in this report.

Although the survey responses still weighted heavily towards white respondents (75%) with communities of color representing only 25%, our interviews were weighted in the opposite direction (persons of color at 65% and white interviewees at 35%). Focus groups represented an almost even split between white (45%) and non-white (55%), and the agencies they represent focused primarily on underserved communities (72%).

Focus groups (n=13, with 52 participants) and interviews (n=79) generated qualitative data that we then collected, coded for keywords, and analyzed. This method aligned with the early project decision to maintain anonymity in focus groups and interviews to encourage honest responses. We provide a summary of the focus group and interview data in each research area.

Survey data was more skewed towards an older, white, female population. We tested several methods outlined above to generate better outreach to these communities and explore the weaknesses in the survey data below. Because of this uneven distribution, we chose not to include the survey results as a second dataset (see the research methodology section for more detail) but we provide a general overview here of the responses that were received.

We received 576 survey responses and the survey page received 4,738 views. There were 4,449 points of data collected in the survey responses and 561 comments were collected. (We also generated a subscriber report for future PTRFC use, with 179 email addresses for survey participants who wanted to remain informed about future food system projects in the region.)

In-person outreach, targeted email requests, and targeted social media advertising including a gift card giveaway resulted in a better geographic survey distribution that is in line with county population comparisons, with 8% from outside the region who worked in a Triad county:

* County in which you live:

- 32% Forsyth
- 22% Guilford
- 7% Alamance
- 7% Davidson
- 6% Rockingham
- 6% Davie
- 5% Randolph
- 4% Caswell
- 3% Stokes
- 8% Others
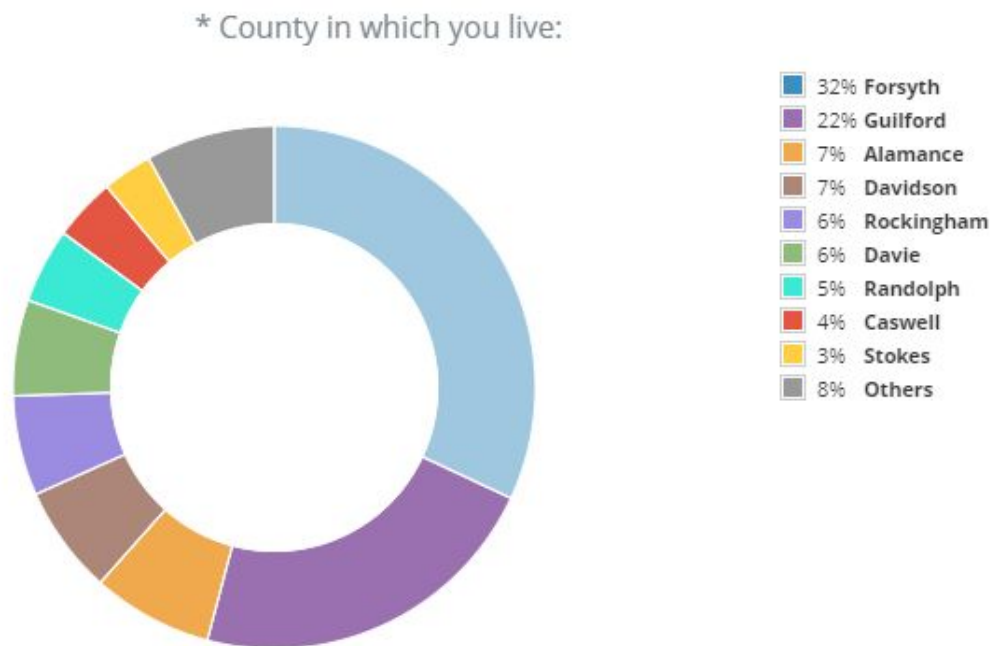
Respondents by age were also in line with county population comparisons, with the majority of respondents aged 35-44, with the next largest group of respondents between the ages of 55-64 (which may be slightly skewed due to uneven aging center participation):

What is your age?

26%	**35-44 years**
21%	**55-64 years**
18%	**45-54 years**
17%	**25-34 years**
12%	**Over 65 years**
6%	**18-24 years**
0%	**Under 18 years**
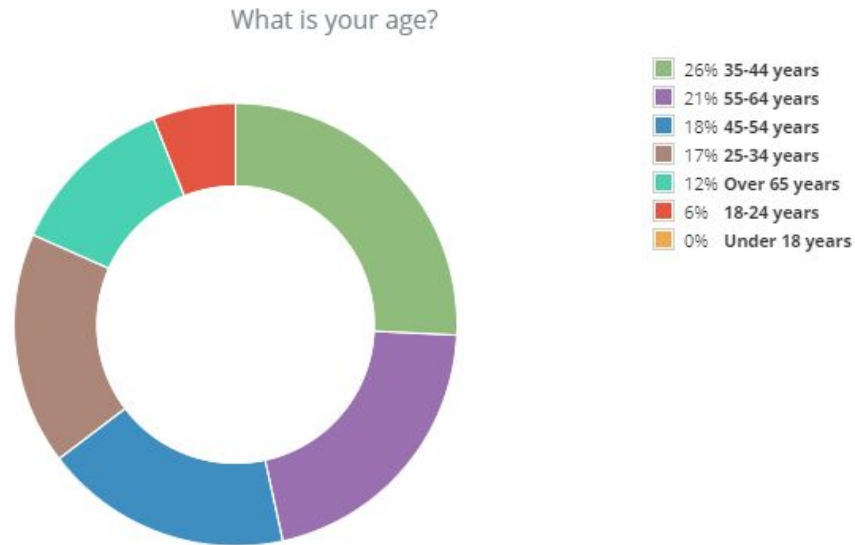
However, survey data remained skewed on the basis of race and ethnicity (white respondents at 73.8%, Black/African-American respondents at 16%, and multiple ethnicities, Hispanic/Latino, and Native American respondents collectively at 10.2%).

I identify my race/ethnicity as:

74%	**White**
16%	**Black or African American**
10%	**Others**
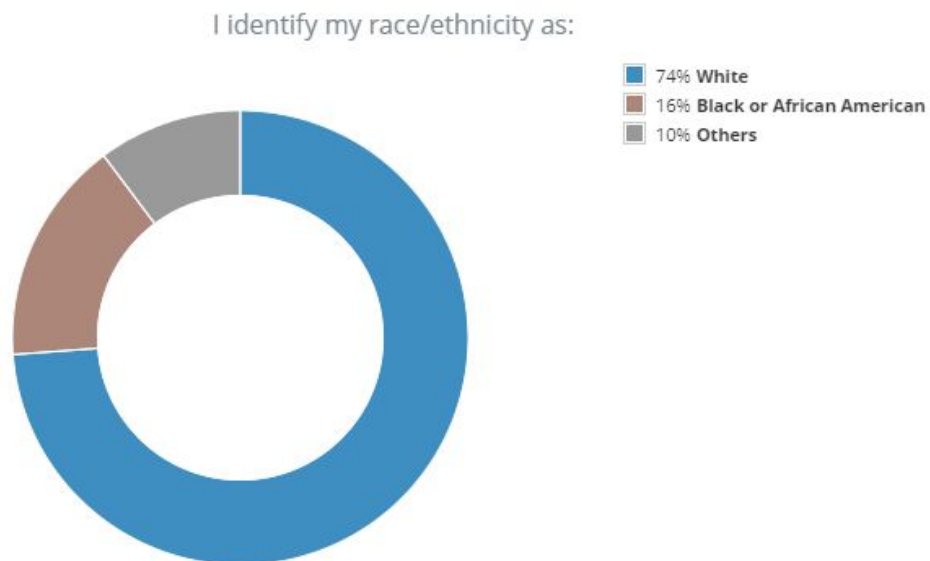
Survey data also remained skewed on a gender basis, with 79% of respondents identifying as female, 20% identifying as male, and only 1% identifying as another gender.

Please select your gender:

- 79% Woman
- 20% Man
- 1% Others
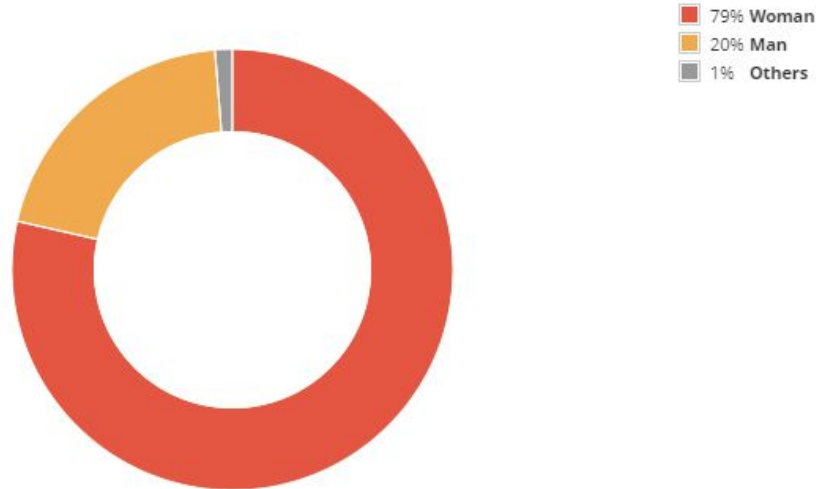
Most of the survey respondents traveled less than 10 miles to purchase food and 91% purchased from grocery stores, with an additional 50% supplementing with purchases from farmers' markets.

The two biggest barriers to accessing food were cost (55% of the 58 respondents reporting difficulty) and food desert location (24% rural citizens more than 10 miles from a grocery store and 21% urban citizens more than 1 mile from a grocery store).

Households varied in size and food budget, with most respondents in a household of two (36%) or four (18%) with a food budget between $200-800 per month (57%). Only 16% of respondents said that more than 40% of their food budget went to fresh fruits and vegetables.

Respondents reported slightly more use of federal and state food programs (11%) after COVID-19, mostly centered in Guilford and Alamance counties and mostly utilizing the Free & Reduced Lunch program and SNAP benefits (this is supported by the FNS application analysis in the Food Security section of this report).

Most respondents said they wanted to see the region focus on adding or expanding community gardens or urban gardens (28%), with another 34% most concerned about addressing hunger for both children and adults.

After COVID-19's direct impacts are dealt with, what are you most interested in seeing your community address or develop?

- 28% Adding or expanding community gardens or urban gardens for citizens
- 17% Addressing child hunger in schools
- 17% Addressing hunger and poverty in my community
- 15% Adding support for entrepreneurs in food or farming businesses
- 15% Addressing the lack of places to buy fresh healthy produce
- 9% Addressing inequities and disparities in our local and state policies", or something more specific about equity and/or policy
- 0% Others

When asked whether they felt their community had a just and equitable food system, most said no, with an emphasis on food deserts (in 81% of comments) and the cost and availability of fresh produce (in 77% of comments). When asked about the most pressing community needs, respondents were most concerned about feeding those in need (89% of comments), especially the elderly (68%) and children (54%).

Summary of Apprentice Experiences in Engagement & Research

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In partnership with Carolina Creative works, the Piedmont Triad Regional Food Council conducted a 12 county assessment across North Carolina evaluating the productivity and flaws within the Food system. Quantitative as well as qualitative data collection was collected from the common public regarding their specific region and the accessibility to fresh foods and resources alike. While the initiative commenced in February, the presence of Covid 19 complicated the rate of response as well as the nature in which the questions were being asked. The assessment shifted from evaluating levels of accessibility to gauging the assets and gaps within a certain region that can help its inhabitants thrive in a global pandemic.

I interviewed several people during the outreach portion of the project. These individuals were a part of organizations specializing in (but not limited to) public health and wellness, food/ resource distribution, business financing for minorities, agriculture, and agribusiness. I attempted to set up interviews with 21 experts; 9 of them responded and were willing to share their perspective in a 30 minute to 1 hour conversation. Of the 9 responders, 4 of them worked directly with farms in the triad, 3 of them worked with

resources non food related, 1 of them worked in public health, and the 1 worked with financing businesses and finance relief.

A summary of the questions that were asked go as followed:

1. In what way is your organization involved within the food system?

The number of staff was also duly noted as well as the number of minority members that held a leadership position. Minorities included POC, LGBTQ, as well as women. All of the organizations had minority representation, with the smallest ratio being ⅛ and the largest ratio being 8/8.

2. Does your organization have paid staff? What kind of funding?

All organizations reflected that they had paid staff and were receiving government funding.

3. How has Covid 19 affected your line of work?

All organizations reflected that there was an influx of services needed besides those that were un food related. However, they were able to adjust their services.

4. In your particular line of work, what are the largest inequities/ injustices?

All groups expressed that people of melanated descent were the group of people experiencing the most inequality within their particular field and from individual observation. Other groups considered highly at risk were those with English being their second language, and those at or below the poverty line. The main reasons for these disparities were the lack of transportation, access to fresh foods, and lack of diverse leadership representation.

5. Assets and Gaps in the food supply chain within your region?

A whopping 100% claimed that a gap that exists in each of their particular areas was the physical ability for locals to gain access to their product or services. Whether rural or urban, the locations in which to be reached were not in reach of public transportation or the market in which it was meant to reach did not have a means of mobilizing. However, because of this fact it also highlighted an asset within these communities. They reflected on how the community support and unity of local businesses was amplified tenfold- in hopes that it is not temporary.

6. What resources would help increase equity in the organization? How can the local food council help?

 Other than the organization that was completely filled with minority leadership, the other organizations expressed that financial help from their local food council as well as other government agencies would help increase the number of minorities and simply people of different backgrounds within their organizations. Three organizations expressed that the connections and weight that the council holds would be helpful in better connecting the gaps between said organization and the inhabitants of the community itself. A large gap lies between the trust of the organizations by the members of the region/ a particular neighborhood.

Greater outreach would be able to be done with deeper involvement of connecting and advocacy by the council itself.

7. How can the community work towards justice & equity?

All companies primarily took accountability for any disconnect they may be having with the community and the outcome of equity. while one financial institution stated how it would be helpful for younger generations to educate themselves as well as their parents on new developments when it comes to business and land decision making. This way, they would be able to reach the community more effectively.

8. What are the most exciting things you've seen in the food system?

The most exciting things that were expressed were the communities ability to unify and support as many local businesses and carry out as many partnerships as possible.

While the presence of Covid 19 reshaped the disparities that existed around access to fresh food, it also brought to light the next steps that need to be made and community actions that could have been prior to. While organizations connected to the Piedmont Triad food system would like to increase their ratio of diversity, the anonymous conclusion was that an increase in funds to do so would be needed. Furthermore, in rural or urban areas, connectivity is what is lacking. Whether that be due to transportation or leadership, According to those interviewed, the Piedmont Triad Regional Food Council could best assist in deeper communal advocacy and enabling resources with greater fiscal means to support the organizations so that they may provide greater access.

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In the Piedmont region, some counties have experienced more food insecurity than others and the pandemic exacerbated those issues. The Covid-19 pandemic made the agricultural and environmental systems of North Carolina take a turn in the way the food supply chain functions and its effects on the environment. In the Piedmont region we have rural areas and city areas, which have different issues than others. We want to see the number of food-insecure counties go down. Food pantries and distribution sites have been a great help during a time like this but the food available at the pantries does not always provide families with their needs. We must take culturally different, health, and other factors into account when it comes to food. A lot of individuals want to see those changes made in the Piedmont region.

The North Carolina food system has experienced many challenges in the past few years. It has endured natural disasters and economic downturns. COVID-19 caused a global pandemic in 2020 that has endangered the health of people globally and caused one of the greatest economic recessions in decades. With Governor Roy Cooper issuing the executive Stay At Home order that consists of several different phases, the fears of businesses closing and losing money in the process had continued. Meat and food processing companies' employees were contracting the virus and having to shut down while others

received little effect. Similarly, businesses such as restaurants and grocery stores took on the toll of not being able to provide enough food/produce for their customers. Also, farmers and farm workers experienced a backlash from the pandemic. With all these things taking place, citizens of North Carolina started to come together to figure out how to create a more resilient system and understand the dynamic in changes they must face.

The pandemic has pushed people even more to provide information, educational programming, and networking opportunities. The COVID-19 pandemic has brought positive changes to the environment with the decreased air pollution because of less factory work and travel, (air travel, bus transportation, cars) that emits greenhouse gases. It has also caused people to become health-conscious in sanitation (Sparks, 2020). On the other hand, the pandemic has caused some farmers to waste products like milk, meat, and produce (Lynch, et al., 2020). With the effects of the pandemic ongoing, we will not really know the extent to which it has affected the food system until it is over.

The effects of COVID-19 on food businesses in North Carolina depends on the area of business, size of the business, and how long it has been running. A business that has been in operations for years typically has a system in place for how they do things. Drastic changes such as the ones they face during the pandemic can cause older businesses to go through complications because changes can be hard for older businesses. While small businesses that are just getting started can adjust to changes more easily. A lot of local businesses struggled during phase 1 of Governor Cooper's executive order of shutting down non-essential businesses. Businesses considered essential under the executive order included food, agricultural systems, and health care. But even essential businesses have struggled to remain stable. A statement was made about not being affected by Covid-19 now, but the future outcomes could be detrimental to the business once numbers are reviewed.

At the beginning of Covid-19 people panicked, buying up a lot of produce and necessities for survival. Stores have had to set limits on certain produce (Milk, eggs, bread, meat, canned goods). Produce is already wasted enough in America, about one-third of all food produced and consumed is being wasted. Farmer's Markets are having to readjust to changes and are not receiving as much business because many families have been cutting back on their food budget because of unemployment. The food distribution and restaurant industry have been affected by meat plants or processing companies who cannot supply them with meat products. The pandemic has significantly affected food processing, shipping, and travel, which has made it difficult to keep up stock in chain grocery stores. Meals in the United States travel an estimated 1,500 miles from farm to plate and some borders have now been closed.

We will not know what adversity may come that challenges our systems again; we can only prepare to have a better and more efficient system going forward. Staying positive on the changes observed, it will bring together positive outcomes. The citizens of North Carolina have come together to create a change in the food system. More companies have moved towards online interaction and they have been able to continue their work remotely. While it is still going to take determination and focus to get accustomed to changes, we can make these changes happen.

Trends and Impacts of COVID-19 on Food Systems

Overview of Case Study Utilization and Trends Analysis

Although the original scope included the use of national case studies as relevant examples of food system projects and programs, the events of 2020 and the shift in the research design changed the way we approached the use of case studies. This section serves as a literature review and case study selection that summarizes the news, trends, and impacts we followed from COVID-19 and its economic impacts. We include links to relevant literature that the council may find useful in selecting future strategies and projects through which to support the regional food system. In some cases this information also appears in the relevant research area, when a tangible example helps demonstrate the solution or challenge we've identified or the economic modeling has been used to make general predictions about the coming year.

Food Systems Literature

Harvesting Opportunity, a book produced by the Federal Reserve and USDA, provides an exploration of recent economic studies on local food systems, highlights models for policymakers, practitioners and the financial community; and identifies research, policy and resource gaps that could contribute to regional food system development.

Of particular interest to the council will be Chapter 4 - Advancing Food Equity through Local and Regional Food Systems, which provides case studies on how five organizations tackle equity issues through their food system work and how food equity impacts other social systems. (In a previous chapter, the book also tackles geographic equity, and how rural and urban markets can work together to increase equity among a region.)

Chapter 5 explains why this is so important - and their findings mirror many of the equity issues we highlight in the research areas of this report, although the statistics they use are from 2017: at that time, nationally, more than 70% of farm workers were foreigh-born, and workers of color comprise almost half of all food production and processing jobs and over 40% of all restaurant jobs in the nation. The numbers in our study indicate that these numbers have only risen over the intervening years.

The book provides significant guidance for institutional purchasing and expanded market access, including how procurement, marketing, and sales practices connect to increases in job growth and job quality. It also includes information about food system investments, non-economic impacts, and unused capacity and how to utilize those spaces.

RSF Social Finance produced an excellent investment analysis in September 2020 that highlights both the difficulty of investing in food systems and why it's more necessary than ever after COVID-19. Hard Truths from a Decade of Investing in a Regional Food System discusses attempts both over the past decade and during COVID-19 to address the inequities in the food industry.

These systems will remain out of reach, though, unless we address persistent, decades-old structural issues. Price pressures continue to challenge the viability of decentralized food systems and communities

of color continue to be underserved — as farmers, food chain workers, supply chain entrepreneurs and consumers. We need to change both who we fund and how we fund if we want to create equitable, thriving regional food systems.

RSF developed and ran a 10-year investment program specifically for food system projects and this report highlights what they learned, what they would change, and what they see as the main issues in continuing to make investments in the food system. Above all, they note, investments in the food system aren't simply made on an economic basis - investors should account for social and public goods that arise from a more equitable food system, and from the knowledge that farmers and communities don't have the same risk capacity as other businesses. High impact, they note, will be almost guaranteed; high returns, not necessarily.

For global policies, a sense of the global system and comparative policy, we recommend the [Food Systems Dashboard](#) produced by Google and Johns Hopkins, which was released in June. It offers information on a country level - not by individual region - but allows exploration of how global food systems changes have an impact on countries around the world.

Food Equity Case Studies and Reports

The food system equity issues we highlight in each section are difficult, decades old, and require a nuanced understanding of the history and impacts of past food system projects before embarking on new solutions.

The literature and case studies here may be useful reading for the council members during equity trainings and as they seek to become leaders and advocates for food equity throughout the regino.

[How Racism Shaped the American Farming Landscape](#) is a comprehensive article from Eater that demonstrates white Americans' dominance of farming and agriculture as late as 2014. The demographic comparisons they found in their analysis are mirrored and sometimes exceeded by the demographic analysis we conducted in the Triad region. Not only are farmers of color significantly underrepresented (at between 2-3% nationally and regionally of all farmers), those farmers also tend to be tenants or farmworkers instead of owners of land, own less land and smaller farms, and generate less wealth from farming than white farmers.

[The Winston-Salem Poverty Thought Force created a 2017 report](#) that included recommendations for the metro area's hunger and food insecurity issues. That included access to food for children through a universal breakfast-in-class program, expansion of food stamp values for healthy food and use at community markets, creating new partnerships to bring food into food deserts, and building both spaces and programs to serve food insecure persons in the region. Although our research did not indicate many of these projects were yet underway, many of the equitable access issues the Thought Force worked on were exacerbated by COVID-19 and will remain issues in the region for years to come.

[The Center for Social Inclusion](#) maintains and updates a database of programs, policies, and research tools for food equity. They focus on engagement of local leaders of color as a tool for building bottom-up

solutions and developing policy tools to connect federal, state, and local policy to stronger food systems. Many of these recommendations are mirrored in our report.

Food Security Impacts & Resources

With the changes in the job market due to COVID-19, many millions more have become unemployed or underemployed. Secondary impacts from widespread unemployment include a loss of healthcare coverage, which almost always results in additional food insecurity within a twelve-month period due to medical costs. As such, the demand for food pantry goods has greatly increased in 2020: data from Feeding America shows that food insecurity will impact 19.3% of North Carolinians in 2020. In comparison with other states at the moment, we are projected at tenth in the nation with the highest expected food insecurity rates. Many individuals have to wait to access food banks or food pantries, or wait for SNAP benefits to arrive. For many people, food security has become a rising issue due to COVID-19.

Food Deserts Are Their Own Pandemic Hot Spots, an article from Gen, demonstrates the disproportionate impacts of COVID-19 on food deserts and how to overcome them through policy changes, such as support for urban farming, expansion of distribution locations, support of innovative nonprofit solutions, and integration of Opportunity Zone tax breaks for developers who prioritize grocery store development and hire local workers.

Additionally, COVID-19 has greatly impacted families' ability to feed children and put food on the table consistently. This can be seen in the No Kid Hungry, "The Longest Summer" report. As the unemployment rate has increased more people have struggled to purchase food, students were unable to receive their Free and Reduced lunches through the school system. According to the report, 70% of parents said COVID-19 made them realize that more children are reliant on school meals than they knew.

One solution that has been underway through Wake Forest Baptist Health, and is covered in this article, is the food prescription program. The article analyzes a program in Pasadena, TX which is located in Harris County. Families received nutrition educational materials and 30 pounds of fresh produce, plus four healthy non perishable food items every two weeks for up to 12 visits at a local food pantry. Interviews with participants showed that the pilot was well received and could be brought forward as a collaborative clinic-based food prescription program.

The key for addressing food security at the local level has been proven this year not necessarily to mean producing more - but giving people more purchasing power of their own.

Farm & Food Production

Data from ASAP and Carolina Farm Stewardship Association estimate that before the pandemic almost 70% of farmers in the state sold at farmers' markets for part or all of their revenue stream. However, CFSA's examination of COVID impacts demonstrated that sales fell for 76% of local farms because of the pandemic.

With tragedy often comes opportunity: non-traditional partnerships during COVID resulted in new markets being developed on the fly, and new partnerships being formed. One example of this comes from early in

the pandemic, when [Publix promised to purchase foods](#) from local farmers wherever they were located. All of the food that was purchased was donated to food banks through Feeding America. Private organizations like Publix can find unique ways to invest in communities and improve food security and the market during this pandemic. So far, Publix alone has purchased over five million pounds of produce.

According to a recent analysis by [Digital Diplomacy](#), there are three main points that must be met to ensure the resiliency of the global food system, all of which translate well to a regional system:

1. there are limits to the occurrence and severity of disruptions to the food system,
2. there is mobilization of a skilled coalition that understands how new technologies can transform food access and focuses more on collaboration, and
3. more people recognize that new technologies are useful but not a panacea for systemic issues.

DD finds that all aspects of the global food system are under review because of the pandemic and its immediate and widespread impact on demand, markets, and supply chains around the globe. States and counties will need better indicators about regional and mid-scale food supply chains to accurately predict vulnerabilities like those seen during 2020 - something that the assessment begins to address with baseline benchmarking in the supply chain section of this report.

Farmers' markets - which nationally account for roughly 65% of all small- and mid-scale farm sales - have also been impacted by COVID-19, but were more agile in their ability to pivot to online sales, curbside pickup, and order aggregation. Community Food Lab's recent [Farmers Market Survey](#) surveyed 78 markets from across the state. Of the farmers markets that responded, roughly half of them accept SNAP/WIC, with fewer offering nutrition incentive programs. 55% of markets reported greater/steady sales in 2020 when compared to 2019. 45% of markets reported greater/steady visitors in 2020 when compared to 2019. Markets that offered curbside pickup reported a greater sales rate than markets without that option and markets with an email mailing list reported a greater sales rate than markets without that list.

Socioeconomic and Demographic Impacts

Despite attempts at relief from the federal government, many programs aimed at mitigating the impacts of COVID-19 have not been successful, particularly for underrepresented communities and communities of color. Many administrative errors have been made in the distribution process, according to a recent NBC article on how [small farmers were left behind in the COVID-19 Relief Package.](#) Further, COVID-19 recovery funds were not equitably shared or distributed, according to recent analysis: the top 1% of recipients received over 20% of the funds, which comes out to over $1 billion. These funds likely helped already high-income farms, but left many middle- and lower-income farms out to dry.

However, other regional programs have had much more success. The [New Emergency Food Program in Travis County](#) has provided meals to those in need through an innovative use of CARES Act funding to purchase food from farms, pay local businesses to process foods, and distribute those foods to those in need. To date, the program has spent $611,000, and not only does the program pay for meals for residents, but it also puts money back into the economy by paying local businesses to make the meals.

Supply Chain Impacts and Trends

There have been many processing shutdowns, particularly within the meat industry, as many employees have tested positive and shutdowns threatened to derail processing scheduling. In North Carolina and across the country, slaughterhouses and farmers wound up disposing of animals that could not be processed in a timely manner to reach markets that had suddenly dried up overnight (such as restaurants, tourism industries, and institutions). Changes in production and demand affect consumer pricing at a time when most of the country is facing economic uncertainty about jobs and the future economic outlook.

As farms continue to produce, they are also finding that restaurants are closed or closing and cannot purchase or accept their usual products. This has led to an extreme surplus for farmers with many extra items. CNN found in one report, A Nightmare Scenario for Farmers is Happening Right Now, that just one farmer they interviewed had a surplus of over 24,000 eggs. This kind of overproduction in 2020 will greatly impact the forced destruction of goods and the current year's revenue as well as the estimates for 2021 production and the capital through which farmers are able to prepare for the coming season.

Several industry associations and leading companies, including the United Food and Commercial Workers Union, DHL, and the American Freight Association, released their own reports highlighting the national pandemic impacts on food production industries. A full global analysis of the impacts on grocery, retailing, and marketing sectors worldwide is summarized here. We have included summaries of these data where possible throughout this report, and emphasize that the supply chain interruptions and resiliency modeling are both short- and long-term issues for all food systems to address - not just the Triad region.

Market Analysis and Economic Impacts

 In August, according to Marker, over 15,000 restaurants in the United States had closed. It is estimated that the number of restaurants that will permanently close could reach 1 in 3. With these kinds of closures, the entire supply chain has been disrupted and millions of people are un- or under-employed.

According to the Independent Restaurant Coalition, North Carolina's restaurant economy totals more than $21.4 billion. Local independent restaurants recirculate more money from revenue (65%) back into the local economy as compared to chain restaurant counterparts (30%). There are further equity concerns with the closing of restaurants, as the industry boosts minority employment and advancement, with an additional factor that half of all restaurant workers are women. Furthermore, the restaurant industry supports a plethora of supply chains and when aggregated, generates more middle class jobs three times faster than other sectors in the economy.

Community Assets and Network Mapping

Community Asset and Network Analysis Overview

This section seeks to describe communities' access to food assets and services, highlighting which communities do or do not have access to services such as grocery stores, farmers' market, food banks, transportation, and other vital aspects of local food systems. A network analysis allows us to visually and quantitatively measure these systems, demonstrating the level of access to food services within the community and how equitably those assets are distributed, along with identifying future partners for the council to leverage.

The data in these maps and directories has several purposes. It helps to analyze how food systems align with food security, farm ownership, and overall economic health; investigating the relationship between food systems and food security demonstrates how the efficiency of a food network impacts an individual's access to food. Looking at farm ownership helps identify how age, gender, and racial representation in organizations providing support to agriculture may impact the ownership of farms. Lastly, understanding how the overall economic health of counties relates to food systems will provide important insights into the overall quality of life benefit of robust food systems. Some of these visualizations appear in this section, while others can be found in their relevant research area section.

We also focus on mapping and identifying the hundreds of partners, agencies, advocates, and individuals who were referred to us as food system experts in their local communities. Because the council is in the early stages of development, there is significant work to be done in future years to build strong local partnerships, especially in counties not currently represented by a local food council, and to continue to convene these stakeholders to generate ideas, offer resources, and promote equity across the region. In the recommendations section, we make specific recommendations for how to structure the regional council to better support local agencies in their actions at the local level, and to partner with them to generate and develop regional goals that meet the needs of all twelve counties.

