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From Food Desert to Food Oasis: *Blueprint for Change in Chicago*

Commissioned By

Wal-Mart Stores Inc.

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Background

Mari Gallagher Research & Consulting Group (MG) popularized a now nationally known term with the 2006 release of *Examining the Impact of Food Deserts on Public Health in Chicago*, sponsored by LaSalle Bank, now Bank of America. We updated Chicago's Food Desert boundaries in 2009 (using Fall of 2008 retail data) and found that – while some progress had been made since our original report – there are still over 600,000 Chicagoans who live in Food Deserts who are more likely to die or suffer prematurely from diet-related diseases after accounting for income, race, and education. Also in 2008 and 2009, with the support of the Searle Family Funds of the Chicago Community Trust, MG and the National Center for Public Research helped the City of Chicago prioritize and document 6 high-impact sites for grocers. That analysis was based on ranking approximately 30 total sites citywide, both inside and outside the Food Desert, which the City had already targeted for potential commercial redevelopment. In late 2009 and early 2010, MG partnered with Peapod and social enterprise Neighbor Capital to identify the top 100 blocks where mainstream food would positively impact the most children, which pinpointed a cluster of blocks in the Chicago Lawn community and motivated the partners to launch a 10-piece bag of assorted “Best Fruit of the Season” offering for \$2.99 at local community drop-off sites. In late spring of 2010, Wal-Mart commissioned our firm to develop a plan to eliminate Chicago's Food Deserts altogether. They wanted to know what it would take to make Chicago's Food Deserts disappear entirely. To conduct this analysis, we must first analyze the potential improvement from placing a new mainstream grocer at the center of every single block in the city so that we can determine mathematically the smallest combination of improvements (in this case, new mainstream grocery stores) that would achieve that final result. The purpose of this report is to present the findings of the Wal-Mart-commissioned study and the new grocer locations collectively required to eliminate Chicago's Food Deserts.

RESEARCH QUESTION:

What Would It Take To Eliminate Chicago's Food Deserts Entirely?

This analysis required over 97.5 billion calculations.

Methodology

We began by updating Chicago's Food Desert boundaries to take account of changes in the city's food retail landscape. Our grocer retail data is current as of May of 2010 and includes changes citywide.

We define a Food Desert as a large, contiguous area with poor access to mainstream grocers. A grocer entering or exiting a Food Desert area can have a huge impact on expanding or reducing the Food Desert, although this is not always the case. Sometimes it has little or even no impact on changing the Food Desert boundaries, although certainly it has impact on improving food access and thus health, at least on

that particular block and likely on some adjoining blocks. When a grocer moves into or out of a particular community, and we wish to measure the impact of that market change, we must update and re-run our entire geospatial program for every block in the study area. Said another way, our Food Desert methodology considers the ripple effect and resulting new food access patterns across every single block in the city and in the buffer zone immediately surrounding the city. In Chicago's case, that includes a ring of Chicago suburbs and also bordering towns in Indiana. Chicago consists of over 18,000 non-zero population blocks and 850-plus non-zero population Census tracts. We calculated the distance from the center of every block to the closest mainstream grocer, weighting the block by population density, and then drew the Food Desert boundaries by tract anew. This by itself consists of millions of calculations and usually requires two or three days for our data program to finalize results. More on our methodology can be found at marigallagher.com.

Strategies

There are three key ways in which a mainstream grocer entrant can shrink the Food Desert.

The first is by reducing the average distance to a mainstream grocer for a particular Census tract by enough to move that tract out of the Food Desert, which in many cases can be accomplished by locating a new mainstream grocer at the approximate center of almost any existing Food Desert tract. This is often, although not always, the case; the tract could possibly remain in the Food Desert. Much depends on how low the relative threshold is for mainstream food access and also population density block-by-block across the tract. Furthermore, the center of the tract might or might not result in the greatest impact of all possible locations across the tract.

Map 1 on page 5 shows an example of this strategy when it is successful: census tract 2513 is at the western edge of the Food Desert (north of Chicago Avenue and west of Central Avenue), but placing a grocer within this tract improves average grocer access enough to move only this one tract out of the Food Desert.

The second key strategy involves improving mainstream food access in “domino” census tracts. These tracts include higher “ripple effect” locations where improved access not only eliminates that particular single tract from the Food Desert but also a set of adjoining tracts.

The third strategy is to break the contiguity of Food Desert tracts. One of the key Food Desert definitions is that low-access tracts cluster. Just like in the type of desert where one must travel a long distance in search of water, in the Food Desert, one must search for healthy food. There can be low-access tracts in the city but – if they do not cluster with magnitude with other low-access tracts – they are not in the Food Desert. Map 2 on page 6 shows an example of [the second and third strategy combined](#): census tract 2914 (south of Chicago Avenue and east of Kedzie Avenue) connects two parts of the



Food Desert. Locating a grocer within this tract improves average grocer access enough to move both this tract itself and nine adjacent tracts out of the Food Desert. This hybrid strategy provides the greatest return on investment. We programmed our block-by-block geospatial system to identify the potential grocer locations that would do the most to break up and shrink the Food Desert in this way. Again, our research goal was to find the lowest number of collective new mainstream grocer locations that would not only improve health, wellness, and food access but also eliminate the Food Desert altogether.

