Ecodistrict Feasibility Scan

Elevated Chicago Station Areas

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CNT

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INTRODUCTION

Elevated Chicago promotes racial equity, climate resiliency, improved public health, and arts and culture throughout Chicago. Elevated Chicago uses the lens of equitable Transit Oriented Development (eTOD) to focus work at the neighborhood scale.

Conventional transit-oriented development (TOD) promotes the benefits of locating community assets, such as housing, jobs, and amenities, within walking distance of public transportation. The eTOD concept adds to this by prioritizing equity in development planning and construction, to avoid displacing existing residents and businesses.

Elevated Chicago strives to concentrate investments within its "eHubs," the ½-mile radius area around seven selected Chicago Transit Authority (CTA) train stations.[1] These eHubs represent Chicago's diversity of market conditions, demographics, and catalytic assets.

CNT has conducted an Ecodistrict Feasibility Scan for each of the Elevated Chicago eHubs. The primary objectives of the Feasibility Scan are to:

1. Identify underutilized land that presents an opportunity to promote sustainable resource management and economic development; and

2. Identify community ownership and affordability preservation strategies that enable existing residents and businesses to remain within the neighborhood.

The first objective is discussed in detail in this Feasibility Scan. The second objective is addressed in the companion publication, Elevated Chicago *Strategies for Community Control and Affordability Preservation.*

WHAT ARE ECODISTRICTS?

Ecodistricts integrate innovative green building techniques and sustainable infrastructure (the "Eco"), within a defined boundary (the "District"). Ecodistricts are formed through deep resident and stakeholder engagement, and sustained through community-based governance. Ecodistricts are developed over time, with the goal of creating long-term catalytic neighborhood transformation.

The scale of an Ecodistrict is important. It must be large enough to make an impact in the community, but small enough to encourage local expression and ownership (see Figure 1).

The Building scale focuses on efficiency for building owners and residents. Common strategies include rooftop solar and cisterns to capture rain for on-site use. Benefits include lower costs for owners and tenants. Resilient buildings can be a shelter during local disasters that disrupt conventional infrastructure.

The District scale networks the buildings and infrastructure in a neighborhood. Infrastructure becomes smarter, more efficient, and less reliant on a centralized facility to provide service. Strategies include community solar and district stormwater, as well as locating new development near transit hubs. Entire neighborhoods become more resilient to adverse economic changes and climate impacts.

The City scale aggregates the impact of Building and District strategies. For example, if community solar arrays and energy efficient buildings are developed in many neighborhoods, a city may be able to avoid building a new power plant, which reduces air pollution, which in turn improves public health for the entire city.

READER'S GUIDE

This report is organized into four sections. Section One, *Ecodistrict Strategies*, presents an overview of sustainable best practices for energy, food, water, and air, which may be feasible within the available land in the Elevated Chicago eHubs. Section One contains case studies, and references to technical guidance and local policy documents that regulate the implementation of these practices.

Section Two, *Existing Conditions*, discusses local climate and health impacts, as well as community assets and priorities identified by stakeholders for each eHub.

Section Three, *Recommendations*, identifies a high-level path to implementation. Specific Ecodistrict strategies are suggested for each eHub, based on available land, community assets, and community priorities.

Section Four, *Practitioners and Allied Organizations*, provides a resource list of organizations that can assist with the implementation of one or more Ecodistrict strategies.

[1] *For the purposes of this study, one of the eHubs (Logan Square) was mapped as a 1-mile radius for research purposes, due to the limited availability of land within the ½-mile radius.*

ECODISTRICT STRATEGIES

This section presents a regional scan of Ecodistrict practices that may be feasible within the available land in the Elevated Chicago station areas.

There are a wealth of sustainable and innovative strategies for urban communities. This section does not present an exhaustive list of options, but selects strategies that have the potential to contribute to the following criteria:

- Increases *equity* within the city
- Enhances the *health* and *quality of life* of residents
- Protects our *climate* and fosters neighborhood *resiliency*
- Boosts the *local economy* and attracts transformative *investment*
- Bolsters neighborhood *identity* and cultural expression

The selected Ecodistrict strategies are grouped into four areas:

Energy
- Community Solar
- District Energy

Food
- Urban Agriculture

Water
- District Stormwater

Air
- Complete Streets
- Buffer Parks
- Sustainable Manufacturing

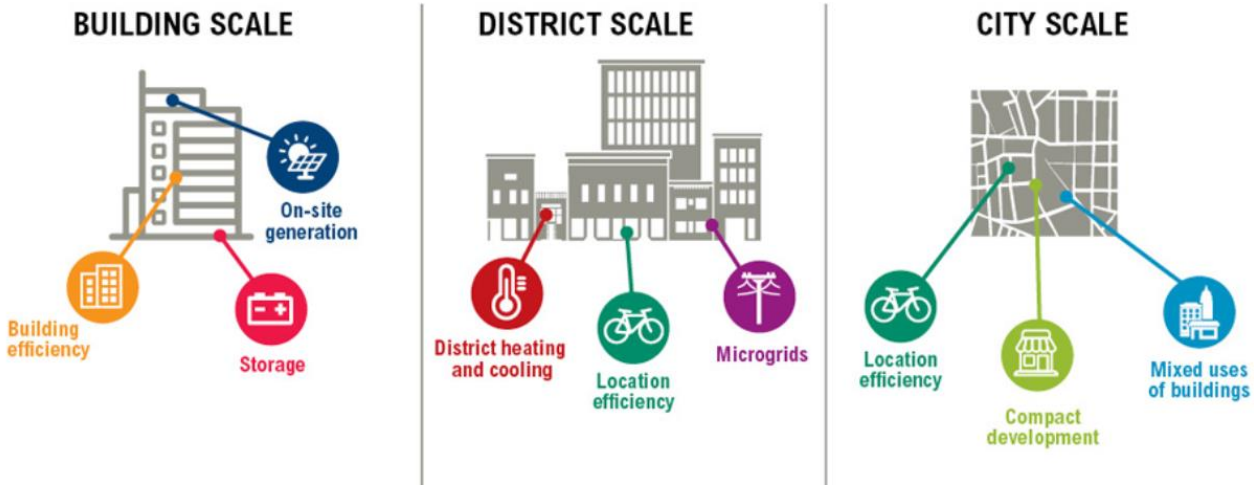


Figure 1. Sustainable development can occur at multiple scales. By integrating systems and aggregating the impact of multiple building and infrastructure improvements, cities can achieve important long-term benefits for public health, economic development, and the environment. Image Credit: World Resources Institute

1.0 ENERGY

Clean energy is a key component of climate protection and improved public health. Coal power plants and natural gas plants emit greenhouse gases and other chemicals that pollute local communities' air, and contribute to global climate change. Fortunately, renewable energy, such as solar and wind, provides an alternative. A neighborhood-scale energy approach can create economies of scale for developing clean energy projects, provide environmental benefits, and offer economic opportunities for residents.

District scale strategies discussed in this section are:

- Community Solar
- District Energy

COMMUNITY SOLAR

DESCRIPTION

According to the *Community Solar for Cook County* 2017 report, approximately three-quarters of all Cook County households cannot currently access solar. Barriers to rooftop solar include incompatible roof or adjacent land uses; not having full ownership of the roof (e.g., renters, condos); and the expense of paying the upfront cost of solar panel installation. Fortunately, the community solar model allows all residents and organizations to benefit from clean energy.

A community solar installation is a large photovoltaic (PV) solar facility that generates energy for multiple energy customers, such as residents, businesses, and/or institutions. The energy customers do not have to be physically connected to the solar facility, but they must be located within the service territory of the electric utility.

The energy customers are referred to as community solar program "subscribers." Subscribers receive a credit on their electricity bill for the portion of power produced by their solar facility. Subscribers can either purchase panels upfront, lease panels monthly, or purchase a set amount of electricity, depending on the business model of the community solar facility.

A "solar developer" manages the project, including securing land and permits, coordinating with engineering experts, and leading the finance and construction of the system. The solar developer might partner with a third-party subscriber management company to recruit and manage subscribers.

The community solar system is commonly owned by the solar developer, who can take advantage of tax incentives (e.g., Investment Tax Credit; Modified Accelerated Cost Recovery System) and Solar Renewable Energy Credit (SREC) payments. SRECs are tradable commodities that represent proof that one megawatt-hour (MWh) was

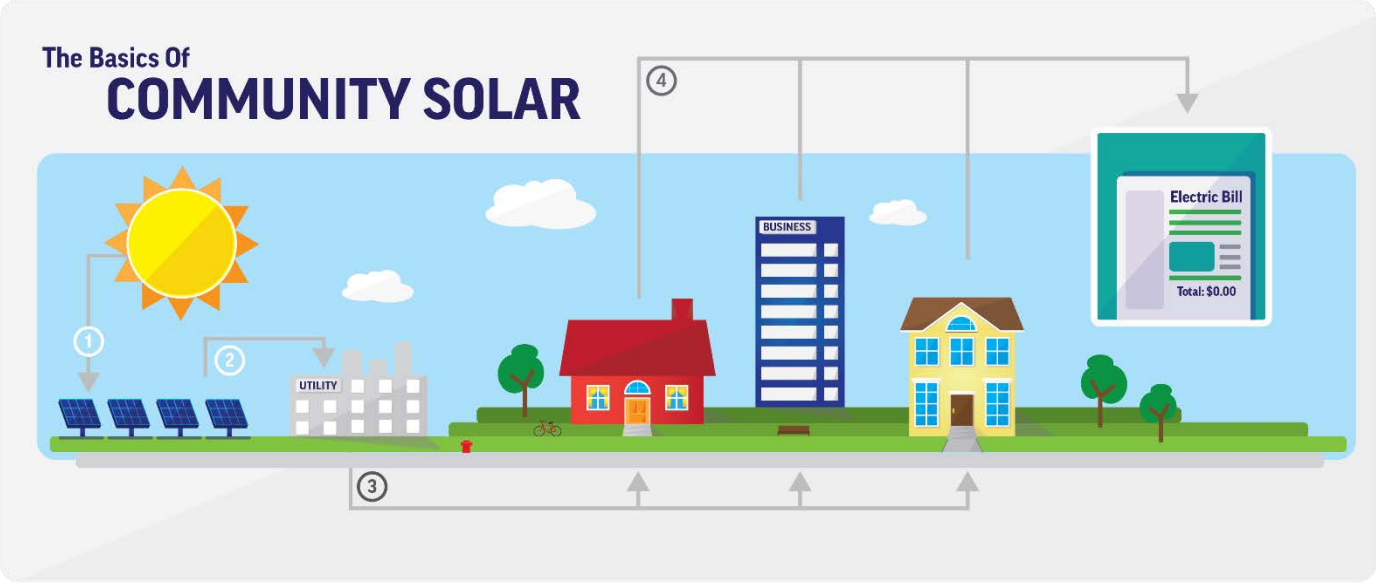


Figure 2.

1. Sunlight hits the solar panels at the community solar facility. The solar panels convert the sunlight to electricity.
2. Electricity flows to the electrical grid. The amount of electricity generated by the solar panels is measured by an on-site meter.
3. The utility company calculates the dollar value of the electricity, and divides this amount among the community solar subscribers.
4. The dollar value of the electricity is applied as a credit on each subscriber's energy bill.

Image Credit: https://solect.com/solar-power-to-the-people-understanding-community-solar/

generated from an approved solar PV system. Illinois utilities must purchase SRECs from community solar projects, to meet State requirements for renewable energy. The actual energy produced by the solar system is sold to another energy customer.

The community solar system could also be owned by a non-profit, public agency, or a special purpose entity. While non-profit and public organizations cannot benefit from tax incentives, they can receive SREC payments and other incentives. A new program, Illinois Solar for All, will provide financial incentives to nonprofit and public sector solar developers that serve low-income communities.

The "host site," or physical location, for a solar array can be a large rooftop, a parking lot, or vacant land. The host site owner receives a lease payment from the owner of the solar system. Several factors must be considered when evaluating a host site, including zoning; public acceptance and subscriber interest; physical obstructions; land value and ownership; and the size, orientation, and condition of the roof or ground surface. Brownfields, and land owned by a municipality or a land bank, may be more feasible for community solar development, due to lower land acquisition costs.[2]

Large solar arrays may be less attractive in areas meant to be walkable, dense urban neighborhoods, and have the potential to create negative impacts such as glare. Smaller arrays can be added to roofs or as parking lot canopies, although fixed installations on rooftops are generally less economical than larger ground-mounted systems that can move to track the sun.[3] Low-impact solar design, such as placing arrays within a larger landscaped commercial campus, can improve community acceptance of an installation.

