

Detroit Project Technical Appendix

**Companion to
Examining the Impact of Food Deserts
on Public Health in Detroit**

**Sponsored by
LaSalle Bank**

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Author's Comments

Examining The Impact Of Food Deserts On Public Health In Detroit assesses the link between food imbalance and the quality and length of life, and the quality and cause of death. Our premise is that the health and vitality of urban communities are block-by-block phenomena. Therefore we first measure the distance from every block in Detroit and the surrounding metropolitan area to the closest grocery store, fast food establishment, and other food venue for roughly 50,000 blocks. We consider the locations of USDA Food Stamp retailers and conduct an analysis of their distribution by specific retail category. Then we develop an empirical score to quantify the *balance* of food choice available to residents. Finally, we compare food access and food balance directly to diet-related health outcomes.

What we found is stark. Over a half million Detroit residents live in areas that have an imbalance of healthy food options. They are statistically more likely to suffer or die prematurely from a diet-related disease, holding other key factors such as income, race, and education constant. Metro Detroit residents also suffer from food imbalance.

Looking ahead, food imbalance will likely have a compounding public health effect on communities as residents age in place, and on future generations that grow up and remain in food imbalanced areas. Unless access to healthy food greatly improves, we predict that, over time, those residents will continue to have greater rates of premature illness and death from diabetes, cardiovascular diseases, cancer, hypertension, obesity, kidney failure, and other diet-related complications. Food imbalance will likely leave its mark directly on the quality, productivity, and length of life, and indirectly on health care costs, school test scores, and the economic vitality of the City and the region.

Our robust data set and scientific tools make clear that we have a big public health problem on our hands. **But what does science tell us about our ability to band together and reverse course, or to create something entirely new?**

Often, our response to public health and other socioeconomic problems is a new law or policy to steer resources in a particular direction. Such measures are needed, and important. But what can be done at the local level, to complement broader action and direct and manage change?

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Imagine that you have the potential to improve food access and public health for one of the 50,000 blocks that we studied. Maybe you're a developer, bringing a full-service grocer to that block, or a community resident, working with a convenience store owner to increase the quality and selection of fresh fruits and vegetables. Given the magnitude of food imbalance in Metro Detroit and especially the city itself, and the fact that there are thousands of blocks and thousands of people in affected areas, it would be human nature to wonder if the one project you might work on could make a meaningful difference.

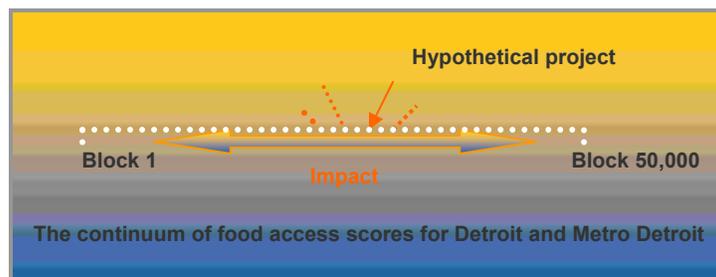
Psychologically, the answer sometimes feels like no – that the problem is too large to tackle – but mathematically, the answer is always yes, at least to some degree. Illustrating the first of many steps in our process of assessing food balance and public health brings this point to life: we measure the distance from every single food venue that we know to exist to the center of every single block in our study area to identify the shortest distance to each type of food venue from each block. This involves millions of individual calculations to compute the final scores for each block. For example, just to calculate the first set of distance scores for USDA Food Stamp retailers, the program must execute over 50 million computations:

1,073 Food Stamp retail venues
X 50,000 blocks

= 53,650,000 computations

Our study is a static picture: one moment in time in the history of Detroit. Moving forward, if we are to track the impact of different types of stores opening and closing block-by-block, we must recalculate the distance and food balance scores all over again for all 50,000 blocks each time, as the scores are only meaningful in relation to one another. It's all relative. Therefore, all blocks have the potential to be affected in some way.

Clearly, the blocks closest to the one where our hypothetical project might take place – the new full-line grocer or the upgraded convenience store – have the greatest potential to improve, but only by recalculating the universe of all 50,000 blocks do we know the true level of impact. And if we intervene with a new project or program on 5 strategically placed blocks in our continuum, instead of just one random block, the ripple effect along the continuum is amplified.