Analysis

The city has 24,749 census blocks¹. We took the first block on this list and located a hypothetical grocer at the center of the block. We then added this location to our existing universe of mainstream grocers and calculated the distance from the center of each Food Desert block to each individual grocer including the new hypothetical grocer. The minimum of all the distances calculated was tabulated as the grocer access for each block. The distances for all blocks in a Food Desert tract were then added together, with the fraction of the tract's population in each block as weights, to determine the minimum grocer distance for an average person in each of the 207 Food Desert tracts. This procedure was then repeated for each of the remaining 24,748 census blocks in the city (by removing the first hypothetical grocer and adding a second hypothetical grocer at the center of the second block to our universe of total grocers and assessing the new entrant's impact on grocer distance at the tract level), requiring a total of more than 97.5 billion calculations. For each of the city's 24,749 blocks, we then recorded the number of Food Desert tracts that would be moved out of the Food Desert if a new grocer opened at the center of that block.

Grocer access for census tracts in the Food Desert was improved by locating a new grocer at the center of any of 9,051 of the city's 24,749 blocks. These 9,051 locations moved an average of 2.8 census tracts out of the Food Desert; 25% of these locations moved four or more blocks out of the Food Desert, and 55 blocks moved 10 or more tracts out of the Food Desert. We then examined the impact on Food Desert tracts of each of the alternative locations to identify the potential locations that would do the most to break up the Food Desert with the addition of the fewest new grocers.

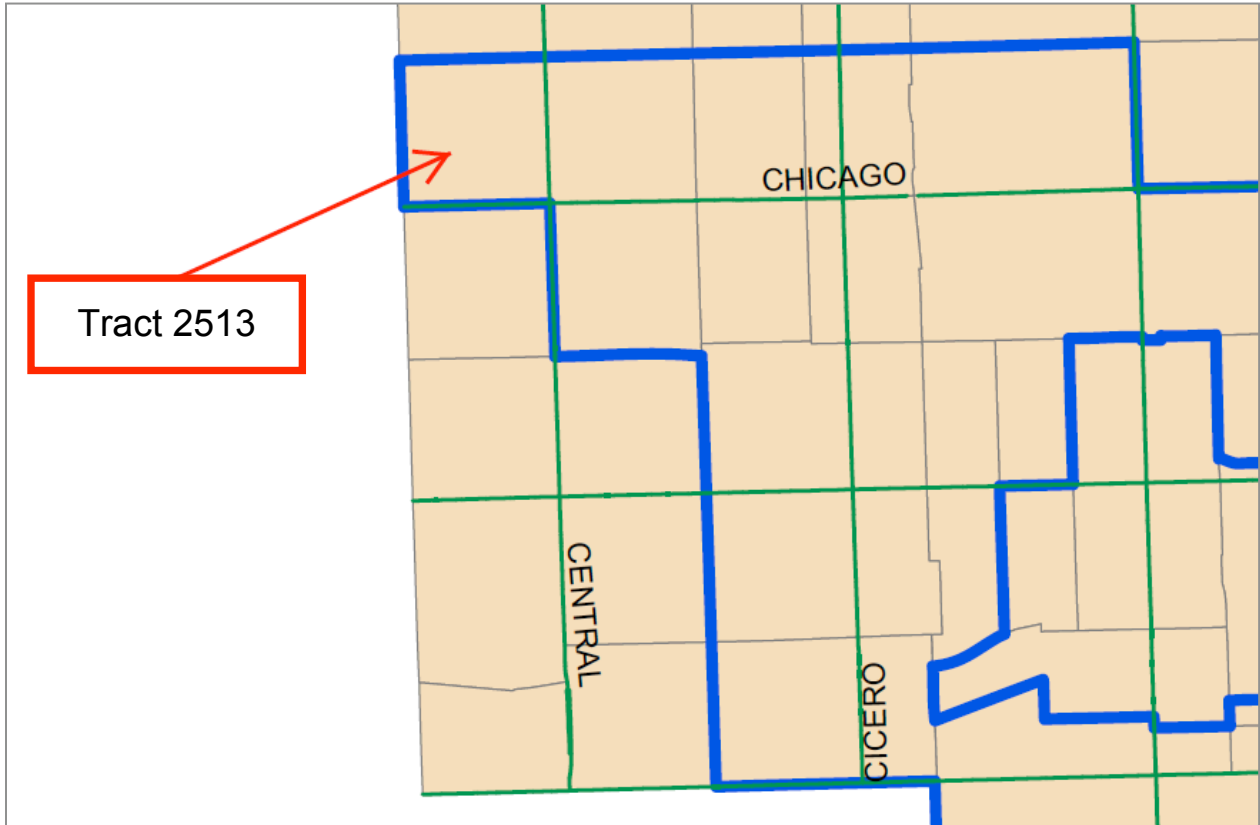
Map 3 on page 7 shows the impact of the 10 most strategic new grocer locations that achieve this final result. The tracts that would be removed from the Food Desert by the 10 new grocery stores are shown in blue and the exact locations for the grocery stores are shown with a green star. Please keep in mind that while we provide an exact location, we are not necessarily suggesting this exact site for the store, as zoning or site availability might be a hindrance. Anywhere within a small radius around that pinpointed location would achieve roughly the same effect. The number on each star