The primary outcomes of this portion of the assessment are included in the Network Mapping and Directories spreadsheet provided as an appendix to this report. That spreadsheet provides PTRFC with mappable data that can be used by PTRC to create visualizations and data dashboards of potential partners, the network of related agencies in each county and in the region, and potential partners and champions with whom to continue this work.

2	Partners List (mapped in our report)
3	Champions List (included as table in recommendations)
4	Email List from Survey Respondents
5	NC Local Food Supply Chain Infrastructure Inventory with NAICS Additions (2020)
6	Other Food & Inputs Businesses from NAICS (2020)
7	Grocery Stores (all regional)
8	SNAP Retailers (all regional)
9	Community Gardens
10	Health Services (all regional)
11	Transit (all regional)
12	Schools (all regional)
13	Farm to School Programs (all regional)
14	Farmers' Markets (all regional)
15	Poultry & Mobile Processors (2020 | all regional | ncchoices.com)
16	Statewide & Regional Partners
17-29	County Tabs (Food Pantries, SBCs, other key partners)
30	All Contacts from PTRFC Food System Assessment, 2019-2020
31	Press Contacts (all counties & region, 2020)

Overview of Regional Contextualization & Process Changes Due to COVID-19

To build our research design and understand how engagement could support data collection and a deeper understanding of the regional food system, we conducted a context mapping exercise during Phase I. Context mapping allows us to articulate what we know - or think we know - about regional food system actors across all sectors, and then to understand where the gaps are in our knowledge and which communities to target for outreach. Context mapping was intended to be an ongoing process throughout the project, particularly during early outreach for our "outside-in" research approach.

Asset / Agency Type	Data Source
Community Gardens	NC Community Garden Partners
Farmers' Markets	NC Department of Agriculture
Health Agencies	NC Department of Health and Human Services
Schools	NC DPI; NC Community College System; UNC System
Food Pantries	Second Harvest Food Bank of Northwest NC
Farm to School	USDA F2S Census
SNAP Retailers	NC DHHS/USDA ERS
Transit Agencies	PART NC
Grocery Stores	USDA Economic Research Service; staff research
Meat Processing	NC Choices
NC LFI Update	NC LFI Data; NAICS Data
Partners List	Recommendations/referrals
Champions Table	Recommendations/referrals
Statewide/Regional Partners	Recommendations/referrals

Please see the final section, Notes about the Data, for specific information on each source and how it was utilized.

This changed slightly due to COVID-19's impacts on our engagement process. People were much less likely to crowdsource local food nodes in an online format, although we made it available through the survey website in an easy-to-use interface. Given these constraints, we chose to examine and source as much data from regional agencies as possible.

Primary Research Questions

Based on this research, our primary research questions were:

- Which agencies, groups, informal networks, funders, governments, and nonprofits are working on local food issues or projects? Where are they? How can they be supported by the regional council?

- What policies are already in place that support local food system development at the local and regional level? What policies are barriers to food system expansion? What best practices or models exist for changes to these policies or for new policies to be implemented?

- Where is the network capacity strongest in the region? Where can local networks be supported to grow and expand? Are any local agencies experiencing significant inequity, or are any communities choosing not to participate in local food efforts because of inequitable practices?

- What does the map of money, power, and information look like among the regional agencies working to support food system expansion in the Triad? How can this network capacity be better expanded, supported, and encouraged towards equitable distribution both geographically and among underserved communities?

- What existing programs and projects are successful in each county? What significant needs exist in each county? How can PTRFC support those projects financially and with resources and knowledge?

- What barriers exist for each of the Triad's participating local governments to participate in the food system? How can those barriers be overcome?

We conducted research during Phase I to propose an initial list of those farthest from justice who should be given priority consideration in the research phase of our project, and to create a list of existing food councils and food advocacy groups in the region.

We then mapped community assets, regional network nodes, supply chains, and other important features of the food system as we completed engagement in each county and conducted interviews, focus groups, and meetings. This section summarizes the mapped results of those efforts as well as the engagement of regional actors within the food system.

Community Asset Mapping & Network Directories

In the spreadsheet provided in the appendix, we mapped the following:

- 78 county-level agencies / advocacy groups for future partnerships
- 83 county-level individuals recommended as food champions for local impact
- 120 grocery stores
- 40 community gardens
- 1,147 health agencies, clinics, and offices
- 621 area schools, colleges, and universities
- 80 farmers' markets
- 238 county-level pantries, agencies, and contacts
- 143 county-level supply chain nodes (processing, storage, distribution, aggregation) and an additional 336 food businesses and additions to the NC LFI

We also included all press contacts utilized in the assessment (104) and all contacts provided or referred to us during the assessment (762), and all the contacts who subscribed for more information after taking the survey (173 email addresses). The table below is a static image of the live partner map from the online report:

PTRFC Potential Partners
Click to make tooltip box stick

Map: Carolina Creative Works • Source: Carolina Creative Works • Created with Datawrapper
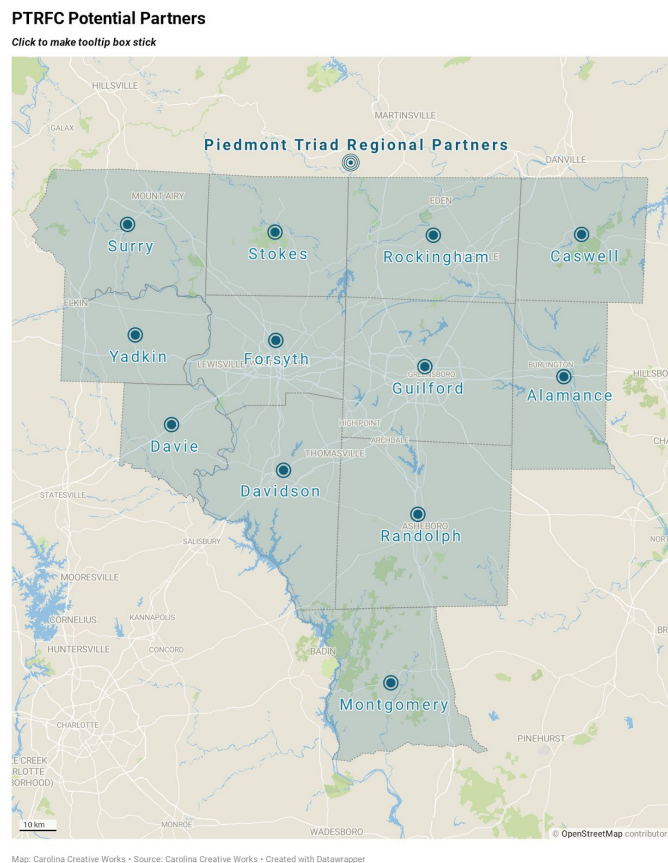
It is important to note that one of the losses due to the lack of in-person engagement is a lack of data for community asset mapping purposes. Although we made this functionality available through the survey and our online meetings, we received very few new entries and have relied on interviews, focus groups, council members, and local knowledge to piece together the existing network. Feel free to submit updates and suggestions for local community food assets to jbedrosian@ptrc.org for additions to these maps.

Regional Food Council Representation and Priorities

When the project began in 2019, PTRFC member representation was limited; however, new members representing almost all counties and subregions have been added throughout 2020. A map of the most recent representation for council members is included below.

2020 PTRFC Council Representation
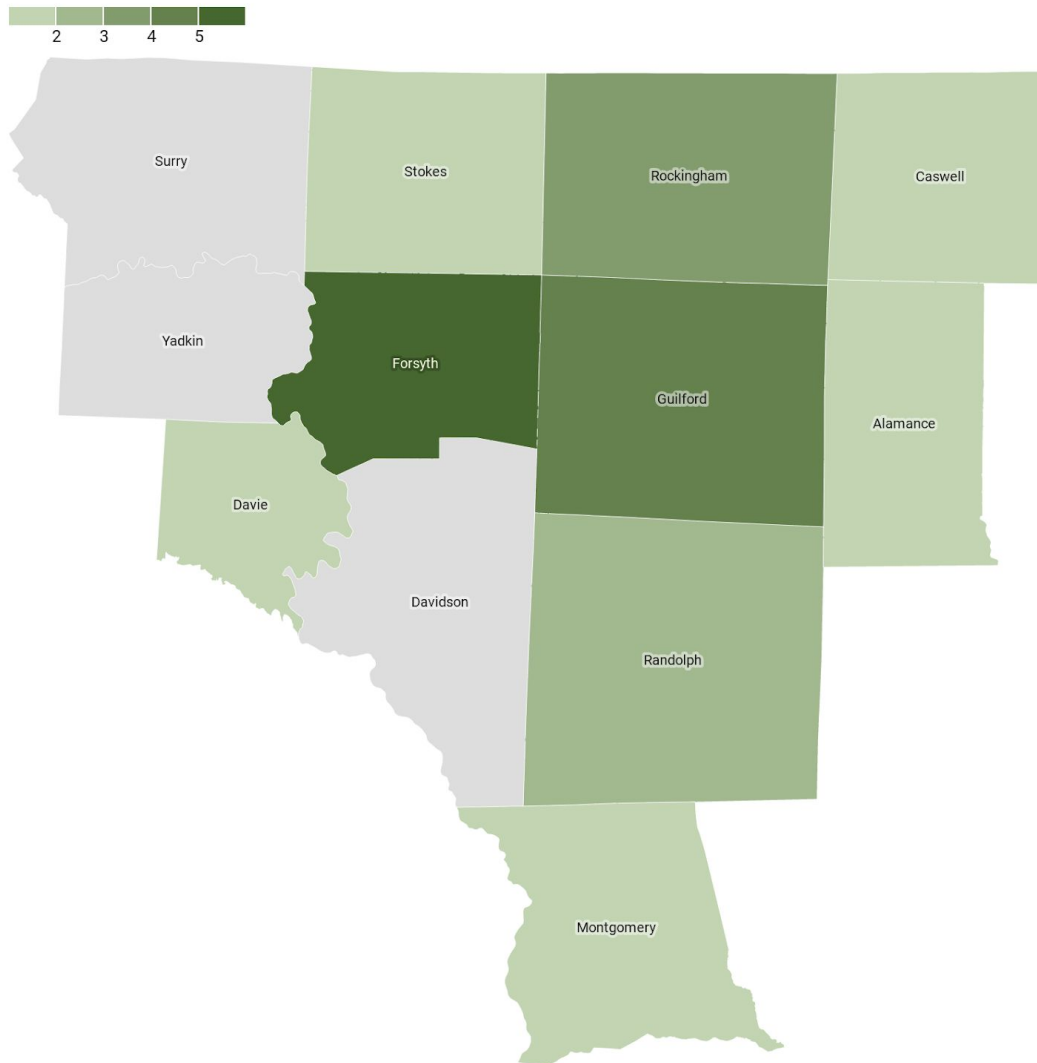
Map: Carolina Creative Works • Created with Datawrapper

The council was surveyed for their top three priorities for the research process during November 2019. We received seventeen responses (roughly 70% of currently-filled council seats) and used this information to guide our design of the research focus areas. The top three priority areas among council members were:

- 58.8% Increased equity in access points to the food economy, particularly in underserved communities

- 58.8% Public health data, including food access and access to healthy food

- 35.3% Value-added and food entrepreneur/food business gaps and opportunities

It is important to note that the second priority area of public health included a wide and varied range of comments from council members with different understandings of what public health's role was in the food system and how public health information could help contribute to the regional food system. Accordingly, we focused our scope of work on food insecurity and food access as it applies to the larger food system and the current landscape of public health-related local food initiatives, while acknowledging that we cannot collect new public health data in the scope of this particular project.

A: Summary of PTRFC Responses to Data Prioritization Survey, as of December 5, 2019.

Supply chain data - small/med farms	4
Supply chain data - all farm sizes	3
Transportation/distribution - mapping & analysis	3
Microgardening and microfarming	2
Public health data - food access	10
Community food assets	5
Labor and workforce data	1
Land/farm production capacity	0
Value-added gaps & opportunities	6
Economic impact data	5
Market analysis - all scales	3
Increased equity to food access points	10
Other:	2

Local Food Councils in the Triad Region

Each of the existing local councils was invited to contribute ideas, recommendations, and focus areas during the early phase of the project from Dec. 2019 to Feb. 2020. A map of those councils and their representation areas is below.

Piedmont Triad Local Food Policy Councils

Caswell County Local Foods Council

Surry

Stokes

Rockingham

Caswell

Yadkin

Forsyth

Guilford

Alamance

Davie

Davidson

Alamance Food Collaborative

Forsyth Foodworks

Guilford Food Council

Winston-Salem Urban Food Policy Council

Randolph

Piedmont Triad Regional Food Council

Greater High Point Food Alliance

Davidson County Local Food Network

Montgomery

1   2   2   3
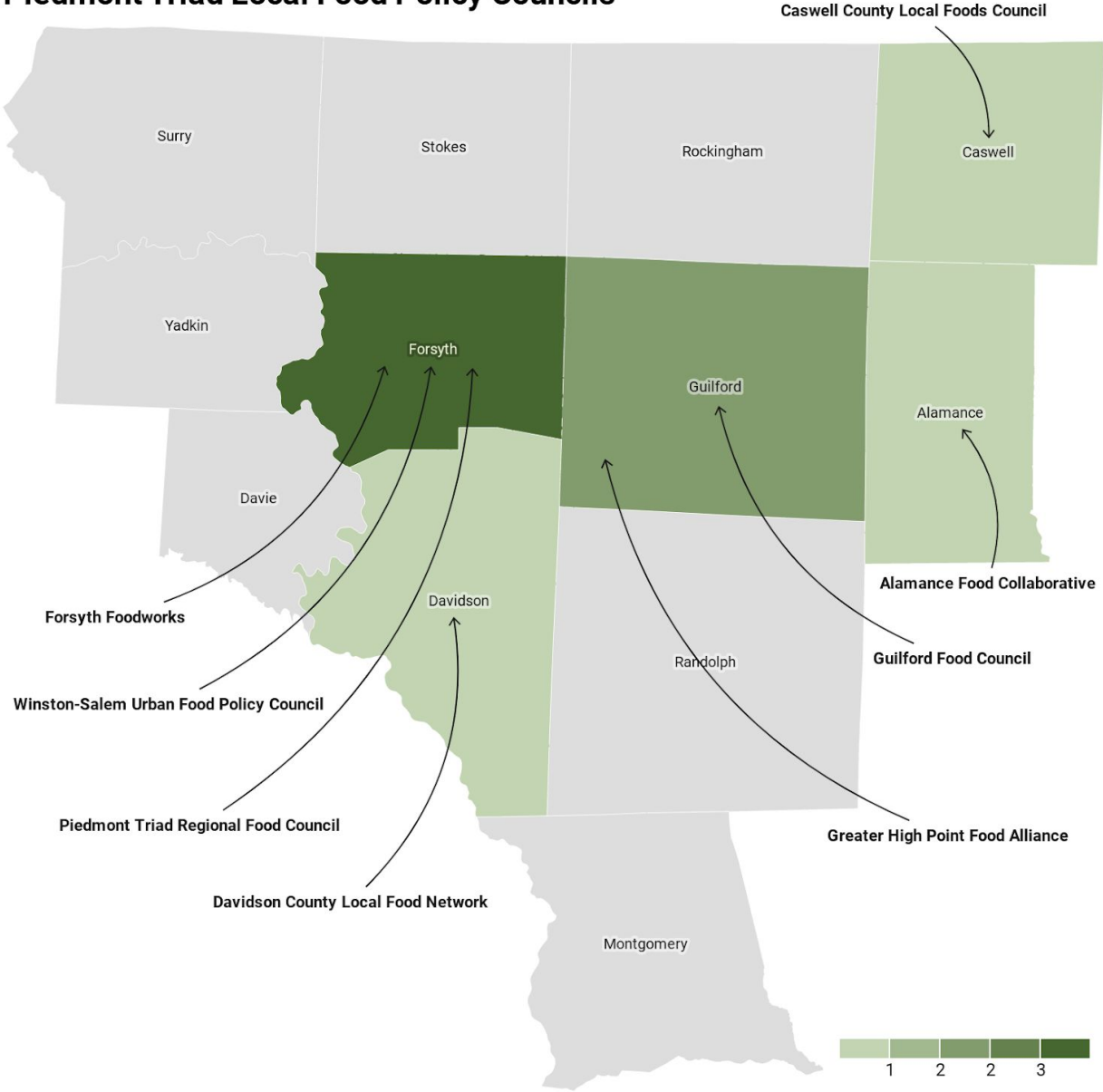
Map: Carolina Creative Works • Created with Datawrapper

Notes about the Data

This data is provided in raw format with address and/or latitude/longitude for mapping by PTRC's GIS department. A full data dashboard was not selected in this contract, so these items have been reserved for future mapping by PTRC.

Grocery stores, health services, and schools were mapped for future institutional purchasing outreach for local food marketing and updated poultry and mobile unit processors were mapped for the region for future processing investment and planning.

Statewide and regional partners are agencies with which PTRFC can work to continue planning and development of the regional food system. County tabs contain Second Harvest Food Bank data on food pantries, churches, nonprofits, and other groups working in food security, and also occasionally include other county partners.

Note that the partners list does not include individual farms or food champions, although these should be considered future partners as well and for privacy reasons are listed in a separate Champions Table. This list focuses on identifying community groups, nonprofits, and advocates who can in turn catalyze the network of individual farms and champions in their respective counties. The partners list also does not include county food & nutrition programs (although it includes public health departments), farmers' markets, individual pantries or church food programs, county aging programs, schools, or local governments, except in cases where no local food agencies exist, in which case the EDC or equivalent has been listed. The above exceptions are mapped elsewhere in the data and should be considered part of regional outreach across all counties.

Note that the Community Gardens list is sourced from NC Community Garden Partners and may not be up to date. This was in the original scope for in-person asset mapping, but can be done via online form when the online dashboard is published.

Note that the Champions Table includes some, but not all, of the recommendations for interviews and focus groups that we received from the PTRFC as a whole throughout the course of the project. Persons who were recommended whose agencies were mentioned elsewhere, such as in the partners list or on another mapped tab, were not duplicated in this list.

Data Sources and Analysis

Most of our data for this sector came from local resources and stakeholder knowledge about the major assets of the region. We provide an overview of these detailed sources under "Additional Resources and References" and will briefly discuss the more institutionalized data sources we used. Additional data notes are provided in the Network Mapping & Directories spreadsheet provided in the appendix.

The U.S. Department of Agriculture (USDA) had twice conducted the Farm to School Census which seeks to understand K-12 school's relationship with the food network, specifically looking at if they have a farm-to-school program and how those programs are built out. Responses are collected on a school district level, and in North Carolina are only available for public schools. We used this data to overview which counties have active farm-to-school programs. Randolph and Rockingham counties did not respond to the Farm to School Census.

All community assets, potential partners, and networks are geocoded and included in the appendix for mapping and sharing by the Council. (A data dashboard and mapping service were proposed, but not

included, in the final contract for this assessment. For more information, see the Community Assets & Network Analysis section.)

Additional Reports and References

- Infrastructure (Regional/Local)
    - Health Departments (12 county, geocoded)
    - Medical Facilities (12 county, geocoded)
    - Colleges (12 county, geocoded)
    - Public Schools (12 county, geocoded)
    - Non-public schools (12 county, geocoded)
- Budget (Regional/Local)
    - 12 County Budget 2018-2019
    - 60 Municipalities Budget 2018
- Transportation (State)
    - Regional interstates, secondary and state roads and freight flows

Food Security

Overview of Food Security Analysis

Our analysis of food insecurity in the Piedmont Triad region considers whether or not residents have the resources and capability to obtain food at the household level, recognizing that local planning and structural inequities play a significant role in food insecurity across the nation and in this region. We also aimed to create a more granular understanding of food security than the county-level data provided by Feeding America's Map the Meal Gap project, and included a snapshot analysis of Second Harvest Food Bank data for the region in order to do so.

It was also important to compare food security data with demographic data and social determinants of health, although this analysis was not comprehensive (there is no existing data collection of this on a census tract or zip code level, and the project did not include a scope to allow for data collection at that level). Instead, we focused on providing a baseline benchmark of food security across the 12-county region at the community level, utilizing snapshot data from mid-2020 from Second Harvest Food Bank, and providing means of analysis for how food security is affected by four SDOH markers of income, education level, unemployment rate, and poverty rate at the county level.

We know that food security and food access are worse in the region - and will likely continue to be so as we move into 2021 with the pandemic still growing. Food banks are seeing more than double the demand from last year as we move into the winter and recent estimates show that nearly 1 in 3 North Carolinians are experiencing food insecurity this year.

Our original scan of the baseline data for this research area showed us that:
- The County Food Environment Index ranges counties from 1-10 for a score of food accessibility, with an average of 6.75 in the Piedmont Triad
- In North Carolina, data exists linking health to be impacted by:
  - Median household income, percentage below poverty, areas of concentrated poverty, the percentage unemployed, and percentage uninsured (North Carolina Social Determinants, 2016).
  - Food Access is a Social Determinant of Health, but the data is limited or nonexistent in most NC counties.

Based on those findings, we scoped the following research questions for this research area:
1. What is the regional baseline for food insecurity? What does this look like geographically?
2. Can we model existing food insecurity data from local food banks and food pantries, Feeding America's aggregated hunger data, and national food desert data from local emergency food resources and other data such as food philanthropy, urban agriculture, community-level or mobile units, and nontraditional food retail?

3. Where are low-to-moderate-income households accessing emergency foods? Healthy foods? What are the barriers they encounter?
4. How does local food access fit into the landscape of diet-related health impacts in the region? Who do these impacts most affect, and who is working to change them?
5. What opportunities exist for regional healthcare agencies to participate in positive food system change? What is currently occurring in public health programming in the region?

In this section, we answer those questions as well as possible given our limited engagement process by providing detailed information about our data sources and analysis, and then examining the baseline data available from national and state sources before providing contextualizing information such as socioeconomic indicators, granular data from regional agencies, and predictions around food security impacts from COVID-19.

2020 Outreach Results

Our survey, interview, and focus group analysis is also used to analyze the pre-COVID-19 data and provide recommendations for how to increase resiliency and equity in addressing food security in the Triad.

The interview and focus group data points to a trend in the growing needs of individuals and families across the region. In addition to increasing access to nutritious, culturally appropriate food, organizations working in food security and access have also increased nutrition education efforts, including successful pilot programs within and in areas adjacent to the Triad, for example pre-diabetes screening programs and local farm partnerships.

Focus group participants also indicated that the COVID-19 pandemic has made it more difficult to source food, adding to the exponential increase in demand. County and municipal leaders noted that Meals on Wheels and other meal programs such as Second Harvest's Summer Feeding Program and Child and Adult-Care Food Program were robust operations working to address food insecurity among the Triad's most vulnerable populations. These local leaders also stated that community partnerships were crucial, specifically in areas of counties with high need and low resources. Notable areas from interviews and focus groups included zip codes 27105, 27107, 27215, 27217, 27253, 27302, 27326, among other areas. The wealth and income disparities in these zip codes and surrounding areas exacerbates the issues surrounding food security. Participants also mentioned that communities of color, immigrant communities, senior communities, and rural communities were those most affected.

An additional obstacle for organizations combating food insecurity is ingrained pride. Many individuals that are in need of food and other resources often express beliefs that they are not "as bad off as their neighbors" or they report knowing someone else or another family that could use the food or resources more. Second Harvest and county WIC/SNAP officials mentioned that these misconceptions make it extremely difficult to serve people to the fullest. Rural communities especially have a strong "neighbor helping neighbor" mentality. While this strength of community and interpersonal connections binds communities, it can also be a hindrance in providing emergency or sustained services. One official stated, "when both neighbors are lacking the basics, neither can help the other. This can often be a coping mechanism for not requesting help." The strong sense of community does come with benefits. There is a

strong knowledge of resources, but the community ties and leaders are not given the power or resources to make or enact significant change.

Triad organizations including Second Harvest seek to best serve community members while also supporting local agriculture and businesses. Bureaucratic red tape and financial regulations and stipulations can cause inflexibility in programs and program spending. This can make it difficult for organizations to source local produce and products. For example, the Summer Feeding Program and the Child and Adult-Care Food Programs have just recently offered waivers meaning the food can now be consumed off-site. Waiting lists are also a malady plaguing many programs. Meals on Wheels reported the long wait lists frustrate members of the senior community, often leading them to not stay on the waitlist. WIC officials stated that they provide recipients with a list of local businesses where nutritious food can be purchased. Transportation becomes a major concern here. A final obstacle Triad organizations noted in addressing food security was fear, particularly among individuals without permanent legal status. The fear of self-exposure and the threat of negative consequences as a result often lead these individuals to go without aid.

Community Health Assessments: Contextualizing Food Security & Public Health

Several counties in the Piedmont region have published and shared their county health assessment, which in some cases, includes insight into food security. Those that had this information were Alamance, Davidson, Guilford, Randolph, Rockingham, and Surry. Alamance County's Health Assessment from 2018, included data that showed 14.7% of Alamance County's total population as being food insecure, or 22,930 residents. Of this group, roughly 82% are income-eligible for federal anti-hunger programs, leaving 18% who are dependent on charitable food assistance. For Davidson County, the information focused on the changes in available healthy foods. In 2015, the healthy available options in restaurants and grocery stores were at 19.2% and by 2018 they were at 46.6%. The Health Department for Guilford shared the Guilford County Health Assessment, which highlighted that there are 26 total food deserts in the county. In some of the food desert areas, there are up to 38% of households without a car. To combat these issues, they are working to install more food pantries and food banks.

Randolph County also tracked their residents' well-being in the Randolph County 2019 Community Health Assessment. It is expressly stated that for Randolph, food security is one of the main issues residents are facing. They are working to address this issue and attempting to find solutions. Rockingham's most recent community health assessment clarified that one of their largest issues around food security is that unhealthy foods are abundant. In the county, approximately 42% of food establishments are considered to be fast food. Surry County's Health Assessment discusses that one of the largest issues for the community in terms of food access is general high cost.

Food Environment Index: Baseline Indices for Future Tracking

The Food Environment Index is a metric that aggregates access to food within a reasonable distance and general access to healthy food options. Significant evidence has demonstrated the importance of healthy food choices in preventing negative health outcomes such as obesity and improving overall physical health performance. In the above map, the scale goes from 0-10, with 10 being the highest score (showing

reasonable access to healthy food options). There are clear divides by county and Rockingham, Guilford, Forsyth, Caswell, and Alamance counties scored lowest in the FEI data; this indicates a need for addressing food deserts, healthy food outlets, and transportation barriers in those counties.

The index includes access to healthy foods by considering the distance an individual lives from a grocery store or supermarket, locations for health food purchases in most communities, and the inability to access healthy food because of cost barriers. There is strong evidence that food deserts are correlated with high prevalence of overweight, obesity, and premature death as supermarkets traditionally provide healthier options than convenience stores or smaller grocery stores. Additionally, those with low income may face barriers to accessing a consistent source of healthy food. Lacking consistent access to food is related to negative health outcomes such as weight gain, premature mortality, asthma, and activity limitations, as well as increased health care costs (see full statistics and explanations here).

Food Environment Index by County (2017)

Shows the Food Environment Index in each county of the Piedmont-Triad. The Food Environment Index combines several indicators of food access to provide an overall metric of access to food.

Food Environment Index
5
9
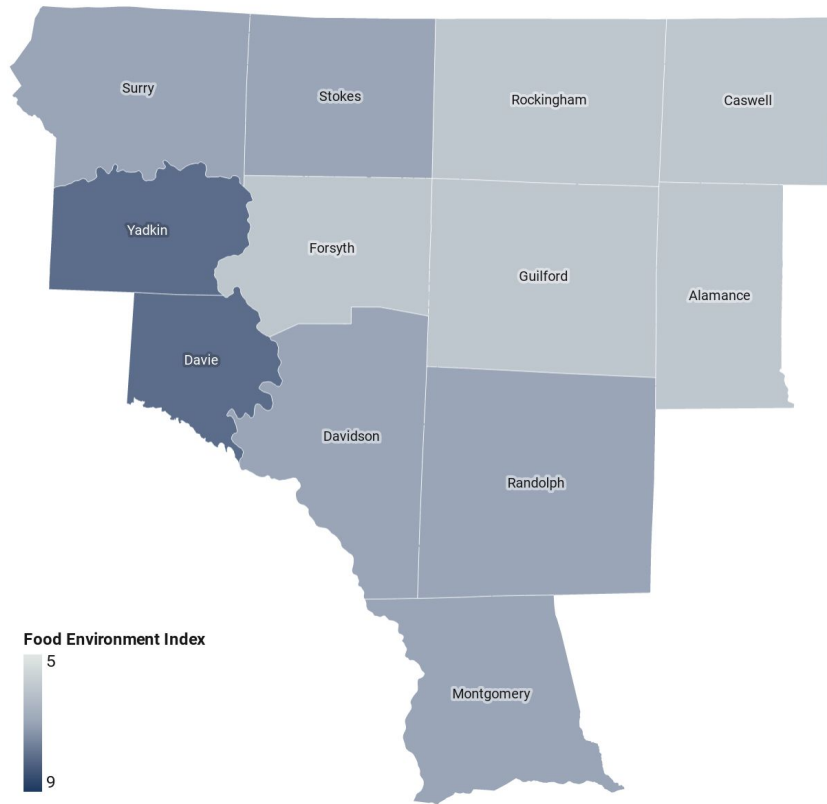
Map: Carolina Creative Works •
Source: Robert Wood Johnson Foundation & the University of Wisconsin Population Health Institute •
Created with Datawrapper

FEI is calculated from 2015 and 2017 data to create 2020 county profiles and is calculated by the University of Wisconsin Population Health Institute. FEI / County Health Rankings has not provided a 2020 update for the FEI nor projections for how the pandemic might impact these calculations, so this information is included as part of the baseline food security assessment.

Social Determinants of Health: County Demographic Analysis

Comparisons below are made to NC 2018 per capita income ($46,117) and demographic comparisons are made within county to county population total.

Alamance's communities of color are almost twice as likely to live below the poverty level as white residents, and the per capita income is only $21,157 - far below the state average. Unemployment among Black communities is twice as high as it is for White, Hispanic, American Indian, and Asian communities. Education levels vary, although over half the population has less than a Bachelor's degree and only 18% of the population holds a Bachelor's degree or higher.

Caswell's communities of color are almost twice as likely to live below the poverty level as white residents, and the per capita income is only $21,692 - far below the state average. Unemployment is highest among the Native Hawaiian and Other Pacific Islander population, roughly 6x higher than the White population. Education levels vary, although most of the population has less than a Bachelor's degree and only 10% of the population holds a Bachelor's degree or higher.