Low-impact solar design can also be combined with urban agriculture practices that provide economic opportunity for residents, while also reducing construction and maintenance costs for the solar developer.[4] For example, some types of crops can grow alongside panels, creating a more aesthetically pleasing site. Apiaries for commercial honey production are being located at solar arrays with pollinator-friendly plants.[5] Solar technology has also been placed on commercial greenhouse roofs.[6]

Costs for solar installations have decreased significantly over the years. The 2016 estimates for solar PV costs are approximately $2 million per MW.[7] To put this in context, a large university campus might have a peak demand of 40 to 60 MW. A 1 MW system would offset the electricity used by 140 single-family homes, each year.[8]

Community solar facilities must be 2 MW or less to be eligible for Illinois Solar For All incentives. As a rule of thumb, developers typically prefer sites that can yield at least 500 kWh (0.5 MW), but smaller installations may be financially feasible through Illinois Solar For All incentives.[9] Financial viability of a community solar system must be determined on a case by case basis, in partnership with a solar developer.

BENEFITS

Renewable energy systems provide energy reliability, independence from fossil fuels, and a low carbon footprint. There are economic benefits as well, for land owners, businesses, and residents who subscribe to a community solar system.

Land owners that host a community solar installation receive a lease payment. Owners of vacant brownfield sites are well-positioned to participate in Illinois Solar For All, which incentivizes the development of community solar on brownfields.

Businesses who subscribe to community solar can benefit from lower electricity bills. Purchasing solar power also allows businesses to hedge their bets against uncertain fossil fuel prices.

Residents also benefit from lower electricity bills - Illinois Solar For All incentives mandate a 50% reduction on the energy rate for low-income subscribers.

Even residents who don't subscribe will benefit from more reliable, less expensive energy in the long run. If community solar adds energy closer to the neighborhood where energy is used, the amount of energy lost by the system is reduced (referred to as "line loss," electricity is lost as it passes through electric lines) and thereby the cost to maintain the grid is reduced.

[2] *Communication with Elevate Energy (V. Greco, 6/19/18).*

[3] *Communication with Microgrid Energy (M. Elmore, 6/11/18).*

[4] *National Renewable Energy Laboratory (2013). Overview of Opportunities for Co-Location of Solar Energy Technologies and Vegetation.*

[5] *Communication with Bolton Bees (C. Bolton, 8/21/18).*

[6] *NREL (1/12/17). Co-Location of Solar and Agriculture: Benefits and Tradeoffs of Low-Impact Solar Development Webinar; http://www.soliculture.com/projects*

[7] *National Renewable Energy Laboratory (February 2016). Distributed Generation Renewable Energy Estimate of Costs.*

[8] *See Community Solar for Cook County 2017 report.*

[9] *Communication with Microgrid Energy (M. Elmore, 6/11/18). Communication with AEE Solar (M. Johnson, 6/6/18).*

Community solar programs could incorporate a variety of community benefits to increase equity, such as:

- Local hire and local contracting requirements for community solar construction and subscription management services;
- Directing a percentage of community solar revenue towards a local community assistance fund or community-based organizations;
- Targeting or restricting subscriptions to a specific geography and/or income-eligible households;
- Selecting a host site that redevelops underutilized land, such as brownfields;
- Donating energy to residents (e.g., the host site, such as a church or multifamily building, purchases the electricity, uses some of it and gifts the remainder to congregants or tenants);
- Transferring ownership of the community solar system from the developer to a community-based organization after SREC payments cease.

DISTRICT ENERGY

DESCRIPTION

District energy provides heating, cooling, and/or electricity to an interconnected system of buildings. Common technologies include a pipe network of steam heat and chilled water, and the incorporation of renewable energy such as rooftop solar. District heating takes what would be normally wasted – such as heat generated as a byproduct during an industrial process – and instead recycles it as part of a "closed loop" of energy.

The buildings in a district energy system can be a mix of industrial, commercial, and residential properties, such as the installation in downtown St. Paul (MN), which serves nearly 300 residential and 200 non-residential buildings (almost 32 million square feet).[10] District energy is well-established outside of the U.S., providing 12% of heat in Europe, and 23% in China.[11]

Costs for district energy systems are not widely available, and will vary depending on the availability of an existing asset that can be retrofitted. In one example, the Veolia district energy system in Boston and Cambridge (MA), which incorporated an existing cogeneration system, cost $122M and has 256 MW in capacity ($0.4 million per MW).[12]

BENEFITS

District energy can provide several health, economic and environmental benefits. Air pollution and greenhouse gases can be reduced by lessening the need to produce energy from fossil fuels. In St. Paul, municipal wood waste is used instead of an equivalent 255,000 tons of coal annually to power a complex of buildings in the downtown district.

And finally, district energy can boost local economies. In Oslo, Norway, district energy creates an estimated 1,375 full-time jobs. And because district energy uses a "recycled" energy source, residents and businesses become less vulnerable to rising fuel prices.

[10] *Nina Axelson, "Building Community Energy in St. Paul," District Energy, Q2 2016.*

[11] *United Nations Environmental Programme. (2015). District Energy in Cities: Unlocking the Potential of Energy Efficiency and Renewable Energy*

[12] Center for Neighborhood Technology. (2017). *Industrial Ecodistricts Primer.*

RESOURCES

Chicago Department of Buildings. *Green and Solar Permit Incentives.*

Chicago Department of Planning & Development. (November 2015). *City of Chicago Solar Zoning Policy.*

Cook County Department of Environment and Sustainability, et al. (2017). *Community Solar for Cook County.*

Database of State Incentives for Renewables & Efficiency.

Elevate Energy. *Cook County Solar Map.*

SOLARWISE

Ramsey, MN

Connexus Energy, an electricity cooperative serving more than 130,000 members in Minnesota, developed SolarWise, a community solar garden of nearly 800 solar panels with battery storage. SolarWise is located on 1.2 acres of Connexus' corporate campus in suburban Ramsey, MN. Neighboring homes are shielded from the view by landscaping. Connexus community solar subscribers can either choose a one-time purchase to own all energy produced by their panel until 2034 and receive a monthly bill credit, or add a low monthly fee to offset half or all the home's electricity with solar energy. Instead of placing the panels on gravel or grass, SolarWise uses a diverse mix of low-growing, shade tolerant flowers and grasses, to create a pollinator-friendly habitat. Connexus partnered with Bolton Bees, a family-owned local beekeeping operation, to create "Solar Honey." Honey is produced from the 15 apiaries located at solar garden. In the first year, Bolton Bees extracted about 4,000 pounds of premium local honey, offered for commercial sale.

Source: Connexus Energy; National Geographic; Smithsonian
Photo: Bolton Bees

CAPITOL HILL ECODISTRICT

Seattle, WA

This 25 kWh/year community solar system is installed on the roof of Holiday Apartments, a 30-unit affordable housing property managed by Capitol Hill Housing (CHH). Subscribers purchase a $150 solar unit upfront and receive incremental reimbursements through their utility bill. Seattle City Light, the electric utility, provided the capital for the installation of the system, and will own and manage it until 2020. Ownership and management will then be transferred to CHH. The energy produced by the system will reduce the operating costs of the building.

Source: Seattle City Light; Capitol Hill Ecodistrict
Photo: Capitol Hill Ecodistrict

2.0 FOOD

A local food system links together several components: Production (e.g., farms); Processing (e.g., factories); Distribution (e.g., cold storage warehouses); Access (e.g., grocery stores); and Waste (e.g., landfills). A sustainable local food system uses practices and policies that benefit community health, the environment, and the local economy. Rather than an industrial one-crop lettuce farm that sprays pesticides and underpays workers, food could be grown on a small, organic farm that grows a variety of vegetables and provides job training for local youth. Rather than trucking food hundreds of miles to a grocery store, neighbors could buy just-picked crops directly from a local farmer. And rather than throwing food waste into a landfill where it creates greenhouse gases, it could be composted for use by neighborhood gardeners.

Figure 3. A sustainable food system is a closed loop, starting with growing food locally, and ending with composting food scraps for reuse in local food production.
Image Credit: CMAP (2002)

Food insecurity is the limited or uncertain access to healthy and culturally appropriate food, due to economic or social conditions.[13] In Cook County, adults with disabilities face disproportionately high levels of food insecurity.[14] Children, seniors, recent immigrants, low-income, unemployed, and single-parent families are also at increased risk of food insecurity.[15,16]

Urban agriculture is one strategy to increase food security. By engaging in neighborhood food production, residents can become more resilient to grocery prices, eat healthy food, and support their local economy.

URBAN AGRICULTURE

DESCRIPTION

Urban agriculture refers to several types of small agricultural operations located in an urban area.

1. Urban Farm
   Urban farms are businesses that may include food processing and distribution through farm stands, neighborhood markets, and/or residents who subscribe to a community supported agriculture (CSA) program.

2. Community Food Garden
   Food gardens (sometimes called victory gardens) are typically managed by a community-based organization and farmed by residents who produce and consume food from their own garden plot.

3. Community Food Forests and Urban Orchards
   A food forest is a place where people collaboratively grow food in a garden that mimics a natural forest, using a variety of edible trees and other plants that create a low-maintenance ecosystem. Urban orchards typically grow fruit trees and may not have the variety of plant types found a food forest. Residents participate in creating or maintaining the forest.

4. Waste Recovery and Composting
   Urban farms can reuse organic waste from local businesses (such as breweries), restaurants and households, to create compost. Compost is used to enrich the soil and create more productive farms and gardens.

Urban agriculture can be created in many locations. Small gardens can be created in yards and on patios. Larger gardens can be installed on vacant lots or commercial rooftops. Food forests can be installed on public right of ways or vacant lots. If a food forest is grown on public land, a maintenance plan should include provisions for harvesting, so that unharvested fruit does not become a nuisance.

[13] *USDA Economic Research Service. (2012) Definitions of Food Security.*

[14] *Greater Chicago Food Depository. (2017) Food Insecurity Among Adults with Disabilities in Cook County.*

[15] *Health Canada. (2007) Canadian Community Health Survey.*

[16] *Chicago Dept. of Family & Support Services et al. (2018). Forward Together: A Roadmap to Reduce Food Insecurity*

Urban farms are subject to more considerations, such as zoning; public acceptance; access to sunlight and water; and land value and ownership. Other siting considerations for urban farms include:[17]

- Area: minimum of 7,500 square feet of contiguous land
- Surrounding land use: A two-story building located south of the farm will block access to sunlight; Residential neighbors may dislike farm operations; Commercial beekeeping requires sufficient bee-friendly plants and water within a three-mile radius of the hives[18]
- Location efficiency: Access road suitable for commercial trucks; Near transit, if a farm stand is desired
- Slope: No slope; Ideally, the site will already be flat to avoid regrading costs
- Existing conditions: Urban soils will require environmental testing and remediation before food production can begin.[19] Sites with known or likely contamination should be avoided. If the site is covered by a concrete slab, this can eliminate costs for soil testing and remediation.

Urban agriculture is often viewed as an interim land use, before the land is redeveloped for a more lucrative purpose. In some cases, long-established community gardens have been demolished by land owners, over the objections of residents. Long-term land ownership can be secured through a land trust, such as Chicago's NeighborSpace. Urban farms that serve eligible populations may also be able to access federal funds – one Chicago farm acquired its land through the McKinney Act, which offers surplus land to organizations working with homeless individuals.

Urban agriculture operations must comply with local regulatory requirements, including zoning, composting, and food production restrictions. City of Chicago ordinances address zoning, composting, and cottage food industries (such as preserves). Urban farms must comply with the City's zoning code and will need to coordinate with the local Alderman and Chicago Department of Planning and Development.

Start-up costs and insufficient revenue can be barriers for urban farms and food production businesses. Certification is needed to operate a farming business, which can require several years to achieve. New farmers can gain technical instruction and business planning from university extension services, to reduce financial risk.

Costs include site preparation, water connections, site fencing, equipment, and seed. Costs can be reduced by sharing expenses with others in the local food system, such as insurance, tools and vehicles, and refrigeration. The City of Chicago provides free or low-cost water to community gardens, but the cost for a water bib installation on a new lot is approximately $25,000. Total site preparation costs for an urban agriculture business can be $60,000 to $100,000.[20]

Revenue can be increased by using farm techniques to extend the growing season (e.g., hoop houses); diversifying buyers (e.g., selling to local restaurants, stores, and CSAs); selling value-added products (e.g., pickles, jams, and beeswax candles); and acting as a broker for products from other farms.