¹ To be in the Food Desert, a block must have what we call "non-zero" population. But in analyzing how to improve the Food Desert, we include all blocks as potential grocer locations.



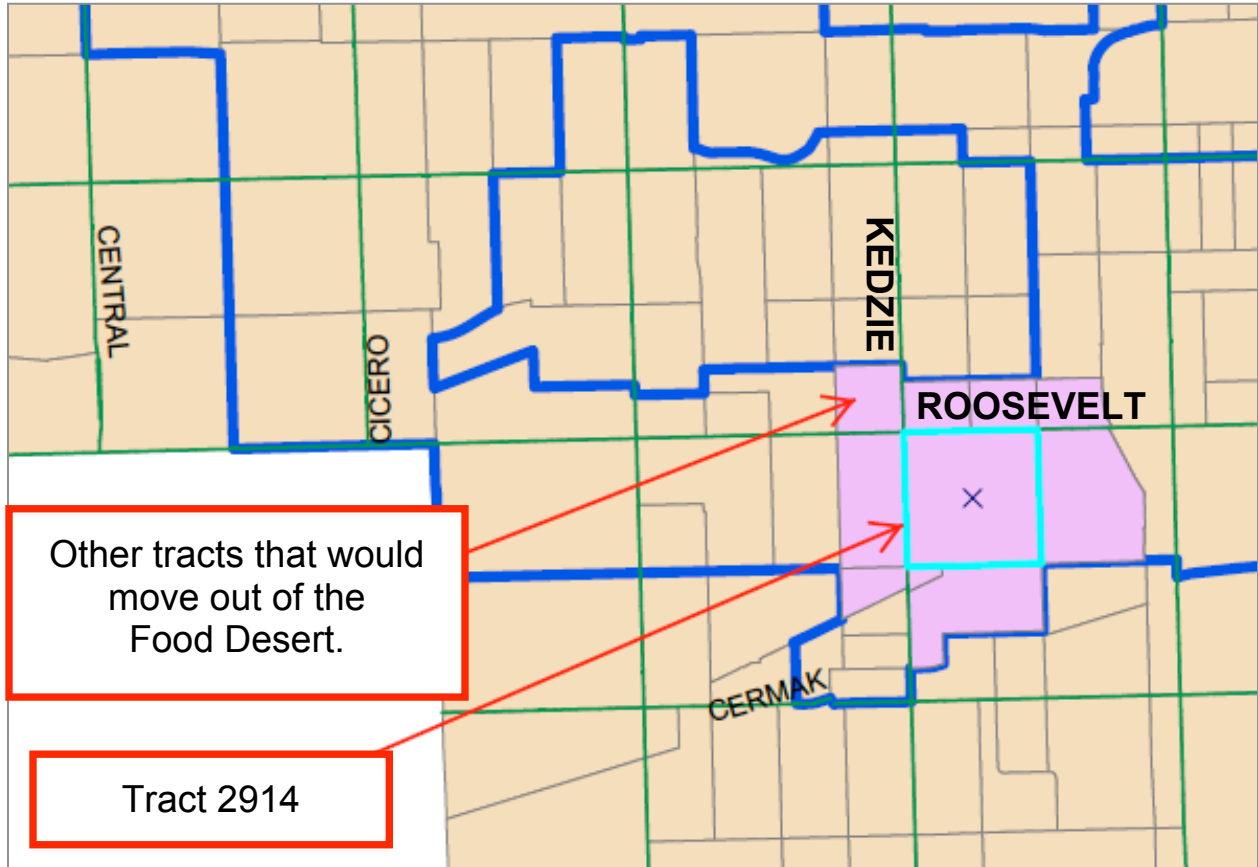
corresponds to Table 1 on page 8. Also, for each site, we show a google map with the coordinate marked in a red “A” beginning on page 8.