Davidson's communities of color are almost twice as likely to live below the poverty level as white residents, and the per capita income is only $24,231 - far below the state average. Unemployment is highest among the American Indian and Alaskan Native population, which is over double the rate for the White, Asian, and Hispanic or Latino populations. Education levels vary, although most of the population has less than a Bachelor's degree and only 18% of the population holds a Bachelor's degree or higher.

Davie's communities of color are over twice as likely to live below the poverty level as white residents, and the per capita income is only $29,234 - far below the state average. Unemployment among American Indian and Alaskan Native communities is over twice as high as it is for White, Hispanic, Black, and Asian communities. Education levels vary, although over half the population has less than a Bachelor's degree and only 23% of the population holds a Bachelor's degree or higher.

Forsyth's Black, American Indian, Native Hawaiian, and Hispanic communities are over twice as likely to live below the poverty level as White and Asian residents, and the per capita income is only $28,640 - far below the state average. Unemployment among Black and American indian communities is over twice as high as it is for White, Hispanic, and Asian communities. Education levels vary, although over half the population has less than a Bachelor's degree and 34% of the population holds a Bachelor's degree or higher.

Guilford's communities of color are over twice as likely to live below the poverty level as white residents, and the per capita income is only $28,582 - far below the state average. Unemployment among Black and American Indian communities is over twice as high as it is for White, Asian, and Native Hawaiian communities. Education levels vary, although over half the population has less than a Bachelor's degree and only 29% of the population holds a Bachelor's degree or higher.

Montgomery's residents have a high rate of those living below poverty across all ethnicities, over 20%, and the per capita income is only $20,900 - far below the state average. Unemployment among American Indian and Black communities is over twice as high as it is for White communities. Education levels vary,

although over half the population has less than a Bachelor's degree and only 14% of the population holds a Bachelor's degree or higher.

Randolph's Black and Hispanic communities are almost twice as likely to live below the poverty level as White, American Indian, Asian, and Native Hawaiian residents, and the per capita income is only $22,349 - far below the state average. Unemployment is relatively low for all communities, but is highest at 8.09% for Black residents. Education levels vary, although over half the population has less than a Bachelor's degree and only 15% of the population holds a Bachelor's degree or higher.

Rockingham's Black, Hispanic, and Asian communities are almost twice as likely to live below the poverty level as White, American Indian, and Native Hawaiian residents, and the per capita income is only $22,521 - far below the state average. Unemployment is almost double the rate for Black and Asian communities than it is for White, American Indian, Native Hawaiian and Hispanic residents. Education levels vary, although over half the population has less than a Bachelor's degree and only 15% of the population holds a Bachelor's degree or higher.

Stokes' American Indian and Hispanic populations are twice as likely to live below the poverty level as White, Black, Asian, and Native Hawaiian residents, and the per capita income is only $23,500 - far below the state average. Unemployment among Black and Hispanic communities is twice as high as it is for White residents. Education levels vary, although over half the population has less than a Bachelor's degree and only 14% of the population holds a Bachelor's degree or higher.

Surry's Black and Hispanic populations are twice as likely to live below the poverty level as White, American Indian, Asian, and Native Hawaiian residents, and the per capita income is only $22,533 - far below the state average. Unemployment among Black residents is twice as high as it is for White, American Indian, and Hispanic residents. Education levels vary, although over half the population has less than a Bachelor's degree and only 14% of the population holds a Bachelor's degree or higher.

Yadkin's Asian and Hispanic communities are almost twice as likely to live below the poverty level as White and Black residents, and the per capita income is only $23,038 - far below the state average. Unemployment among Black communities is three times as high as it is for White and Hispanic populations. Education levels vary, although over half the population has less than a Bachelor's degree and only 12% of the population holds a Bachelor's degree or higher.

Context Chart: Socioeconomic Indicators & Food Security Rates

The data from the 2017 American Community Survey & the 2017 Map the Meal Gap data (the latest year for which both datasets are available) was used to compare information from Feeding America to make conclusions and determinations about links between the two. This table shows information about those living below the poverty rate, unemployment level, per capita income, and education levels compared to food security rates.

Socioeconomic Indicators and Food Security Rates in the Piedmont Region

🔍 Search in table

County	Adults Below the Poverty Rate	Civilian Population Unemployment Rate	Per Capita Income	Less Than High School Education	Food Insecurity Rate
Alamance	16%	6%	$21,157	15%	14%
Caswell	18%	8%	$21,692	22%	18%
Davidson	15%	8%	$24,231	17%	13%
Davie	14%	6%	$29,234	13%	11%
Forsyth	17%	7%	$28,640	11%	16%
Guilford	16%	7%	$28,582	11%	17%
Montgomery	20%	6%	$20,900	22%	14%
Randolph	15%	6%	$22,349	19%	12%
Rockingham	18%	7%	$22,521	19%	16%
Stokes	13%	7%	$23,500	17%	12%
Surry	16%	5%	$22,533	22%	12%
Yadkin	16%	6%	$23,038	21%	12%

Table: Carolina Creative Works • Source: American Community Survey / Feeding America • Created with Datawrapper

County-Level Food Security Data from Map the Meal Gap (Feeding America)

According to the baseline data that was analyzed from the 2017 American Community Survey and 2018 Feeding America Food Insecurity studies, all counties in the Triad showed high rates of adult food insecurity and child food insecurity rates were even higher, by an average of 8 percent. Children and communities of color were at the highest risk for food insecurity even before COVID-19 hit this year.

This issue has been further impacted by COVID-19, especially during the summer, according to a report by No Kid Hungry. According to the report, parents were struggling to put food on the table for their children as many people were losing jobs during the pandemic. This was worsened as many children were unable to receive food in-person through the Free and Reduced Lunches program. No Kid Hungry reports that although improvements had been made in decreasing the number of children experiencing hunger, COVID-19 has increased that number again. As such, the food insecurity numbers listed in the graphics

below represent the pre-COVID food insecurity, and the rates have likely increased by at least 20-35% given national economists' best estimates.

Projecting Future Food Insecurity Rates with Map the Meal Gap Data

The last available Map the Meal Gap data is from 2018 (released in 2019) from the only national source for food insecurity data, Feeding America's Map the Meal Gap project. However, Feeding America released a 2020 update in October of this year to help communities estimate the impacts of the pandemic and economic closures on food security for this year and for 2021.

FA projected changes to the variables in its model as follows:

> *To predict changes in food insecurity as a result of COVID-19, we have used projected changes to unemployment and poverty, two variables that have a statistically significant effect on food insecurity estimates and are likely to be most directly affected by COVID-19. Table 1 displays the assumptions used for unemployment and poverty at the national level and the food insecurity levels that would result for both the overall population and for children. If the annual unemployment rate averages to 10.5% and the annual poverty rate is 14.4% (20.1% for children), 1 in 6 people (more than 50 million people total), including 1 in 4 children (approximately 17 million children total) will experience food insecurity in 2020. 5 2 To estimate the impact of COVID-19 on food insecurity at the local level, we began with the assumptions described above. Because unemployment has varied across the country, the projected change in unemployment at the local level was adjusted using actual unemployment rates since the pandemic began, while the adjustment for poverty used at the national level was used across all geographies.*

Table 1. National projections of food insecurity and underlying factors for 2020

	Overall Population	Child Population
Projected Annual Unemployment Rate (percentage point increase from 2018)	10.5% (+6.6)	10.5% (+6.6)
Projected Annual Poverty Rate (percentage point increase from 2018)	14.4% (+2.6)	20.1% (+3.9)
Projected Annual Food Insecurity Rate (percentage point increase from 2018)	**15.6%** (+4.1)	23.1% (+4.9)
Projected No. of Food-insecure People (increase in millions from 2018)	50.4 M (+13.2)	17.0 M (+5.8)

Table 1 courtesy of Feeding America Map the Meal Gap 2020 Update Report

We have modeled these projections for each county in the Triad region (adding 2020 estimates to the latest release from FA MMG in 2018) and those results are below.

Feeding America has provided 2020 projections of food insecurity to demonstrate the expected impacts caused by the Covid-19 pandemic. The below charts show the baseline food insecurity rates of 2018 and the projected 2020 food insecurity rates for the overall population and specifically for children. Overall, the food insecurity rate is projected to increase by at least 5% in every county, with the child food insecurity

rate increasing by nearly 10% in every county. The child food insecurity rate appears to be more sensitive to economic shocks than the overall food insecurity rate. Nonetheless, the overall food insecurity rate is expected to significantly increase, despite recent progress in food security.

When looking further into the food insecurity rates, we can see that Caswell, Rockingham, and Surry counties consistently show higher rates than the rest of the region, demonstrating how rural counties often struggle with food insecurity despite having smaller populations. In fact, the six counties with the highest food insecurity rates are all more rural counties.

2018 Food Insecurity Rate by County

County	Rate
Alamance	14.0%
Caswell	15.9%
Davidson	14.1%
Davie	12.6%
Forsyth	13.7%
Guilford	13.9%
Montgomery	14.5%
Randolph	13.8%
Rockingham	15.2%
Stokes	13.0%
Surry	15.0%
Yadkin	13.4%

Chart: Carolina Creative Works • Source: Feeding America • Created with Datawrapper

2020 Projected Food Insecurity Rate by County

County	Rate
Alamance	19.2%
Caswell	21.1%
Davidson	19.2%
Davie	17.7%
Forsyth	19.0%
Guilford	19.0%
Montgomery	19.4%
Randolph	18.9%
Rockingham	20.5%
Stokes	17.8%
Surry	20.4%
Yadkin	18.6%

Chart: Carolina Creative Works • Source: Feeding America • Created with Datawrapper

2018 Child Food Insecurity Rate by County

County	Rate
Alamance	19.7%
Caswell	25.1%
Davidson	20.2%
Davie	19.2%
Forsyth	19.5%
Guilford	19.0%
Montgomery	20.9%
Randolph	20.1%
Rockingham	22.4%
Stokes	20.1%
Surry	21.3%
Yadkin	20.4%

Chart: Carolina Creative Works • Source: Feeding America • Created with Datawrapper

2020 Projected Child Food Insecurity Rate by County

County	Rate
Alamance	29.0%
Caswell	34.2%
Davidson	29.3%
Davie	28.1%
Forsyth	28.9%
Guilford	28.0%
Montgomery	29.3%
Randolph	29.2%
Rockingham	31.7%
Stokes	28.4%
Surry	30.8%
Yadkin	29.5%
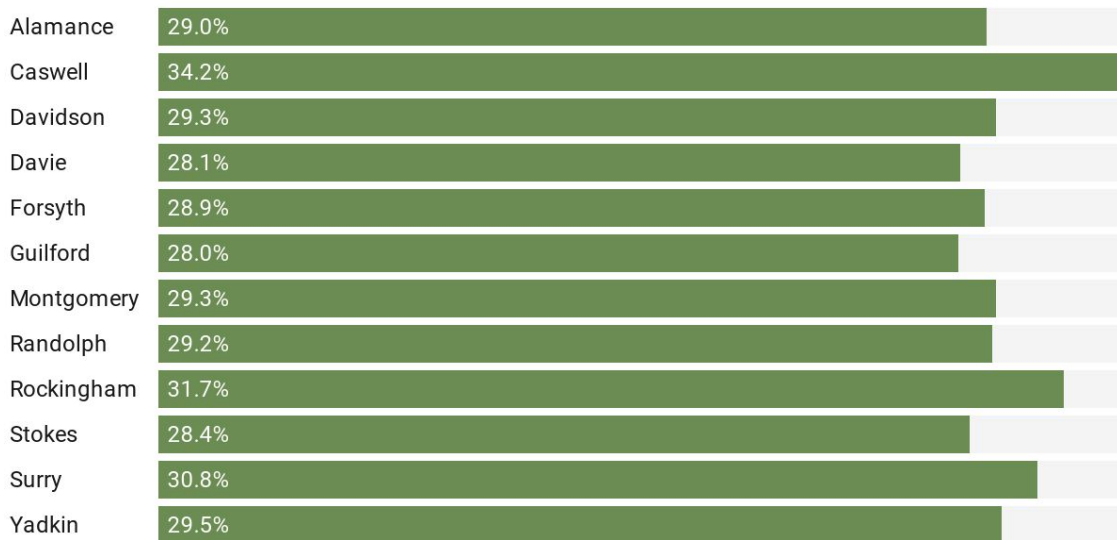
Chart: Carolina Creative Works • Source: Feeding America • Created with Datawrapper

Food Budget Shortfalls: Regional Estimates

According to Map the Meal Gap data, the food budget shortfall for the year 2018 in the Piedmont Triangle region ranged from $1.7 million to $38 million for Triad counties. Given that COVID-19 has more than doubled the national average for food budget shortfalls and that pending economic impacts, such as the expiration of expanded unemployment benefits and student loan deferments, have not yet hit national

datasets, we anticipate that these numbers will be at least 1.5 times if not 3 times higher in 2021. We averaged this to 2.2 times the 2017 numbers and those charts are included below.

2017 Annual Weighted Budget Shortfall

County	Shortfall
Alamance	$11,508,000
Caswell	$1,907,000
Davidson	$9,619,000
Davie	$2,461,000
Forsyth	$28,905,000
Guilford	$45,350,000
Montgomery	$1,793,000
Randolph	$8,271,000
Rockingham	$6,932,000
Stokes	$2,872,000
Surry	$4,378,000
Yadkin	$2,308,000
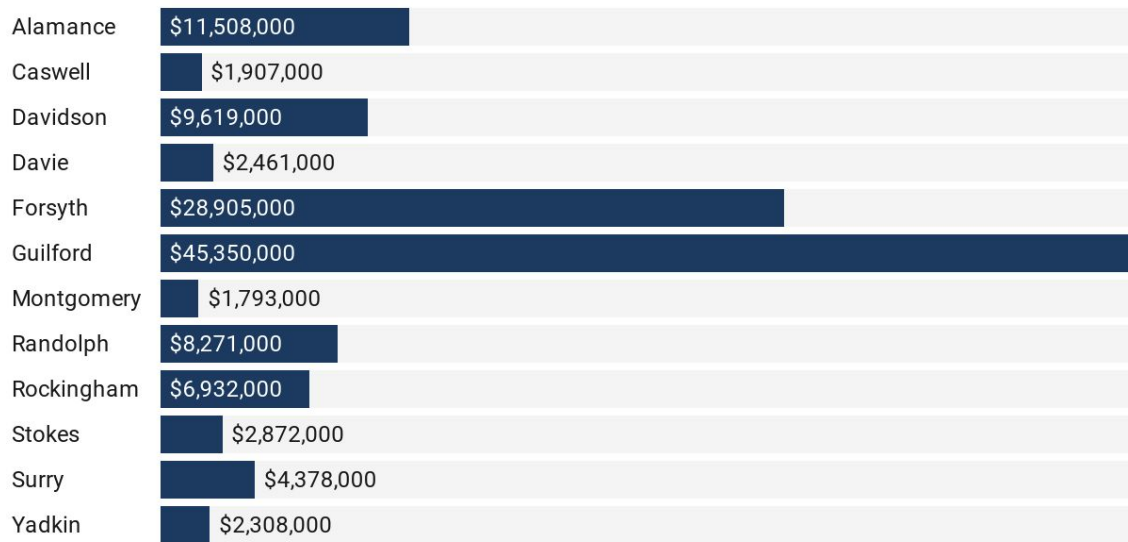
Chart: Carolina Creative Works • Source: Feeding American Map the Meal Gap • Created with Datawrapper

2020 Projected Annual Weighted Budget Shortfall

County	Shortfall
Alamance	$25,317,600
Caswell	$4,195,400
Davidson	$21,161,800
Davie	$5,414,200
Forsyth	$63,591,000
Guilford	$99,770,000
Montgomery	$3,944,600
Randolph	$18,196,200
Rockingham	$15,250,400
Stokes	$6,318,400
Surry	$9,631,600
Yadkin	$5,077,600
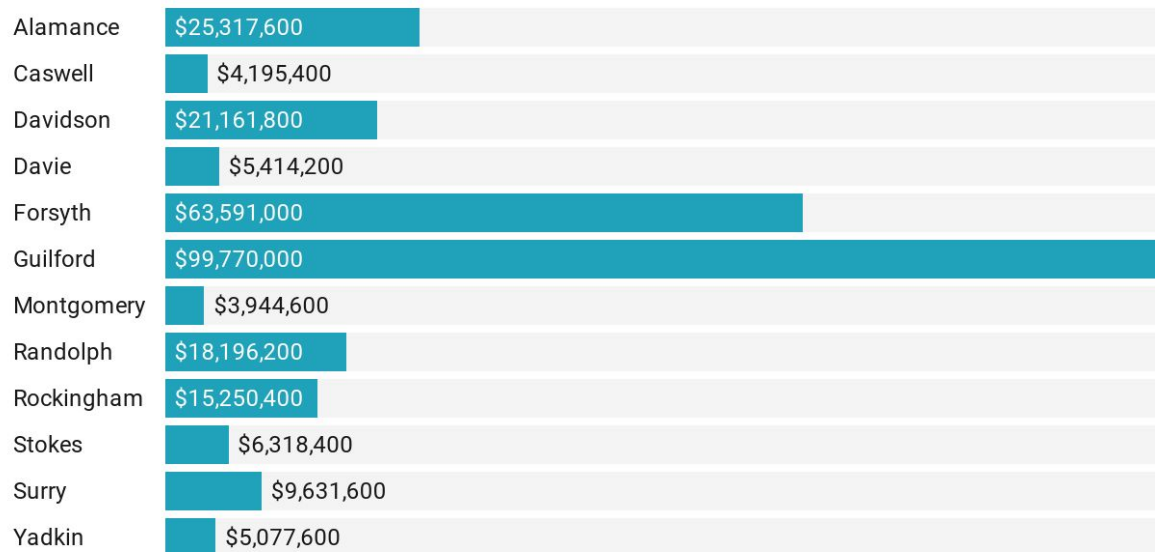
Chart: Carolina Creative Works •
Source: Feeding American Map the Meal Gap and Carolina Creative Works Budget Model • Created with Datawrapper

This figure represents the amount of money needed to feed households that do not have that funding available. Counties with higher shortfalls typically have larger populations; this chart shows the shortfall by county for 2018, the latest year available. Data comes from [Feeding America, Map the Meal Gap](#).

Additional Context: SNAP | FNS Participants & SNAP Retailers

Comparing the Number of Food Nutrition Service Participants in 2019 and 2020
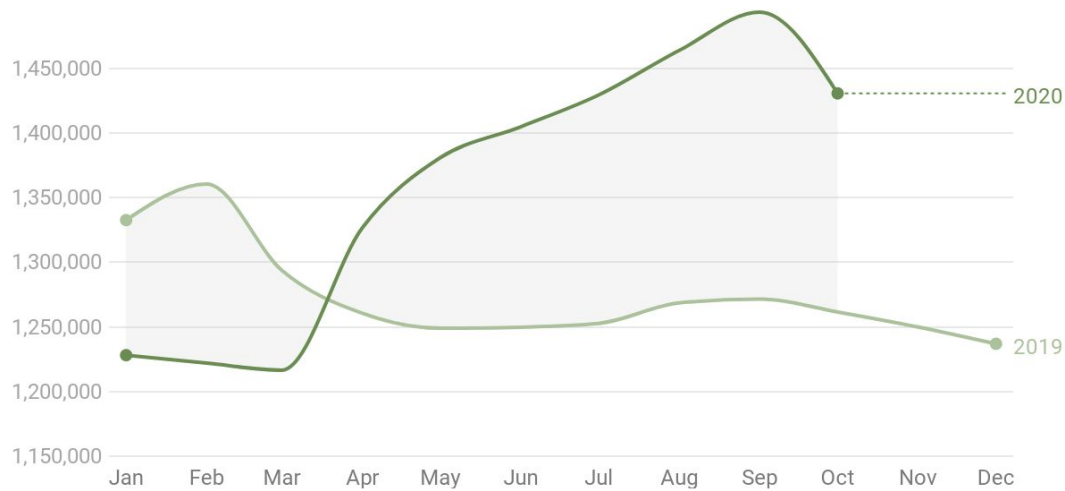
Chart: Carolina Creative Works •
Source: North Carolina Department of Health and Human Services, Food Nutrition Services • Created with Datawrapper

The above figure compares the number of Food Nutrition Service (FNS) participants in the Piedmont-Triad each month in 2019 and 2020. This allows us to understand the impact of Covid-19 on food security in the region. Overall, FNS participants decreased throughout 2019, and continued decreasing in the first quarter of 2020, demonstrating slow improvements in food access. However, the Covid-19 pandemic has reversed that trend, with the total number of FNS participants peaking in September of 2020.

Percent Increase in Food Nutrition Services Participants from October 2019 to October 2020
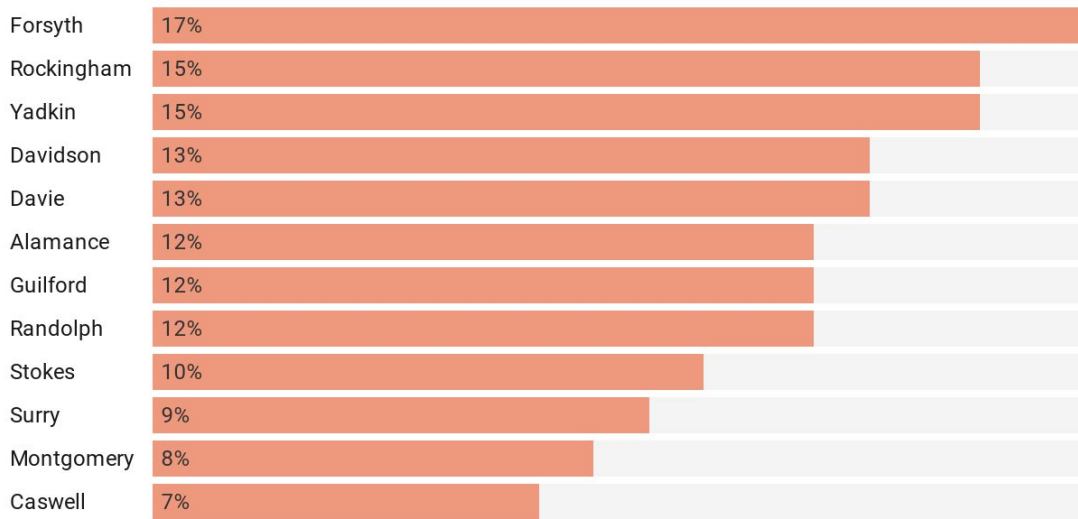
County	Percent
Forsyth	17%
Rockingham	15%
Yadkin	15%
Davidson	13%
Davie	13%
Alamance	12%
Guilford	12%
Randolph	12%
Stokes	10%
Surry	9%
Montgomery	8%
Caswell	7%

Chart: Carolina Creative Works •
Source: North Carolina Department of Health and Human Services, Food Nutrition Services • Created with Datawrapper

The above chart details the increase in FNS participants from October 2019 to October 2020 by county. Here we get an idea of which counties have been most affected by the Covid-19 pandemic. While some counties were less impacted than others, all counties experienced a significant increase in FNS participants, showing the widespread impacts of the pandemic and economic recession on food access.

It is also worth comparing the increase in FNS users to the locations of businesses accepting SNAP benefits. As depicted below, more rural counties – which also showed lower levels of increased FNS participants – have fewer SNAP locations. This could indicate that areas with less access to SNAP participating stores lead to less people participating in the program. All EBT Retailer data is available from https://www.fns.usda.gov/snap/retailer-locator.

Location of Stores Accepting SNAP Benefits
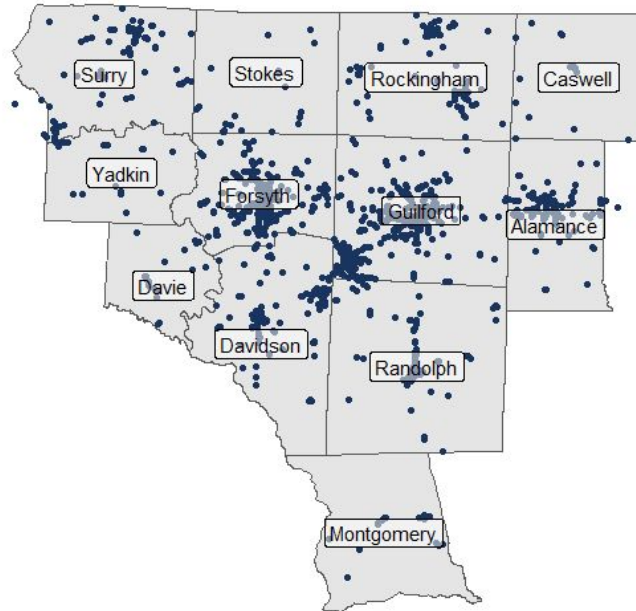
Source: U.S. Depratment of Agriculture Econmoic Research Service

Additional Context: Food Deserts & the Food Environment Atlas

USDA's Economic Research Service tracks two primary food security contributor datasets: Food Deserts and the Food Environment Atlas. Food deserts are mapped from the Food Access Research Atlas in the tables below; the highest area with low access to a food source is in Forsyth County at 37%, while the lowest area is in Montgomery County at 2%. These numbers are also significantly higher for low-income individuals. (Low access areas range from ½ mile to 1, 10, and 20 mile geographic ranges to a grocery store or other outlet with fresh groceries available.)

USDA also tracks the Food Environment Atlas (USDA ERS - Food Environment Atlas) which tracks environmental factors such as store/restaurant proximity, food prices, food and nutrition assistance programs, and community characteristics to see how they interact and influence food choices and food access.

Since both of these datasets are relying on 2015 data, we did not perform further analysis of the collected data but include it as a baseline with recommendations for future benchmarking and surveying to understand changes to these food security factors.

Percent of People with Low Access to Grocery Stores (Food Deserts) - 2015

This chart shows the percentage of people with low access to grocery stores by county. Low access is defined as being further than 1-mile from a grocery store in urban areas, and greater than 10-miles from a grocery store in rural areas.

County	Percent
Forsyth	37%
Alamance	23%
Rockingham	21%
Guilford	20%
Randolph	19%
Stokes	18%
Davidson	17%
Davie	11%
Caswell	8%
Surry	8%
Yadkin	2%
Montgomery	2%
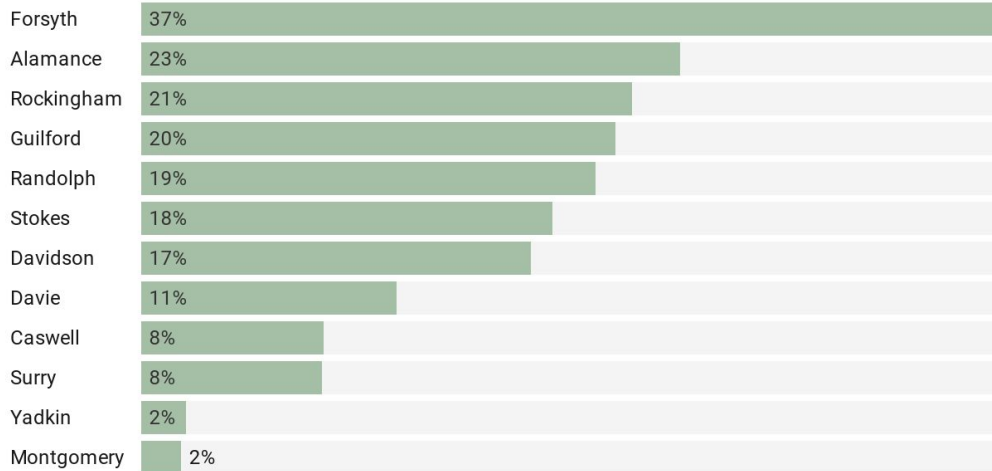
Chart: Carolina Creative Works • Source: U.S. Department of Agriculture, Food Environment Atlas 2017 • Created with Datawrapper

Low Income Individuals with Low Access to Grocery Stores (Food Deserts) - 2015

This chart shows the percentage of low-income individuals with low access to grocery stores by county. Low access is defined as being further than 1-mile from a grocery store in urban areas, and greater than 10-miles from a grocery store in rural areas.

County	Percent
Forsyth	14%
Rockingham	12%
Alamance	10%
Randolph	8%
Guilford	8%
Davidson	7%
Stokes	6%
Surry	3%
Caswell	3%
Davie	3%
Yadkin	1%
Montgomery	1%
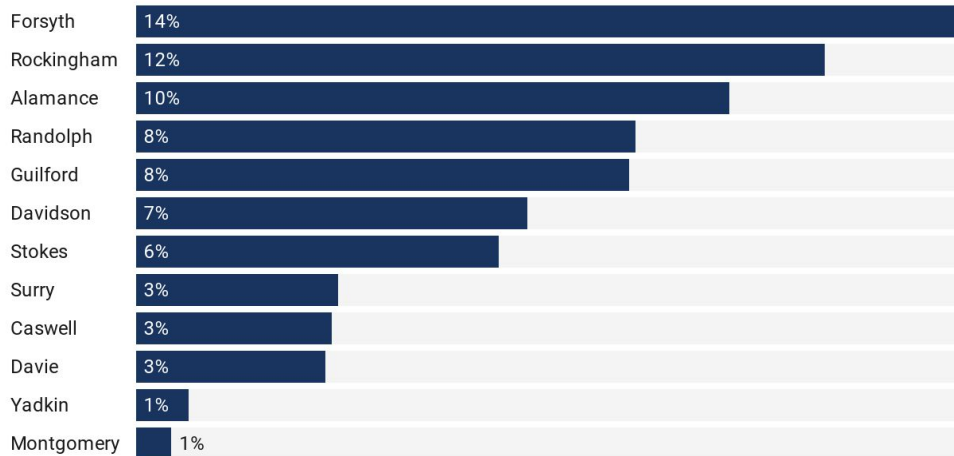
Chart: Carolina Creative Works • Source: U.S. Department of Agriculture, Food Environment Atlas 2017 • Created with Datawrapper

Percent of Children with Low Access to Grocery Stores (Food Deserts) - 2015

This chart shows the percentage of children with low access to grocery stores by county. Low access is defined as being further than 1-mile from a grocery store in urban areas, and greater than 10-miles from a grocery store in rural areas.