BENEFITS

Access to healthy food is directly linked to reducing obesity, which is an epidemic in low-income communities of color.[21] One study found that backyard gardeners reported improving their diet by 61% by eating the food that they grew.[22]

There are several economic benefits as well. Chicagoans have a growing interest in "buying local," which strengthens the market for urban agriculture, but urban farms provide a limited number of jobs. Some urban farms address the job market saturation by offering job training that serves as transitional employment for individuals with barriers to the workplace. Other urban farms offer training in a broader, but linked, job market such as general landscaping and tree nurseries.

Urban agriculture can also become a hub to incubate and attract food-related businesses. The Nuestras Raices farm, located in a Puerto Rican community in Massachusetts, has added approximately $2 million to the local economy, through the creation of new food businesses. Families can also significantly reduce their food bills - one survey found that families met 30 – 60% of their produce needs through community gardening.[23]

By improving neighborhood waste systems, neighborhoods can have significant environmental benefit.

[17] *Communication with Homan Grown (J. Levrant, 7/27/18)*

[18] *Communication with Bolton Bees (C. Bolton, 8/21/18).*

[19] *U.S. Environmental Protection Agency. (2011) Brownfields and Urban Agriculture: Interim Guidelines for Safe Gardening Practices.*

[20]

[21] *Morland et al. (2002). The contextual effect of the local food environment on residents' diets: the atherosclerosis risk in communities study.*

[22] *PolicyLink. (2012) Growing Urban Agriculture: Equitable Strategies and Policies for Improving Access to Healthy Food and Revitalizing Communities.*

[23] *PolicyLink. (2012) Growing Urban Agriculture: Equitable Strategies and Policies for Improving Access to Healthy Food and Revitalizing Communities.*

Compared to conventional landfills, composting creates far fewer greenhouse gas emissions - which helps protect our climate.

Urban agriculture can re-activate vacant land and provide a safe and beautiful space for neighbors to come together. Community gardens can boost property values of homes within 1,000 feet.[24] Like all community investment, sustainable redevelopment should incorporate strategies for community ownership and affordability preservation for existing residents.

Urban agriculture programs can incorporate a variety of community benefits to increase food equity, such as:

- Supporting gardeners who want to grow hard-to-find, culturally appropriate foods (for example, some gardens partner with immigrant or refugee resettlement groups);
- Accepting EBT cards at famers' markets;
- Selling food on a sliding scale for low-income residents;
- Offering work shares to residents; and
- Donating unsold or unharvested produce to local food pantries.

RESOURCES

Chicago Department of Planning & Development. *Urban Agriculture FAQ.*

Chicago Department of Public Health. (July 29, 2015). *City Council Approves Ordinance to Expand Citywide Composting Program*

Chicago Department of Public Health. *Register a Cottage Food Operation.*

Chicago Urban Agriculture Mapping Project.

Chicago Zoning Ordinance – Substitute Ordinance – Urban Agriculture

Community Food Forests.

University of Illinois Extension. *Master Urban Farmer Training Program.*

U.S. Environmental Protection Agency. (2011) *Brownfields and Urban Agriculture: Interim Guidelines for Safe Gardening Practices.*

[24] *Been & Voicu (March 2006) The Effect of Community Gardens on Neighboring Property Values.*

THE PLANT Chicago, IL

The Plant is a former USDA-grade, 93,500 sq. ft. meatpacking plant in Chicago's Back of the Yards neighborhood. In 2010, the building was acquired by a non-profit, Bubbly Dynamics LLC, that re-envisioned the structure as a food and farming business incubator, and a closed-loop system that would capture and re-use waste. Today, the building houses over a dozen small food businesses, including an urban farm and other food producers. As of early 2018, The Plant houses approximately 85 full-time employee equivalent positions. The Plant is still under construction and is expected to be fully complete in 2019.

Source: Bubbly Dynamics LLC
Photo: Zeke Franco, Flickr/Creative Commons

WINDY CITY HARVEST YOUTH FARM Chicago, IL

This urban farming program educates and employs 80 to 90 teens annually at five urban farms located in low-income communities. The curriculum is grounded in Social Emotional Learning (SEL) principles, and teaches team work and accountability, nutrition, and food justice. As of 2013, 93% of high school senior participants graduated from high school, 53% were enrolled in college, 20% were working full-time, and two were in job training programs.

Source: Chicago Botanic Gardens
Photo: USDA, Flickr/Creative Commons

3.0 WATER

Clean water is essential to thriving communities. The urban water system is a complex network that brings together natural system (e.g., plants, soil, Lake Michigan) and built systems (e.g., water treatment plants, drinking water pipes, sewer pipes, homes, and businesses) to manage drinking water, stormwater, and sewage for a city. When water is poorly managed, communities can experience flooding and drought, unaffordable water and sewer bills, and contaminated drinking water.

Sustainable neighborhood-scale water management uses coordinated, integrated technologies to become more resilient to these challenges. For example, a neighborhood that struggles with flooding might examine its overall approach to stormwater management. Historically, Chicago has collected and sent stormwater runoff (excess rain) and sewage into pipes that lead to a centralized water treatment plant, which cleans the water and returns it to a nearby creek or other body of water. If the sewer system is overwhelmed by a large amount of runoff, flooding occurs.

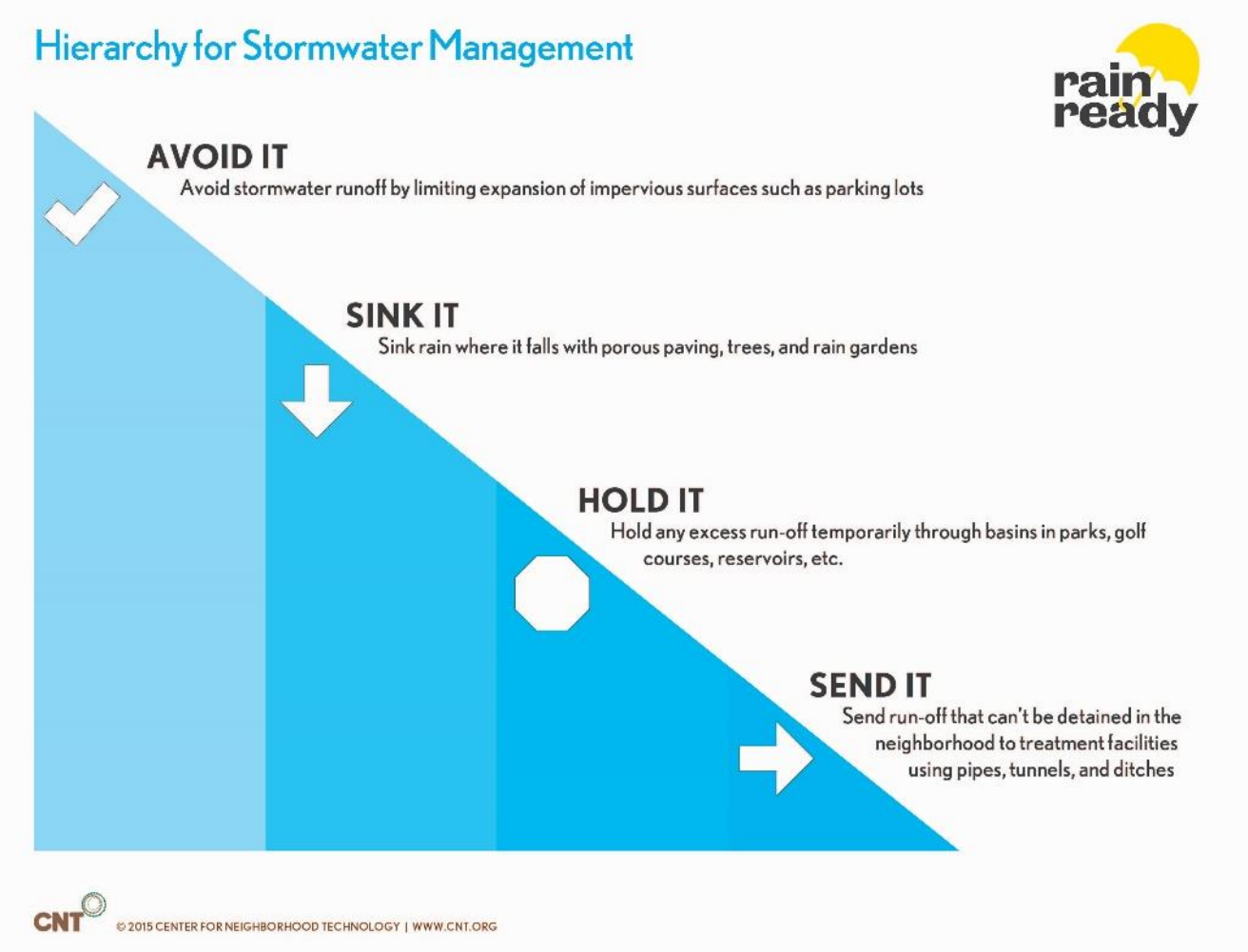
An alternative approach would consider other options *before* sending the water into the sewer pipes. As shown in Figure 3, a neighborhood might choose instead to avoid creating runoff in the first place, by protecting existing vegetation and adding nature-based solutions that let rain sink where it falls. As a last resort, excess rain would be collected and sent to the treatment plant.

DISTRICT STORMWATER

DESCRIPTION

"District stormwater" refers to designing stormwater management solutions on a neighborhood-scale. Some cities set stormwater requirements for individual parcels; for example, requiring newly constructed homes to absorb the first half-inch of rain. By contrast, a district stormwater approach would set a stormwater requirement for the whole neighborhood. Under district stormwater, some parcels would be allowed to absorb very little rain, but other parcels would be specifically developed to absorb very large amounts of rain.

Figure 4. Hierarchy for Stormwater Management



District stormwater strategies include green infrastructure practices, meaning that plants and soil are used to capture and absorb rain ("bioretention and bioinfiltration"). There are several types of green infrastructure that can be used for district stormwater.

1. Stormwater Park
   Stormwater parks do double-duty as recreational parkland that also hold a large amount of water during storms. These parks treat rain as an asset, by incorporating stormwater management into the overall landscape design.
   Typical cost for green infrastructure features in parks: $15,000 to $27,000 per acre.[25]

2. Stormwater Planters and Parkway Bioswales
   Stormwater planters and bioswales use water-loving, deep-rooted plants and porous soil to capture and treat rain. Bioswales also move rain from one location to another. They are typically installed within parkways or other sites next to paved areas, like roads, sidewalks, and parking lots.
   Typical cost: $10.50 - $12 per square foot.[26]

3. Street Zippers, Green Alleys, and Permeable Parking Lots
   A street zipper adds a strip of porous pavement along the sides of a street, often in the parking lanes. Similarly, alleys and parking lots can be depaved and reconstructed with porous pavement. Porous pavement is a hard surface that lets rain pass through to the soil beneath it. Porous pavement can be made from interlocking pavers, or specially engineered concrete or asphalt.
   Typical cost: $15 per square foot. Green Alley: $150,000 per block.[27]

4. Residential and Non-Profit Institution Rain Gardens
   Like bioswales, rain gardens use plants and soil to capture and treat stormwater. Rain gardens are bowl-shaped, and capture rain that flows overland or enters from a disconnected downspout. Some cities offer grants or other incentives to residents and non-profits who want to create and maintain a rain garden on their land.
   Typical cost: $10 per square foot.[28]

Figure 5. A bioswale uses plants and soil to capture, treat, and move rain from one location to another.

Figure 6. A rain garden is a bowl-shaped garden that uses water-loving plants and porous soil to capture rain.
Image Credit: HGTV Home

Figure 7. Homes can incorporate many flood resilience technologies, such as rain gardens, cisterns, and permeable pavement.

