

Sustainable Food Access through Sensing, Data Analytics, and Community Engagement

Sherif Abdelwahed, Brian Verrelli, Sarin Adhikari, Nasibeh Zohrabi, Fabrizio Fasulo, Virginia Commonwealth University
PG, FY2020

Problem: Food insecurity, both the physical lack of food as well as the overabundance of low cost, nutritionally poor food, is a manifestation of socio-economic, geographic, and racial inequalities.

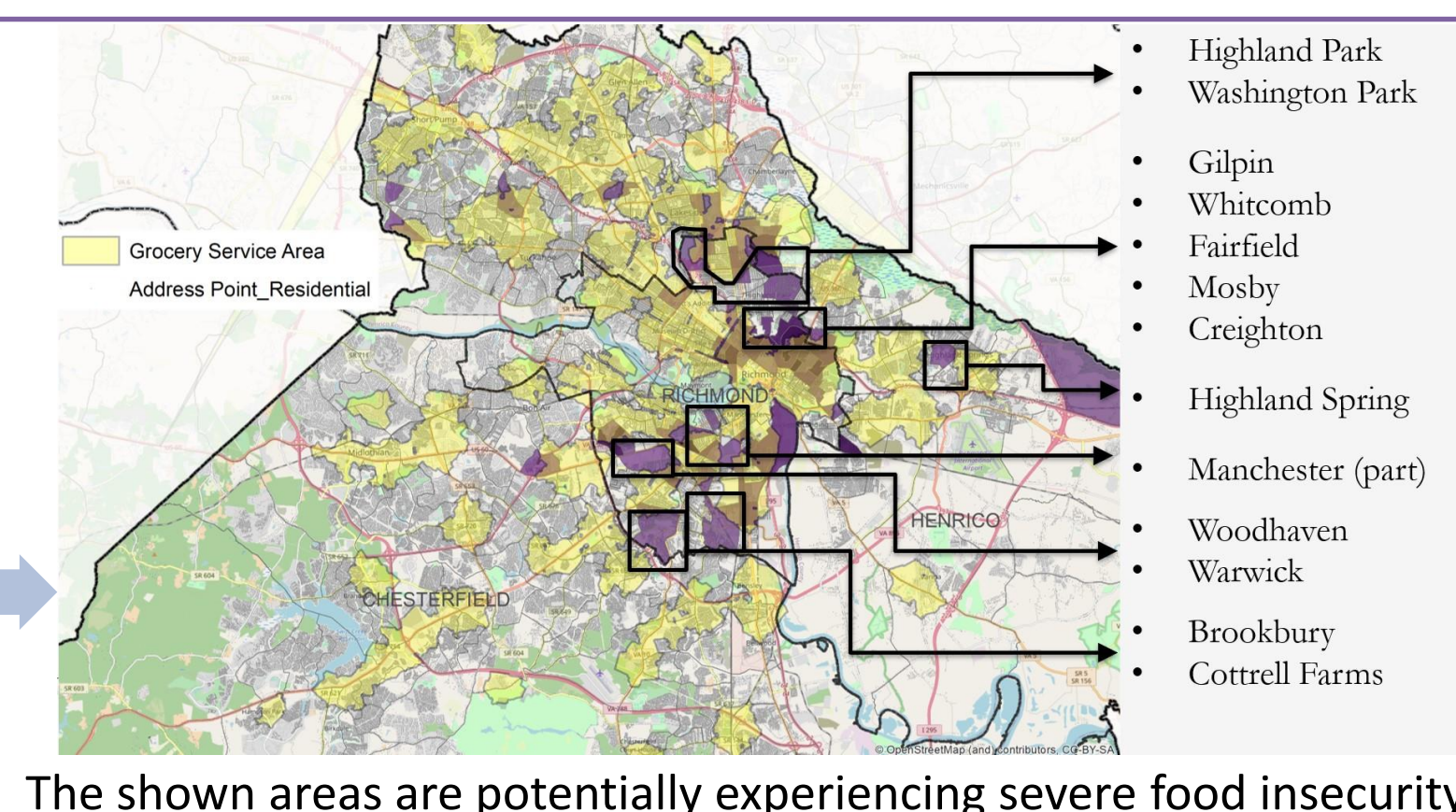
Access to safe and nutritious food is a fundamental individual right!
Project Vision: Utilizing customized sensing, data management, cyber-infrastructure and smart technologies solutions to address hunger and develop a robust program for sustainable healthy food access.