Map 1





Map 2



Map 3

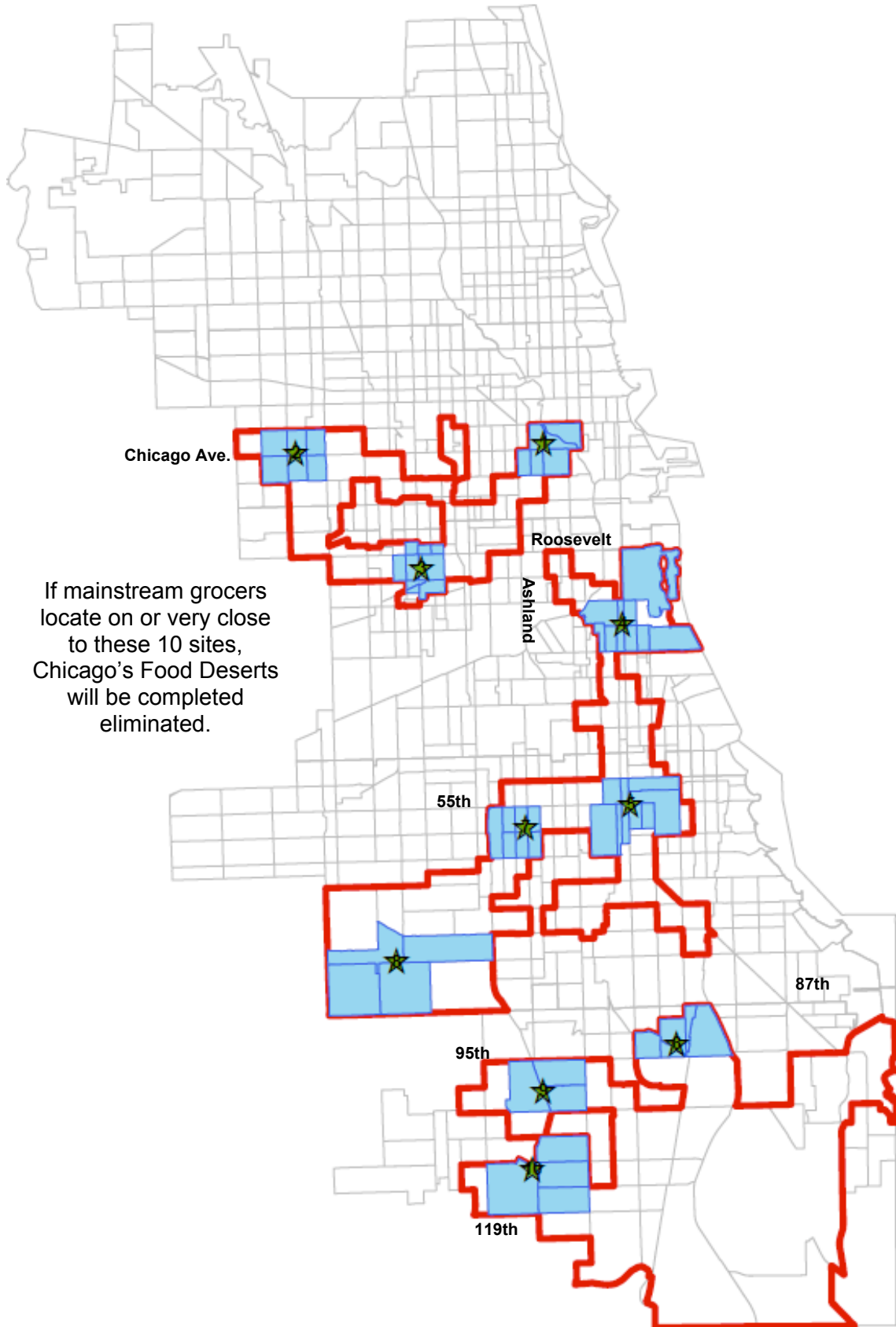
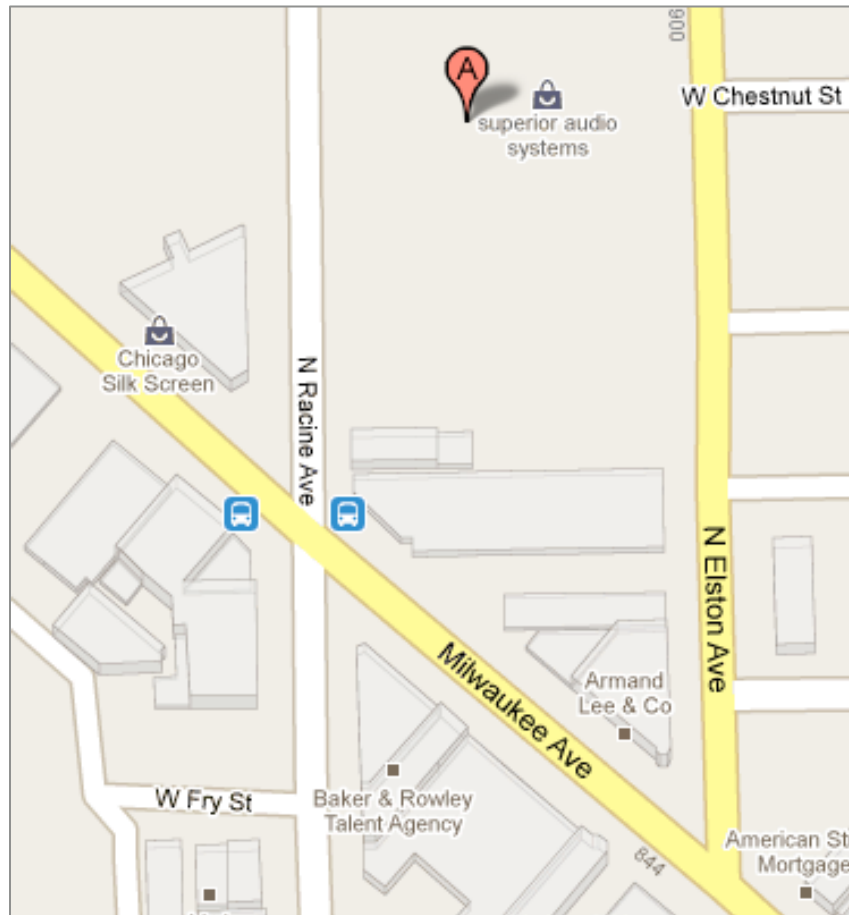