[25] *The Trust for Public Land (March 2016). City parks, clean water.*

[26] *Costs for bioswales, planters and permeable pavement from: Delta Institute. (July 2015). Green Infrastructure Designs.*

[27] *Chicago Dept. of Transportation. 2017 Aldermanic Menu Program.*

[28] *Cost derived from RainReady Home program data (CNT, 2018).*

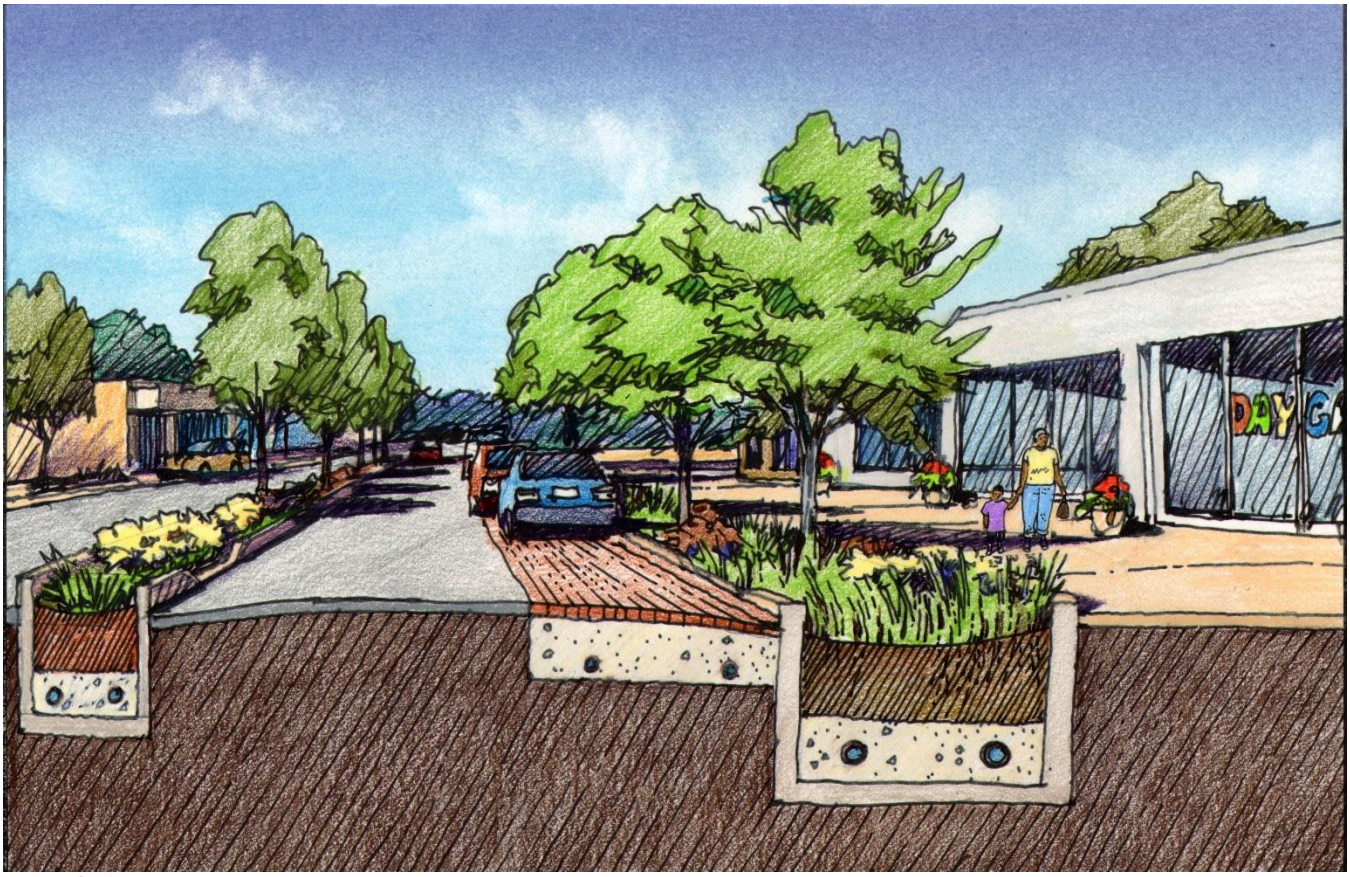


Figure 8. A district stormwater approach considers the stormwater needs for the whole neighborhood, and strategically places green infrastructure to benefit the whole community. Here, a commercial street is re-designed with street zippers and bioswales.

The success of a district stormwater installation depends on several factors.

- The location of the green infrastructure sites. Considerations include the topography and soil conditions of the neighborhood, the capacity and location of the existing sewer system, and analysis to define the borders of the sub-watershed area.
- The engineering design of the green infrastructure. Each green infrastructure installation must be correctly sized and oriented to capture the available rain. Collectively, the network of green infrastructure sites must be large enough to capture the neighborhood's excess rain.
- The construction of the green infrastructure installations. Green infrastructure is more complex than general landscaping. It relies on specific soil mixes, types of plants, and careful excavation in order to function well.
- The long-term maintenance of the green infrastructure. Just like regular sewer pipes, green infrastructure must be well-maintained in order to keep functioning at peak performance.

BENEFITS

District stormwater practices lessen the risk of flooding, by reducing and slowing the flow of runoff entering the sewer system. Flooding has tremendously adverse health and economic impacts on residents (see Existing Conditions section), and the avoided cost of flood repairs can be significant.

There are several benefits of green infrastructure, such as:

- Protecting our drinking water source, by filtering pollution out of runoff;
- Protecting our climate and air quality, by absorbing carbon dioxide and other pollutants;
- Protecting residents from extreme heat, as plants provide shade, cool the air by evaporating water, and absorb less heat than paved surfaces; and
- Offering residents a place to enjoy nature and be outdoors.

District stormwater practices can re-activate vacant land and provide opportunities for creative placemaking. Local

plants and local art can complement each other, highlighting the uniqueness of a neighborhood.

Green infrastructure can be coordinated with other community improvements. To encourage walking and biking, streets can be redesigned with "street zipper" bike lanes, and "bump out" rain gardens that extend the curbs – which calms traffic and makes it safer for pedestrians to cross the street.

Green infrastructure provides several other mental health and safety benefits. Research studies, conducted in low-income Chicago neighborhoods, report that greenery lowers stress and aggression, encourages neighborliness, and reduces both violent crime and property crime.[29]

As with all community investment practices, green infrastructure investment should be coupled with affordability preservation to avoid displacing current residents. Property values increase when a neighborhood has more greenery; one study reported 2 – 10% increase for properties with street trees.[30]

District stormwater can incorporate a variety of community benefits to increase equity and community control, such as:

- Training residents to install and maintain green infrastructure in the neighborhood;
- Local hire requirements for green infrastructure installation and maintenance;
- Procuring plants and soil mixes from urban farms located within the neighborhood;
- Beautifying local community spaces, such as school and parks, with new landscaping;
- Providing grants, technical assistance, donated materials, or utility bill credit to local building owners who install and maintain green infrastructure;
- Incentivizing developers who exceed the minimum required stormwater requirements, e.g., by reducing impact fees; and
- Establishing an ongoing monetary payment or tax credit for local landowners who make their land permanently available for larger-scale green infrastructure.

RESOURCES

Chicago Department of Buildings. *Green and Solar Permit Incentives.*

Chicago Department of Planning & Development. (January 2017) *Chicago Sustainable Development Policy.*

Chicago Department of Planning & Development. *Open Space Impact Fee.*

Chicago Department of Water Management. *Sewer Construction and Stormwater Management Requirements.*

Metropolitan Water Reclamation District of Greater Chicago. *Green Infrastructure Program.*

U.S. Environmental Protection Agency. *Green Infrastructure Funding Opportunities.*

U.S. Environmental Protection Agency. (July 2013) *Implementing Stormwater Infiltration Practices at Vacant Parcels and Brownfield Sites.*

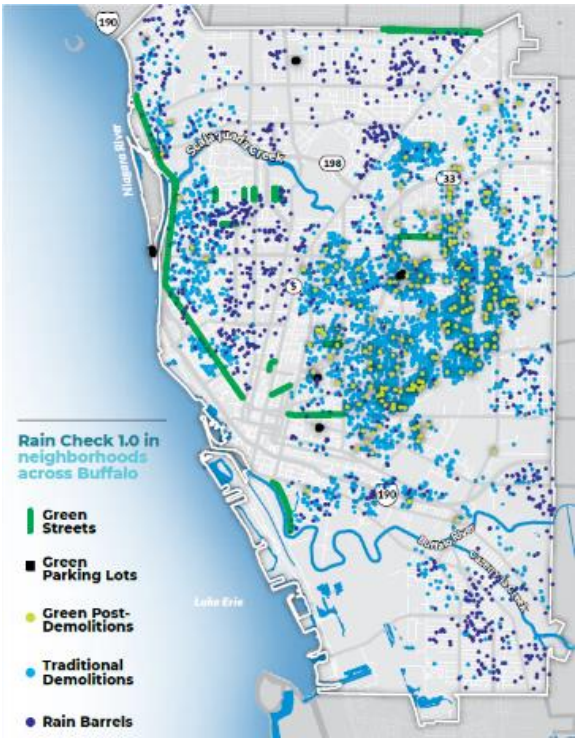
[29] *Kuo & Sullivan (2001). Aggression and Violence in the Inner City: Effects of Environment via Mental Fatigue.; Kuo & Sullivan (2001). Environment and Crime in the Inner City: Does Vegetation Reduce Crime?*

[30] *CNT (2010). The Value of Green Infrastructure.*

RAIN CHECK 1.0 Buffalo, NY

Rain Check 1.0 was launched by the Buffalo Sewer Authority in 2015, as part of a plan to reduce the city's combined sewer overflows. Rain Check uses a city-wide green infrastructure program that incorporates green streets, green parking lots, green post-demolition treatments, and rain barrel and downspout disconnections to manage rain for 1,047 acres of the city – and capture nearly 1 billion gallons of rain annually. Some projects, such as Green Streets, are at the neighborhood scale. Nine miles of Green Streets manage rain for 101 acres of the city, and infiltrate nearly 61 million gallons annually, through de-paving, porous pavement, cobblestone restoration, rain gardens, and street trees. Two acres of Green Parking Lots manage rain for almost 7 acres of the city and are estimated to infiltrate over 6 million gallons annually, through porous paving and rain gardens. Vacant lots have been given a green post-demolition treatment, by replacing debris and compacted soil with a more porous soil mix, regrading to keep water in place, and planting a low-maintenance vegetation cover or empowering community members to create a rain garden. Two hundred twenty-four (224) green post-demolitions manage rain for 20 acres of the city, and infiltrate 19 million gallons annually. Thirteen hundred (1,300) oversized rain barrels have been given to residents, managing rain from 7 acres of private rooftops, and storing 7 million gallons annually.

Source: Rain Check 1.0 Report (May 2018)
Image: Buffalo Sewer Authority



4.0 AIR

Clean air is essential to thriving communities. Ecodistrict strategies can reduce the amount of air pollution created, and buffer homes from the source of the pollution. In urban environments, smog is mainly caused by vehicle emissions[31] (i.e., "mobile" or "non-point" sources like cars, trucks, diesel trains); air toxics are primarily due to industrial operations (a "stationary" or "point" source).[32] Several strategies can be used to address both mobile and stationary sources of air pollution.

District scale strategies discussed in this section include:

- Complete Streets
- Buffer Parks
- Sustainable Manufacturing & Freight Movement

COMPLETE STREETS

DESCRIPTION

A Complete Street network has roads that are safe, accessible, attractive, and convenient for all users - cars, bikers, and walkers of all abilities alike. Complete Streets reduce air pollution and improve public health, by making it easier to shift from driving to walking or biking. Walking and biking does not create air pollution, burns calories, and is more affordable than owning a car.

A Complete Street may incorporate other Ecodistrict strategies such as zero-emission vehicle infrastructure (e.g., bike share stations and electric vehicle charging stations), permeable pavement to manage stormwater, and parklets to provide public gathering spots (e.g., sidewalk extensions that provide amenities such as benches, small gardens, and local art).

The success of a Complete Street network depends on several factors, such as compatibility with existing transportation plans and design standards; a traffic study to identify suitable treatments; engineering design to achieve desired safety and other benefits; high-quality construction practices; and a funded long-term maintenance plan.

1. Curb Extensions and Refuge Islands

Curb extensions (or "bump-outs") shorten the crossing distance for pedestrians and improve visibility for drivers. They reduce speed and improve stop sign compliance by visually narrowing traffic lanes. "Detached bump-outs" create a vegetated pedestrian refuge between the sidewalk and the travel lane. Refuge islands are placed in the middle of a crosswalk, so that pedestrians and cyclists only have to cross one direction of traffic at a time. Typical cost: $15,000 for two bump-outs on a residential street; $30,000 per corner on arterial and collector streets; $60,000 per pedestrian refuge island.[33] Vegetated areas require a maintenance agreement with the City of Chicago.