If we combine blocks into Census tracts, we find that there are 200 tracts in Detroit that have Food Balance Scores of 2 or more, meaning that they are out-of-balance in terms of food access (the distance to the closest mainstream food venue is at least twice as far as the distance to the closest fringe food venue). We can pair the tract-level Food Balance Score with a wide range of variables, such as age, race, household size, car ownership, etc. Our food venue data is most valuable the lower we go down in geography: not only the block but the exact location on the block. The value comes from the data being highly accurate and not extrapolated from a more distant source. Demographic data, such as from the Census or from sources that attribute characteristics based on modeling techniques, are usually not accurate or available at the block level.

Here we show the ordering of tracts from the first tract that has a Food Balance Score of 2 or more:

Obs	Tract	Food Balance	Pop
1	538200	2.02074	2180
2	541400	2.02449	3185
3	500100	2.02719	4328
4	503400	2.02810	2837
5	540300	2.03291	4521
...			
200	520700	13.4804	1919

These 200 tracts sit on the greater continuum of tracts; that we are showing the first observation to be #1 is arbitrary. As we monitor the tracts moving forward over time, we would need to recalculate all blocks, and then all tracts, in Detroit and the outer Detroit region to measure change.

Only having enough resources to intervene with a new project on 1 block or 5 blocks might not seem like much, but, statistically, we can predict *how much* impact we can expect, turning our feelings into objective measures that can be reasonably acted upon. With the data we have assembled already, not only is it possible to quantify all the combinations of 5 blocks in the region or the city that exist but also, and more importantly, the very top combinations of 5 blocks where impact would be greatest in our desired direction: improved public health. Said another way, **we can predict the public health return on community development investment**. We can also identify the very top combinations of the 5 fringe USDA Food Stamp retailers (convenience stores, liquor and party stores, gas stations, etc.), and predict the public health benefit of upgrading those stores to the extent that they cross from a fringe location to a mainstream location. We spend considerable time in the study quantifying Years of Potential Life Lost. We can just as easily calculate a new measure: Years of Potential Life Gained from improved access to healthy food choices.

We think we're really onto something: **a new theory of change that could have very practical implications for the intersection of community development and public health and for each field separately.**

Let's look at our objective through the lens of other disciplines. If we were oceanographers interested in saving a particular type of whale, we would first need to know something about the interconnected systems of the ocean, the many species that live there, and other whales. If we were astronomers interested in the life trajectory of a particular star, we would first need to first know something about all the stars around that star, and maybe nearby planets and the galaxy. If we care about the improvement of a particular block or neighborhood in Detroit, but only know about that one block or one neighborhood, or maybe just a handful of other blocks and neighborhoods – but little about the whole system of blocks and neighborhoods – we fall far short of our task. Only by understanding the relational universe of data at very low geographies can we pinpoint the best set of intervention strategies locally. We need to know how certain blocks and neighborhoods relate to all the other blocks and neighborhoods on the continuum. They exist and function within an interdependent system of relationships. Whether in the natural world or in society, broad vision, policies, and laws are helpful and needed. Intervention or action, on the other hand – like community development and public health – are always local dynamics. The macro and micro must go together somehow. The example of data points on the continuum makes this case, but we see it, too, everywhere else. We talk about this more in the section entitled **Next Steps in Our Food Desert Work.**

As Margaret Wheatley points out in her writing, the deeper scientists probe into the nature of existence, the more they must rely on relationships. Even sub-atomic particles, she writes, do not exist alone. We can only see them in relationship to one another. Scientists call all the matter of the universe “bundles of potentiality” that could transform into something new at some point in time. This means that our reality – whether or not we live near quality grocery stores and eat well, for example, or whether or not we die prematurely from diet-related diseases – can take on many forms and directions, depending on key relationships, connections, and events.

One way to interpret this is that we don't need the majority of people signed on to a particular cause before something meaningful can happen. A handful of highly connected people and strategies – an effective web of relationships and intention – can also create positive change. In an age when most things are mass produced in a global economy, not only goods and services but also culture and concepts such as food and health, this is counter-intuitive. Yet it is mathematically true. It has potential. And notwithstanding the vast advances of society, we all still need to eat to live. A revived, shared concept of healthy, local food might bring an effective handful of highly connected and strategic people together.

On June 19th of this year, LaSalle Bank and Detroit LISC will hold a forum for about 250 people to release the study's findings and, more importantly, to identify solutions. This is certainly more than a handful of people. What is our potential to come together to



improve food access and public health for the residents of Detroit on that day and thereafter?