County	Percent
Forsyth	9%
Alamance	5%
Randolph	5%
Guilford	5%
Rockingham	5%
Davidson	4%
Stokes	4%
Davie	3%
Surry	2%
Caswell	2%
Montgomery	0%
Yadkin	0%
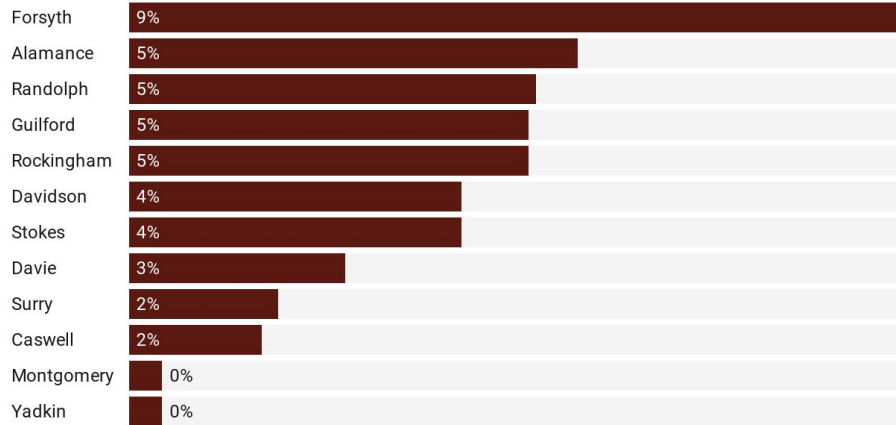
Chart: Carolina Creative Works • Source: U.S. Department of Agriculture, Food Environment Atlas • Created with Datawrapper

Transportation Access: A Major Contributor to Food Security & Economic Strength

Transportation and the lack thereof is a concern for many in the Piedmont. Rural residents without access to reliable transportation experience increased difficulties in accessing food, healthcare, and other basic necessities. This is of significant concern for residents in Caswell, Montgomery, and Stokes counties. While transportation is more readily available for urban residents, there still exist challenges in accessing food, healthcare, and other basic necessities.

Number of Transportation Centers by Zip Code
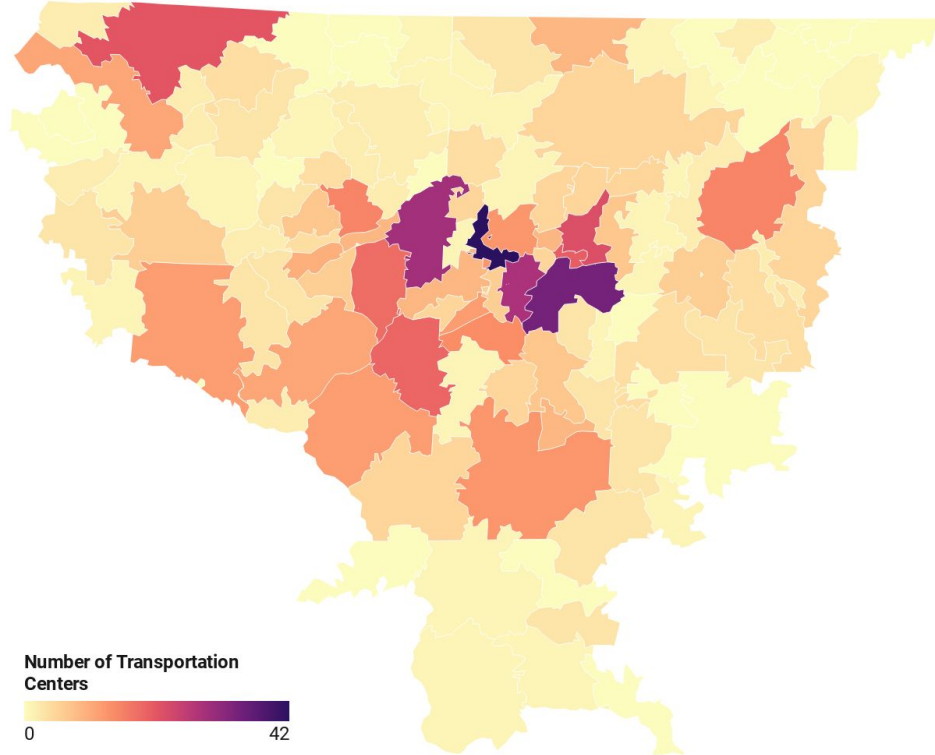
Number of Transportation Centers

0   42

Map: Carolina Creative Works • Source: North American Industry Classification System (NAICS) •
Created with Datawrapper

The map above demonstrates how rural residents in the Triad do not have access to transportation centers. One urban zip code in the region is home to 42 transportation centers, with surrounding zip codes serving residents with fewer transportation centers. Even in urban areas, the concentration of transportation centers is often unevenly distributed.

Contextualizing Hyperlocal Food Security: Second Harvest Food Bank Data

Working with Second Harvest Food Bank of Northwest North Carolina, we utilized a snapshot of data provided through their intake process to provide more granular food security data than is currently available from national sources.

It should be noted that this is not a fully complete dataset, as some counties and programs are not fully onboarded into the data collection process (Davie, Randolph, and Davidson were delayed due to COVID-19). The database utilized is Link2Feed and was migrated to in stages, which means that some counties that joined earlier (Forsyth, Rockingham, and Stokes) have more data in the system, while others that joined later have less (such as Guilford).

This data tracks how many people are using food banks in the Second Harvest network in the Piedmont region (participants are tracked, not just households). In addition to general food bank usage, the data tracked marks the breakdown of usage by demographic, which is outlined in the below charts. As the

pandemic has continued, the demand at regional food banks has doubled and sometimes tripled; given that this is a snapshot of data from mid-summer 2020, we anticipate that these numbers will continue to change over time.

This data collection effort, however, is a commendable effort to increase awareness about specific community needs across the region, and also offers an excellent opportunity for PTRFC to partner with another regional agency to better understand and work to provide solutions for food insecurity across the Triad. Based on our findings, 262,777 people utilize food banks in the Piedmont Triad Region. The zip code with the highest number of participants was 27105. In terms of total percentages, for each zip code, the use of food banks was highest for the White and Black communities.

Maps in this section are static images of the data we provide in interactive form in the online report.

Number of Food Bank Participants by Zip Code

It is challenging to show the full extent of this data using a map. For example, darker areas on the map may have more participants simply because there are more people living there. However, this map does provide some insight on rural areas with high numbers of food bank participants.
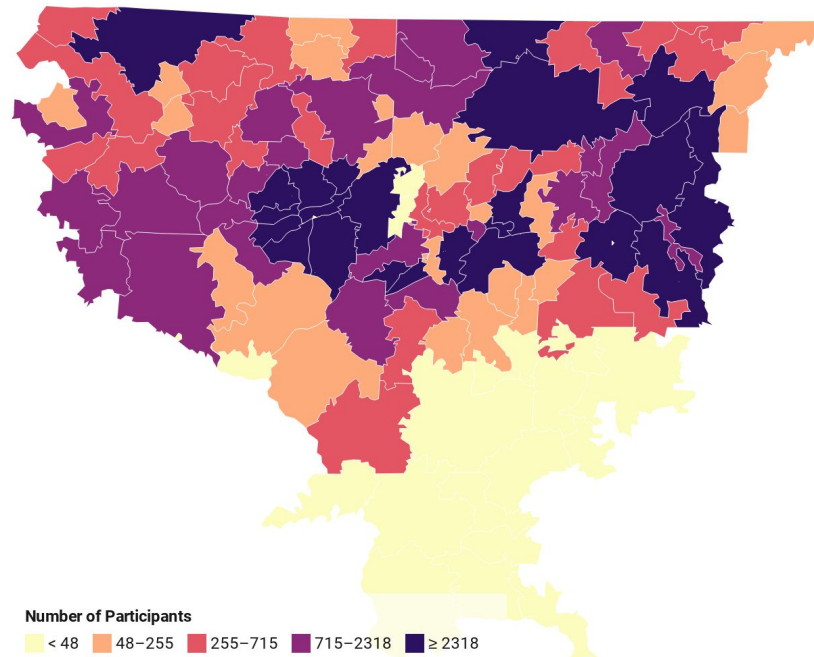
Number of Participants

< 48   48–255   255–715   715–2318   ≥ 2318

Map: Carolina Creative Works • Source: Second Harvest • Created with Datawrapper

Percent of Food Bank Participants Identifying as Black/African American by Zip Code
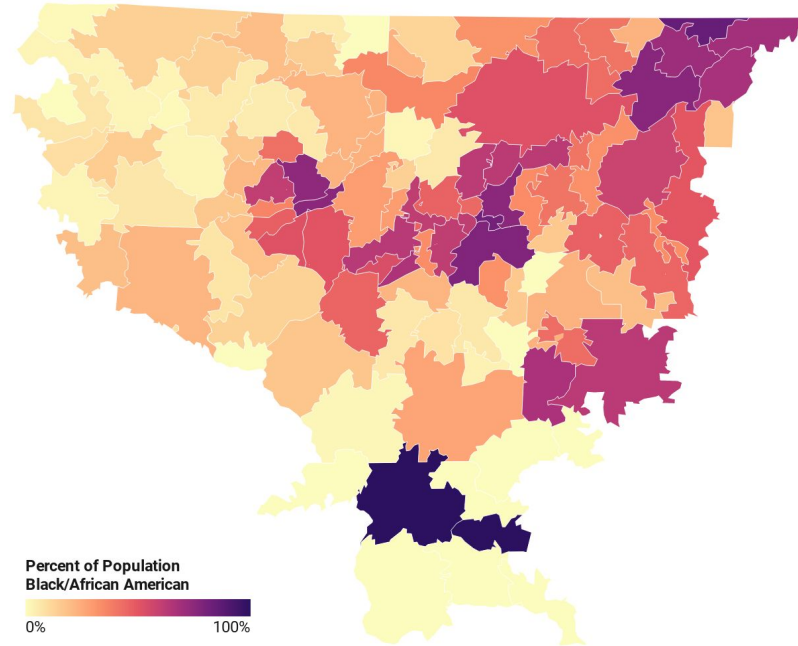
Percent of Population Black/African American

0%   100%

Map: Carolina Creative Works • Source: Second Harvest • Created with Datawrapper

Percent of Food Bank Participants Identifying as Hispanic/Latinx by Zip Code
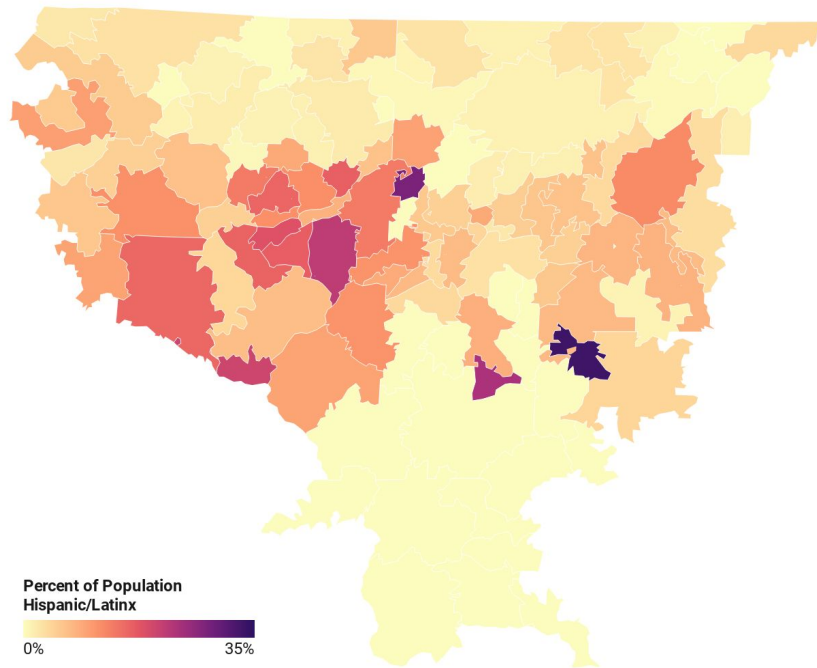
Percent of Population Hispanic/Latinx

0%   35%

Map: Carolina Creative Works • Source: Second Harvest • Created with Datawrapper

Percent of Food Bank Participants Identifying as Native by Zip Code
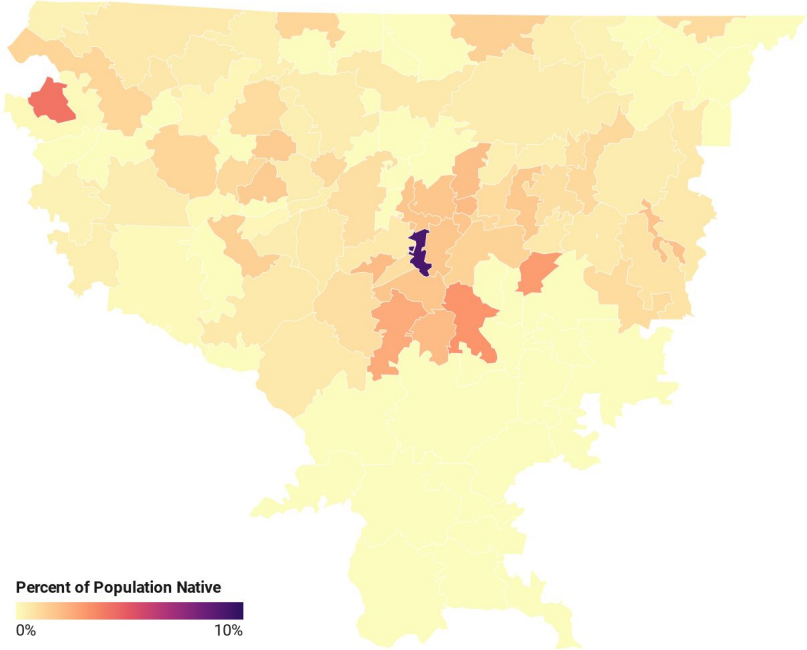
Percent of Population Native

0%   10%

Map: Carolina Creative Works • Source: Second Harvest • Created with Datawrapper

Percent of Food Bank Participants Identifying as White by Zip Code
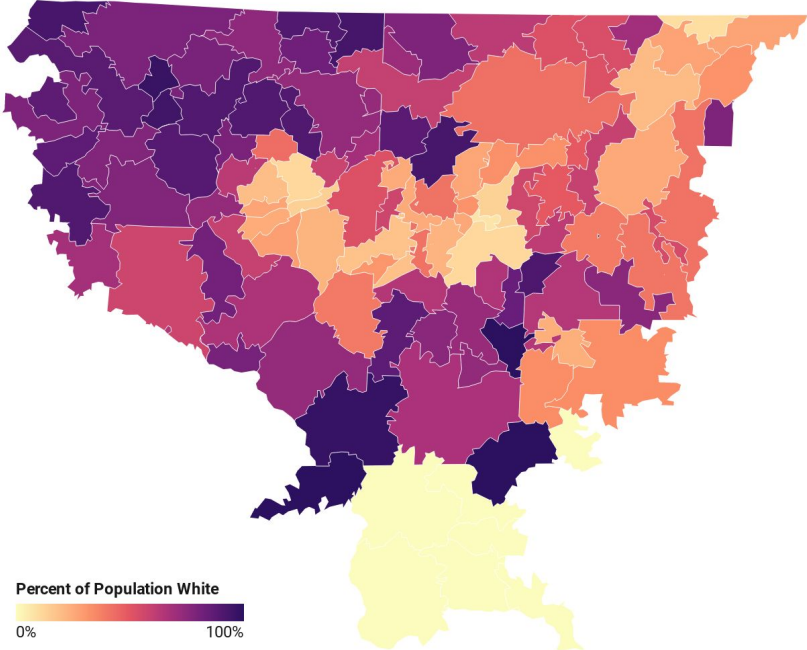
Percent of Population White

0%   100%

Map: Carolina Creative Works • Source: Second Harvest • Created with Datawrapper

Data Sources and Analysis

Feeding America Map the Meal Gap provides county-level data for the entire country describing several indicators related to food security, including food insecurity rates and child food insecurity rates. This data represents the status of food insecurity as of 2017 and provides a baseline for our assessment.

The Economic Research Service of USDA releases the Food Environment Atlas periodically, outlining wide-ranging data regarding individual's proximity to food, the number of food sources by county, and the number of people receiving food-related assistance within counties. We focused on their measures of access to food to demonstrate food deserts in the PTRFC region. This data is available for the entire country on a county-level basis.

The American Community Survey (ACS) is one of the most utilized and most robust sources of data in the US. Each year, the ACS surveys 1% of the population on a long list of wide-ranging issues, from personal demographics and economic standing, to commuting patterns and household characteristics. The ACS also provides 5-year estimates, combining five years of survey responses to cover 5% of the population. Through this, they seek to demonstrate patterns in the entire population, down to the census block level. For this project, we looked at the 2017 ACS 5-year estimates regarding the age, sex, race, ethnicity, poverty rates, and other demographic and economic indicators, all on a county level. We focused on social determinants of health (per capita income, unemployment, education levels, and percentage at or below poverty level) that could be used to help contextualize the available food security data.

To supplement the above sources, we worked with Second Harvest Food Bank of Northwest North Carolina to anonymize and analyze a snapshot of their intake data from early summer 2020. This data allowed us to look at the number of food bank participants by zip code, including their racial identification and participation in any government-provided services, such as SNAP and Medicaid. This data is self-reported, so there are anomalies in the data that we worked to address.

The North Carolina Department of Health and Human Services (NC DHHS) releases data on the number of participants in Food and Nutrition Services (FNS) by county each month. We used this data to demonstrate another measure of food insecurity, looking both at baseline data from 2019 and more recent 2020 data to understand the impacts of Covid-19 on FNS participants.

The Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute use data from the American Community Survey (ACS) and Feeding America to construct a Food Environment Index. This involved taking multiple indicators related to food access and combining them into one value that provides an overall assessment of access to food. More details about the methodology and access to the data can be found on the [County Health Rankings and Roadmaps](#) website.

Additional Reports and References

- Forsyth County Community Food System Plan (2013)
- Greensboro Fresh Food Access Plan (2015)
- PolicyMap, USDA, and reinvestment.org data

A note on food security data: currently, this metric is only reliably tracked at the national level on a county structure by the Map the Meal Gap project, and these rates are not broken down by demographic or other indicators. Other related metrics, such as most social determinants of health, are tracked through the US Census through American Community Survey data on a much more granular level, but food security rates for children and adults are only available from MMG. We realize the council wanted to get granular level data whenever possible, and we worked with Second Harvest to do so. However, we provided this on a zip code level rather than on a census tract level for a number of reasons: it is easier and more accessible for people throughout the region to utilize and understand zip codes relevant to their own communities and it is less "messy" than trying to aggregate down from zip codes to census tracts when we're using only a single localized snapshot and maintaining anonymity for participants in that dataset.

Agricultural Production

Farm and Food Production Overview

Our analysis for both economic opportunities and supply chain opportunities required a thorough examination of where, how, and by whom food is being produced across the region. This included both farming and agricultural enterprises and value-added operations, such as processing. Because of the adjustments to our research design due to the COVID-19 pandemic, we centered pre-COVID-19 data to create a baseline for system change that emphasizes the known inequities in agriculture and in food production and recommends benchmarks for future tracking.

For this component of the assessment, the following research questions guided our analysis:

- What is the capacity of the Triad's existing farmland for production?

- What is the baseline of value-added and food-associated businesses in the region?

- What is the economic gross value of agriculture + food business outputs in each county and the region as a whole? What is the breakdown of these sales channels (local, regional, out of region markets)?

- What gaps exist in the infrastructure to support increased production of food and food products? What barriers are there to entry to these businesses or to expansion of existing businesses? What public programs support business expansion in these industries, and are they effective?

- What populations are excluded from these economic opportunities? What workforce data is available, and are there workforce opportunities or challenges that should be considered?

To address these questions, we selected a number of methodologies:

- Demographic analysis by business income, by acreage owned, and other economic indicators

- Comparative demographic analysis to overall county and region

- Direct survey and outreach to farmers and food businesses

- Outreach and data sharing with trade associations

- Interviews and focus groups with experts in the field, including Cooperative Extension offices in all twelve counties and at the regional level

- Focus groups with Small Business Centers and associated experts

This section focuses on a comprehensive analysis of agricultural production and an overview analysis of non-agricultural food production, which is covered in more detail in the Market Analysis and Economic Impact Assessment section of the report.

Overview of Agricultural Analysis & Data Sources

For most pre-COVID-19 data on agriculture, we utilized the National Agricultural Statistics Service (NASS) of USDA, which releases the Agricultural Census every 5 years. The Agricultural Census has varying levels of information depending on the geography and relies heavily on algorithmic modeling for counties with small numbers of farmers reporting. For this project, we focused on county-level data regarding the demographics of principal farm operators, the number of acres farmed, the amount of production by county, and the number of acres leased versus owned. We used the 2017 Agricultural Census, which served as the baseline year for much of our data. We also incorporated some data from NAICS and the NC Local Food Infrastructure Inventory, as well as the University of Illinois Food Flow Mapping discussed in the Supply Chains section. Our survey, interview, and focus group analysis is also used to analyze the pre-COVID-19 data and provide recommendations for how to increase resiliency and equity in production systems in the region.

Please note: we did not provide crop-based agricultural analysis of the 2017 Ag Census as those profiles have already been done by NC Cooperative Extension and can be found at Resource Highlight: Updated Local Farms and Food Profiles | NC State Extension (ncsu.edu). Links to these resources are also provided in each County Profile & Policy Toolkit.

Overview of Food Production Analysis & Data Sources

For food production, we focused on NAICS data by industry and selected over 200 industries associated with the food system economy. We filtered and analyzed this data by county and by business, translating important sectors into mappable zip code data and analyzing the geographic distribution of food economy and food wealth. We also utilized information from the NC Local Food Infrastructure Inventory, the NC Manufacturing Report (via NC Department of Commerce statistics) and the Cluster Mapping Project (for food processing and manufacturing industries). Our survey, interview, and focus group analysis is also used to analyze the pre-COVID-19 data and provide recommendations for how to increase resiliency and equity in production systems in the region.

2020 Outreach Results: Agriculture & Food Production

The interview and focus group data strongly support indications that agriculture production is changing in the region. Focus group participants noted that the conventional and traditional family farms in the region are seeking innovative approaches to modern agriculture, including diversifying operations. Many farmers and agriculture extension agents in the Piedmont Triad pointed to an increase in interest and entrance into the hemp industry as one such change. Each of the region's 12 counties reported an increase in farming interest, particularly among new or young farmers. Significant challenges for new or young farmers and producers include diminishing available land, limited capital or resources, and limited understanding or knowledge.

There are many innovative practices and initiatives occuring in the Piedmont Triad to address farm and food production challenges, namely:

- Piedmont Community College and Caswell County are partnering to create the Center for Education and Agriculture Development (CEAD). CEAD's focus on economic development and agriculture education will also offer a farm incubator program.

- Forsyth and Guilford counties, as well as colleges and universities (i.e. Guilford College), lead the region in urban agriculture and food production initiatives.

- Alamance is home to at least three meat processing facilities.

Participants also noted that education is key for success for farm and food production. Farmers in the area note that customers also need to be educated on the produce and how to best prepare it. While the interest in purchasing locally has increased during COVID-19, many customers do not fully realize the potential of the variety of fresh seasonal produce provided. Farmers also indicate that consumers need to be educated on fruit and vegetable expectations and how to determine appropriate ripeness.

Meat production and processing has been significantly impacted. Meat processors in the region and across North Carolina have experienced an enormous uptick in demand for processing, which translates into appointments. As a result, a number of locally-owned and operated meat processing facilities are booked through 2021 and have just recently started accepting reservations for 2022. This indicates a great need for more processing facilities. However, there are significant impediments, namely zoning restrictions and a "not in my backyard" mentality. PTRFC can serve as an advocate for meat processors in the region and work on their behalf. In addition to creating more processing opportunities in the region, there is need for further development in regional infrastructure to support regional distribution.

The greatest equity issues facing farm and food production in the area, according to our participants, include:

- Access to capital and ability to find and obtain funding, especially among BIPOC farmers. The price of land continues to steadily increase.

- Decreasing and limited access to land with increasing land development is the greatest competing factor.

- Lack of representation for women and communities of color.

COVID-19 Impacts on Farmers and Food Producers

Data from ASAP and Carolina Farm Stewardship Association estimate that before the pandemic almost 70% of farmers in the state sold at farmers' markets for part or all of their revenue stream. However, CFSA's examination of COVID impacts demonstrated that sales fell for 76% of local farms because of the pandemic.

Despite attempts at relief from the federal government, many programs aimed at mitigating the impacts of COVID-19 on farmers have not been successful, particularly for underrepresented communities and

communities of color. Many administrative errors in the distribution process made it harder, not easier, for less-resourced farms to access PPP and EIDL funding through the CARES Act. (For more on how small farmers were left behind in the COVID-19 Relief Package, see this article from NBC.) Further, COVID-19 recovery funds were not equitably shared or distributed, according to recent analysis: the top 1% of recipients received over 20% of the funds, which comes out to over $1 billion. These funds likely helped already high-income farms, but left many middle- and lower-income farms out to dry.

Several industry associations and leading companies, including the United Food and Commercial Workers Union, DHL, and the American Freight Association, released their own reports highlighting the national pandemic impacts on food production industries. A full global analysis of the impacts on grocery, retailing, and marketing sectors worldwide is summarized here. We have included summaries of these data where possible throughout this report, and emphasize that the supply chain interruptions and resiliency modeling are both short- and long-term issues for all food systems to address - not just the Triad region.

Agricultural production wasn't significantly impacted this year by the pandemic, as it began after the planting season, but it is expected to be impacted for next season's production. However, value-added production, supply chains, and small- and large-scale markets have all been affected by the pandemic and related closures, and industry experts warn that this will have long-term implications for the food industry as a whole. For 2021, projections rely heavily on the widespread availability of a vaccine and the lack of further shutdowns to contain the spread of the virus, but this is far from certain. National estimates are for nearly double the 2019 unemployment rate in spring 2021 across all industries - and this will significantly affect food processing, distribution, storage, and supply chains, as well as the overall market value of local foods. Where possible, we included projections in these areas with significant caveats about those predictions.

Regional Summary: Agricultural Production

Farm and food production varies greatly across the 12-county region, more specifically along the rural/urban divide. The Piedmont Triad area is home to conventional and traditional family farms and livestock production.

Urban areas are home to smaller, localized urban farming operations consisting of both microfarms and community gardens. Livestock production continues to play a significant role in the Piedmont Triad's agriculture landscape, with a significant concern now being meat and poultry processing.

Agritourism, including vineyards and you-pick orchards and farms, is positively impacting family farm operations, farm revenues, and the ways in which the general public interact with agriculture.

- There are over one million acres in the Piedmont Triad that are being operated on in a farming capacity with 9,408 farms total (AGCensus, 2017).

- The 12-county Piedmont Triad region sold $1,072,818,000 in agricultural products in 2017. Top products in terms of revenue included Poultry and Eggs, Tobacco, Nursery and Greenhouse, Cattle and Calves and Milk from Cows (AgCensus, 2017).

- Well over ⅔ of these farms are small farms bringing in up to $100,000 (8,471 farms); there are 156 farms making between $100,000-$250,000 and another 688 farms making over $688,000.

- Prior to COVID-19, we noticed an unsettling difference in the reported number of farms from the 2012 Ag Census to the 2017 Ag Census. The overall number of farms in both Surry and Randolph counties decreased catastrophically. This decrease in farmland was also supported from individual interviews and focus group data, where participants indicated that the sharp decline in farms in these counties was of concern and importance, especially in terms of local economies and food products availability. Increased development in both counties and an aging farming population with fewer young farmers entering the field are the two main causes for the overall decline reported.

The following sections explore in more detail what the Triad's farms produce, agriculture's economic impacts in the region, and agricultural demographics of regional farmers.

About the Triad's Farms: Farm Production Totals by County & Type

The total number of acres in production in the Triad region is well over a million, operated by almost 9,500 farms and bringing in more than $1 billion in sales in the latest data available. Randolph and Surry showed the highest sales annually in animal production, while Surry and Guilford were the highest sales annually for edible crops. Randolph, Surry, and Montgomery led all counties for sales of commodity (non-edible) crops annually.

The net reported income for farms - a very different calculation than the sales numbers listed above - ranged from over $99 million in high-livestock production and commodity production in Randolph County to a negative $474,000 in Forsyth. Rural counties claimed a lion's share of the sales dollars across all agricultural categories - over 60% of all sales in the region.

For detailed infographics for your county and the region, please visit 2017 Infographics/County Ag Profiles – Center for Environmental Farming Systems (ncsu.edu).