Figure 9. Vegetated curb extension.
Image Credit: pedbikeimages.com

Figure 10. Refuge island with vegetated median.
Image Credit: pedbikeimages.com

[31] *Karagulian et al. (2015). Contributions to cities' ambient particulate matter (PM): A systematic review of local source contributions at global level*

[32] *U.S. EPA. (n.d.). Area Sources of Urban Air Toxics*

[33] *CDOT. 2017 Aldermanic Menu Funds.*

2. Neighborhood Greenways and Bike Boulevards

Neighborhood Greenways (or bike boulevards) are comprehensive treatments designed for cyclists, through measures such as traffic calming, traffic reduction, road signs and pavement markings, and crosswalk improvements. Pedestrians and residents also benefit through the elimination of cut-through motor traffic.
Typical cost: $60,000 per half-mile.[24]

Figure 11. Proposed Manor Greenway, with a traffic diverter, curb extension, and pavement markings.
Image Credit: Chicago Dept. of Transportation

3. Marked Shared Bike Lane, Buffered Bike Lane, & Protected Bike Lane

Marked shared lanes use pavement markings and signage to designate a part of the road for the use of bikes. They are placed between the parking lane and the travel lane. Marked shared lanes can be used when the road is too narrow to accommodate a separated bike lane.
Typical cost: $30,000 per half-mile

Buffered bike lanes use pavement markings to designate a buffer space between the travel lane and the parking lane, giving cyclists more room to pass, ride outside the door zone, and separate from vehicles.
Typical cost: $50,000 per half-mile

A protected bike lane uses physical barriers to separate cyclists from vehicles, such as raised medians, on-street parking, or bollards. Protected bike lanes run between the sidewalk and parking lane.
Typical cost: $125,000 per half-mile. [24]

Figure 12. Marked shared bike lane.
Image Credit: bikepedimages.org

Figure 13. Protected bike lane separated by bollards and on-street parking.
Image Credit: City of Chicago

BENEFITS

Complete streets offer benefits to improve public health, equity, the local economy, and sustainability.

1. Public Health

   Complete streets reduce traffic crashes by permanently reducing vehicle speed and discouraging sidewalk riding by cyclists. Reducing travel speeds, through designs such as "road diets" that narrow lanes, is particularly important. When a pedestrian is struck by a car at 20 mph, they have a 25% chance of severe injury, and a 5% chance of death. At 30 mph, the risk is 50% for severe injury and 25% for death; above 50 mph, severe injury or death is almost certain.[34]

   Complete streets combat the obesity epidemic, by encouraging walking and biking. A study of 32 neighborhoods found that living in more walkable areas increased physical activity and decreased obesity for residents, regardless of income level.[35]

2. Equity

   Wide crosswalks, uneven sidewalks, and improperly pitched or missing curb cuts make roads inaccessible to non-drivers. Complete street road designs better meet the needs of individuals with limited mobility, including the elderly. Complete streets combat other inequities too - traffic crashes are more fatal for older individuals[36] and disproportionately affect communities of color and low-income communities.[37]

3. Local Economy

   Complete streets help household finances and boost local businesses. Complete streets lower household costs by offering an affordable alternative to driving. In the Chicago region, an average of 20% of household income is spent on transportation, and the annual cost of owning a car is over $9,000 – not including the cost of gas, maintenance, and repairs.[38] Local businesses benefit too, from improved foot traffic of potential shoppers, and more options for employees to commute to work. A study of seven complete street improvements in New York City showed sales growth for street-level retail and restaurants over a three-year period after the improvement, when compared to similar unimproved sites and the neighborhood at large.[39]

4. Sustainability

   Chicagoans are exposed daily to air pollution from vehicles. Fortunately, transit-served neighborhoods, such as the Elevated Chicago community areas, have an advantage in reducing pollution from vehicles, because residents are more likely to be able to travel to jobs, shops, and schools, without creating driving emissions.

   Complete streets encourage people to shift away from driving, and instead use zero-emission transportation like biking and walking. Fewer car trips reduces the demand for fossil fuels, and decreased air pollution and greenhouse gases from vehicle emissions (e.g., particulate matter, NOx, and volatile organic compounds (VOCs)).[40]

RESOURCES

Active Transportation Alliance. *AT Policy Resources.*

Chicago Area Clean Cities. (2018). *Funding.*

Chicago Department of Transportation. *Chicago Complete Streets.*

Chicago Department of Transportation. (2012) *Chicago Pedestrian Plan.*

Chicago Department of Transportation. *Chicago Streets for Cycling Plan 2020.*

Chicago Department of Transportation. (2013) *Complete Streets Chicago Design Guidelines.*

Chicago Metropolitan Agency for Planning (CMAP). (2015). *Complete Streets Toolkit.*

Drive Electric Chicago.

Vision Zero Chicago. (June 2017). *Action Plan 2017 – 2019.*

Vision Zero Chicago. (June 2018). *High Crash Corridors Framework Plan.*

[34] *CMAP (March 2015). Complete Streets: The Basics*

[35] *Sallis, J et al. (2009). Neighborhood built environment and income: Examining multiple health outcomes. Social Science and Medicine 68:1285-1293*

[36] *Tefft, B.C. (2013) Impact speed and a pedestrian's risk of severe injury or death. Accident Analysis & Prevention, 50:871-878*

[37] *CMAP (March 2015). Complete Streets: The Basics.; City of Chicago, Vision Zero Chicago: Action Plan 2017-2019*

[38] *CNT (accessed 8/2018). H+T Index. CBSA: Chicago-Naperville-Elgin*

[39] *New York City Department of Transportation (December 2013) The Economic Benefits of Sustainable Streets*

[40] *Zhu, Y. et al. (2016) Effects of Complete Streets on Travel Behavior and Exposure to Vehicular Emissions. University of California Los Angeles.;*

Frank, L et al. (2006). Articles

Many Pathways from Land Use to Health: Associations between Neighborhood Walkability and Active Transportation, Body Mass Index, and Air Quality. Journal of the American Planning Association.

ARGYLE SHARED STREET Chicago, IL

Argyle Shared Street Site Plan. Credit: Site Design Group

Argyle Street is a bustling commercial corridor in Chicago's Uptown neighborhood with an elevated train station, Argyle Station, at its center. Settled by a wave of Southeast Asian refugees in the mid-1970s, the blocks surrounding the Argyle station are filled with dozens of immigrant-owned businesses. The area is a magnet for suburban and out-of-state shoppers who drive in to buy imported groceries or restaurant supplies. Argyle is a cultural tourism attraction, as visitors are drawn to its multicultural character, while foodies flock here to dine. At the same time, the area has a large senior population, many of whom speak limited English. Each winter, Argyle plays host to a Lunar New Year week-long celebration and parade. In the summer, a Night Market fills a block of the street with food vendors and music and draws up to 5,000 each night.

While the CTA renovated the station in 2012, Argyle Street itself was long in disrepair and for years the business community advocated for improvements to the streetscape, which had narrow, dingy sidewalks, and was seen as a deterrent to drawing shoppers. Thus, the Chicago Department of Transportation (CDOT) envisioned piloting the state's first "shared street" on Argyle. Argyle was determined to be an appropriate site due to its relatively low traffic volumes and lack of a bus route, and its need for ADA accessibility and flood mitigation.

A shared street, common in cities around the world, creates a plaza-like atmosphere that eliminates curbs and uses visual and tactile cues to slow down traffic in areas with high numbers of pedestrians and retail. The idea is give passersby reason to linger as a way to boost an area's vibrancy. The intent was to create a flexible streetscape that could support Argyle Street's events, while also making space for outdoor cafes, improving stormwater retention, and providing safe travel for pedestrians, cyclists, and drivers equally.

Figure 14. Before and after Argyle streetscaping project. Image: Site Design Group

The new Argyle Shared Street has a reduced speed limit, traffic calming design, full ADA compliance, and a pedestrian refuge island. The new design provides space for patio dining and public gatherings, plus bike racks, stormwater planters, permeable pavers, and LED streetlights.

The 48th Ward and Uptown United, who manage the local 15-mile Special Service Area (SSA) district, were key partners in the planning process, and liaisons to the local business community during the planning and construction process. Uptown United entered into a maintenance agreement with CDOT to maintain the stormwater planters and permeability of the paver system.

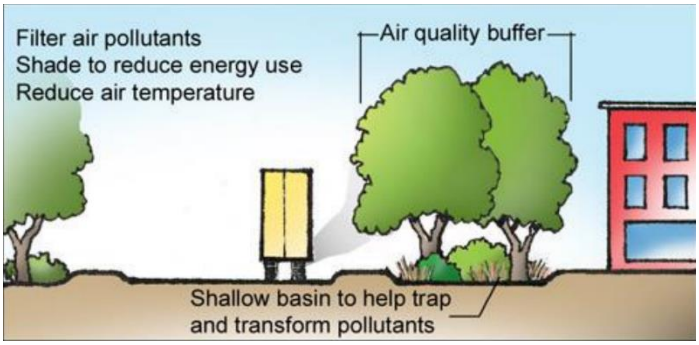
The new streetscape enables pedestrians of all abilities to use the street, creates a flexible public space, encourages drivers to give way to pedestrians, manages water sustainably, and supports the local economy. The Shared Street has been successful at hosting public gatherings, although the pavers require additional effort to clean after events, particularly from cigarette litter. The number of attendees for the Night Market is up 30% from 2017 to 2018, and the number of groups participating in the Lunar New Year Parade doubled.

Economic impacts have been varied. Local business owners reported a decline of sales during the two-year construction process, including contractor delays. A perceived lack of parking has discouraged out of town shoppers from visiting, and some feel that more post-construction marketing is needed to return to pre-construction shopper volumes. Also, no entity currently has dedicated funding for the maintenance of hardscape elements, which have seen damage from delivery trucks and cars. Positive impacts include a four-fold increase in sidewalk cafes, substantial increases in Night Market attendance, and nearly $2 million in private investment to improve businesses and buildings along the streetscape since construction began. (Source: Site Design Group; Uptown United)

BUFFER PARKS

DESCRIPTION

Buffer parks, also called vegetated buffers, are clusters of trees, shrubs, and other vegetation strategically located to create a barrier between areas such as a residential neighborhood and a highway or industrial corridor.[41] They are an effective solution for filtering out air pollution.



Vegetated air quality buffer.
Image Credit: USDA

The success of a buffer park depends on several factors.[42]

- Plant Selection. A buffer park should use a combination of specific types of trees, shrubs, and grasses. Plants should be able to handle the site conditions, such as pollution, road salt, high temperatures, and local soil, sunlight, and wind conditions.[43] Site constraints, such as underground and overhead utilities, pavement, buildings, and existing trees will determine which plants can thrive. A diverse range of plant species is critical to avoiding plant disease and pests. Approximately 200 tree species grow well in the Chicago area; avoiding the "top ten" most-planted trees can help diversify the tree canopy.[44]

Examples of leaf characteristics including waxy pine needles (left) and hairy leaf surfaces (right).
Image Credit: U.S. EPA

- Park Location and Design. Plants should be grown as close to the point of pollution as possible without damaging the health of the plants. The buffer park must not have gaps in the barrier. Gaps can create a funnel effect, moving pollution into a smaller area, and cause winds to stagnate leading to higher downwind concentrations of pollutants. A buffer park needs multiple vertical layers to prevent gaps: a combination of grasses, shrubs and trees will likely be needed to create a "green wall" against air pollution.

- Air Quality Conditions. Plants should be selected and grown according to the air quality needs.[45] For example, hairy leaves capture more particle pollution than smooth leaves, and herbaceous species, like native grasses, absorb more gaseous pollutants. Higher and thicker buffer parks are more effective for reducing downwind pollution. High pollen trees should be avoided, to protect residents vulnerable to asthma.

- Other Community Needs and Preferences. Buffer parks can layer in several benefits to address community needs. For example, to reduce flooding as well as reduce air pollution, native plants should be selected, and the park should be designed to capture stormwater (see Water section). Plant selection should also incorporate community preferences for visual appearance, aroma, and other characteristics.

- Maintenance Plan. A buffer park will need a short-term and long-term maintenance plan. Generally, plants will need more care during their establishment stage (1-3 years). Maintenance plans should account for site conditions such as soils, sun exposure, and average temperatures.

Examples of Effective (left) and Ineffective (right) Roadside Vegetated Buffers.
Image Credit: U.S. EPA

[41] *USDA. Conservation Buffers. Chapter 6.3 "Air Quality Buffers."*

[42] *ibid*

[43] *CAPHE. (2018). Vegetative Buffer Toolkit: Using Trees to Improve Air Quality in Detroit.*

[44] *Communication with Morton Arboretum (M. Caustic, 6/5/18).*

[45] *EPA. (2016) Recommendations for Constructing Roadside Vegetation Barriers to Improve Near-Road Air Quality.*

BENEFITS

Buffer parks offer many benefits including improved health, reduced utility expenses, and climate protection and resiliency.