Table 1

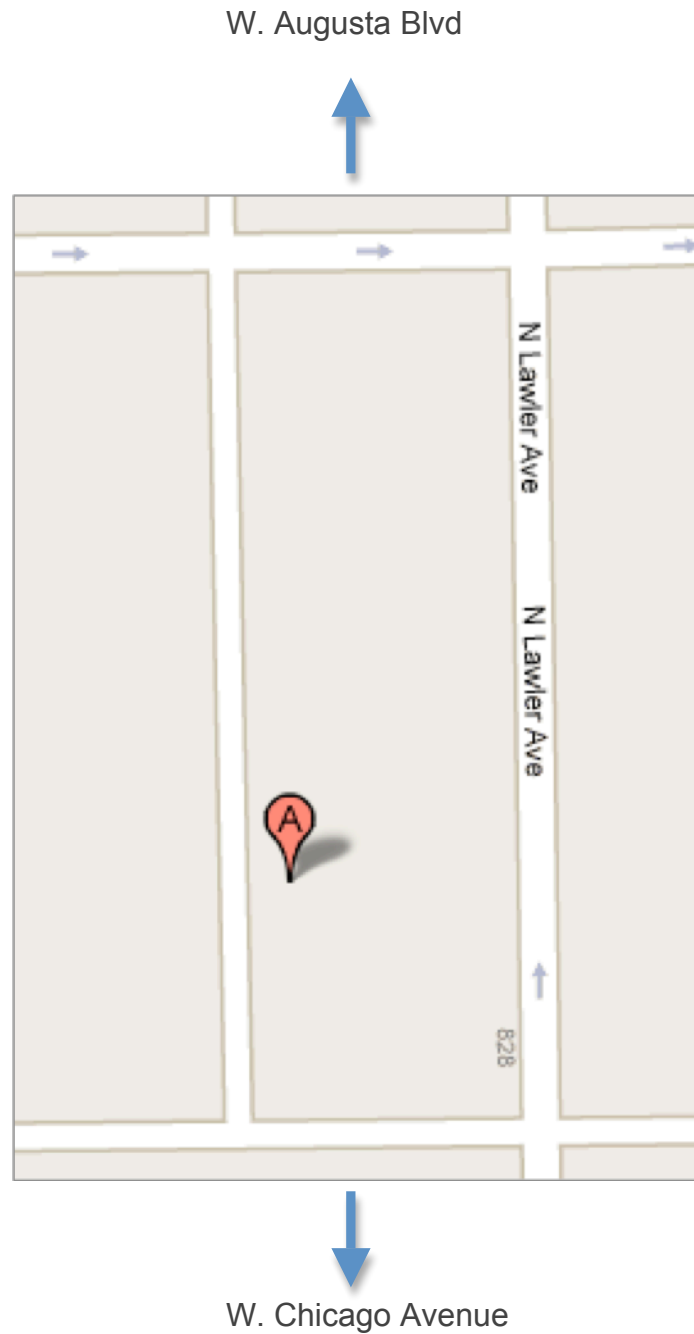
#	Tract	Block	Latitude	Longitude
1	2418	1002	41.898332	-87.657170
2	2511	3005	41.895831	-87.752456
3	2914	2004	41.863191	-87.704290
4	3303	1012	41.846183	-87.627603
5	4005	3000	41.794424	-87.625000
6	4409	2005	41.726034	-87.608096
7	6703	1004	41.788083	-87.665247
8	7002	3000	41.75005	-87.715125
9	7202	2000	41.712633	-87.659324
10	7505	1001	41.690483	-87.663609