This project aims to address the food access problem in Greater Richmond area, by engaging a wide range of food access-related stakeholders and utilizing the power of data analytics and advanced smart technologies.

Community: Richmond Metropolitan Region

30% of the region's population face significant challenges in accessing healthy foods.
The COVID-19 has exacerbated this problem.

We intersected geospatial information at the Block Group level such as a half-mile walkshed of existing grocery stores, a proportion of the population without a vehicle, areas with high poverty and unemployment, and high dependency on public transportation to determine Food Vulnerable Areas in Richmond.



Intellectual Merit

This planning project is establishing multidisciplinary efforts and mutual collaboration between several VCU disciplines and local community representatives to improve food access and the overall health of the Greater Richmond area.

- (1) developing a fundamental understanding of challenges facing communities due to food desert problem
- (2) developing a better understanding of the factors contributing to food access problem
- (3) recognizing various types of data collection in communities for addressing food access challenge
- (4) deriving data-analytics techniques that can help identify effective solutions and evaluate their impacts
- (5) facilitate customized sensing, data-management, cyber-infrastructure and smart technologies solutions

Mutual collaboration between VCU and community

- Establish interdisciplinary efforts and mutual collaboration between VCU and community
- Identify various types of data collection in communities for addressing food insecurity
- Building community food knowledge, and skills
- Offer a research and development model that can be extended to other cities & communities

Workshop 1

Promoting Food Access In Our Communities

The First VCU Food Access Workshop: Breakout Sessions

- Measures of Success
- Datasets and Metrics
- Community Partners
- Related Efforts
- COVID-19 Impacts

Identify the Problem

- Semi-formal definition of food access problem
- RVA and VA specific food access problems
- Contributing factors
- Model-based problem statement
- Input from workshop #1

Assessment of the Current State

- Current data on food access in RVA and VA
- Future trends based on economic and demographics indicators
- Covid-19 effects
- Input from workshop #1

Identify Potential Solutions

- RVS Existing effort
- Experience of other cities
- Related work in literature
- Existing metrics & assessment initiatives
- Success measures
- Preparation for workshop #2

Food Insecurity Rate in Richmond Region

We obtained information on food insecurity rates calculated by **Feed More - a non-profit food bank** serving the region. Areas with higher food insecurity rates calculated by Feed More overlap with our estimate of areas with potential food insecurity.

Estimated Demand (Pounds)

We also obtained the total demand (in pounds) of food by census tracts in the Richmond region. The demand data is skewed heavily towards Richmond's Southside which overlaps portions of the food insecure areas identified by this research, but a number of neighborhoods in the Northside and the Eastend of Richmond and Eastern Henrico County do not show as much demand.

Feed More acknowledges that there is room for improvement in demand estimates, and looks forward to working together with the VCU team to develop reliable database and estimation models.

Community Outreach: City of Richmond Office of Community Wealth Building, Richmond and Henrico Health Districts, Feed More, Representatives from Richmond Public Schools, Greater Richmond Transit Company, Representatives from Local Urban Farms, etc.

Broader Impact – Society:

Build a network of researchers working collaboratively, and in synergy with the community to build smart strategies for considering different criteria in the community, including:

- health and well-being with improving access to healthy food,
- food security by fighting food poverty with improving access to affordable healthy food,
- improving food distribution and waste management,
- economy and community development by supporting local growers, retailers, markets, and employment

➤ The developed data analysis and other software tools will be freely available to researchers, policymakers, and practitioners.

Broader Impact – Sustainability:

- Establish a consortium for people who are working on food access.
- Create the knowledge and tools for community-based sustainable food access program.
- Offer a research and development model that can be extended to other cities and communities.
- Provide measures for tracking the food accessibility problem in real-time and predict the impact of different factors on the problem which will help policy makers in decision-making process.
- Create/maintain publicly accessible data portals with local/regional food systems data to inform government, emergency food providers, entrepreneurs, and producers.

Next Steps