Number of Acres Operated by County in 2017

County	Acres
Surry	152,452
Randolph	147,781
Rockingham	124,613
Caswell	104,882
Stokes	92,904
Davidson	92,359
Yadkin	87,522
Alamance	80,042
Davie	76,933
Guilford	76,352
Forsyth	34,801
Montgomery	33,521
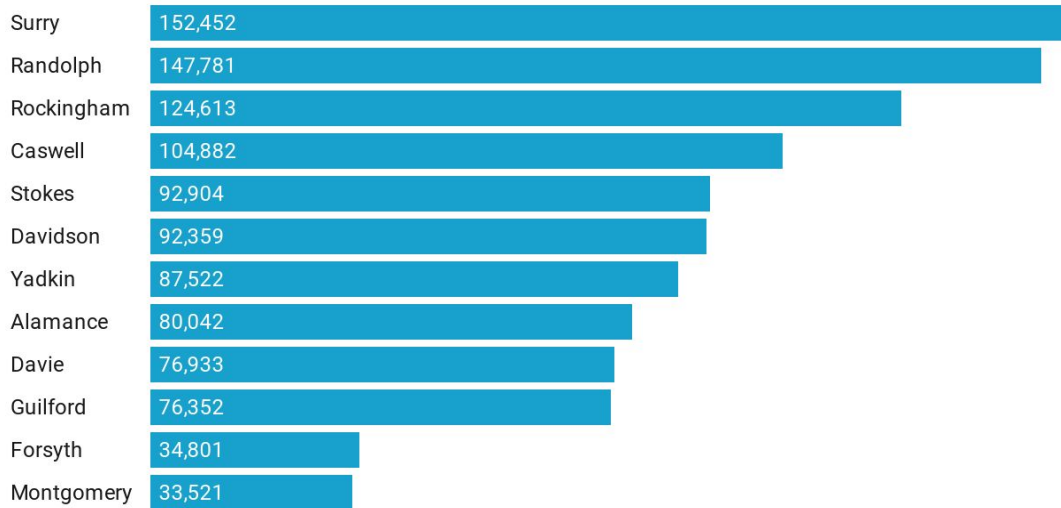
Created with Datawrapper

Animal Product Sales in 2017

County	Sales
RANDOLPH	$253,913,000
SURRY	$180,712,000
MONTGOMERY	$135,099,000
YADKIN	$112,406,000
DAVIDSON	$30,847,000
STOKES	$30,002,000
ALAMANCE	$27,011,000
GUILFORD	$19,357,000
CASWELL	$16,813,000
DAVIE	$14,551,000
ROCKINGHAM	$9,732,000
FORSYTH	$1,628,000
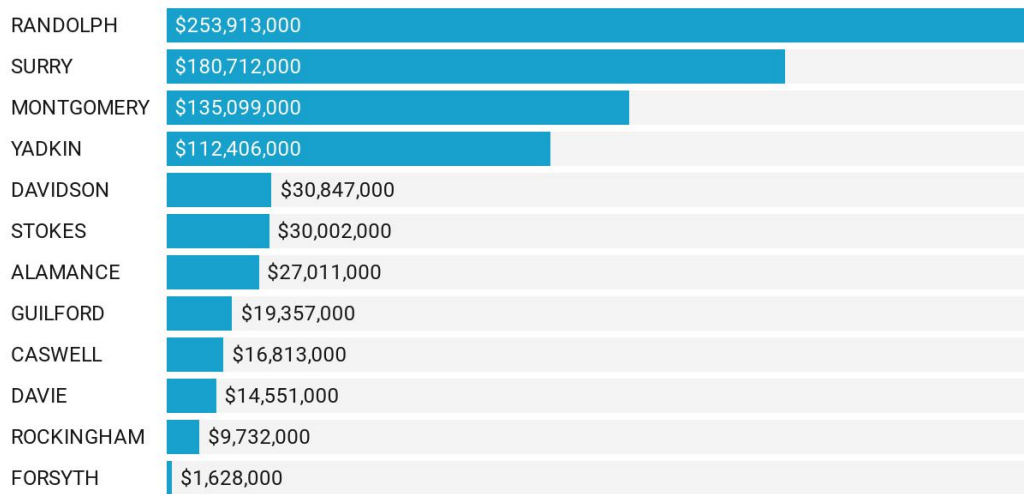
Created with Datawrapper

Crop Product Sales in 2017

County	Sales
SURRY	$49,393,000
GUILFORD	$32,829,000
ROCKINGHAM	$29,340,000
RANDOLPH	$27,943,000
YADKIN	$27,245,000
CASWELL	$21,113,000
DAVIDSON	$16,223,000
ALAMANCE	$14,739,000
STOKES	$12,420,000
DAVIE	$12,380,000
FORSYTH	$9,275,000
MONTGOMERY	$8,205,000
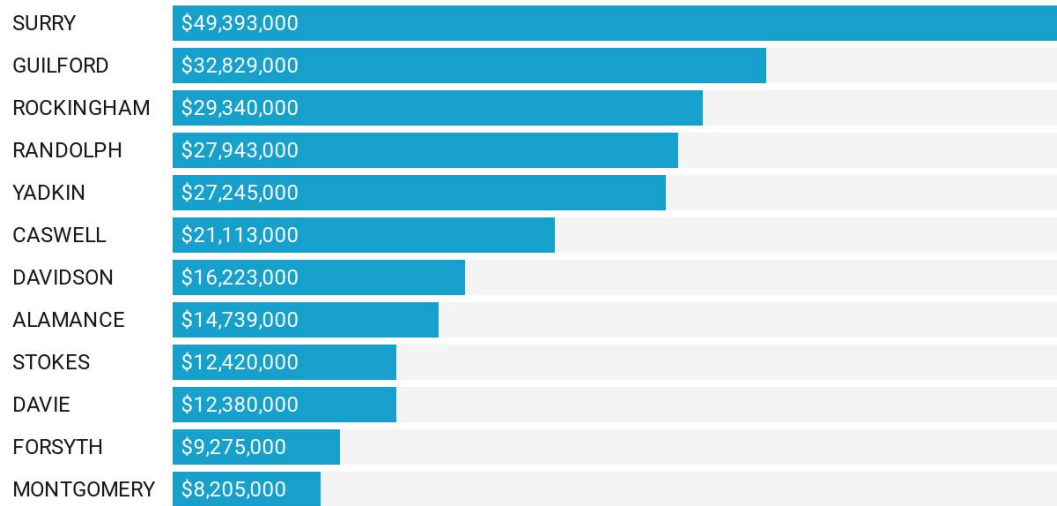
Created with Datawrapper

Commodity Product Sales in 2017

County	Sales
RANDOLPH	$281,856,000
SURRY	$230,105,000
MONTGOMERY	$143,304,000
YADKIN	$139,652,000
GUILFORD	$52,186,000
DAVIDSON	$47,070,000
STOKES	$42,422,000
ALAMANCE	$41,749,000
ROCKINGHAM	$39,072,000
CASWELL	$37,926,000
DAVIE	$26,931,000
FORSYTH	$10,903,000
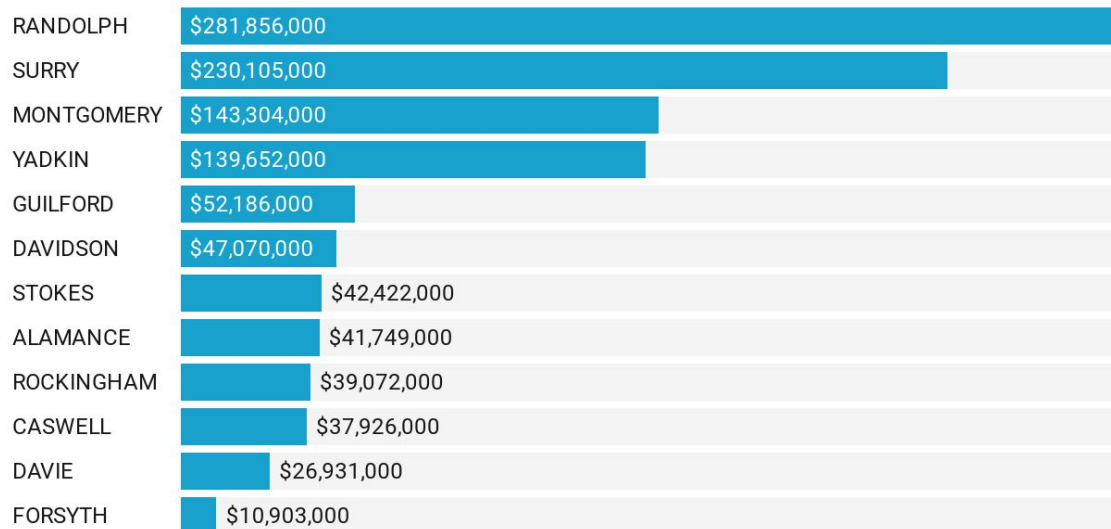
Created with Datawrapper

Net Income of Farms in 2017

County	Net Income
RANDOLPH	$99,575,000
SURRY	$75,420,000
MONTGOMERY	$50,323,000
YADKIN	$46,548,000
DAVIDSON	$12,812,000
ROCKINGHAM	$10,497,000
STOKES	$9,866,000
CASWELL	$9,720,000
GUILFORD	$8,140,000
ALAMANCE	$8,036,000
DAVIE	$4,797,000
FORSYTH	−$487,000
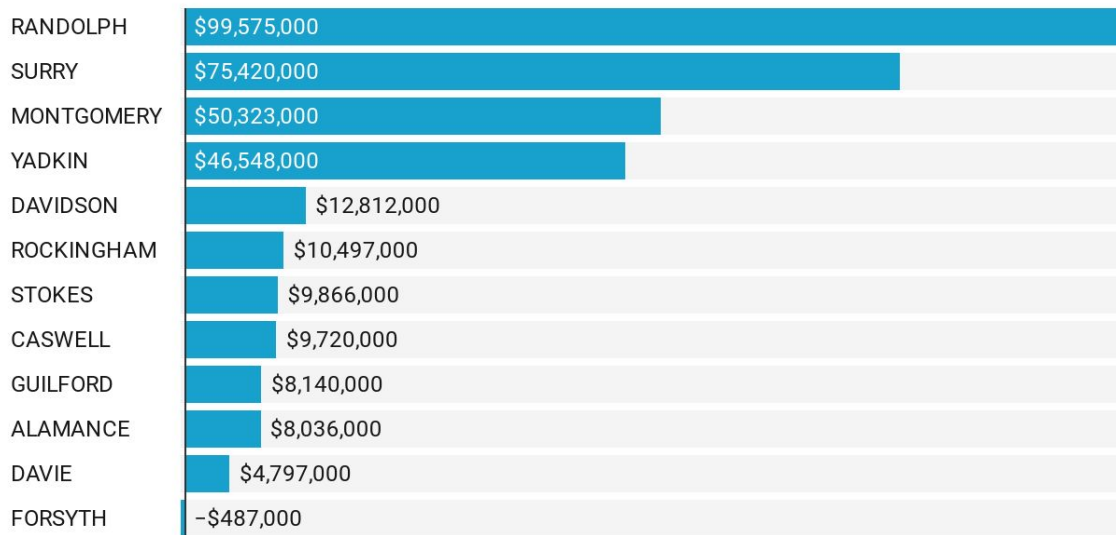
Created with Datawrapper

About the Triad's Farms: Urban Farms and Community Gardens

In 2013 Forsyth County created their County Community Food System Plan, and in 2015 Greensboro created the Fresh Food Access Plan. Forsyth County made it one of their goals within the plan to improve urban farming through training and improved connections. Greensboro's plan addresses ways to improve urban farming. Specifically, they updated their Land Development Ordinance to "…establish a framework for the creation of free-standing community gardens and urban farms within the city limits, making it easier for private entities to initiate these types of uses." They also had urban farmers within the committee shaping the plan, which improved insight for adjustments. Both metro areas have the highest concentration of urban farms in the region, along with the highest numbers of community gardens. Similar policies are an easy way to stimulate small-scale and microfarming in both rural and urban settings.

Urban farming has grown with the popularity of community gardens. Based upon the information from the North Carolina Community Garden Partners, the Piedmont region has over forty community gardens. In all, Alamance has one, Davidson has one, Forsyth has nine, Guilford has twenty-four, Randolph has two, Rockingham has one, and Stokes has two. Guilford has the most at the time but as popularity continues to grow, there will likely be higher numbers in each county going forward. Urban garden maps are provided in the Network Maps & Directories dataset as an appendix to this report.

About the Triad's Farmers: County Agricultural Demographics

Each county's agriculture census data was analyzed for demographic indicators such as age, gender, and race. A summary of each county's findings is included below, with full charts in the county profiles and policy toolkits provided as an appendix to this report.

Alamance's principal producers are unevenly distributed among age groups, with over half being 55 and over. In terms of gender, there is also a sizable gap between men and women that are principal producers, with a 71-24 percent split. Further, Alamance's White population takes over the principal producer demographics with over 90% being White.

Caswell's principal producers are unevenly distributed among age groups, with three quarters being 55 and over. In terms of gender, there is also a sizable gap between men and women that are principal producers, with a 76-24 percent split. Further, Caswell's White population takes over the principal producer demographics with over 84% being White. The next highest representation is the Black community at over 14%, and the leftover 2% is the remaining groups.

Davidson's principal producers are rather unevenly distributed among age groups, with well over half being 55 and over. In terms of gender, there is also a sizable gap between men and women that are principal producers, with a 76-24 percent split. Further, Davidson's White population takes over the principal producer demographics with over 99% being White.

Davie's principal producers are rather unevenly distributed among age groups, with well over half being 55 and over. In terms of gender, there is also a sizable gap between men and women that are principal producers, with a 78-22 percent split. Further, Davie's White population takes over the principal producer demographics with over 95% being White.

Forsyth's principal producers are rather unevenly distributed among age groups, with well over half being 55 and over. In terms of gender, there is also a sizable gap between men and women that are principal producers, with a 72-28 percent split. Further, Forsyth's White population takes over the principal producer demographics with over 95% being White.

Guilford's principal producers are rather unevenly distributed among age groups, with well over half being 55 and over. In terms of gender, there is also a sizable gap between men and women that are principal producers, with a 72-28 percent split. Further, Guilford's White population takes over the principal producer demographics with over 96% being White.

Montgomery's principal producers are rather unevenly distributed among age groups, with well over half being 55 and over. In terms of gender, there is also a sizable gap between men and women that are principal producers, with a 78-22 percent split. Further, Montgomery's White population takes over the principal producer demographics with over 97% being White.

Randolph's principal producers are rather unevenly distributed among age groups, with over half being 55 and over. In terms of gender, there is also a sizable gap between men and women that are principal producers, with a 75-25 percent split. Further, Rockingham's White population takes over the principal producer demographics with over 97% being White.

Rockingham's principal producers are rather unevenly distributed among age groups, with over half being 55 and over. In terms of gender, there is also a sizable gap between men and women that are principal

producers, with a 77-23 percent split. Further, Rockingham's White population takes over the principal producer demographics with over 97% being White.

Stokes' principal producers are rather unevenly distributed among age groups, with well over half being 55 and over. In terms of gender, there is also a sizable gap between men and women that are principal producers, with a 71-29 percent split. Further, Stokes' White population takes over the principal producer demographics with over 98% being White.

Surry's principal producers are rather unevenly distributed among age groups, with well over half being 55 and over. In terms of gender, there is also a sizable gap between men and women that are principal producers, with a 79-21 percent split. Further, Surry's White population takes over the principal producer demographics with over 98% being White.

Yadkin's principal producers are rather unevenly distributed among age groups, with well over half being 55 and over. In terms of gender, there is also a sizable gap between men and women that are principal producers, with a 78-22 percent split. Further, Yadkin's White population takes over the principal producer demographics with over 98% being White.

About the Triad's Farmers: Farm Operators and Farm Ownership

Although the Triad region is about 51% white and 49% people of color, almost 97% of principal farm operators in the latest Ag Census identified as white, indicating that communities of color are significantly underrepresented among principal farm operators in the region. Similarly, although women make up over 50% of the Triad's population, only 24.9% are principal farm operators, with the remaining 74.1% of farm ownership belonging to men.

Race/Ethnicity Comparison of Principal Farm Operators to Overall Population: Piedmont-Triad

In the Piedmont-Triad, about 97% of farm operators are white though only about 64.8% of the total regional population identify as white. People of color are largely under-represented among principal farm operators.
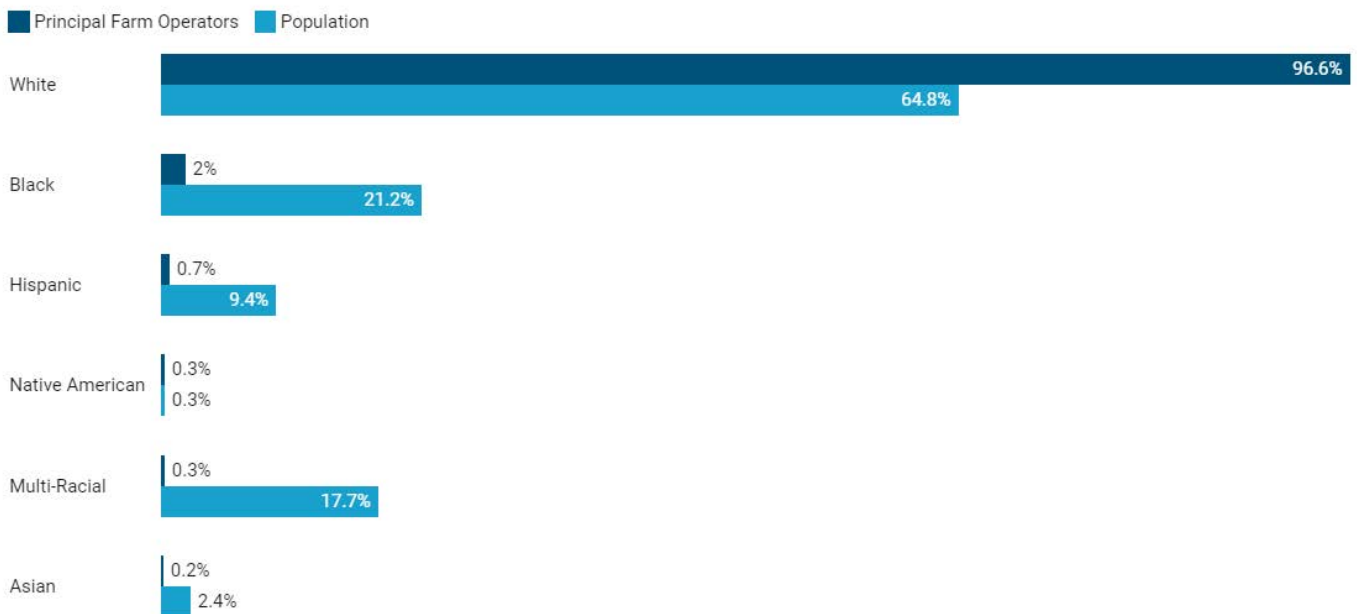
■ Principal Farm Operators ■ Population

White
- 96.6%
- 64.8%

Black
- 2%
- 21.2%

Hispanic
- 0.7%
- 9.4%

Native American
- 0.3%
- 0.3%

Multi-Racial
- 0.3%
- 17.7%

Asian
- 0.2%
- 2.4%

Chart: Carolina Creative Works • Source: American Community Survey 2017 (5-Year Estimates); 2017 Agricultural Census • Get the data • Created with Datawrapper

Comparison of Principal Farm Operators to Population by Gender - Piedmont Triad

Despite comprising 52% of the population in the region, women constitute only 25% of principal farm operators.

■ Principal Farm Operator ■ Population

Female
- 24.9%
- 52%

Male
- 75.1%
- 48%
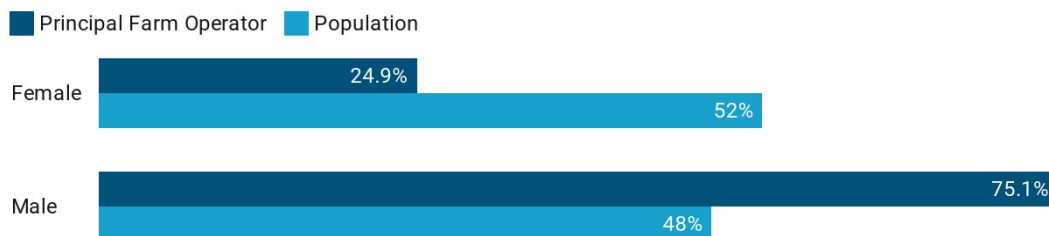
Chart: Austin Amandolia • Source: American Community Survey 2017 (5-Year Estimates); 2017 Agricultural Census • Created with Datawrapper

In addition to the demographic breakdown of principal farm operators, we can also see economic impacts from whether farmers are tenants, partial owners, or full owners of the land they farm. The chart below breaks down farm ownership by type from the Agriculture Census, and shows that while most farmers in the

region have full ownership of their land, a significant portion are either partial owners or leaseholders - roughly 30%.

Acreage Ownership by County: Fully Owned, Partially Owned, and Tenanted Land

% Acres Part ■ % Acres Full ■ % Acres Tenant

Alamance
% Acres Full:
38.0%
(% Acres Part: 58.0%)

Caswell
% Acres Full:
49.0%
(% Acres Part: 50.0%)

Davidson
% Acres Full:
45.0%
(% Acres Part: 54.0%)

Davie
% Acres Full:
38.0%
(% Acres Part: 55.0%)

Forsyth
% Acres Full:
56.0%
(% Acres Part: 40.0%)

Guilford
% Acres Full:
39.0%
(% Acres Part: 55.0%)

Montgomery
% Acres Full:
60.0%
(% Acres Part: 36.0%)

Randolph
% Acres Full:
47.0%
(% Acres Part: 50.0%)

Rockingham
% Acres Full:
39.0%
(% Acres Part: 58.0%)

Stokes
% Acres Full:
55.0%
(% Acres Part: 43.0%)

Surry
% Acres Full:
40.0%
(% Acres Part: 56.0%)

Yadkin
% Acres Full:
31.0%
(% Acres Part: 67.0%)

Created with Datawrapper

Regional Summary: Food Production

Agricultural production wasn't significantly impacted this year by the pandemic, as it struck after most major operations had begun production. However, value-added production, supply chains, and small- and large-scale markets have all been affected by the pandemic and related closures, and industry experts warn that this will have long-term implications for the food industry as a whole.

For 2021, projections rely heavily on the widespread availability of a vaccine and the lack of further shutdowns to contain the spread of the virus, but this is far from certain. National estimates are for nearly double the 2019 unemployment rate in spring 2021 across all industries - and this will significantly affect food processing, distribution, storage, and supply chains, as well as the overall market value of local foods. Where possible, we included projections in these areas with significant caveats about those predictions.

Restaurants, markets, and wholesale businesses account for the majority of total sales in food production & associated industries across the Piedmont. The majority of rural zip codes in the region have roughly an equal number of food-related businesses, but most are concentrated in urban areas, which tend to receive the benefits of regional food system development. The highest processing sales were in Randolph County ($31.7 million) and Stokes County ($29.7 million) while Montgomery and Caswell had the lowest sales for processing facilities ($3.01 million and $1.5 million, respectively).

For more detailed information, please see the Market Analysis and Economic Assessment and Supply Chain sections of this report.

Primary Findings: Equity and Justice Issues in Agriculture & Food Production

Although the Triad region is about 51% white and 49% people of color, almost 97% of principal farm operators in the latest Ag Census identified as white, indicating that communities of color are significantly underrepresented among principal farm operators in the region. Similarly, although women make up over 50% of the Triad's population, only 24.9% are principal farm operators, with the remaining 74.1% of farm ownership belonging to men.

Food equity researchers have long warned about the consequences of decades of racial inequality in agriculture along with the rapid loss of farmland across the country. Nationally, since 1982, over 23 million acres of prime farmland has been developed, with Black farmers losing family farms at near-catastrophic rates - almost 25% of the total land lost. While USDA has made strides to address a history of racial lending practices, the direct payments that agency oversees still go to over 1 in 3 white farmers, but only 1 in 4 Black farmers, 1 in 6 Latino and Native American farms, and 1 in 8 Asian farms. Not only are farmers of color significantly underrepresented (at between 2-3% nationally and regionally of all farmers), those farmers also tend to be tenants or farmworkers instead of owners of land, own less land and smaller farms, and generate less wealth from farming than white farmers.

The inequity continues in food production industries, where over 40% of low-wage workers are workers of color and over half of workers are women. The restaurant industry is particularly vulnerable to increased inequities from the economic impacts of COVID-19, and far more workers of color earn subminimum wages in the food industry than white workers. (See source data at the Center for Social Inclusion here.) We also know that only 42% of food industry jobs in America provide healthcare, and that as these industries saw their workers deemed essential, "hero pay" provided through the CARES Act ran out only 100 days into the pandemic for workers in frontline meat processing, packaging, grocery, and food industries.

Data Sources and Analysis Methods

The National Agricultural Statistics Service (NASS) of USDA releases the Agricultural Census every 5 years. The Agricultural Census has varying levels of information depending on the geography. For this project, we focused on county-level data regarding the demographics of principal farm operators, the number of acres farmed, the amount of production by county, and the number of acres leased versus owned. We used the 2017 Agricultural Census, which served as the baseline year for much of our data.

Businesses are classified by industry codes under the North American Industry Classification System (NAICS). Each industry code ranges from two to four digits, with more digits meaning greater detail. For example, NAICS 11 includes all Agriculture, Forestry, Fishing, and Hunting industries, and NAICS 1111 is Oilseed and Grain Farming, which is included in NAICS 11. We requested data on businesses in the NAICS sectors related to farming. This provided us with information about where businesses were located, what industry they are in, their total sales, and number of employees. With this information, we were able to demonstrate which counties have stronger business infrastructure in food-related industries and which counties hold the most capital by business type.

Additional Reports and References

- Business Types and Revenues (State)
    - NAICS data from AGCensus
- State Agriculture (State)
    - Local Foods Infrastructure Inventory
    - NC Manufacturing Report
- Business Employments Dynamics (all of NC) (National)

Supply Chain Analysis

Overview of Supply Chain Analysis & Research Methods

The COVID-19 adaptations made to the assessment process do not significantly change our original research design and goals for this section. The aim is to capture a baseline understanding of each component of the supply and its associated economic value, and then to create a benchmarking system that helps the council develop long-range goals for economic impact. Most of the supply chain economic assessment data can be found in detail in the Market Analysis & Economic Assessment section; a summary of those findings hsa been provided here along with detailed information about transportation and distribution flows and sales channels for regional products. (Those benchmarking recommendations are examined in detail in the recommendations section.)

Our primary research questions for this area of the assessment are:
- What is the current baseline status of the supply chain for local and regional products?

- What volume of local and regional product is moving through each distribution channel (wholesale, retail, hyperlocal) and where is its final destination (in-region or out-of-region)?

- Who are the primary actors in the food supply chain (whether they focus on local and regional or not) and what capacity exists in current facilities and assets to support more products moving within those channels? What gaps exist where facilities, equipment, business expansion, more producers, or other investments could have an impact?

- What economic impact can we expect from different supply chain investments? Are those impacts evenly distributed, or can they be focused to benefit more disadvantaged communities?

Summary of Supply Chains and Transportation Analysis

According to the Piedmont Authority for Regional Transportation Advanced Freight Model study,the I-85/I-40 gateway has the highest truck flows in North Carolina and is one of the world's largest transportation and logistics clusters.

The Piedmont Triad region has a strong supply chain for many industries and is geographically central for distribution in the East Coast and Mid America markets. However, there's a disparity of access among supply chain industries that significantly disadvantages food-related businesses in the region. The PART study found that only 226 of 45,138 shipping firms in the region were exclusively shipping in the agriculture industry, and only a few cold storage facilities offer agricultural use of their facilities in the region.

To further understand the barriers and opportunities in the existing supply chain, we examined two additional sources of data: the University of Iowa's Food Freight Analysis and the existing NC Local Foods Infrastructure Inventory, hosted by PTRC and originally compiled by NC State University. (More information on both these sources is provided at the end of this section.)

First, we performed a data analysis on the University of Iowa food supply chain transportation data and isolated destination data for both import and export of goods by kilogram for all 12 counties in The Piedmont Triad region. The report provides a county summary of import / export that can show a detailed picture of what is coming in, what is leaving and what is being grown for internal county use.

Then, we utilized NAICS data by industry type, the information from the NC PART study, and the NC Local Food Infrastructure Inventory to identify updates to the 2017 data in the NCLFI.

Supply Chain Details: How Food Travels the Piedmont Triad

The initial baseline data analysis also showed the Piedmont Triad region's high concentration of major interstate highways (I-40, I-85, I-77) and logistics infrastructure, as it serves as a major thoroughfare for North Carolina and the mid-Atlantic region. The region's transportation infrastructure is well developed due to its recent past as a major furniture and textile hub. While manufacturing still exists in the region, industry is shifting towards distribution and technology.

"Leakage" is a supply chain term that describes how agricultural goods are being produced and exported compared to the amount being imported. This type of analysis, shown in the below charts, can help PTRFC identify areas for focus in supply chain investments over a longer period of time.

Supply Chain Regional "Leakage"

This highlights food that is grown in the Piedmont Triad region and then is exported outside the region and food that has been grown outside the region and then imported.

County	M Kgs Exiting PTR	% Kgs Exiting PTR	M Kgs Imported from outside PTR	% Kgs Imported from outside PTR
Alamance	249	60	221	63
Caswell	205	50	303	51
Davidson	274	93	192	57
Davie	234	86	159	56
Forsyth	77	40	344	78
Guilford	190	59	226	81
Montgomery	54	62	74	56
Randolph	241	55	86	50
Rockingham	142	63	210	73
Stokes	2	3	77	45
Surry	593	99	266	95
Yadkin	497	78	282	89

Table: Carolina Creative Works • Source: University of Illinois • Created with Datawrapper

While there's nothing wrong with exporting or importing food, for example, it does highlight an opportunity for communities to find ways to make a more local and sustainable food supply chain, build businesses in a food economy, and make sure there's enough healthy local food to support consumers in the community at all levels. When communities do this kind of work, they are more resilient and have fewer shortages, and it's an economic boost that creates more jobs allowing more people to afford and access food.

Below is an overview of the supply chain statistics for the entire Piedmont Triad Region. It shows what is grown in the counties and then remains there. It also shows what is imported and exported outside of the Piedmont Triad Region. One of the areas that could be an opportunity for improvement is that 67% of the food required is imported from outside the region. This need could be filled by local and regional farms. (County-level summaries like this one are provided in the County Profile & Policy Toolkit documents as an appendix to this report.)

Piedmont Triad Region

Food Supply Chain

This is a county overview of the food supply chain of the Piedmont Triad Region of North Carolina. This information is based on the Food Flow Model developed by University of Illinois using Freight Analysis Framework from Oak Ridge National Laboratory, US Ag Cenus and 8 other databases.