Site #1 (Shown as Point A)





Site #2 (Shown as Point A)

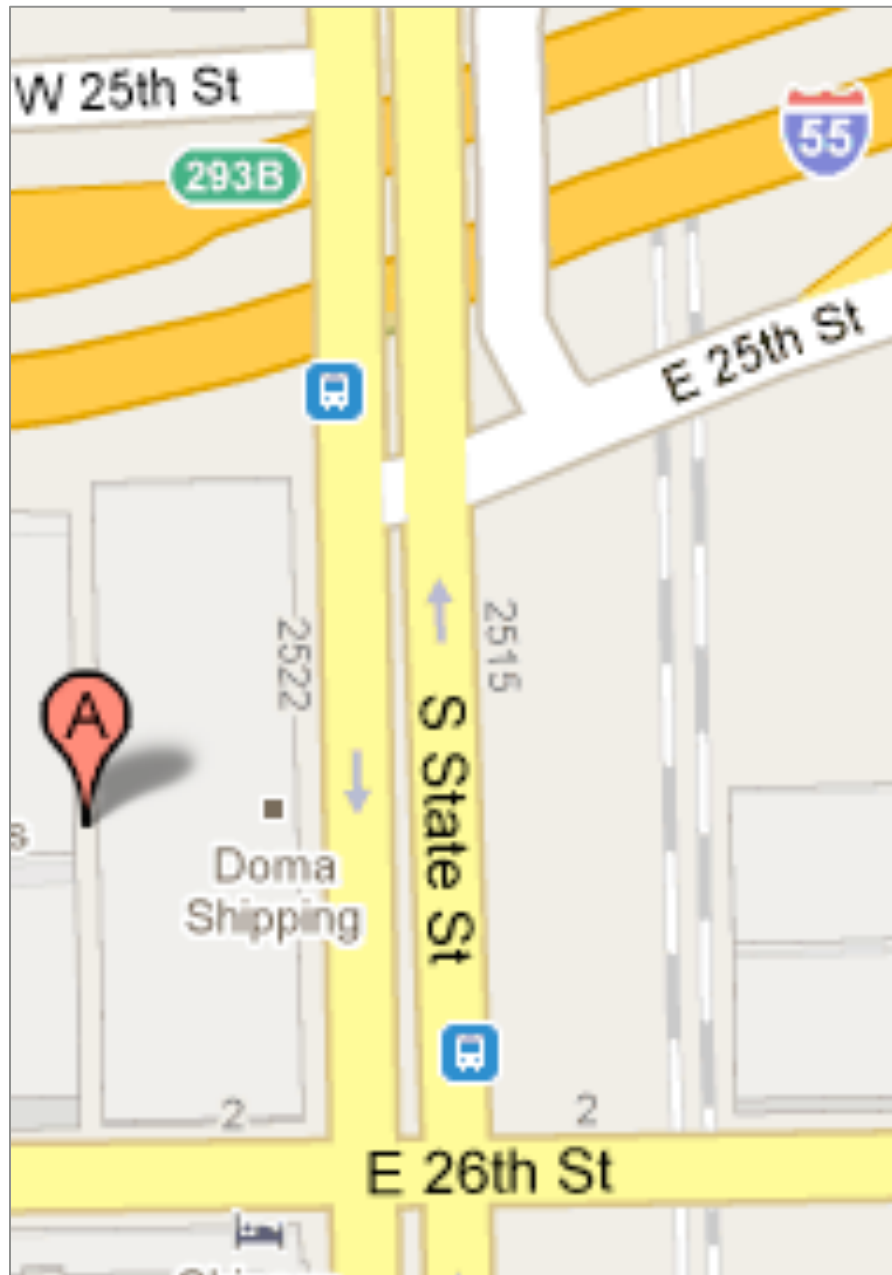




Site #3 (Shown as Point A)