1. Clean Air

Trees, especially when planted in contiguous forest stands in an open space area, are extremely effective at removing pollutants. A 65 – 600-foot-wide buffer could reduce particulate matter, such as dust, gas, and soot, by 40 – 75%.[46,47] An area with 100% tree cover can remove as much as 15% ozone, 14% sulfur dioxide, 8% nitrogen oxide, and .05% CO from the air.[48,49]

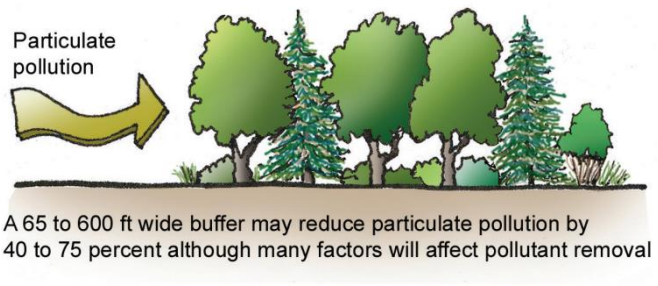


Illustration of particulate pollution reduction effect.
Image Credit: USDA Forest Service

The health benefits are substantial. Research shows that buffers have the potential to improve respiratory health; and lower the number of cases of heart attacks, irregular heartbeat, cardiovascular disease, low birth weight infants, and cancer. [50,51]

2. Quieter Neighborhoods

Linear buffer parks act as a noise barrier for residents, reducing sound from a highway or industrial zone. Trees, and open space in general, have also been shown to improve mental health and reduce violent crime.[52]

3. Recreation + Gathering Space

Buffer parks offer space for walking and running trails, play spaces, and neighborhood gathering spots. If trails and other recreational uses are included in a buffer park, they should be surrounded by vegetation to protect residents from pollution.[53]

4. Reduced Urban Heat Island + Energy Use

Research shows that 5 to 10% of urban electricity use is spent on air conditioning to combat urban heat island effect.[54] Trees are very effective in mitigating and reversing urban heat island. The evaporation from a single large tree can produce cooling effects similar to ten room-sized air conditioners operating 24 hours a day. This translates into household savings too, as families need to turn on the A/C less often.

5. Reduced Flooding

Well-designed buffer parks can help manage stormwater. Tree canopies reduce the stormwater runoff by capturing and evaporating rainfall. Tree roots soak up water and make soil more porous. Studies show that trees can reduce runoff by millions of gallons and save cities tens of thousands to millions of dollars annually in stormwater management facility costs.[55]

6. Climate Protection

Trees and other plants are effective at reducing greenhouse gases. One acre of tree cover absorbs 2.2 tons of carbon per year.[56]

7. Equity + Economic Opportunity

Buffer parks can incorporate a variety of community benefits to increase equity and community ownership, such as:

- Workforce development for neighborhood residents who learn landscape installation and maintenance;
- Local hire requirements to install and maintain the park;
- Procuring plants and amendments from urban farms in the neighborhood; and
- Providing grants, technical assistance, or donated materials to local manufacturers or freight operators who install buffer parks.

[46] USDA Forest Service (2008) Conservation Buffers: Design Guidelines for Buffers, Corridors, and Greenways.

[47] CMAP (2013) Go To 2040 Strategy Papers: Parks and Open Lands: Environmental Benefits

[48] Sherer (2006) Trust for Public Land. The Benefits of Parks: Why America Needs More City Parks and Open Space

[49] The online program iTree quantifies the level of pollution reduction, and other benefits, for a particular urban area based on tree cover.

[50] EPA (2015) Nearby Roadway Air Pollution Health

[51] California Environmental Protection Agency Air Resources Board. (2005) Air Quality and Land Use Handbook: A Community Health Perspective.

[52] Kardan, et al. (2015) Nature: Scientific Reports. Neighborhood greenspace and health in large urban center. DOI: 10.1038/srep11610

[53] USDA Forest Service (2008).

[54] CMAP (2013)

[55] EPA (2013) Stormwater to Street Trees: Engineering Urban Forests for Stormwater Management.

[56] CMAP (2013)

RESOURCES

Chicago Regional Trees Initiative. *Chicago Region Trees Initiative Priority Maps.*

Community Action to Promote Health Environments (CAPHE). (2016) "7.3 Buffers & Barriers." *Working Together to Improve Detroit's Air.*

Community Action to Promote Health Environments (CAPHE). (2018). *Vegetative Buffer Toolkit: Using Trees to Improve Air Quality in Detroit.*

Morton Arboretum. *Northern Illinois Tree Selector.*

University of Illinois State and Local extension services.

USDA Forest Service. *i-Tree.*

U.S. EPA. *Stormwater Calculator.*

U.S. EPA. *Enviro Atlas.*

U.S. EPA. (2016). *Recommendations for Constructing Roadside Vegetation Barriers to Improve Near-Road Air Quality.*

MARATHON GARDENS PARK

Detroit, MI

Marathon Gardens Park is a community driven "green space" project in partnership with a local urban development firm PEA and Marathon Petroleum Company (MCP). MCP purchased 100 acres of land in one of the most heavily industrialized areas of Detroit. The land sits between the company's refinery and Detroit's Rouge River and encompasses the Oakwood Heights neighborhood, a community that has faced high levels of asthma and other health issues due to its proximity to a heavily industrialized area.

The Park is in its first stage of implementation, which includes wildlife habitat restoration on three acres and a community-driven urban agriculture project. Other park elements will include park landscaping, riverfront greenspace, and expanded habitat restoration and urban agriculture areas.

Sources: PEA Inc. Project Portfolio; CAPHE Buffer Toolkit (2018)
Images: Southwest Detroit Environmental Vision

SUSTAINABLE MANUFACTURING & FREIGHT MOVEMENT

DESCRIPTION

Numerous technological innovations are available to allow industry to remain within neighborhoods as anchor employers, while reducing negative environmental impact to residents. Energy, water, and waste strategies can create more integrated, efficient, and clean manufacturing facilities.[57]

BENEFITS

There are several benefits to adopting an Ecodistrict approach for manufacturing facilities.

Reduced Operational Costs
Lower the cost of utilities by generating energy on-site, using energy and water more efficiently, and locating near multiple freight transportation options.

Improved Resiliency
Avoid costly downtime with the ability to continue operating during an electrical outage or drought.

Lower Environmental Impact
Reduce air pollution, greenhouse gas emissions, wastewater discharge, and landfilling through smarter manufacturing processes.

More Local Jobs
Improve access to living-wage jobs by locating manufacturing near transit and workers.

Increased Competitiveness
Strengthen the brand by highlighting environmentally friendly manufacturing, and locally made products.

Meeting Policy Requirements
Use innovative technology to comply with environmental regulations and impact policies.

The following selected industrial Ecodistrict strategies can assist in lowering residents' exposure to air pollution from the manufacturing process.

- Design Standards
- Clean Equipment
- Transportation

1. DESIGN STANDARDS

Buffers should be created around manufacturing sites. A buffer could be open space, or "stepping up" land uses, meaning that the activity intensifies gradually over a given area.[58] In keeping with design standards for Ecodistricts, manufacturing sites may face residential communities with greenery borders, office-based functions, retail outlets, and light manufacturing processes. Intensive material processing activities and freight arteries may be located behind these buffers. Vegetated berms should be built around active freight areas, which can create a buffer to air, noise, and light pollution (see Buffer Parks).

Facilities should have adequate loading docks and paved parking areas. Limited and mismatched docking space can lead to increased diesel emissions from idling trucks, and create hazardous road conditions when trucks are forced to block streets. Parking areas should be paved to limit dust pollution from trucks.[59]

2. CLEAN EQUIPMENT

Clean fleets that use zero-emission and low-emission vehicles can replace older diesel vehicles and greatly reduce air pollutant emissions. Long-range electric trucks are still largely prototypes, but fully electric trucks can be used right now for first and last stage intermodal trips. Tens of thousands of full-powered, all-electric trucks are on order and should appear on highways shortly after 2020. Furthermore, new diesel-powered equipment can reduce emissions from trains by 80%, and from trucks by more than 25%, compared to current fleet averages. Even large facilities can adopt clean technologies and ambitious goals. For example, community organizations, public authorities, and innovative freight carriers are moving the nation's largest port complex in Los Angeles and Long Beach toward zero emission operations.

The City of Chicago's Drive Clean program has incentivized the deployment of over 400 cleaner vehicles since 2010 – representing a reduction of 2,850 tons of greenhouse gas emissions.[60] Drive Clean offers an 80%

[57] *See CNT's Industrial Ecodistrict Primer for a detailed discussion of this topic.*

[58] *FHWA. (2012). Freight and Land Use Handbook.*

[59] *National Cooperative Freight Research Program. (2012). Report 14. Guidebook to Understanding Urban Goods Movement. Chapter 5.*

[60] *Drive Clean Chicago. (2016).*

up-front discount on the incremental cost of upgrading to a cleaner vehicle. IEPA will also use the Volkswagen settlement to fund replacement of diesel vehicles with cleaner vehicles; IEPA may also support funding of electric vehicle charging stations.

3. TRANSPORTATION

Diesel emissions can be reduced by modernizing freight logistics. For example, third-party logistics companies offer "truck sharing" services that consolidate freight from multiple smaller manufacturers to be combined in one vehicle, reducing the number of trips needed.[32] In one example, the Murphy's Warehouse firm of Minneapolis receives rail car and intermodal container shipments and breaks down these cargoes for local truck deliveries. Murphy's also receives products from local manufacturers and consolidates them into rail car or intermodal container shipments, sending them out by train for a lower cost and one sixth the fuel consumption of all-truck movements. Computer-assisted freight routing programs also minimize the number of miles that trucks drive empty or by indirect routes.

At the neighborhood level, freight vehicles must be directed to adequate transportation routes, ideally away from residential areas. Routes that are difficult to navigate may increase travel time and traffic congestion and thereby increase diesel emissions. Safe pedestrian and cyclist crossings should be available for all freight corridors.

Finally, the enforcement of local policies, such as Chicago's Anti-Idling Ordinance, can substantially reduce emissions by prohibiting diesel vehicles from idling unnecessarily. Local regulations can also restrict local truck parking and delivery times. Delivery time restrictions can even increase the speed and efficiency of deliveries, and thereby lower diesel emissions, if truck traffic is shifted to off-peak hours.[34] Compliance with regulations can be improved by providing clear signage and physical barriers, such as retractable bollards that restrict access during times with high pedestrian activity.

RESOURCES

Center for Neighborhood Technology. (2017). *Industrial Ecodistricts Primer.*

Chicago Area Clean Cities. (2018). *Funding.*

Chicago Department of Transportation. (2009) *City of Chicago Anti-Idling Ordinance.*

Drive Clean Chicago.

IEPA. *Volkswagen Settlement.*

U.S. EPA. *Clean Diesel and DERA Funding.*

U.S. EPA. *Midwest Clean Diesel Initiative.*

http://www.drivecleanchicago.com/About/What.aspx

METHOD SOAP FACTORY

Chicago, IL

Method Soap Factory, a 150,000 square foot manufacturing facility located in the historic Pullman neighborhood on Chicago's far South Side, is one of only two LEED Platinum factories in the U.S. Located on a former brownfield, the factory employs approximately 90 people, many of whom live in Pullman.

A wind turbine generates half of the factory's electricity. A solar panel array is built over the surface parking lot, producing energy while creating shade that reduces urban heat island effect. An urban agriculture company, Gotham Greens, uses the 75,000 square foot roof as a commercial greenhouse, producing 500 tons of food annually. Another 1,520 square feet of green roof makes the building more energy efficient and sustainably manages stormwater. The area around the building is landscaped to manage rain.

Source: Method; Curbed Chicago; Chicago Tribune
Image: Anna Elsea, GreenBlue

EXISTING CONDITIONS

The *Existing Conditions* section presents an overview of community needs, preferences, and strengths concerning climate resiliency and community control. The preceding section, *Ecodistrict Practices*, discussed types of sustainable development strategies that are suitable for Chicago's climate and policy landscape. Following the *Existing Conditions* section, the next section *Ecodistrict Recommendations*, will identify sustainability strategies that are recommended for each community area, based on available land, community assets, and community priorities.