The built environment is affected by a myriad group of actors; even if you don't live in Detroit, or in a city, you are one of them. Identifying market as well as needs-based solutions that promote access to nutritious foods and healthy food choices will require input and support from the food desert residents themselves as well as from grocers, banks, brokers, developers, planners, health advocates, educators, government, and foundations – ultimately everyone – to achieve even a modest level of success.

Every researcher, if not everyone generally, wants to bring something new to the equation at hand. **The unique contribution of our work is our robust data set and methods that assess food access and health comprehensively for a fairly large geography, yet builds up from the block each time.** The development of the Food Balance Score and the testing of our Food Balance Theory are also unique to our group. Our Food Balance methodology is something that we are particularly excited about. As we take our work on the road, many people ask, *what is the perfect distance to a mainstream grocery store?* Our answer so far is that there isn't one – it's all relative. Some areas of New York City, for example, have a vertical sense of space and scale, yet in some of its boroughs, the environment is less dense and resources are spread out. In many locations across the country, public transit plays a role. Yet in other areas, getting to the grocery store is nearly impossible unless you have a car or can get a ride from friends. We try to dispel the myth that food deserts are solely an urban problem. They are not. Rural and suburban areas suffer as well. This is where the Food Balance Score is practical for broader policy making and resource allocation. For example, in Michigan there is an active statewide policy group concerned with food access. Could we make for them a statewide map of *grocery store distances*? Technically, yes, but it would be inappropriate and misleading. What about a statewide or national map of *Food Balance Scores*? That would not only be appropriate but probably very useful, assuming we have the resources to develop accurate data.

Unlike grocery or fringe food distances, Food Balance Scores can be compared across urban, rural, and suburban geographies simultaneously. Thus far we have found that a Food Balance Score of 2 is always undesirable; grouped together, scores of 2 or more correlate on average with worse diet-related health outcomes. A score of 1 always means the location is in balance; it is just as easy, or just as difficult, to reach a mainstream food option as it is to reach a fringe food option. The Food Balance Score is useful because it accounts for these two factors at once – mainstream and fringe – which are most meaningful in relationship to one another. Said another way, the Food Balance Score is a measure of relativity that can be isolated down to the lowest geography: the block or even the address where a particular person lives. By contrast, one distance score of .41 miles from the center of a particular block to a particular type of food venue stands alone and provides little insight by itself. We need to know more about the larger environment in which the block (or the person) functions. We are again back to relationships.



Our group is not the first to do research in this area, nor will we be the last. We acknowledge and thank the many other researchers doing work in Detroit, around the country, and around the world who came before us and helped pave a path for this study. We also wish to emphasize that we did not coin the term food desert; it originated over a decade ago with researchers in the UK studying similar issues. **LaSalle Bank's sponsorship** of our Chicago study, and now this Detroit study (including graphic design of the report, public forums, extensive coverage on CNN, etc.), helped popularize the term around the country. One of the comments that we hear repeatedly when we present our food desert findings is *How great that a bank supports this work – they made people pay attention!* We agree; our food desert work to date would have been impossible without LaSalle's generosity in sharing its expertise and resources. We talk more about LaSalle Bank's key role later in the *Acknowledgements* section.

We also would like to acknowledge and encourage those new researchers not yet on the scene. Remember that no one person or group has an inherent lock on any field of study. Whether you are a graduate student defending your thesis, a community activist who never graduated from high school, or a single mom who wants to improve the local school lunch program, the opportunity is yours to question and study your environment, and to report out and apply what you find. **This curious, creative, passionate, and intellectual freedom is a right that we all share.** Paired with greater democratization of information and data, our worlds might improve.

Finally, a few personal words to Detroit. You have hit some hard times but you are a beautiful city. Your people are warm, energetic, committed, talented, and resourceful. Together you have great potential.

We welcome your comments.

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Forum Friends

Social Compact

The Urban Institute, National Neighborhood Indicators Partnership

PolicyLink

The Food Trust

Community Food Security Coalition

United Way for Southeastern Michigan

Michigan Food Policy Council

Michigan Department of Agriculture

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Forgotten Harvest
Food Gatherers
The Skillman Foundation
Michigan Department of Community Health
Gleaners Community Food Bank
Detroit Economic Growth Corporation
Knight Foundation

Panel

Mike Curis

Oran Hesterman, Ph.D.

James Johnson-Piett

Phylliss Meadows

Olga Savic

Malik Yakini

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