391 MILLION
KG OF FOOD <u>GROWN</u>
STAYS IN THE COUNTY OF ORIGIN

1.2 BILLION
KG OF FOOD <u>GROWN</u> IN REGION
STAYS IN PIEDMONT TRIAD REGION

4.4 BILLION
KG OF FOOD IS <u>GROWN IN TOTAL</u>
THE PIEDMONT TRIAD REGION

2.8 BILLION **(63%)**
KG OF FOOD <u>GROWN</u> IN REGION
LEAVES THE PIEDMONT TRIAD REGION

2.4 BILLION **(67%)**
KG OF FOOD IS <u>IMPORTED</u> FROM
OUTSIDE THE PIEDMONT TRIAD REGION

SOURCE: HTTPS://IOPSCIENCE.IOP.ORG/ARTICLE/10.1088/1748-9326/AB29AE

Food Supply Chain Overview *Inside* Region

This is an overview of the food that is grown and stays within the Piedmont Triad Region
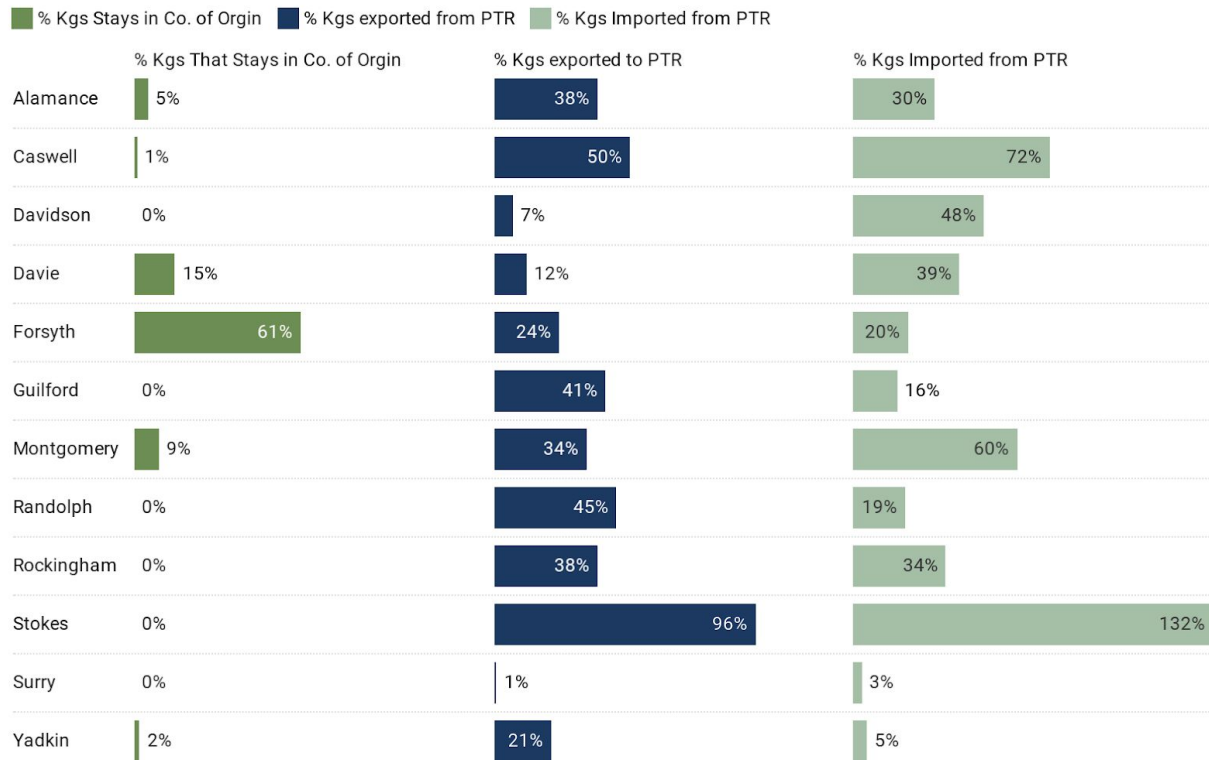
■ % Kgs Stays in Co. of Orgin   ■ % Kgs exported from PTR   ■ % Kgs Imported from PTR

	% Kgs That Stays in Co. of Orgin	% Kgs exported to PTR	% Kgs Imported from PTR
Alamance	5%	38%	30%
Caswell	1%	50%	72%
Davidson	0%	7%	48%
Davie	15%	12%	39%
Forsyth	61%	24%	20%
Guilford	0%	41%	16%
Montgomery	9%	34%	60%
Randolph	0%	45%	19%
Rockingham	0%	38%	34%
Stokes	0%	96%	132%
Surry	0%	1%	3%
Yadkin	2%	21%	5%

Chart: Carolina Creative Works • Source: University of Illinois • Created with Datawrapper

This is a breakdown by county of the food that is grown and stays within the Piedmont Triad Region. Please note that 10 of the 12 counties export more than half of their food production to outside the Piedmont Triad region; this highlights an opportunity to create a more local food economy both for resilience and as an economic driver. *Please note that counties that show 0% are not represented in the data available, but likely do have some amount of food that stays in the county of origin but is not tracked on national distribution data.*

Piedmont Triad Inter-Regional Food Flow Map
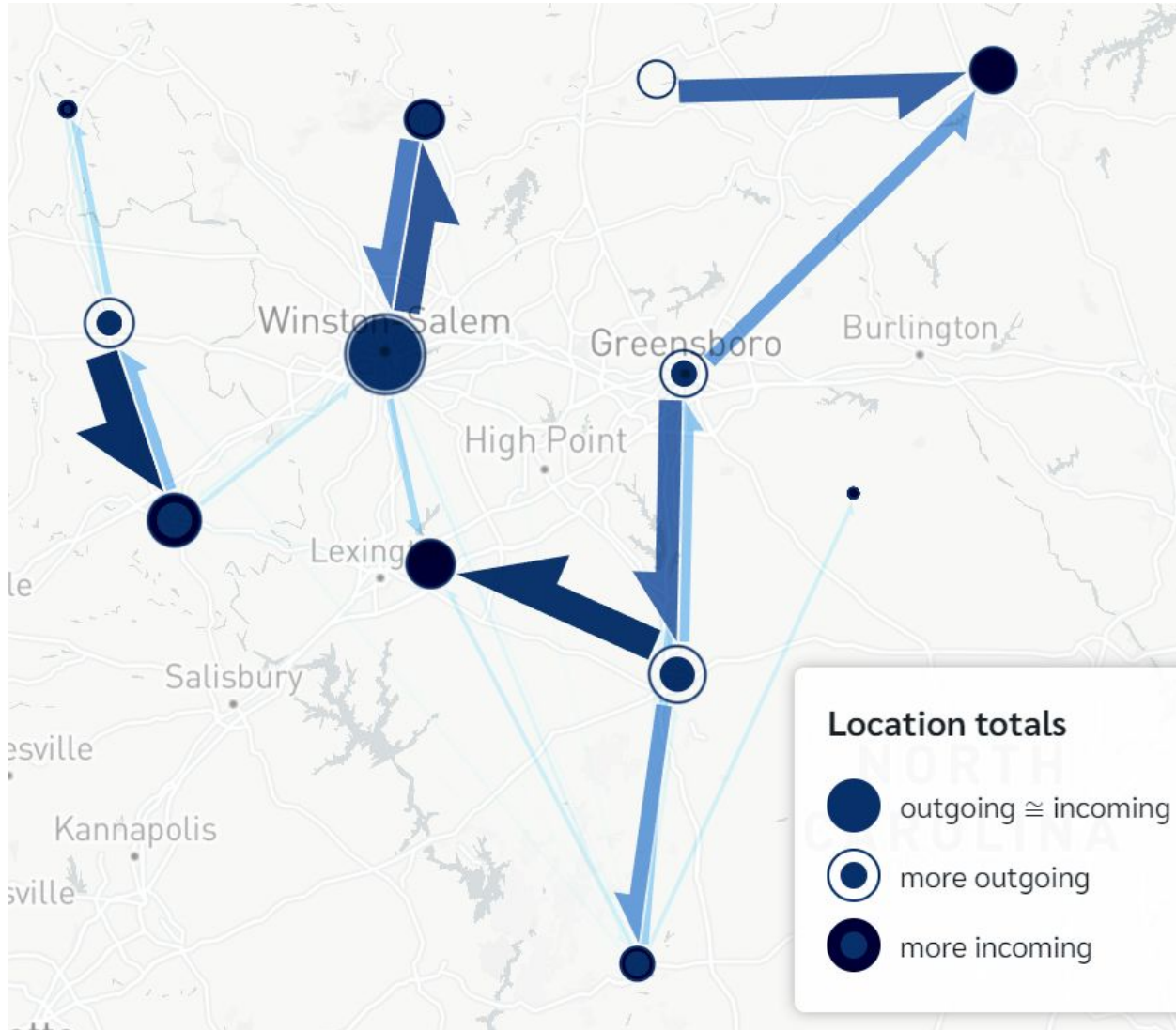
This map shows the food supply chain food flow between counties in the Piedmont Triad region. Note that there is almost no longitudinal food flowing between counties in the region. Some of this may be explained by the highway system routes; however there should be further research into cultivating more inter-county food import and export connections. Roughly only half the county-to-county connections available for export / import are being made (there are a total of 37 actual county-to-county connections of 78 possible connections).

Summary of Piedmont Triad Regional Local Food Infrastructure

Our initial baseline data analysis highlighted the existing data in the Local Food System Infrastructure Inventory hosted by PTRC on behalf of the NC Growing Together Project. We provided updates to that based on our analysis of other datasets and our outreach results.

Infrastructure Category	2017 NC LFI Data (PTRC)	2020 Updates
Cold Storage	2	+6
Dairy Processing	12	+3
F&V Processing	14	+4
F&V W/D	16	+8 -1
Farmers' markets	40	+4 -2
Meat processing	52	+11 -4
Multi-farm CSA	1	+2
Seafood W/D	3	+6 -1

Primary Findings: Regional Local Food Infrastructure & Food Flows Analysis

According to our analysis of the University of Iowa data, seven of the twelve counties in the region don't have appreciable movement of food either in an import or export capacity. Ten of the region's twelve counties export more than half of their food production to outside the PTR (i.e. "leakage").

We also found that:

● Only half the county-to-county connections available for export / import are being made (there are a total of 37 actual county-to-county connections of 78 possible connections).

● Surry County is both the lowest importer and export of ag goods in the region, and exports 99% of its production outside of the region.

● Davidson County, while the 5th largest producer of ag goods in the region, exports 93% of its production outside of the region.

● Guilford and Surry counties export 81% and 85% respectively of their ag goods to outside of the region.

● Of 148 cold storage facilities located within the transportation region of the Piedmont Triad, only 6 have accommodations for cold storage of agricultural products and food and beverage. These sites are almost entirely utilized by larger companies shipping intrastate and there is a significant lack of

mid-scale producer-sized cold storage, of which we found only three locations (located an average of 1.5 hours from most regional farms).

Regional food systems have often benefited places with higher population densities and median income . With careful investment, however, regional food system development can address linkage, build stronger urban-rural connections, and utilize import substitution and other strategies to further support the infrastructure and market capacity for local food products. (For a primer on investing in just food systems, we recommend the third chapter of [this book by the St. Louis Fed](#).)

The biggest challenge the region faces is the lack of storage facilities, namely cold storage for perishable, agricultural products. It is important to note that agriculture businesses may not have access to certain cold storage facilities (which can appear in industry data but are not rated for agricultural use, rather for medical or other cold storage needs).

Additional findings about market value, pandemic impacts, and other aspects of the supply chain can be found in the Market Analysis & Economic Assessment section of this report.

Data Sources and Analysis

To analyze these questions, we utilized the following methods for outreach, direct data collection, and dataset analysis:

- One-on-one confidential interviews with private sector supply chain entities

- Economic analysis of existing distribution and supply chain data

- Groundtruth mapping to update the Local Food Infrastructure Inventory using direct outreach to NC Cooperative Extension and other agencies

Our supply chain analysis relies on two primary sources of data: first, import/export data compiled by the University of Illinois, and second, on the existing infrastructure mapped in the region through the 2017 NC Growing Together Project.

The UI data is based on the Freight Analysis Framework (FAF) version 4. FAF is comprised of regions that do not align with traditional geographic boundaries, such as counties. Because of this, UI used several other datasets, including data from the Bureau of Economic Analysis, the US Census Bureau, and USDA, to connect the FAF regions to counties. They then used the Food Flow Model to map the flow between FAF regions to counties. Their model included techniques such as machine learning and other algorithmic methods.

There is robust literature to support these methods, however it is still worth keeping in mind the potentially significant gaps in the dataset that are managed by modeling and algorithms. Their detailed paper describing this method is available on [IOPScience](#). FAF also uses algorithmic-based methods similar to the Agriculture Census. More about the modeling process for FAF is available at the Oak Ridge National Laboratory Data Sources and Estimation Methodologies Report [here](#).

The NC Local Foods Infrastructure Inventory was originally compiled by NC Cooperative Extension through the NC Growing Together Project and was updated in 2017. The inventory covers the entire state and is hosted by the GIS department at Piedmont Triad Regional Council. Our team pulled the regional infrastructure nodes in all categories and updated them with new information from supply chain interviews and survey responses.

Businesses are classified by industry codes under the North American Industry Classification System (NAICS). Each industry code ranges from two to four digits, with more digits meaning greater detail. For example, NAICS 11 includes all Agriculture, Forestry, Fishing, and Hunting industries, and NAICS 1111 is Oilseed and Grain Farming, which is included in NAICS 11. We requested data on businesses in the NAICS sectors related to farming. This provided us with information about where businesses were located, what industry they are in, their total sales, and number of employees. With this information, we were able to demonstrate which counties have stronger business infrastructure in food-related industries and which counties hold the most capital by business type.

Market Analysis & Economic Assessment

While agricultural production is examined in more detail in a separate section, the remainder of the food system's economic actors are examined in this market analysis and economic impacts report (food processing, food retail and wholesale, food packing, storage, and distribution, and other supply chain sectors). We provide a brief summary of small and hyperlocal market analysis; large and intermediary market analysis; and a detailed assessment of the economic impact of each of seven industry types (agricultural businesses, restaurants, wholesalers, food processors, storage, transportation and markets.

Overview of Market Analysis & Economic Assessment Goals

The COVID-19 adaptations made to the assessment process do not significantly change our original research design and goals for this section. The aim is to capture a baseline understanding of each component of the food system and its associated economic value, and then to create a benchmarking system that helps the council develop long-range goals for economic impact. Minor changes were made to the scope of procurement data, as many restaurants, food processors, wholesalers, and institutional buyers were not available for surveying due to the impacts of the pandemic. (Those benchmarking recommendations are examined in detail in the recommendations section.)

As such, the following research questions guided this portion of the assessment:

- Where are the region's products currently being sold (retail, wholesale, hyperlocal, and in-region or out of region)? Where are opportunities for expansion and growth?

- What are consumer access points for locally and regionally produced foods? What are the cost ranges for those products at those points? Are they in line with national averages?

- Which institutions are currently purchasing local foods, and what's the economic value of expanding institutional purchasing?

- What is the baseline of value-added and food-associated businesses in the region?

- What is the economic gross value of agriculture + food business outputs in each county and the region as a whole? What is the breakdown of these sales channels (local, regional, out of region markets)?

- What gaps exist in the infrastructure to support increased production of food and food products? What barriers are there to entry to these businesses or to expansion of existing businesses? What public programs support business expansion in these industries, and are they effective?

- What populations are excluded from these economic opportunities? What workforce data is available, and are there workforce opportunities or challenges that should be considered?

Accounting for the Impacts of COVID-19

Most sections of this analysis include notes about the projected impacts of the COVID-19 pandemic and associated economic shutdowns, although this is a difficult prediction science and we have relied on national estimates to create regional predictions wherever possible.

Agricultural production wasn't significantly impacted this year by the pandemic, as it struck after most major operations had begun production. However, value-added production, supply chains, and small- and large-scale markets have all been affected by the pandemic and related closures, and industry experts warn that this will have long-term implications for the food industry as a whole. For 2021, projections rely heavily on the widespread availability of a vaccine and the lack of further shutdowns to contain the spread of the virus, but this is far from certain. National estimates are for nearly double the 2019 unemployment rate in spring 2021 across all industries - and this will [significantly affect](#) food processing, distribution, storage, and supply chains, as well as the overall market value of local foods. Where possible, we included projections in these areas with significant caveats about those predictions.

The overall food supply chain impact has hit restaurants particularly hard, and this is true across the Triad region in both rural and urban markets. Despite gradual reopenings, delivery services, online ordering, and outdoor dining, many restaurants have either already closed or anticipate closing in the next few months - with some estimates of permanent restaurant closures as high as 1 in 3 nationally. North Carolina's restaurant economy totals more than $21.4 billion, and we know that local independent restaurants recirculate more money from revenue (65%) back into the local economy as compared to chain restaurant counterparts (30%). This could be a significant blow to local food economies across the region, and should be an area of major focus for the council in 2021.

We also found that even before the pandemic there was a significant gap in the Triad's markets, specifically intermediary markets that help smaller producers scale into larger and wholesale markets. The region's farmers and producers have access to local farmers markets and on-farm sales opportunities, as well as larger, wholesale opportunities, but very few options exist for farmers at an intermediary scale. Although COVID-19 has increased public interest in purchasing local products and supporting area farms, many of these businesses will need significant assistance to both pivot to different sales platforms and delivery and distribution as well as to navigate the supply chain and marketing challenges the pandemic represents.

2020 Outreach Findings: Markets and Supply Chains

Our survey, interview, and focus group analysis is also used to analyze the pre-COVID-19 data and provide recommendations for how to increase resiliency and equity in production systems in the region.

The interview and focus group data indicate a gap in the intermediary markets. There are robust farmers markets and on-farm sales opportunities in the 12-county region, as well as larger wholesale and institutional opportunities. Farmers and producers can easily find themselves in a difficult predicament when they outgrow a local farmers market but are not yet ready to enter wholesale contracts or have the appropriate resources or investments to do so. Caswell County and Piedmont Community College's Center

for Education and Agriculture Development (CEAD) is seeking to fill the gap in the intermediary market for farmers and producers.

Location, particularly proximity to larger urban areas and associated markets, is an asset for the region. Focus group participants also noted the importance of utilizing technology and capitalizing on marketing as key steps in entering and being successful in a given market. (NC Department of Agriculture and NC Cooperative Extension are partnering to launch and operate the Visit NC Farms app, which allows individuals to search for local farms and agriculture businesses where they can support agritourism, purchase products, and buy local. This is one example of how PTRFC can partner with others to leverage technology in support of local food economies.) The need to bring agriculture into online markets was exacerbated by the pandemic restrictions, and many food businesses still need support to successfully pivot to online sales.

Location can also be a struggle, as we heard from various interviewees and survey participants. In the supply chain section, we see that there are so few cold storage facilities, for example, that most farmers in the region would have to drive an average of 1.5 hours to access one that is rated for commercial shipping and freight.

Summary of Agricultural Production Analysis & Impacts

Agricultural production and farming incomes are significant portions of Piedmont-Triad's overall economy. The total number of acres in production in the Triad region is well over a million, operated by almost 9,500 farms and bringing in more than $1 billion in sales in the latest data available. Randolph and Surry showed the highest sales annually in animal production, while Surry and Guilford were the highest sales annually for edible crops. Randolph, Surry, and Montgomery led all counties for sales of commodity (non-edible) crops annually.

The net reported income for farms - a very different calculation than the sales numbers listed above - ranged from over $99 million in high-livestock production and commodity production in Randolph County to a negative $474,000 in Forsyth. Rural counties claimed a lion's share of the sales dollars across all agricultural categories - over 60% of all sales in the region.

A comprehensive agriculture analysis can be found in the Food & Farm Production section of this report.

- There are over one million acres in the Piedmont Triad that are being operated on in a farming capacity with 9,408 farms total.

- The 12-county Piedmont Triad region sold $1,072,818,000 in agricultural products in 2017. Top products in terms of revenue included Poultry and Eggs, Tobacco, Nursery and Greenhouse, Cattle and Calves and Dairy.

- Most small farms are only bringing in up to $100,000 (38,699 farms); most of the economic value is in large farms that bring in $1 million or more (3,442 farms) or between $250,000-$999,999 (4,277 farms).

- Food-associated businesses, such as wholesale distribution, restaurants, food production, and supply chain agencies, bring in over $28 billion in annual sales from over 6,400 Triad businesses.

- The economic downturn as a result of the COVID-19 pandemic is impacting business and economic expansion in already economically depressed or stagnant areas.

- There is a drive to increase and support minority-owned and started businesses. Lack of resources and support are key limiting factors.

- The region has a significant number of institutions, including major hospitals and 13 colleges and universities, 9 technical schools and community colleges, and over 400 public K-12 schools.

- Ten of the region's 17 school districts were participating in Farm to School programs as of 2013-2014, totaling 95 schools with an estimated annual combined purchasing of $33,035,454 (Farm to School Census 2015).

- Only Forsyth and Rockingham Counties have signed the NC 10% Campaign pledge.

- According to the USDA Food Atlas, there are over 300 grocery stores in the region, with almost another 1,000 convenience and corner stores.

Summary of Small- and Mid-Scale Markets Analysis

There is a significant gap in the Piedmont Triad's markets, specifically the intermediary market. The region's farmers and producers have access to local farmers markets and on-farm sales opportunities, as well as larger, wholesale opportunities, but very few options for farmers in the intermediary. Marketing is also a concern for products, as the definition of "local" varies, as well as the intersection with Got to be NC products. The region's meat market is also in flux due to COVID-19 exacerbating existing issues.

Prior to COVID-19, we noticed an unsettling difference in the reported number of farms from the 2012 Ag Census to the 2017 Ag Census. The overall number of farms in both Surry and Randolph counties decreased catastrophically. This decrease in farmland was also supported from individual interviews and focus group data, where participants indicated that the sharp decline in farms in these counties was of concern and importance, especially in terms of local economies and food products availability. Increased development in both counties and an aging farming population with fewer young farmers entering the field are the two main causes for the overall decline reported.

Meat production and processing has been significantly impacted. Meat processors in the region and across North Carolina have experienced an enormous uptick in demand for processing. As a result, a number of locally-owned and operated meat processing facilities are booked through 2021 and have just recently started accepting reservations for 2022. This indicates a great need for more processing facilities to avoid delays like this in getting meat to markets.

The overall food supply chain impact has hit restaurants particularly hard. Despite gradual reopenings, delivery services, online ordering, and outdoor dining, many restaurants have either already closed or anticipate closing in the next few months - with some estimates of permanent restaurant closures as high as 1 in 3 nationally. North Carolina's restaurant economy totals more than $21.4 billion, and we know that local independent restaurants recirculate more money from revenue (65%) back into the local economy as compared to chain restaurant counterparts (30%).

Farmers' markets - which nationally account for roughly 65% of all small- and mid-scale farm sales - have also been impacted by COVID-19, but were more agile in their ability to pivot to online sales, curbside pickup, and order aggregation. Community Food Lab's recent Farmers Market Survey surveyed 78 markets from across the state. Of the farmers markets that responded, roughly half of them accept SNAP/WIC, with fewer offering nutrition incentive programs. 55% of markets reported greater/steady sales in 2020 when compared to 2019. 45% of markets reported greater/steady visitors in 2020 when compared to 2019. Markets that offered curbside pickup reported a greater sales rate than markets without that option and markets with an email mailing list reported a greater sales rate than markets without that list.

Summary of Procurement & Infrastructure Economic Analysis

In relation to the temporary closure that has been seen in the supply chain, many restaurants have permanently closed as well. Many could not make ends meet with a difference in patrons and were forced to close. In August, according to Marker, over 15,000 restaurants in the United States had closed. It is estimated that the number of restaurants that will permanently close could reach 1 in 3. With these kinds of closures, the entire supply chain has been disrupted. According to the Independent Restaurant Coalition, North Carolina's restaurant economy totals more than $21.4 billion. Local independent restaurants recirculate more money from revenue (65%) back into the local economy as compared to chain restaurant counterparts (30%). There are further equity concerns with the closing of restaurants, as the industry boosts minority employment and advancement, with an additional factor that half of all restaurant workers are women. Furthermore, the restaurant industry supports a plethora of supply chains and when aggregated, generates more middle class jobs three times faster than other sectors in the economy.

Institutional purchasing with a focus on supporting local businesses and local agricultural products is a significant opportunity for the region. The NC 10% Campaign, founded in 2010, has worked with partnering organizations across the state to "encourage North Carolina individuals, businesses, organizations, and institutions to spend at least 10% of their food dollars on NC-grown foods." To date, over 8,000 individuals and 1,200 businesses have spent over $71.5 million locally.

The NC 10% Campaign has a number of programs, namely University Local Foods Programming and County Local Food Campaigns. Member counties of PTRC are encouraged to learn more about the County Local Food Campaigns. A number of colleges and universities in the region have signed on the NC 10% Campaign. They are Bennett College, Elon University, Guilford College, NC A&T University, Salem College, UNC-Greensboro, UNC-School of the Arts, and Winston Salem State University. Due to the COVID-19 pandemic and associated disruptions on college and university campuses, it is currently unknown if these colleges and universities were still able to purchase 10% of their food dollars on NC-grown foods.

To promote the purchasing power of buying local, the Center for Environmental Farming Systems' (CEFS) Farm 2 School Coalition of NC offered "up to 21 Local Education Agencies (LEAs) $4,000 in funding to support urgent need and long term capacity building for local food purchasing and local foods educational programming" through their rapid response Farm to School funding. The report deadline was December 15, 2020 and to date, Rockingham County Schools is the only K-12 school system in the region to participate.

There are 17 public school districts in the Piedmont-Triad area. Within these districts, there are 457 public schools. The region is also home to 142 private schools and 21 post-secondary institutions. USDA's Farm to School Census (2015) reported that 62% (84 districts) of school districts in NC participate in farm to school activities, with an additional 17% indicating a plan to begin farm to school activities in the future. These survey results are from 2015 and report on academic years dating back to 2013. The fact that the majority of NC school districts are participating in, or hope to begin, farm to school activities is promising. 11 of PTRC's public school districts responded yes to already participating in farm to activities.

In addition to schools and post-secondary institutions, we mapped 1147 health organizations in the region that could either serve as potential insitutitions to purchase agricultural products or could serve as referrals or partners. These health organizations include hospitals, long-term care facilities, clinics and other medical offices, and county health departments.

In total, the Piedmont Triad region is home to 1,767 opportunities for institutional purchasing power to be leveraged in buying local.

Market Analysis & Economic Assessment of Non-Agricultural Food Production, Food Processing, Food Storage, Transportation, Distribution and Affiliated Sectors

Unemployment Impacts on Market Analysis & Economic Assessment

The charts below show the latest available federal and state unemployment estimates by county and are included in order to highlight the disproportionate impact of unemployment on communities of color across the region. Many of the industries we include in this assessment already rely heavily on workers of color, particularly restaurants, food processing, and food packaging businesses. The impacts of COVID-19 and economic recovery or downturn in 2021 can significantly change these estimates. As a result, we did not factor additional projections on employment saturation or workforce participation into our analysis.

Unemployment Rate by Race - State of North Carolina (2017)
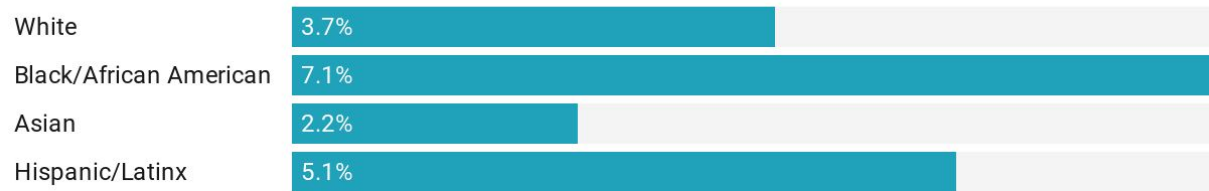
White	3.7%
Black/African American	7.1%
Asian	2.2%
Hispanic/Latinx	5.1%

Chart: Carolina Creative Works • Source: American Community Survey 5-Year Estimates (2013-2017) • Created with Datawrapper

Prior to the COVID-19 pandemic and associated economic crisis, people of color experienced higher rates of unemployment as compared to white individuals. COVID has exacerbated these disparities, with unemployment rates increasing in all the above categories.

Unemployment Rate by County (2017)

Alamance	4.2%
Caswell	4.7%
Davidson	4.3%
Davie	3.9%
Forsyth	4.3%
Guilford	4.7%
Montgomery	4.5%
Randolph	4.3%
Rockingham	5.1%
Stokes	4.2%
Surry	4.1%
Yadkin	3.9%

Chart: Carolina Creative Works • Source: American Community Survey 5-Year Estimates (2013-2017) • Created with Datawrapper

Unemployment across the Triad in 2017 ranged from 3.9%-5.1%, with Davie and Yadkin counties experiencing the lowest rates and Rockingham reporting the highest.

Business Industry Analysis

The following charts analyze seven major industries related to the food system: Agriculture, Storage, Markets, Processing, Restaurants, Transportation and Wholesale. These are coded from the NAICS analysis described in the data sources section of this report. The first tables show the number of businesses under each two-digit NAICS code by county and the total sales by two-digit NAICS in each county.

Altogether, the NAICS analysis shows that the seven selected industries bring in over $28 billion in annual sales to the region, generated by over 6,400 businesses of all sizes. Guilford and Forsyth are home to almost a third of these businesses (1,947 and 1,236 respectively) while Caswell has the fewest at 76 businesses.

Restaurants, markets, and wholesale businesses account for the majority of total sales across the Piedmont. Businesses in these industries in Forsyth and Guilford counties generated nearly half the total regional sales (almost $16 billion) with remaining counties having smaller percentages (with Caswell again coming in lowest at $55.3 million).

Overall, the charts show that most of the economic activity and value is centered around Forsyth and Guilford. Randolph is the strongest in Agricultural-associated businesses; in addition to Forsyth and Guilford, Alamance, Davidson, Randolph and Surry counties showed over $1 billion in restaurant sales. There are several counties without cold storage facilities, which are mostly concentrated in Guilford and Alamance.

Number of Businesses in each industry by County

Click on each heading to sort and see which counties have the most businesses in a given sector.

Search in table

County	Agriculture	Storage	Markets	Processing	Restaurants	Transportation	Wholesale
Alamance	26	3	117	25	304	38	20
Caswell	10	0	16	1	44	4	1
Davidson	26	1	108	21	299	54	16
Davie	18	0	34	5	101	16	9
Forsyth	38	5	307	63	683	108	42
Guilford	65	1	416	99	1,069	244	53
Montgomery	16	0	17	4	67	5	5
Randolph	74	0	102	25	341	57	21
Rockingham	18	1	67	12	183	21	8
Stokes	22	0	34	6	94	7	6
Surry	33	0	74	28	242	44	24
Yadkin	38	0	31	17	126	13	11

Table: Carolina Creative Works • Source: North American Industry Classification System (NAICS) • Created with Datawrapper

The breakdown of the number of businesses across industries in each county shows which business types are more prevalent and where they are located, across the seven major components of the food supply chain industry.

COVID-19 has significantly impacted each industry, with the restaurant industry being the hardest hit. This is of great importance as restaurants employ majority female workers and workers of color. Forsyth and Guilford are home to the vast majority of the region's restaurants, as well as transportation businesses and

markets. There are market opportunities in each county, as well as a number of agriculture businesses across the region. The biggest challenge the region faces is the lack of storage facilities, namely cold storage for perishable, agricultural products. It is important to note that agriculture businesses may not have access to certain cold storage facilities (which can appear in industry data but are not rated for agricultural use, rather for medical or other cold storage needs).

Number of Businesses in each industry by County

Click on each heading to sort and see which counties have the most businesses in a given sector.

County	Agriculture	Storage	Markets	Processing	Restaurants	Transportation	Wholesale
Alamance	26	3	117	25	304	38	20
Caswell	10	0	16	1	44	4	1
Davidson	26	1	108	21	299	54	16
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Guilford	65	1	416	99	1,069	244	53
Montgomery	16	0	17	4	67	5	5
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Rockingham	18	1	67	12	183	21	8
Stokes	22	0	34	6	94	7	6
Surry	33	0	74	28	242	44	24
Yadkin	38	0	31	17	126	13	11

Table: Carolina Creative Works • Source: North American Industry Classification System (NAICS) • Created with Datawrapper

This graphic shows the number of businesses by sector in each county. Caswell, Davie, Montgomery, and Stokes counties have fewer businesses per industry when compared to neighboring counties, whereas Alamance, Forsyth, Guilford, and Randolph have greater percentages. Randolph County leads the region in the number of agriculture businesses. The location of wholesale businesses is not evenly dispersed across the region, with the majority of wholesale opportunities in Forsyth and Guilford counties. Caswell is home to only one wholesale business. This presents a challenge for farmers and producers looking to enter wholesale markets.