The *Existing Conditions* section includes a community profile for each of the Elevated Chicago eHubs:

- Kedzie Corridor
- Green Line South Corridor
- Logan Square Blue Line
- California Pink Line

Each community profile provides information regarding the existing conditions of:

- Affordability and Community Ownership
- Environment and Health
- Community Assets
- Community-Led Strategies

Affordability and Community Ownership
This subsection discusses economic characteristics, including household income, housing, land use, and development patterns. City-wide overview maps (Map Series 1) provide information concerning racial/ethnic segregation, household income, economic hardship, child opportunity, housing market, and risk of displacement to existing residents. The eHub community maps (Map Series 2 – 5) provide detailed information concerning land use/ownership, and development activity.

Environment and Health
This subsection discusses the climate challenges that present the most risk for our region – urban flooding, extreme heat, and air pollution. Our communities' health is inextricably linked to our environmental and economic well-being. Flooding and heat waves are predicted to worsen as a result of climate change, which is caused by greenhouse gases (GHGs). Our energy-intensive region creates a disproportionately large amount of GHGs.[61] The Ecodistrict recommendations will include strategies to help neighborhoods adapt to the stresses of a changing climate, while also mitigating climate change impacts by reducing GHGs.

In addition to weather-related risks, this subsection presents information on other community health concerns affected by the built environment, including pollution, lead poisoning, obesity, and violence.

City-wide overview maps (Series 1) provide information concerning life expectancy, vulnerability to heat, urban heat island (land surface temperature), heat- and asthma-related emergency room visits, susceptibility to flooding, and historical flood damages experienced by homeowners. The eHub community maps (Series 2 – 5) provide information concerning flooding, heat, air quality, and traffic crashes.

Urban Flooding
The health and economic impacts of flooding are significant. In a survey of Cook County flood victims, 84% reported stress; 13% reported ill health; 41% lost the use of part of their property; 63% lost valuables; and 74% lost work hours in order to handle repairs to their home.[62]

Flooding, especially when coupled with warmer temperatures, can create indoor air quality problems, such as mold, and result in respiratory problems. Warmer temperatures and changes in rainfall patterns may also increase the risk of contracting diseases carried by pests, and is linked to asthma caused by a longer pollen season.

In Cook County, most flooding happens outside of a mapped floodplain. This is called "urban flooding," which occurs when rain overwhelms the sewer system and floods buildings and streets. Urban flooding is related to 1) intense storms; 2) impervious land use (i.e., land that is unable to absorb water, like buildings and asphalt parking lots and streets); and 3) older sewer systems. Over the past 60 years, intense storms have increased almost 40% in our region. At the same time, Chicago has become more built up, with fewer open spaces that would naturally let rain sink in where it falls. And Chicago's sewer system, which was originally built over a hundred years ago, isn't always able to keep up with the ever-increasing amount of rain and sewage that enter the sewer lines. As a result, a mixture of rain and raw sewage can back up into basements, pond in yards for hours or days, and make roads impassable.

Extreme Heat and Air Quality
Chicago, like other large cities, is more prone to heat waves and degraded air quality because of "urban heat island effect." Urban heat island refers to the fact that large cities are 1.8 – 5.4 degrees warmer than the surrounding rural areas – and as much as 22 degrees warmer on still nights.[63] This happens because as cities

[61] Pryor et al. (2014), Ch. 18: Midwest. Climate Change Impacts in the United States: The Third National Climate Assessment

[62] CNT (2014), The Prevalence and Cost of Urban Flooding

[63] U.S. EPA (n.d.) Learn about Heat Islands.

are built up, vegetation changes from trees and shrubs to pavement and buildings – which means less shade from trees, less evaporation of water from plants (which cools the air), and more heat-absorbing building materials (such as large asphalt parking lots and commercial building rooftops). However, parks, open land, and water bodies create a cooler "microclimate" in the area around them.

Heat islands increase the need for air conditioning, which raises energy bills for families. In turn, the demand for energy increases the amount of GHGs and other pollution released by power plants.[64]

In our region, heat waves have become more frequent over the last sixty years. One study projects between 166 and 2,217 Chicagoans will die of heat-related deaths by 2081-2100 (the lower number assumes greenhouse gases will significantly decrease; the higher number assumes greenhouse gases will continue to increase).[65]

Heat can also trigger mental health concerns. Suicide rates rise with heat waves; some medications interfere with body temperature regulation; and dementia is a risk factor for heat-related death.[66] Research suggests that violent crime rises with warmer temperatures, especially unseasonably warm winter days.[67]

Chicagoans live and work in areas that do not meet the National Ambient Air Quality Standards (NAAQS), especially for ozone and fine particulates (PM 2.5). Urban heat island degrades the air quality in our communities, by directly creating ground-level ozone.[68] Air pollutants are also released from sources like power plants, factories, cars, and trucks. Nationally, ozone and particle pollutants are estimated to cause between 1,000 – 4,300 deaths by 2050.[69]

Strategies for Adapting

Neighborhoods can counteract urban flooding, extreme heat, and poor air quality in several ways. Fortunately, strategies can often address multiple types of climate risks at once.

1. By reducing greenhouse gases (e.g., less driving, more energy efficient building, more clean energy sources like solar), communities can lessen climate impacts in the future.

2. By protecting existing open space (e.g., parks, lagoons, and undeveloped land), communities can provide space for plants to soak in and evaporate rain, and limit the impervious building materials that absorb heat.

3. By adding several types of "green infrastructure," communities can use building materials that reflect heat (e.g., "cool pavement"), plant trees to provide shade on hot days, use vegetation to create a physical buffer between homes and large air pollution sources, and create a natural stormwater system that holds and soaks in rain.

4. By planning for ways to protect the most vulnerable residents (e.g., mapping vulnerable populations, establishing community cooling centers), the health and resiliency of all residents will be improved.

Community Assets

This subsection discusses the assets that currently exist in each community, including stakeholders and social networks, institutions, food, and health resources, building stock, transportation facilities, and open space. The eHub community maps (Map Series 2 – 5) provide detailed information concerning community asset locations.

Community-Led Strategies

This subsection compiles the existing, planned, and proposed projects of stakeholders working on community control and sustainable development projects within each community area, as reported in the Community Table Work Plans and in CNT's stakeholder interviews.

[64] *U.S. EPA (n.d.) Heat Island Effect.*

[65] *Pryor et al. (2014), Ch. 18: Midwest. Climate Change Impacts in the United States: The Third National Climate Assessment*

[66] *Luber et al. Ch. 9: Human Health. Climate Change Impacts in the United States: The Third National Climate Assessment*

[67] *Shinasi & Hamra (2017) A Time Series Analysis of Associations between Daily Temperature and Crime Events in Philadelphia, Pennsylvania*

[68] *U.S. EPA (n.d.) Heat Island Impacts.*

[69] *Luber et al. Ch. 9: Human Health. Climate Change Impacts in the United States: The Third National Climate Assessment*

MAPS

Series 1: Overview Maps

- 1A. Project Area (CNT, 2018)
- Equity Maps
    - 1B. Racial and Ethnic Segregation by Census Block (Rankin, 2010)
    - 1C. Household Income by Census Block Group (Rankin, 2009)
    - 1D. Economic Hardship by Chicago Community Area (CDPH, 2016)
    - 1E. Child Opportunity Index by Chicago Community Area (CDPH, 2016)
    - 1F. Housing Submarket by Chicago Community Area (Regional Housing Solutions, 2016)
    - 1G. Mapping Displacement Pressure in Chicago (DePaul University, 2017)
- Climate and Health Maps
    - 1H. Life Expectancy by Chicago Community Area (CDPH, 2016)
    - 1I. Chicago Heat Vulnerability by Census Tract (University of Illinois, 2010)
    - 1J. Chicago Land Surface Temperature, 2014 (CNT, 2018)
    - 1K. Heat-Related ER Visits by Zip Code and NAAQS Exceedances by Census Tract (CNT, 2018)
    - 1L. Asthma-Related ER Visits by Chicago Community Area (CDPH, 2016)
    - 1M. Flood Susceptibility Index (CMAP, 2017)
    - 1N. Residential Flood Insurance Claims by Zip Code (CNT, 2018)
    - 1O. Median Income and Flood-Related Insurance Payouts by Zip Code (CNT, 2018)
    - 1P. Traffic Crashes by Chicago Community Area (CNT, 2018)

METHODOLOGY

CNT consulted the following data sets to prepare the Existing Conditions community profiles: 1) Stakeholder interviews; 2) Review of existing reports; 3) Review of existing maps; and 4) Field data collection during site visits.[70]

Stakeholder Interviews:

1. Juan Carlos Linares, LUCHA
2. Ghian Foreman, Greater Southwest Development Corporation
3. Nootan Bharani, Arts + Public Life
4. Naomi Davis, Blacks in Green
5. Kevin Sutton, North Lawndale Community Coordinating Council
6. Mike Tomas, Garfield Park Community Council
7. Luis Gutierrez, Latinos Progresando

Reports and Map Data:

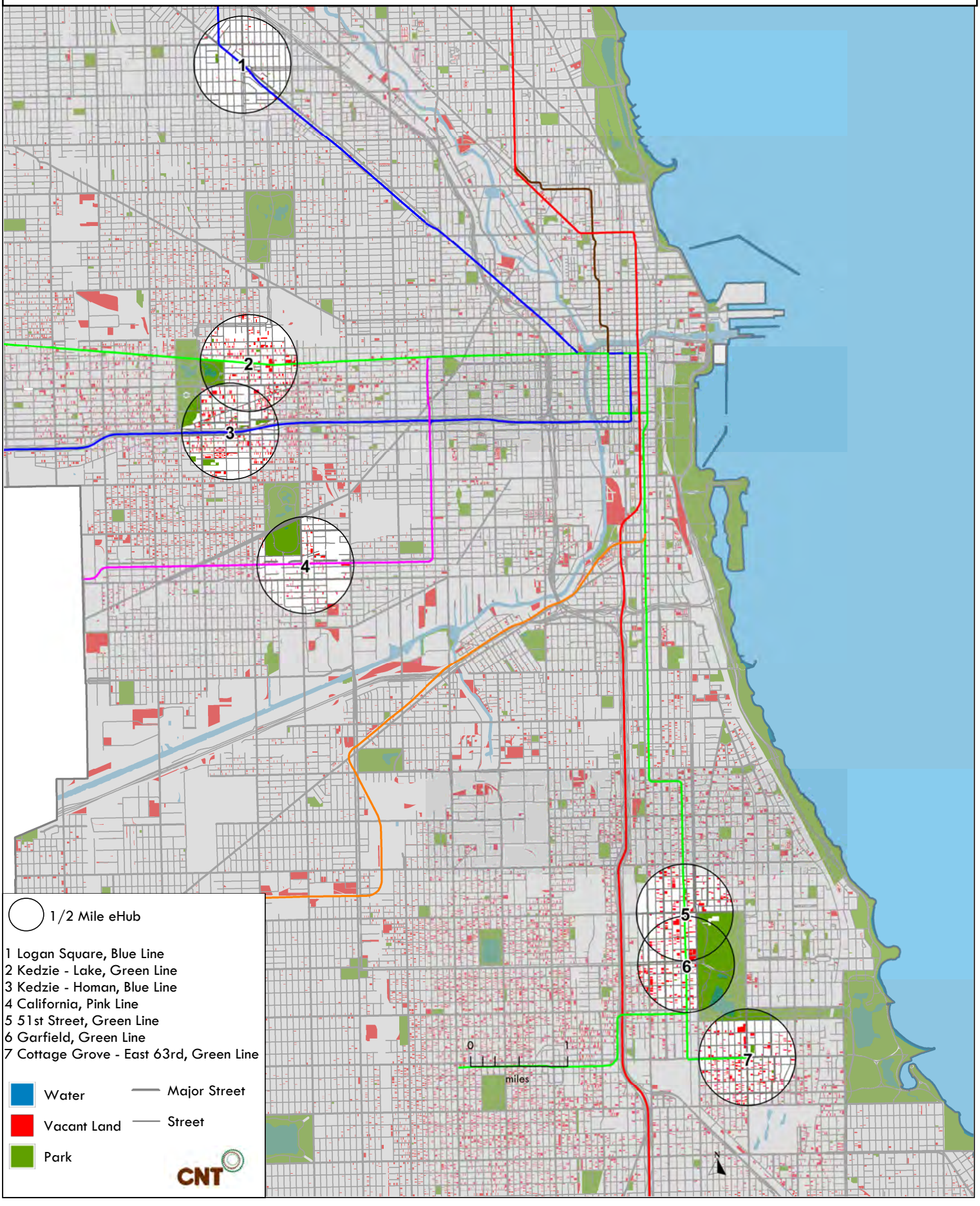
1. Elevated Chicago Kedzie Corridor 3 Year Work Plan
2. Elevated Chicago Green Line South Work Plan
3. Elevated Chicago Logan Square Table Strategies
4. Elevated Chicago Pink Line-California Station Community Table Action Plan
5. Elevated Chicago Climate Vulnerability Assessment Indicator Maps
6. Chicago Metropolitan Agency for Planning (CMAP), Regional Flood Susceptibility Index
7. AllTransit (https://alltransit.cnt.org/)[71]