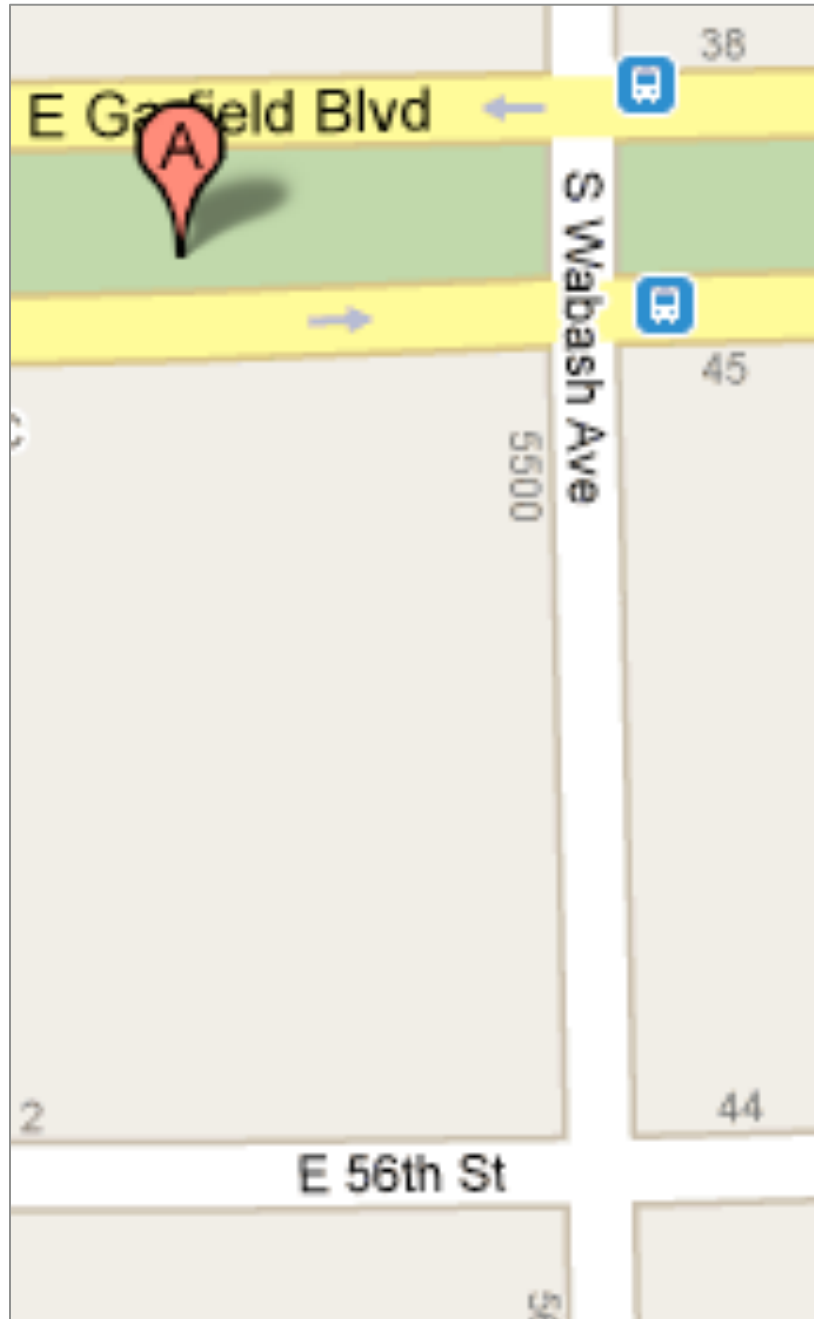


Site #4 (Shown as Point A)