Total Sales by Industry per County

Click on each heading to sort and see which counties have the most businesses in a given sector.

Search in table						

County	Agriculture	Storage	Markets	Processing	Restaurants	Transportation	Wholesale
Alamance	$5,888,000	$6,424,000	$388,727,000	$106,211,000	$1,331,836,000	$74,592,000	$238,691,000
Caswell	$2,076,000	$0	$10,342,000	$1,580,000	$38,325,000	$860,000	$2,208,000
Davidson	$4,978,000	$541,000	$476,010,000	$127,931,000	$1,177,325,000	$156,010,000	$208,866,000
Davie	$10,421,000	$0	$106,170,000	$6,413,000	$471,132,000	$52,726,000	$103,413,000
Forsyth	$33,051,000	$10,364,000	$978,117,000	$360,393,000	$3,966,946,000	$264,480,000	$1,866,417,000
Guilford	$51,924,000	$641,000	$1,344,786,000	$527,504,000	$4,662,747,000	$936,889,000	$815,306,000
Montgomery	$3,652,000	$0	$17,947,000	$12,046,000	$287,079,000	$7,305,000	$156,218,000
Randolph	$54,321,000	$0	$251,817,000	$793,473,000	$1,547,924,000	$51,903,000	$202,662,000
Rockingham	$3,185,000	$280,000	$176,684,000	$66,935,000	$671,086,000	$38,508,000	$135,862,000
Stokes	$4,462,000	$0	$66,702,000	$4,851,000	$431,832,000	$1,834,000	$57,598,000
Surry	$32,216,000	$0	$205,895,000	$278,674,000	$1,123,460,000	$165,912,000	$282,599,000
Yadkin	$8,912,000	$0	$40,646,000	$120,445,000	$309,270,000	$26,656,000	$69,908,000

Table: Carolina Creative Works • Source: North American Industry Classification System (NAICS) • Created with Datawrapper

Number of Food-Related Businesses by Zip Code
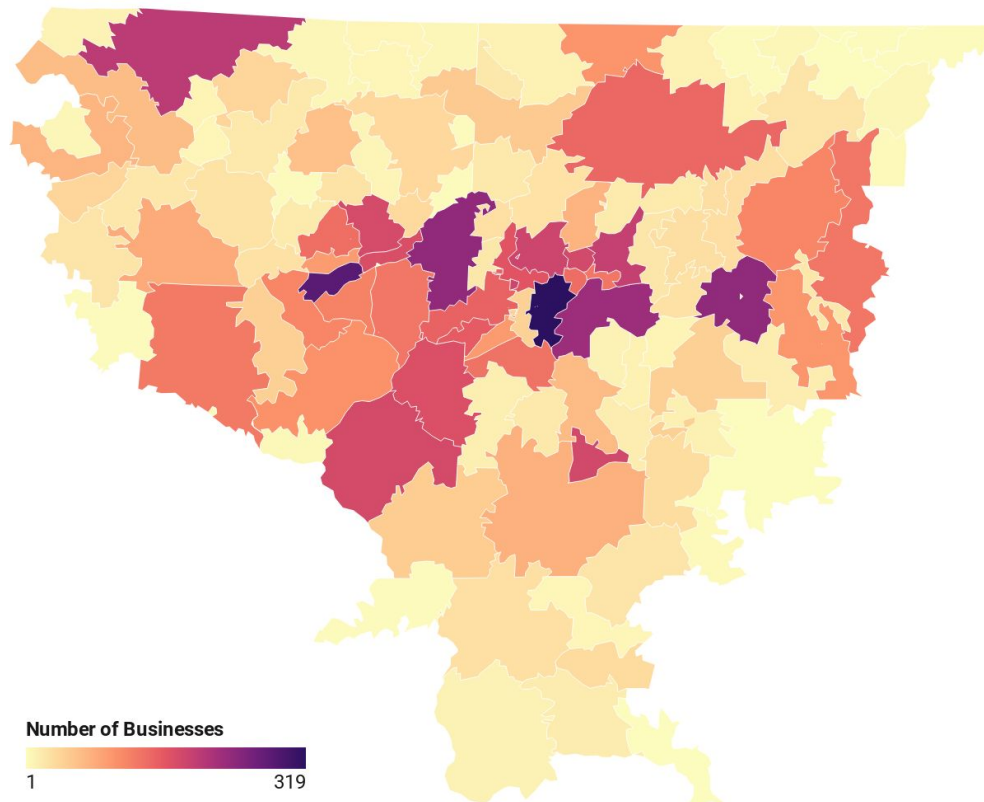
Number of Businesses

1   319

Map: Carolina Creative Works • Source: North American Industry Classification System (NAICS) • Created with Datawrapper

The number of food-related businesses for the Piedmont is quite similar across rural areas in the region. The majority of rural zip codes in the region have roughly an equal number of food-related businesses. This map indicates a centralized area where the majority of the Piedmont's food-related businesses are located, with one zip code being home to 319 food-related businesses.

Wholesale Business Analysis

The average number of sales for wholesalers by county ranges from $2.2 million in Caswell County to $44.4 million in Forsyth County. Montgomery is second highest with $31.2 million in average sales and Rockingham County ranking third with $16.9 million.

Average Sales per Business by County - Wholesalers

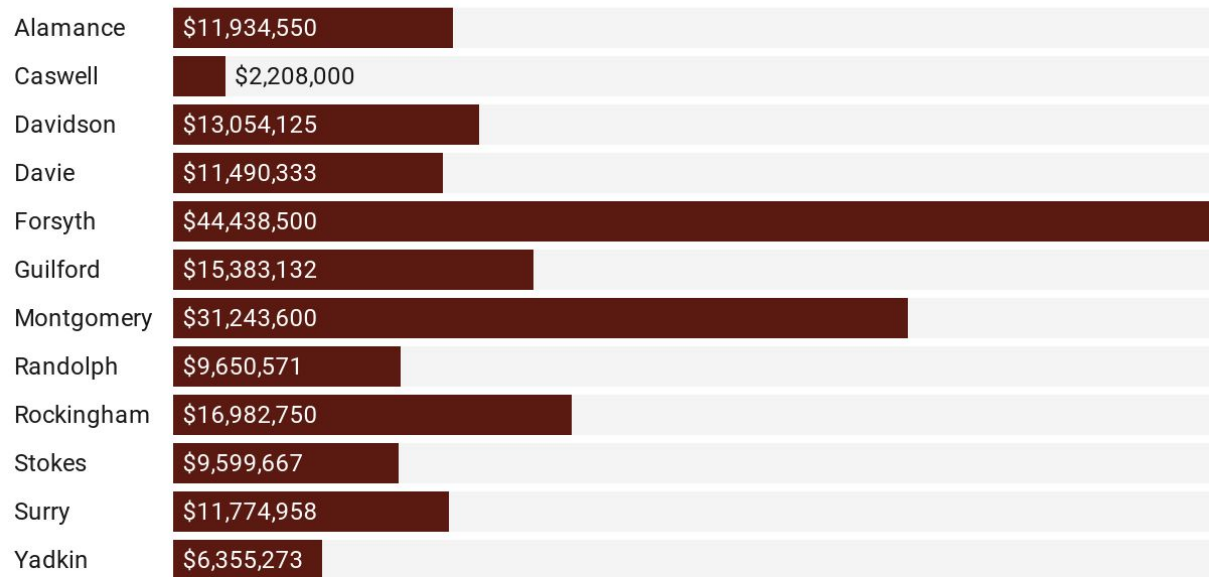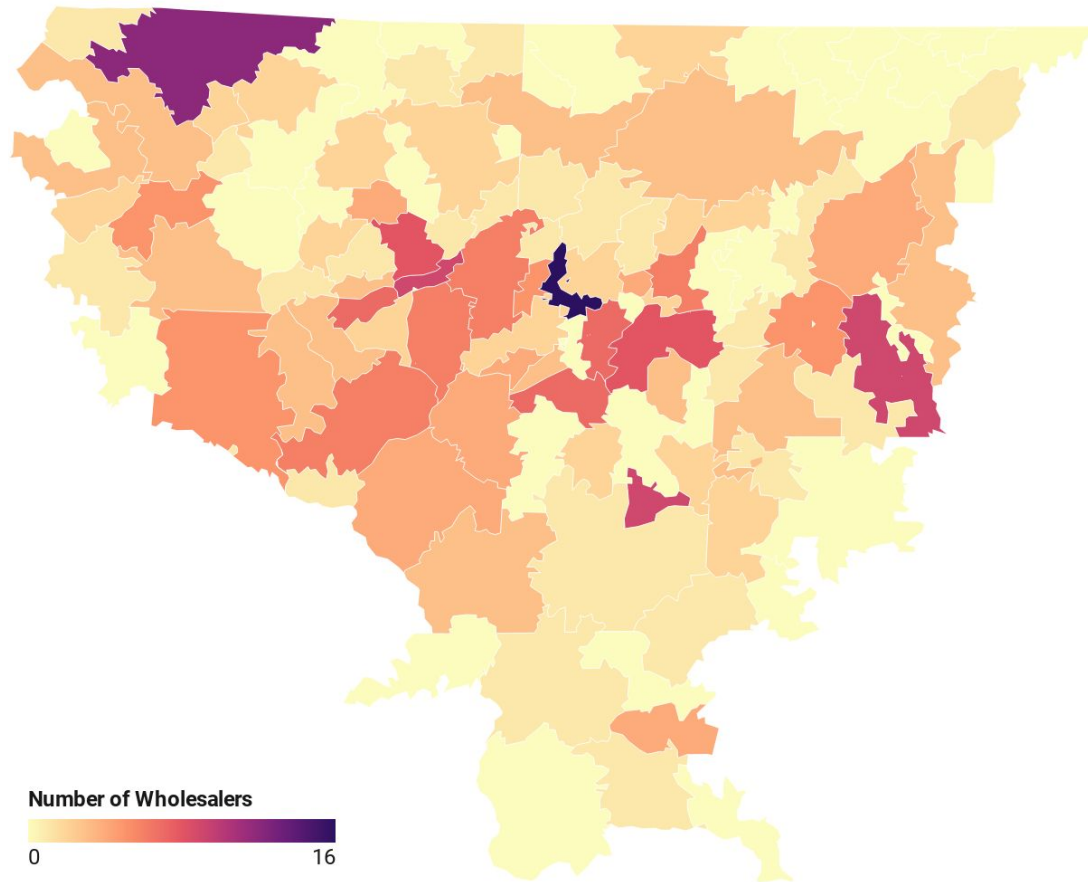| County	Average Sales
Alamance	$11,934,550
Caswell	$2,208,000
Davidson	$13,054,125
Davie	$11,490,333
Forsyth	$44,438,500
Guilford	$15,383,132
Montgomery	$31,243,600
Randolph	$9,650,571
Rockingham	$16,982,750
Stokes	$9,599,667
Surry	$11,774,958
Yadkin	$6,355,273

Chart: Carolina Creative Works • Source: North American Industry Classification System (NAICS) • Created with Datawrapper

Number of Wholesalers by Zip Code

Number of Wholesalers

0   16

The number of wholesalers for the Piedmont is similar across rural areas in the region. The majority of rural zip codes in the region have roughly an equal number of wholesalers. This map indicates a centralized area where the majority of the Piedmont's wholesalers are located, with one zip code being home to 16 wholesalers. The northwest quadrant is also home to over a dozen wholesalers.

Restaurant Business Analysis

Forsyth, Davie, Stokes, Randolph and Surry counties lead the region in average sales by restaurants. Yadkin and Caswell counties rank in the bottom tier of average restaurant sales.

Average Sales per Business by County - Restaurants

County	Sales
Alamance	$4,381,039
Caswell	$871,023
Davidson	$3,937,542
Davie	$4,664,673
Forsyth	$5,808,120
Guilford	$4,361,784
Montgomery	$4,284,761
Randolph	$4,539,367
Rockingham	$3,667,137
Stokes	$4,593,957
Surry	$4,642,397
Yadkin	$2,454,524

Chart: Carolina Creative Works • Source: North American Industry Classification System (NAICS) • Created with Datawrapper

Number of Restaurants by Zip Code
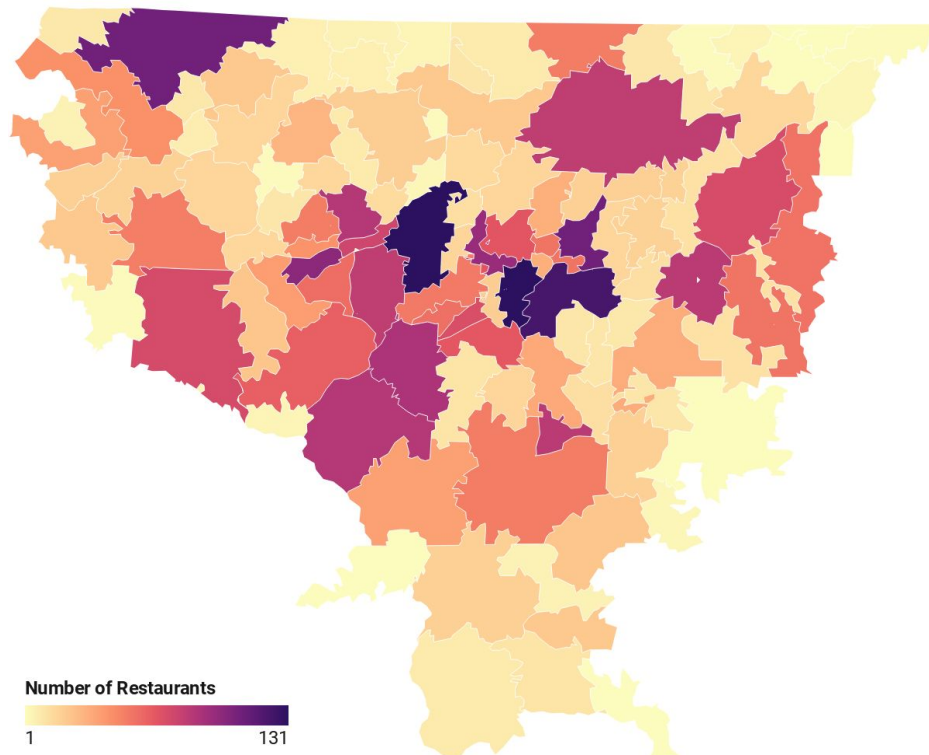
Number of Restaurants

1   131

Map: Carolina Creative Works • Source: North American Industry Classification System (NAICS) • Created with Datawrapper

Each zip code is home to at least one restaurant. However, the majority of the restaurants are located in urban and suburban areas, particularly along major routes and interstates. The extreme northern and southern zip codes in the region are home to the fewest restaurants.

Agriculture Business Analysis

Agriculture businesses include most of the two-digit NAICS sector for farming (NAICS Code 11). This sector covers all types of farms, but we excluded tobacco farming, fishing, and logging. Surry County leads the region in average sales in agriculture businesses with $976,242 in average sales. The region's average sales per agriculture business ranges from $176,500 (Rockingham) to $976,242.

Average Sales per Business by County - Agriculture

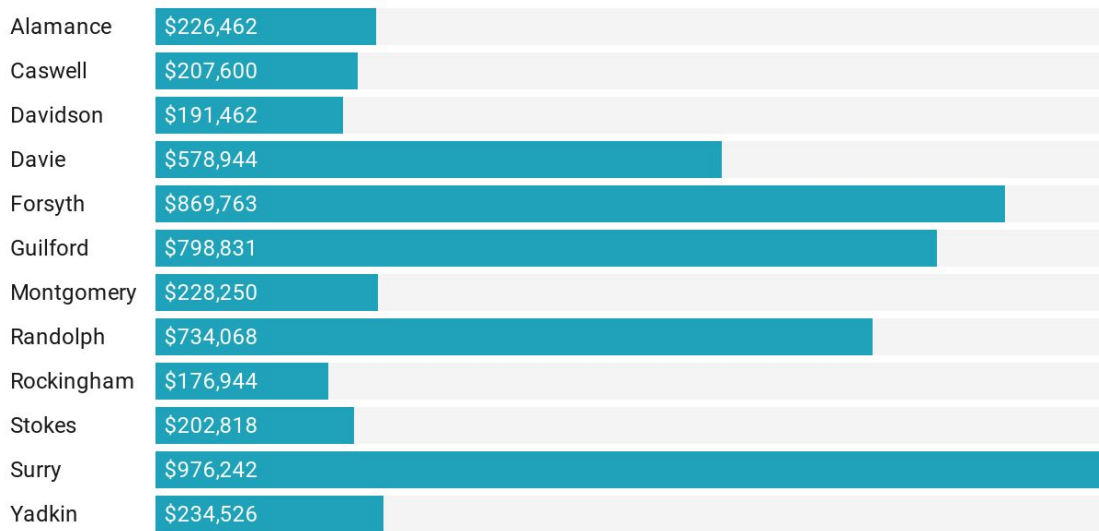| County	Average Sales
Alamance	$226,462
Caswell	$207,600
Davidson	$191,462
Davie	$578,944
Forsyth	$869,763
Guilford	$798,831
Montgomery	$228,250
Randolph	$734,068
Rockingham	$176,944
Stokes	$202,818
Surry	$976,242
Yadkin	$234,526

Chart: Carolina Creative Works • Source: North American Industry Classification System (NAICS) • Created with Datawrapper

Number of Agricultural Businesses by Zip Code

Number of Agricultural Businesses

0   15
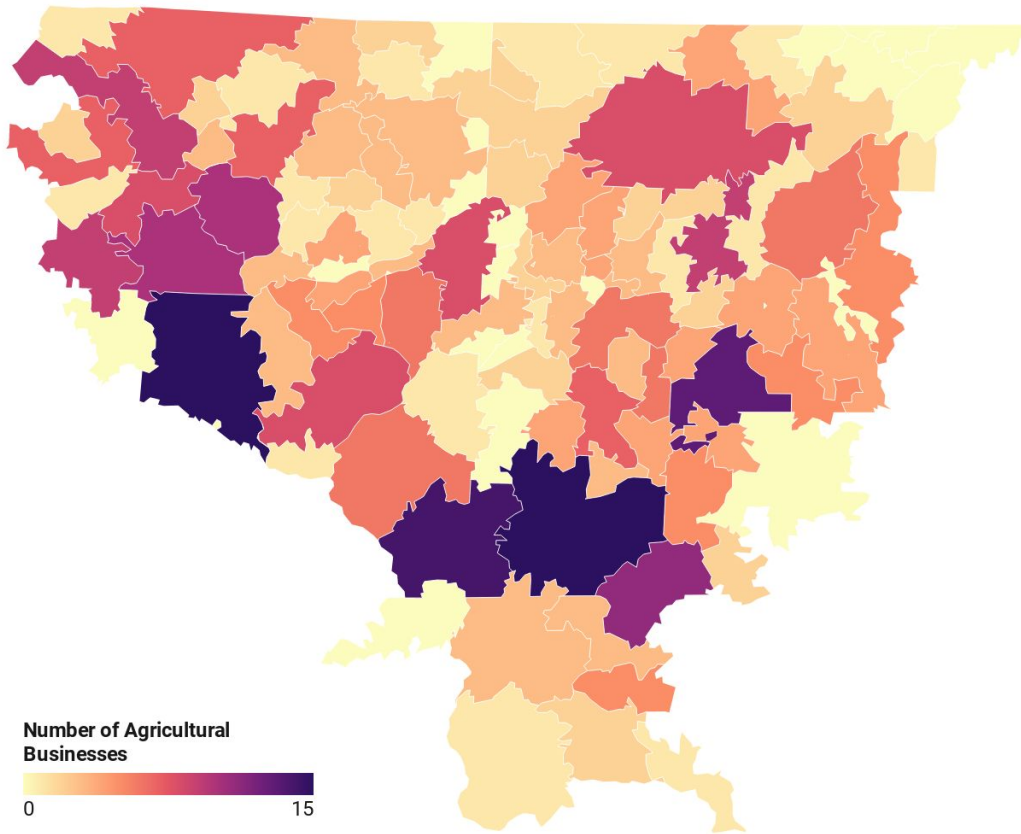
Map: Carolina Creative Works • Source: North American Industry Classification System • Created with Datawrapper

The greatest number of agricultural businesses per zip code is 15, with roughly 8 zip codes having a dozen or more agricultural businesses. The zip codes bordering Virginia, those in the southernmost area of the region, and urban zip codes have the fewest number of agricultural businesses, with some reporting none.

Processing Facility Analysis

Please see the Supply Chains section for more information about processing and cold storage facilities in the region.

Average Sales per Business by County - Processing Facilities

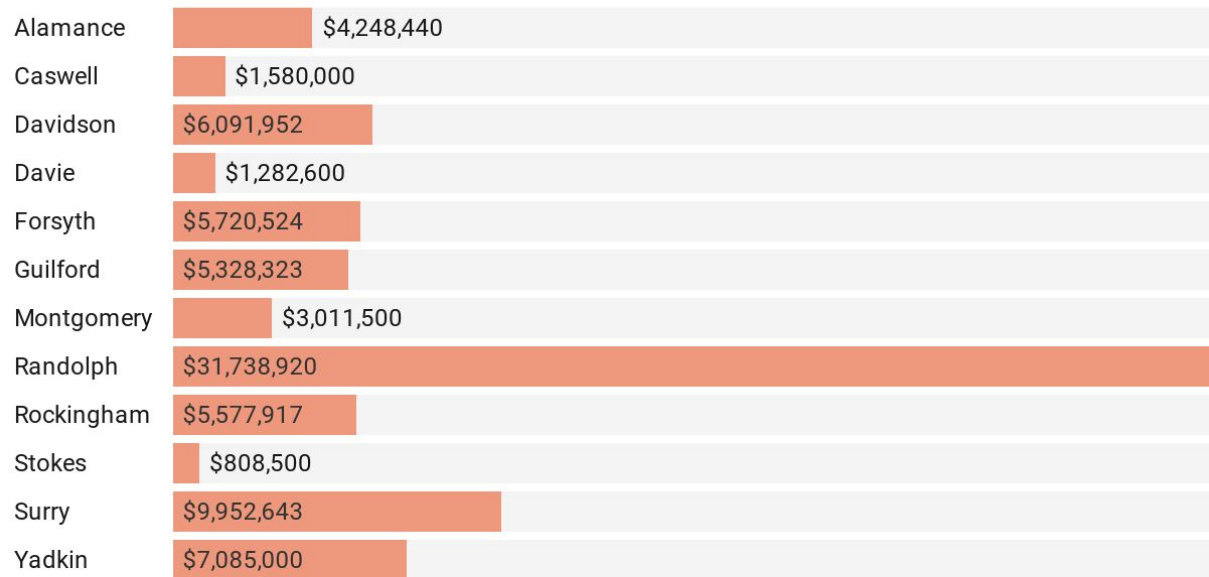| County	Sales
Alamance	$4,248,440
Caswell	$1,580,000
Davidson	$6,091,952
Davie	$1,282,600
Forsyth	$5,720,524
Guilford	$5,328,323
Montgomery	$3,011,500
Randolph	$31,738,920
Rockingham	$5,577,917
Stokes	$808,500
Surry	$9,952,643
Yadkin	$7,085,000

Chart: Carolina Creative Works • Source: North American Industry Classification System (NAICS) • Created with Datawrapper

The highest processing sales were in Randolph County ($31.7 million) and Stokes County ($29.7 million) while Montgomery and Caswell had the lowest sales for processing facilities ($3.01 million and $1.5 million, respectively).

Number of Processing Facilities by Zip Code
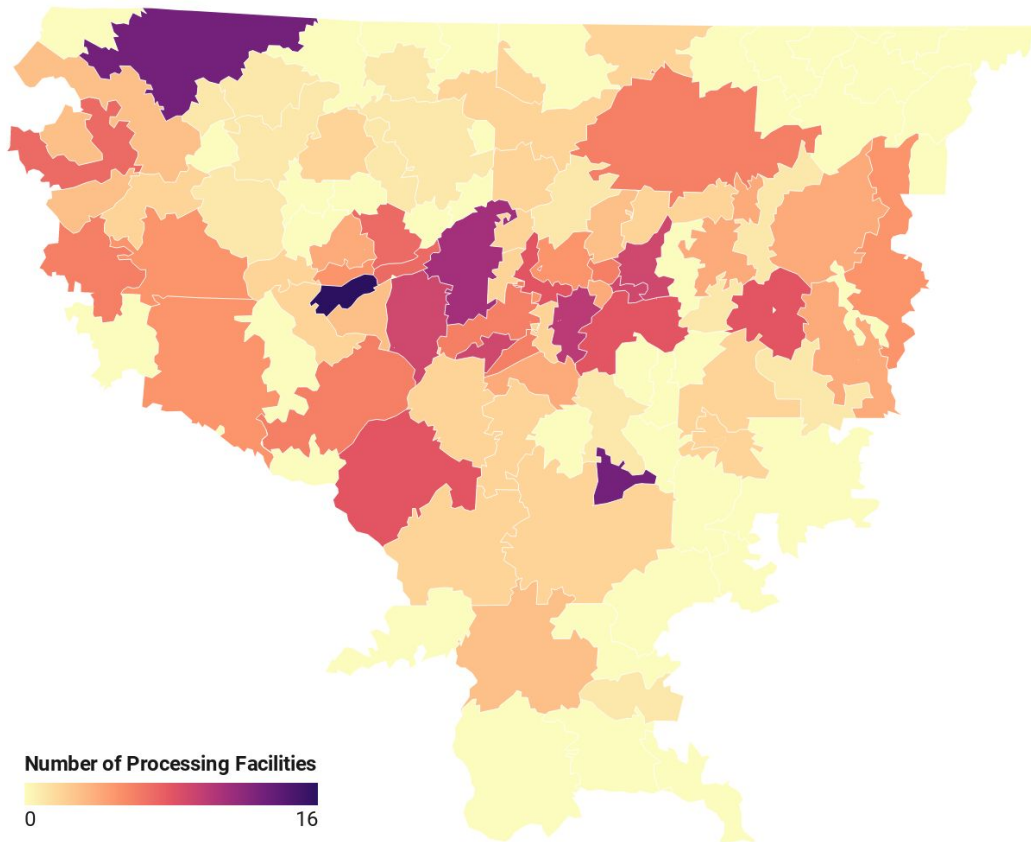
Number of Processing Facilities

0   16

Map: Carolina Creative Works • Source: North American Industry Classification System (NAICS) •
Created with Datawrapper

Most of the processing facilities are concentrated in four zip codes, with many zip codes in the region having no processing facilities. This can lead to a drive of up to 1.5 hours for some farms to find appropriate regulated processors for use. Please see the supply chain section and the attached Network Maps & Directories file for lists of processing facilities.

Retail Food Markets Analysis

Markets in NAICS coding include grocery and supermarkets, all food stores including convenience stores, meat markets, fish markets, and vegetable markets.

Average Sales per Business by County - Markets

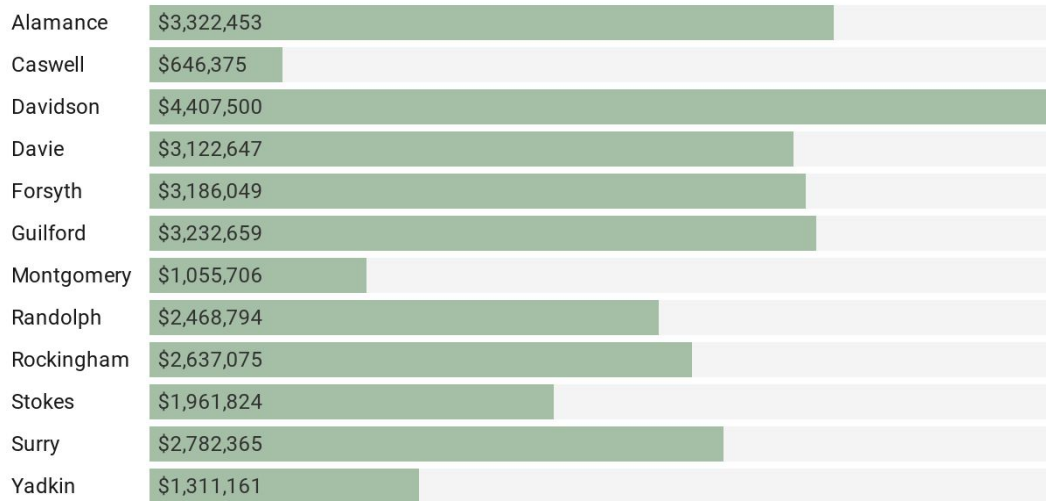| County	Sales
Alamance	$3,322,453
Caswell	$646,375
Davidson	$4,407,500
Davie	$3,122,647
Forsyth	$3,186,049
Guilford	$3,232,659
Montgomery	$1,055,706
Randolph	$2,468,794
Rockingham	$2,637,075
Stokes	$1,961,824
Surry	$2,782,365
Yadkin	$1,311,161

Chart: Carolina Creative Works • Source: North American Industry Classification System (NAICS) •
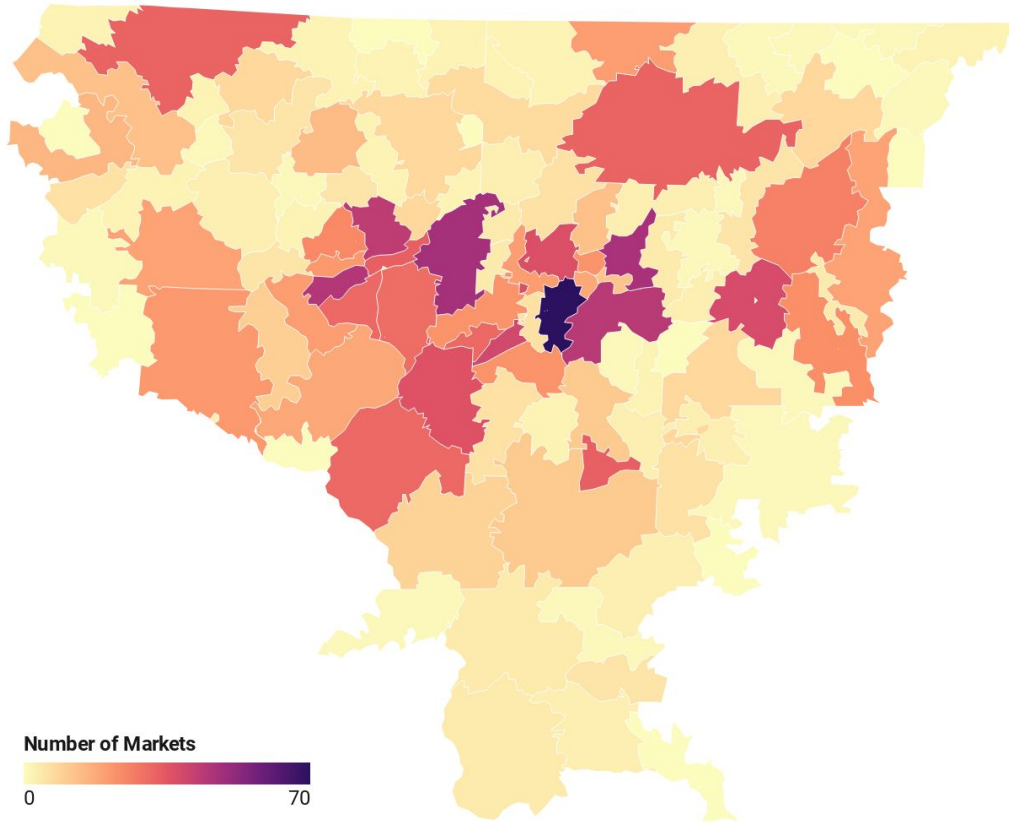Created with Datawrapper

Number of Persons per Market by County

Shows the ratio of people to businesses by county. For example, in Alamance County, there are 1,349 people for each market. Higher numbers show counties that have less businesses to support local residents.

County	Persons per Market
Alamance	1,349
Caswell	1,427
Davidson	1,520
Davie	1,228
Forsyth	1,200
Guilford	1,243
Montgomery	1,614
Randolph	1,400
Rockingham	1,367
Stokes	1,357
Surry	977
Yadkin	1,220

Chart: Carolina Creative Works • Source: North American Industry Classification System (NAICS) •
Created with Datawrapper

Number of Markets by Zip Code

Number of Markets

0   70

Map: Carolina Creative Works • Source: North American Industry Classification System (NAICS) •
Created with Datawrapper

Storage Facility Analysis

Please see the Supply Chains section for more information about processing and cold storage facilities in the region.

The Piedmont is lacking in the number of storage facilities available. This diagram shows the economic impact of storage facilities in the region, with only 5 counties reporting sales. Alamance, Davidson, Forsyth, Guilford, and Rockingham counties control the storage facilities markets in the region, with average sales ranging from $280,000 (Rockingham) to $2.14 million (Alamance). Please see the supply chain section and the attached Network Maps & Directories file for lists of storage facilities.

Average Sales per Business by County - Storage Facilities

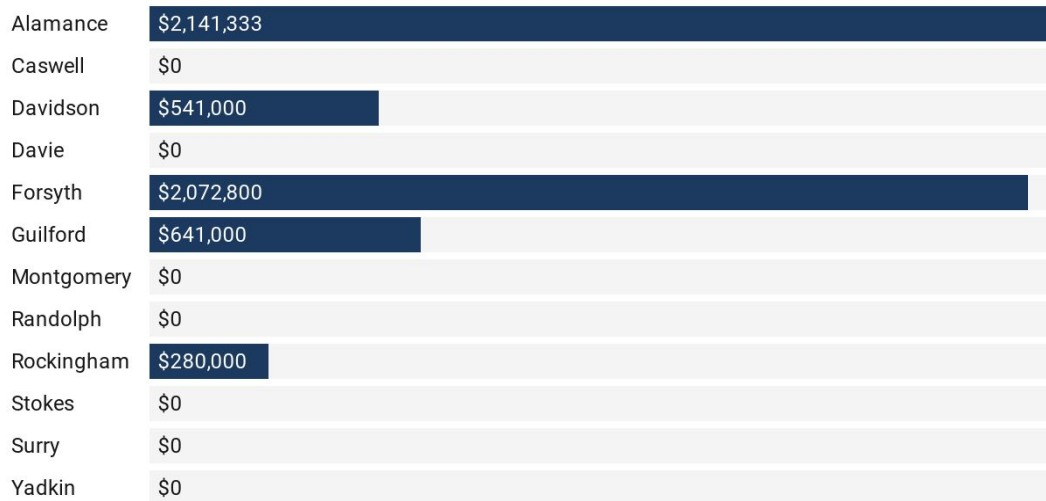| County	
Alamance	$2,141,333
Caswell	$0
Davidson	$541,000
Davie	$0
Forsyth	$2,072,800
Guilford	$641,000
Montgomery	$0
Randolph	$0
Rockingham	$280,000
Stokes	$0
Surry	$0
Yadkin	$0

Chart: Carolina Creative Works • Source: North American Industry Classification System (NAICS) • Created with Datawrapper

Number of Persons per Storage Facilities by County

Shows the ratio of people to businesses by county. For example, in Alamance County, there are 52,615 people for each storage facility. Higher numbers show counties that have less businesses to support local residents. Counties with a zero have no storage facilities.

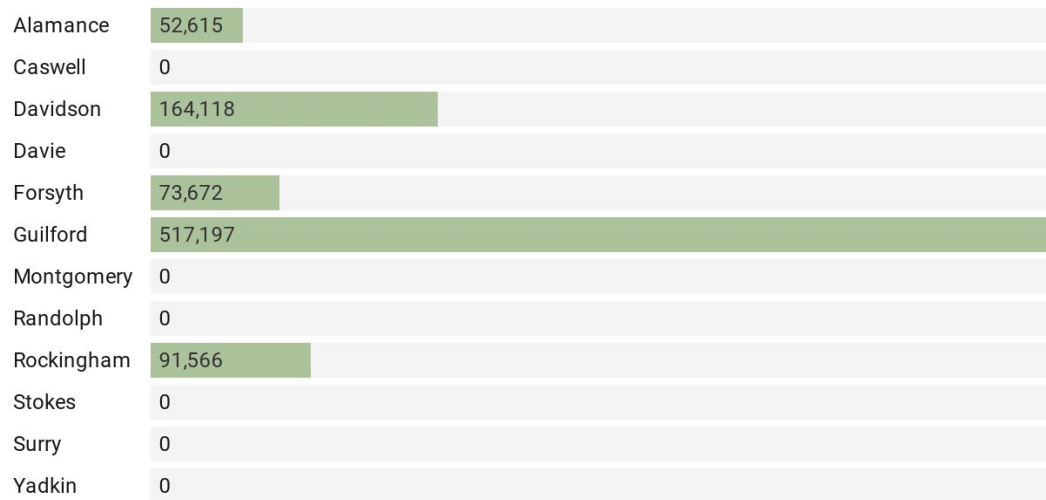| County	
Alamance	52,615
Caswell	0
Davidson	164,118
Davie	0
Forsyth	73,672
Guilford	517,197
Montgomery	0
Randolph	0
Rockingham	91,566
Stokes	0
Surry	0
Yadkin	0

Chart: Carolina Creative Works • Source: North American Industry Classification System (NAICS) • Created with Datawrapper

When portrayed as a ratio of people to business, the numbers are stark. There are no agriculture-specific cold storage facilities for mid-scale producers in Caswell, Davie, Montgomery, Randolph, Stokes, Surry, and Yadkin counties. While Alamance, Davidson, Forsyth, Guilford, and Rockingham counties are home to storage facilities, the available square footage does not adequately provide access to all mid-scale producers in the same counties. The lack of storage facilities, particularly ones that offer cold storage,

places a burden on farmers, producers, and processors in the region, resulting in people having to go outside the region. According to the Piedmont Authority for Regional Transportation Advanced Freight Model study, only 6 facilities offer agricultural use of their facilities in the region.

Number of Storage Facilities by Zip Code
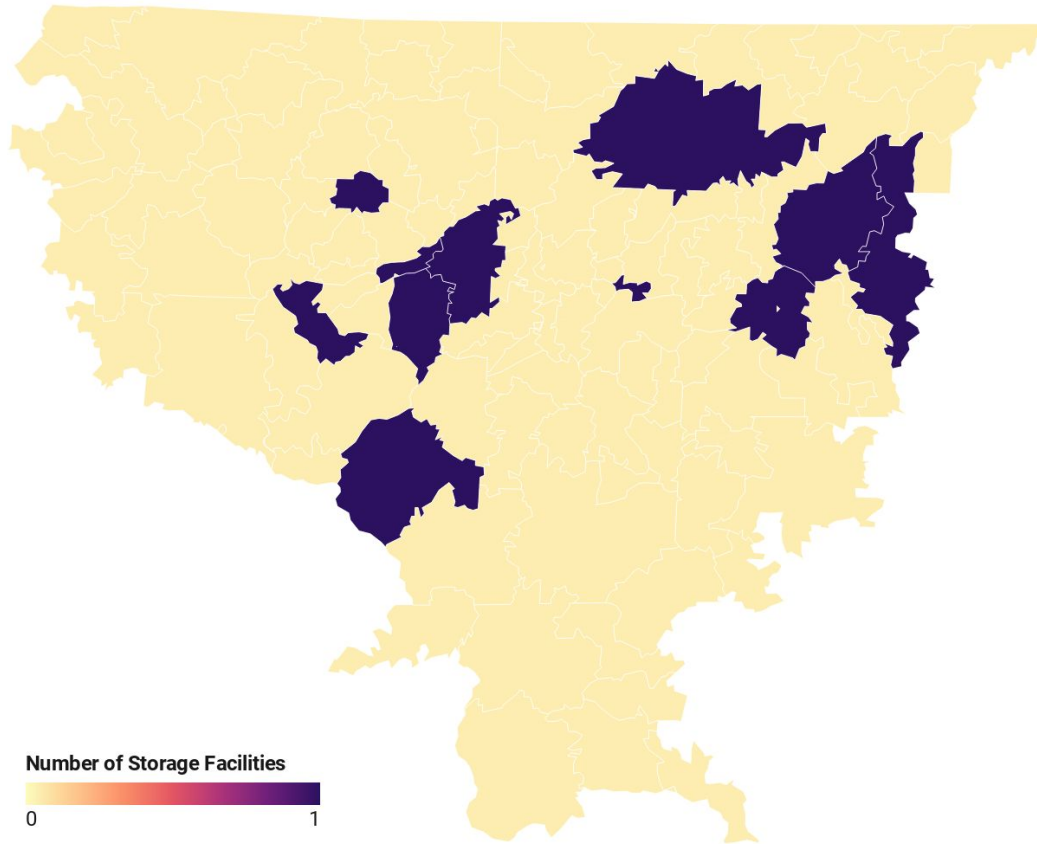
Map: Carolina Creative Works • Source: North American Industry Classification System (NAICS) • Created with Datawrapper

Industry Clusters

Regional economies are often defined by their industry clusters, which are groups of industries that are closely linked based on the types of products and services they provide or by industry connections through supply chains. Food-related clusters include livestock processing, food processing, and agricultural services. As shown in the chart below, the Piedmont region only breaks the top 50 of 179 regions across the country in some of these clusters. Further, the average wages of these clusters are consistently lower in the Piedmont region compared to the rest of the country.

Greensboro-Winston-Salem Economic Area Food-Related Industry Clusters

Industry clusters are groups of industries that are closely related by the types of products they offer or by connections through supply chains. Ranks are out of 179 economic areas. This data does not include farming, but instead focuses on the non-agricultural pieces of the food system.

Cluster Name	National Rank	2017 Employment	2017 Average Wages	2017 US Average Wages
Transportation and Logistics	43	9,768	$44,519.59	$57,843.77
Food Processing and Manufacturing	112	388	$40,095.24	$42,423.64
Agricultural Inputs and Services	67	91	$22,928.10	$50,866.20
Livestock Processing	65	175	$0.00	$38,288.61
Local Food and Beverage Processing and Distribution	47	22,020	$42,918.07	$44,126.50
Local Logistical Services	41	12,902	$23,726.13	$29,740.39

Table: Carolina Creative Works •
Source: Harvard Business School's Institute for Strategy and Competitiveness, the U.S. Department of Commerce, and the U.S. Economic Development Administration
• Created with Datawrapper

Data Sources and Analysis

The U.S. Cluster Mapping Project is an initiative done in collaboration between Harvard Business School's Institute for Strategy and Competitiveness, the U.S. Department of Commerce, and the U.S. Economic Development Administration. Together, they developed a dashboard that measures regional industry clusters based on economic areas. Clusters are combinations of industries that are closely related regarding the products and services they produce. Economic areas are geographic regions defined by the connection between the local economies within them. In other words, counties that are tightly connected economically comprise economic areas. We used this data to look at how the PTRFC region performs in several of these industry clusters.

Businesses are classified by industry codes under the North American Industry Classification System (NAICS). Each industry code ranges from two to four digits, with more digits meaning greater detail. For example, NAICS 11 includes all Agriculture, Forestry, Fishing, and Hunting industries, and NAICS 1111 is Oilseed and Grain Farming, which is included in NAICS 11. We requested data on businesses in the NAICS sectors related to farming. This provided us with information about where businesses were located, what industry they are in, their total sales, and number of employees. With this information, we were able to

demonstrate which counties have stronger business infrastructure in food-related industries and which counties hold the most capital by business type.

The Bureau of Labor Statistics (BLS) releases Occupational Employment Statistics (OES) annually, highlighting employment and average and median wages by occupation. Occupations are organized by the Standard Occupational Classification (SOC) system, which is organized differently than the NAICS system described above. The essential difference is that NAICS codes look at the activity of businesses and categorizes all employees under a specific industry, whereas SOC codes look at what individuals are doing within their workplace to determine their category. The BLS only releases OES data on a metropolitan and micropolitan statistical area, so some counties may be left out of the data and granularity is hard to come by without proprietary data. For our assessment, we looked at OES data for the Winston-Salem and Greensboro-High Point metropolitan areas.

Additional Reports and Resources
- Economic Development Reports (Regional/Local)
    - Triad Tomorrow: Building Our Communities for Tomorrow's Jobs (PTRC, 2016)
    - Piedmont Together: Comprehensive Regional Plan (Piedmont Together, 2014)
    - Suitable Growth Pattern of the Piedmont Triad Region (Piedmont Together, 2014)
- Transportation (Regional/Local)
    - PTRC Commuting Patterns (2015)
- Economic Development/Infrastructure Reports (State)
    - State-level not done by county
- Labor and Workforce (State)
    - BLS and NC Labor Force data
- 2017 Rankings Market Value of Ag Products Sold (State)
- USDA ERS - Local Foods
- USDA ERS - Data Products
- USDA AMS Farmers Markets Map

Recommendations: A Regional Roadmap

Roadmap Overview

One of the major goals of this project was to assess the existing elements of the food system in each of the 12 counties of the region and for the Triad as a whole, and then to provide a roadmap for the Regional Food Council to use in future years for both micro and macro projects. The roadmap is built around the following major areas of the assessment:

- Council Vision, Equity Goals, and Infrastructure

- Council Relationships with Local Community Partners

- Building a Data-Driven Framework for the Regional Food System

- Increasing Food Security in the Piedmont Triad

- Supporting Producers, Supply Chain Actors, and Food Infrastructure

While we know the substantial impacts of COVID-19 will continue to develop over time, there are also new ways to innovate in regional food system improvements that can help to increase equity, build market opportunities, and make long-term strategic investments that support a resilient food system.

In regional food systems, a return to normal would mean a return to structural inequities, top-down decisionmaking, and an overreliance on data to make decisions about what's best for communities. But the council has an opportunity in 2021 to center the voices of underserved communities working on the ground, to empower those groups and individuals with the resources they need to address the problems that they know exist, and to create a stronger and more resilient network of partners across the Triad.

We centered equity in our research, guided by the council's definitions and goals, and although our engagement strategies were reduced this year, equity for communities that are furthest from justice is still a central component of this assessment. In each research area and in our recommendations, we've included equity highlights demonstrating areas of opportunity for the council to focus on, as well as partners with whom the council can work to better effect change.

Although the food system challenges we outline in this assessment are significant, this year has demonstrated that systemic change can come when we remove all constraints and reimagine what a strong food economy can look like. PTRFC is already doing an excellent job of representing and convening groups doing important work in their communities. We're hopeful that this assessment, our recommendations, and the county-level reports we've provided will empower council members, the regional council of governments, and local actors across the region to make sure that the regional food system doesn't go back to normal - but comes back better than it was before.

Council Vision, Equity Goals, and Infrastructure

The council is formalizing itself during a time of great upheaval, with new members and staff being onboarded in 2020. Building a strong vision, shared equity goals, and infrastructure for implementing projects and programs will ensure the council meets its goals in 2021 and in future years.

Council Vision & Purpose

With a year of development in the books and a completed food system assessment, early 2021 will be an important time for the council to more seriously consider its vision and purpose and the details of how it will achieve those goals. Related recommendations can be found in the equity and infrastructure sections below.

- Conduct a workgroup session of the council to identify clear strategies for actions and programs that the regional council hopes to focus on.

    - Which roles are priorities for the council?

    - What are the benefits to having a council at the regional level rather than locally?

    - Which roles allow the council to have the most impact in the areas it hopes to focus on first?

    - What strategies are most useful and relevant to local partners working to build the food system on the ground?

- Articulate these roles and strategies clearly, identifying how the council can support local agencies, before reaching out to new partners. Identify and share a vision that is reciprocal - that brings the council's resources and leverage to the work of the local partner.

- Consider changing the structure and format of regional council meetings, experimenting with innovative approaches to the traditional government advisory board structure.

    - Can council members report on their region and identify needed resources each month? Can trainings, talks from local partners about their work and their needs, or work sessions take place to keep council members informed about what's happening across the region? Can a certain number of meetings per year take place in volunteer efforts at food banks or farms, with discussion afterward about structural issues and how the council can support their work? Are there other ways the council can creatively keep its volunteer members engaged and informed?

Accomplishing Shared Equity Goals
This assessment process helped the council clarify and articulate its vision for an equitable food system, and the Equity Subcommittee's support was invaluable in this process. The council also undertook racial equity training during the year to support all members having access to the resources they need to make informed decisions.

Some of the assessment's further recommendations for ensuring equity goals are met are described below, while others are included in separate topics in these recommendations, to ensure that equity is a component of all projects developed from this process:

- Engaging leaders of color in small and grassroots organizations across the Triad (see additional recommendations in the next section)

- Identifying two to three priorities for each county and allowing council members to take ownership of supporting those equity goals

- Researching & supporting state and federal policy change that can have a real impact on equity in local communities, such as federal food funding, Farm Bill changes that support small farms and farmers of color, broadband expansion statewide, and state expansion of programs that address food security and access to resources for small farms

- Providing a venue for the council to learn from groups already doing this work in the Triad region and beyond, including RAFI, CFSA, CEFS, and others

- Prioritizing council projects and programs, including distribution of funds, in a manner that ensures equitable support (including reserving loan funds for farmers and food producers of color and rural businesses and prioritizing underserved recipients in shared gifting processes)

- Reducing the administrative burden required for underserved communities to be involved in and take ownership of the food system, both through internal programs and through external relationships (see next section)

- Providing a venue for local agencies, advocates, and food system actors to request policy change and program development, with a clear strategy for how those requests are managed and implemented

Implementation Infrastructure

How the council manages and implements the shared regional goals will inform much of its success in the coming years. Prioritization, shared ownership, communications, and partnerships will form the foundation of a successful implementation program from here forward.

- Clearly review and identify priorities from the assessment that the council will focus on in coming years, and share those strategies with partners and interested residents. There's a lot of information in this assessment and hundreds of ways to begin working on improvements to the food system: choosing council priorities and building a clear workplan with strategies for how those will be implemented will help show partners and stakeholders that the council is prepared to move forward with implementation.

- Focus on sharing a clearer vision, mission and goals with a much broader audience than has currently been established.

    - Because the council is new, there is a two-fold challenge in building support for regional projects: first, most local agencies aren't aware of the regional council, and second, the council has had a difficult time articulating why and how local partners should be involved.

    - Clearly articulating the benefits the council brings to local groups and specific details of how local and regional agencies can collaborate on implementation will go a long way towards establishing a stronger regional food network.

- To support this, the council needs to invest significant resources in communications and media, particularly since the pandemic and associated lockdowns have pushed communications online. This is a challenge in all government organizations, but strong social media profiles and a relevant and regularly updated web presence will significantly increase the number of participants, supporters, and new partnerships and projects.

- Continue the successful apprenticeship program that was tested during the assessment process. There are dozens of schools across the region who can work with the council to place students in paid apprenticeship positions, which can help ensure that outreach, engagement, and equity goals are met in addition to the implementation goals that staff members will focus on. These apprenticeships also serve important roles in raising awareness of the food system to new audiences, training students in new skills to support future food system work, and expanding youth access to food system change.

- Create more awareness among council members of the PTRC resources that can be put to use by the food council. This might include monthly guest speakers from the planning, mapping, aging, or transportation departments who can share their work and discuss ways that the council can work with existing resources to accomplish some of the goals from this assessment.

Council Structure & Relationships with Local Community Partners

The assessment focused on mapping and identifying the partners, agencies, advocates, and individuals who were either referred to us as experts in local communities or already known to be working to improve the food system from the ground up.

Because the council is in the early stages of development, there is significant work to be done in future years to build stronger local partnerships, especially in counties not currently represented by a local food council, and to continue to convene these stakeholders to generate ideas, offer resources, and promote equity across the region.

The recommendations above - about clearly articulating the council's implementation strategies and the benefits the council can bring to support local efforts - will help to build those relationships, but there are several other ways the council can explore innovative approaches to building better regional networks to support this work.

- Keep the promises made at the beginning of the assessment process by reaching back out to the Stage A interview and focus group participants, early partners, data sharing partners, and other stakeholders, along with interested participants who responded to the survey and signed up for updates. Build a monthly email or social media means of continuing to engage those groups after sharing the assessment results and implementation plan.

- Partner with groups and individuals who represent furthest from justice communities - including many identified in this report - and instead of asking them what the council should do, ask them what they're already doing and how the council can support them in that work. Many partners, individuals, and community champions we interviewed reiterated a feeling of deja vu, feeling that they'd been bringing the same issues up to county and government leaders for many years without results, leaving them to do the work alone. To overcome this, it's important for the council to realize that building trust and support for regional goals may take time.

- Build trust with community partners by empowering them to do the work they already know is needed, through shared gifting, microlending or microgrants programs, and other resource support. Larger projects, while appealing, tend to be more top-down (or inside-out, as our research design noted). Building relationships within communities by showing up, providing support, and getting out of the way can lay the groundwork for larger regional projects in future years.

  - Many partners indicated during our interviews and focus groups that they are already stretched thin with keeping operations up, especially after COVID-19, and that participating in something like a regional planning session feels like another overcommitment they're hesitant to make.

  - Rather than asking partners to join regional-level meetings or fill out a form or questionnaire, experiment with new ways to make it easy for them to share their needs on an ongoing basis - and give them incentives, by listening and showing up when asked with resources, to continue to do so (see next section).

- Build trust with community partners by listening to them, not just once during an assessment, but as part of the fabric of how the council operates. Some means for doing this might be:

  - Assign each county's regional council member to check in with partner agencies in their county each month and report up to the regional council any issues, needs for resources, or questions.

  - Hold micro-level meet and greets or learning opportunities (in-person or online) to bring a resource or training to a smaller county or community, and engage local partners at the same time.

  - Offer to be the bridge builder for local nonprofits and community advocates to their county or municipal government. Make introductions, share ideas, connect resources, and bring questions and requests to the planners, economic developers, managers, and other public officials who can support the work at the local level.

- Build awareness of the food system within local government agencies across the region. The existing relationships with local governments are PTRC's strongest asset in this work, and bringing county and municipal partners on board with county goals would be a significant boost in support for most of the nonprofit and community groups working on food system efforts. (This also includes specific government sectors, such as outreach to school districts, aging centers, transportation and transit providers, workforce development agencies, and others: there is a wide variance in which agencies participate at the county level and how they choose to do so. A more unified approach from the county level would make regional decisions much easier to navigate and implement.)

- Partner with local counties and small groups to generate and develop regional goals, based on the data from this assessment, that meet the needs of all twelve counties.

- Explore ideas from the case studies (in the Trends & Impacts section) provided here as well as new ideas from around the country. Set aside a portion of each meeting for sharing innovative or creative approaches and create a framework for deciding which ideas are worth additional research to see if they can be implemented in the region.

- Engage organizations representing communities the council identified as furthest from justice in the Triad food system over the next several years to co-create the plan of work for future projects and work with them to leverage resources and projects that support the communities they serve. These are included in the Network Map & Directories spreadsheet in the appendix (see Partners List, Champions Table, and county tabs).

Building a Data-Driven Framework for the Regional Food System

The council continues to emphasize the importance of accurate data and analysis in making long-term decisions about food system investments. THis is important, although difficult after COVID-19 due to a lack of national and state data that will likely not be readily available until at least early 2022. Stimulus packages, unemployment benefit policy changes, funding for state and local governments, and business funding availability will all have an impact on how sectors of the economy recover from the pandemic. Below are general recommendations that can help the council balance the need for data-driven decision-making processes with the reality that long-term economic data is incredibly uncertain at the moment.

- If data continues to be an important consideration for the council's current and future members, consider investing in a data dashboard either internally through PTRC capacity or externally from a source such as mySidewalk. Most of the data provided in this report can be built into a publicly available dashboard (see Network Maps & Directories as well as other datasets in the appendix).
  - We also recommend services such as mySidewalk's new public health dashboards ([Health Dashboards — mySidewalk: Data-Driven Insights, Improvement, and Innovation for Communities](#)).

- Center future data collection efforts on the benchmarking performed in this assessment. We have provided a template that can be modified to meet the needs of the council and the COG with suggestions for important metrics.
  - Future data collection should be consistent (see our notes on how engagement can be skewed when only one of the twelve county agencies participates, for example) across counties and across agencies.
  - Future data collection should work within existing systems to avoid duplication whenever possible. This might mean collaborating with Second Harvest to continually analyze food security data or with all regional hospitals to collect public health or social determinants data.

- Consider more frequent "light" assessment updates with tools such as partner data collaborations or trusts, particularly throughout 2021 as the full economic impacts of the pandemic and stimulus packages are known.

- Focus council efforts in early 2021 on building strong partnerships that can provide the information needed for decisions at the local level without large-scale surveying or assessment tools. There are several innovative approaches to creating shared information and goals among local and regional agencies that have worked in other industries, such as transportation, aging, and workforce development; can any of those be modified to treat food systems as another regional and local shared process?

- Join and work with the ncIMPACT program at the UNC School of Government, which is creating an "information to action" framework for post-COVID economic development decision-making. Learn more at https://ncimpact.sog.unc.edu/.

Increasing Food Security in the Piedmont Triad

Food security will remain an issue into the coming years, as rates across the region were already high and projections indicate they'll get much higher as we navigate the remainder of the economic impacts of the pandemic. Working closely with Second Harvest to support their work in each county is the most effective way to support changes to food insecurity across the Triad.

- Utilize the existing transportation planning functionality of the council of governments to address food deserts and food access through transportation. Making food access a key component of future transportation programs can help to decrease the significant number of food deserts in both rural and urban areas.

- Similarly, utilizing the regional economic development agency to prioritize recruitment of grocery stores and supermarkets in addition to smaller local food outlets can address food access issues.

- Child food insecurity is higher than adult food insecurity in almost every county and is projected to rise higher. Collectively working with school districts and health agencies across the region, the council can leverage its regional knowledge to advocate for both local and state programs to expand childhood food access.

- Support urban and community gardening programs through structural resources like small grants or microfunding. These programs were of significant interest to survey and interview respondents and can bring a source of local fresh food to communities with relatively little upfront investment.

- Work with Second Harvest to continue tracking and benchmarking food bank participation over time, particularly in 2021 on a regular basis, to establish which areas are most in need. Work with local jurisdictions to determine whether there are opportunities for shared economic development, transportation, or food system projects that can help to mitigate high participation rates.

Supporting Producers, Supply Chain Actors, and Food Infrastructure

The lack of intermediary markets for agricultural producers and the need for business support to pivot food businesses into online and delivery sales during the pandemic are the two highest priority areas from our outreach and data analysis.

For supply chains and infrastructure, a focus on storage, including cold storage, and direct partnerships with distributors are the two primary areas for focus in the long-term investment planning for the council.

- The council can work with existing networks around the region of Cooperative Extension offices and Small Business Centers to address these issues, along with other private and nonprofit entities working to achieve these goals.

- Coordinated support for smaller farms and food producers can also be a shared economic development goal between the regional and local economic development agencies.

- Small grants, shared gifting, and microloan programs can be implemented with regionally leveraged funds to support beginning farmers, farmers and food producers looking to expand or diversify, and farmers and food producers of color. We recommend specific funding set aside for farmers and food producers of color, minority- and female-owned businesses, and rural businesses seeking urban markets.

- Explore, understand, and share information about the history of marginalization in the agriculture industry and the food industry, and work with local advocacy groups to share how the council and their partners are working to overcome what is often a historically disproportionate impact of racist policies and programs.

- Encourage adoption of Food Access Plans and updated Land / Unified Development Ordinances at county and municipal levels, using both Greensboro and Forsyth as examples of local policies that support food system development.

- Leverage Opportunity Zones for development of food & farm infrastructure and supply chains; there are some innovative ideas [here](#), as well as from across the nation, to utilize Opportunity Zones to stimulate food system growth.

- NC Department of Agriculture and NC Cooperative Extension are partnering to launch and operate the Visit NC Farms app, which allows individuals to search for local farms and agriculture businesses where they can support agritourism, purchase products, and buy local. This is one example of how PTRFC can partner with others to leverage technology in support of local food economies, including by assisting with advertising to both farmers and consumers across the region.

- Similarly, the council can promote adoption of the NC 10% Campaign and NC Farm to School programs and aim for 100% participation in both programs in all counties by the end of 2021.

- Utilizing the regional economic development & transportation agency networks to prioritize recruitment of infrastructure businesses and transportation nodes (particularly for cold storage and

mid-scale farmer access to storage and transportation) could have an outsized impact on farm and food production and growth in the coming years.

- Serve as a regional resource and leverage council funding to support the pivots and diversification necessary for restaurants, farmers' markets, and food businesses, which make up a large proportion of all food sales dollars in the region. Some program approaches might include providing support to small business centers working with businesses to create and implement online sales tools; providing funding to farmers' markets to serve as technical assistance providers in helping farmers implement delivery, inventory, and online ordering systems; and providing assistance through marketing and promotions in a regional communications network.

- Work directly with county governments to identify possible inter-county supply chain connections, using the food flow maps included here as a base, and identify supply chain gaps in each county. Serve as the connecting agency for counties interested in working together to increase both import/export relationships and shared infrastructure development (such as a cold storage facility that serves farmers in two or three counties, or two counties who can assist their farms with providing direct links to markets nearby).

- Form a supply chain subcommittee made up of producers, private firms, wholesalers, and Cooperative Extension representatives to examine local gaps and assets and make recommendations to the regional council and to county governments about areas for economic development opportunities.