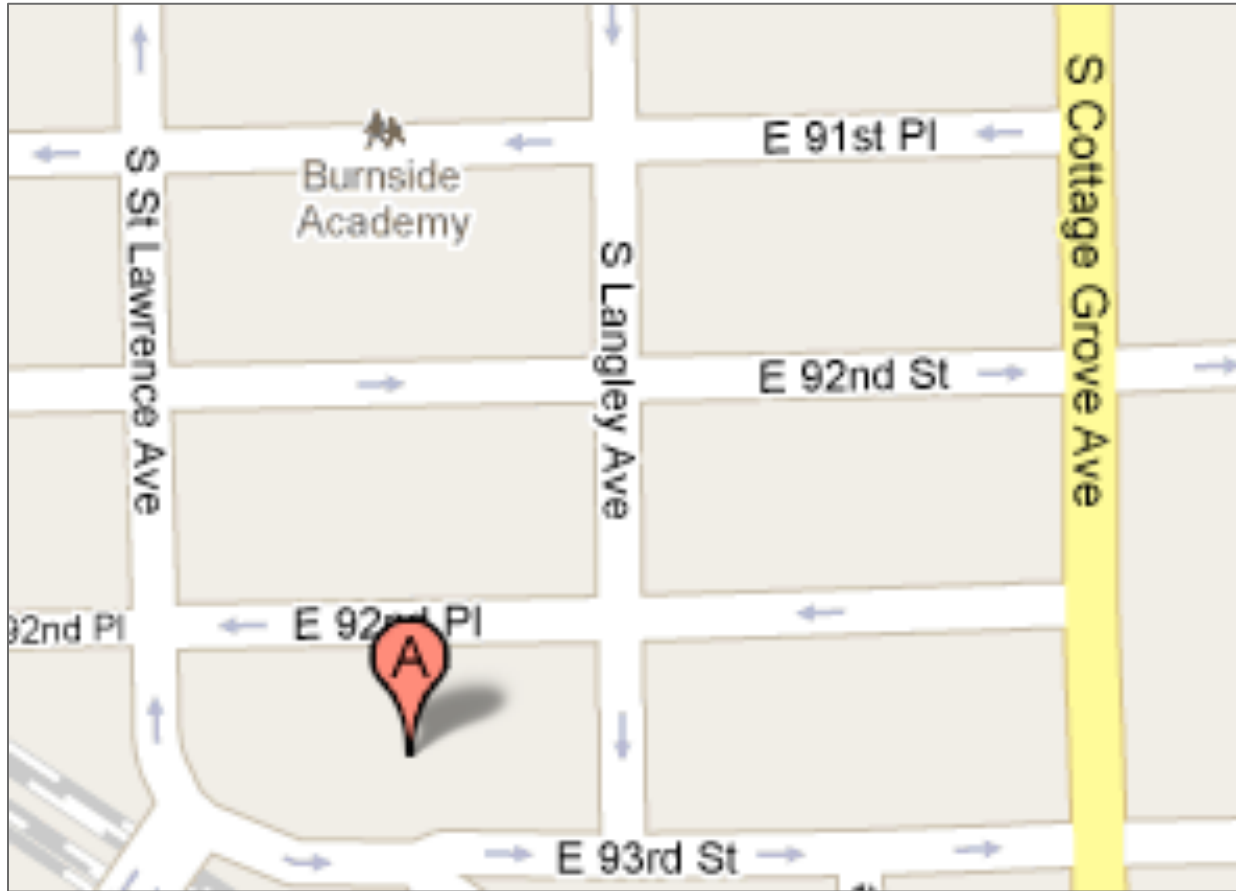


Site #5 (Shown as Point A)



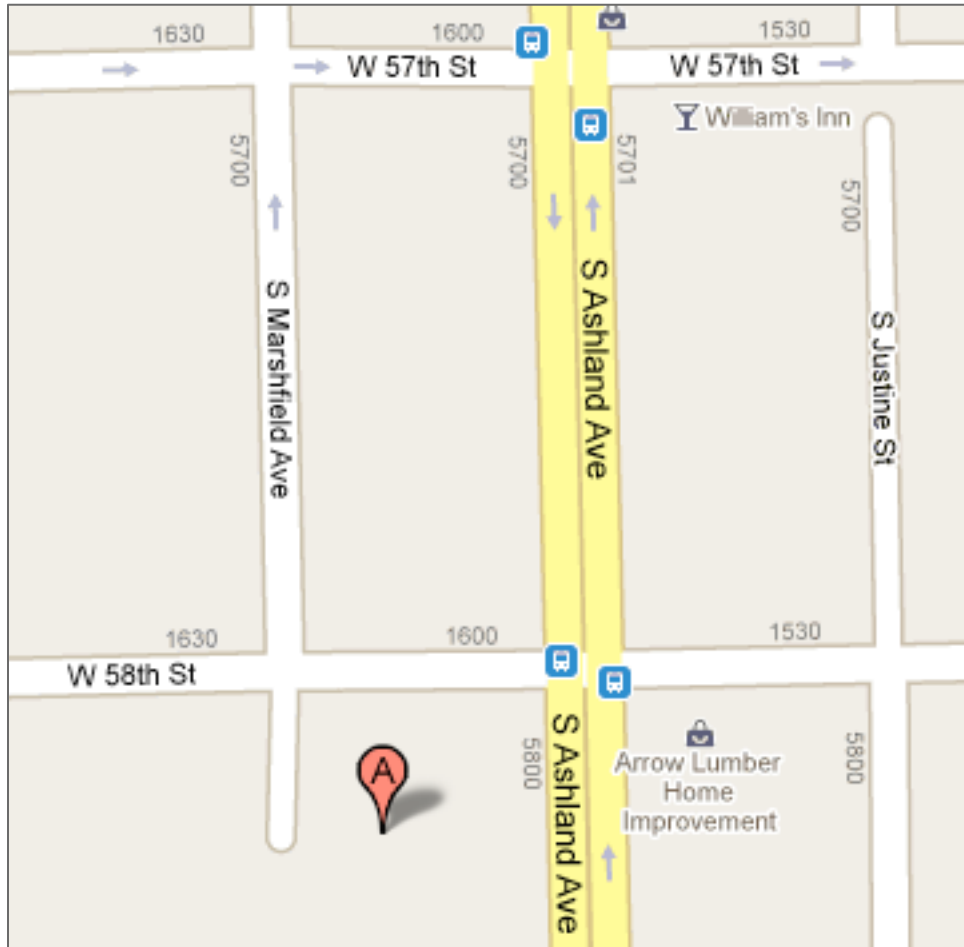


Site #6 (Shown as Point A)





Site #7 (Shown as Point A)





Site #8 (Shown as Point A)





Site #9 (Shown as Point A)





Site #10 (Shown as Point A)