[70] *Field data was collected during site visits on June 28, 2018 and July 5, 2018.*

[71] *The AllTransit Performance Score evaluates transit access and performance of transit, i.e., connections to other routes, jobs accessible in a 30-minute transit ride, and the number of workers using transit to travel.*

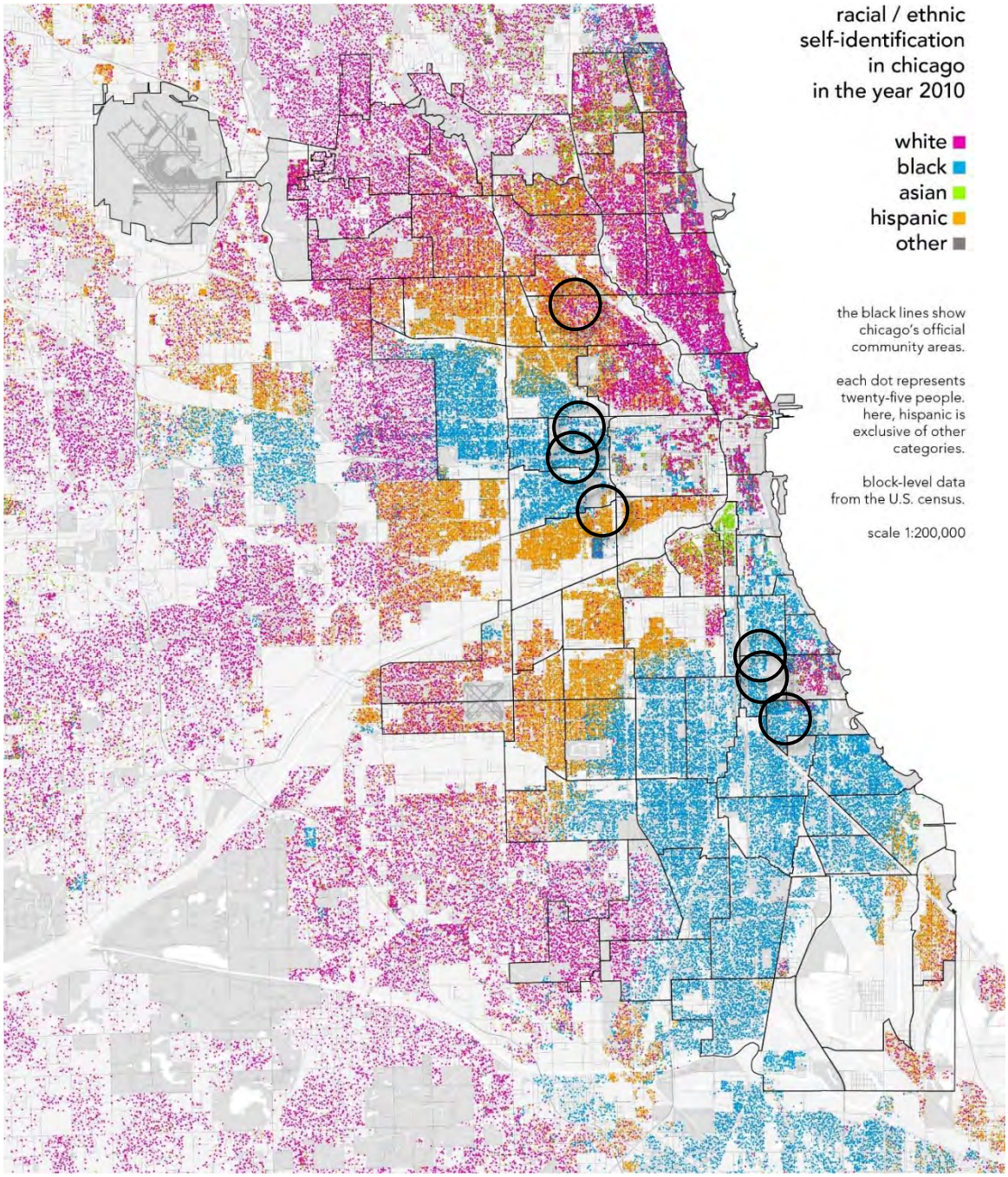
Map Series 1

1A. Project Area



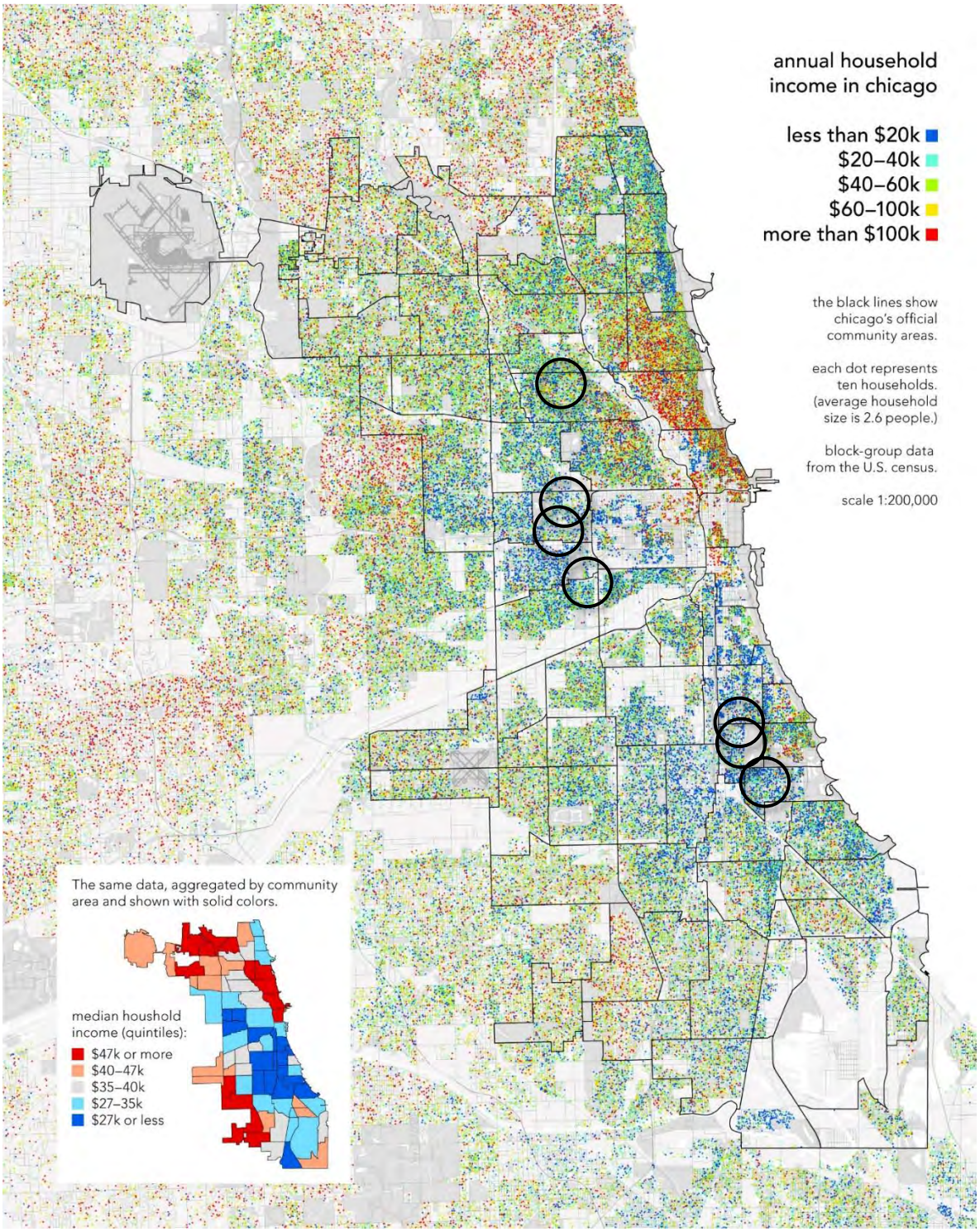
Equity Maps

Map Series 1
1B. Racial and Ethnic Segregation by Census Block



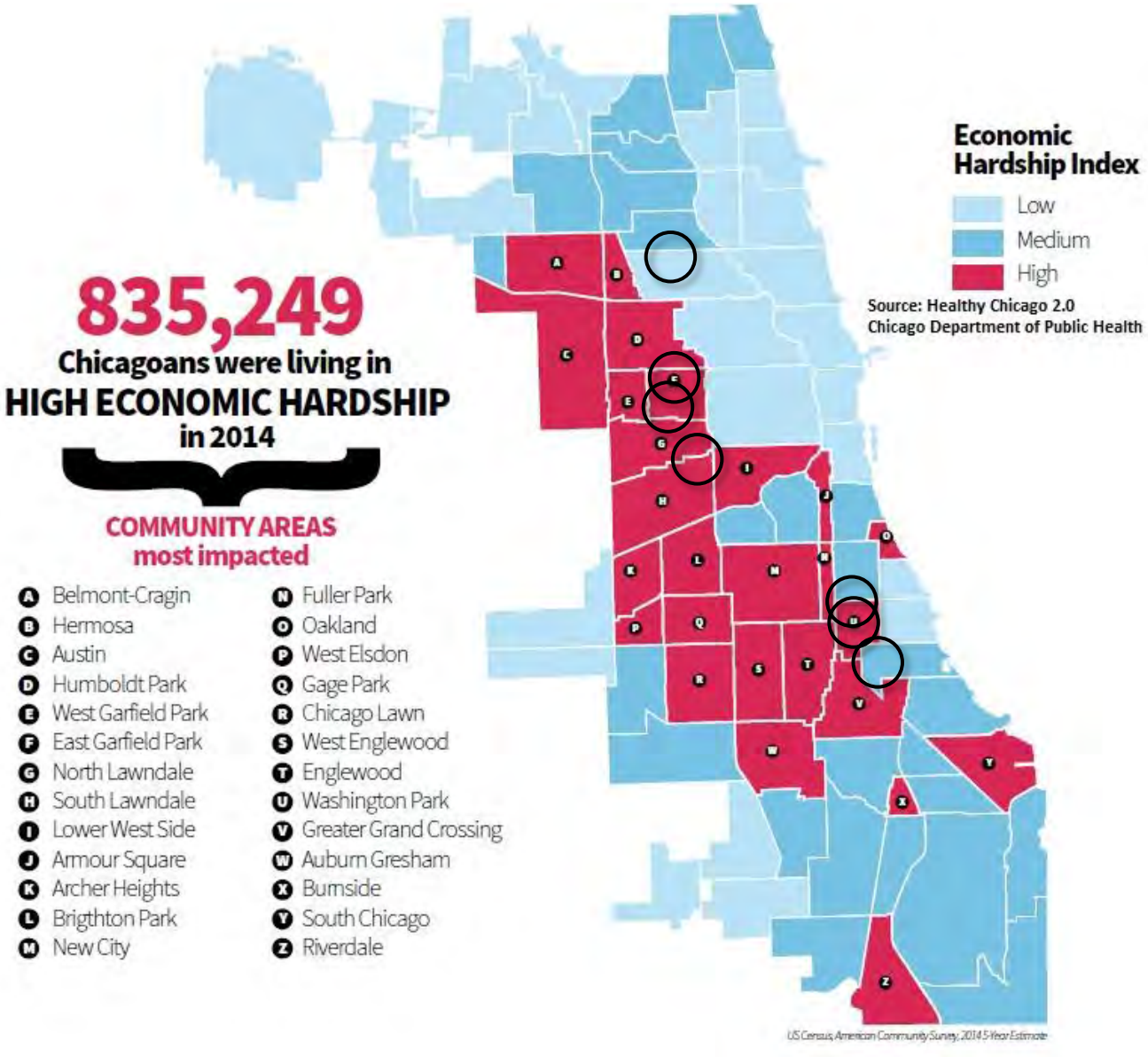
Source: Bill Rankin, 2010, www.radicalcartography.net

Map Series 1
1C. Household Income by Census Block Group



Source: Bill Rankin, 2009, www.radicalcartography.net

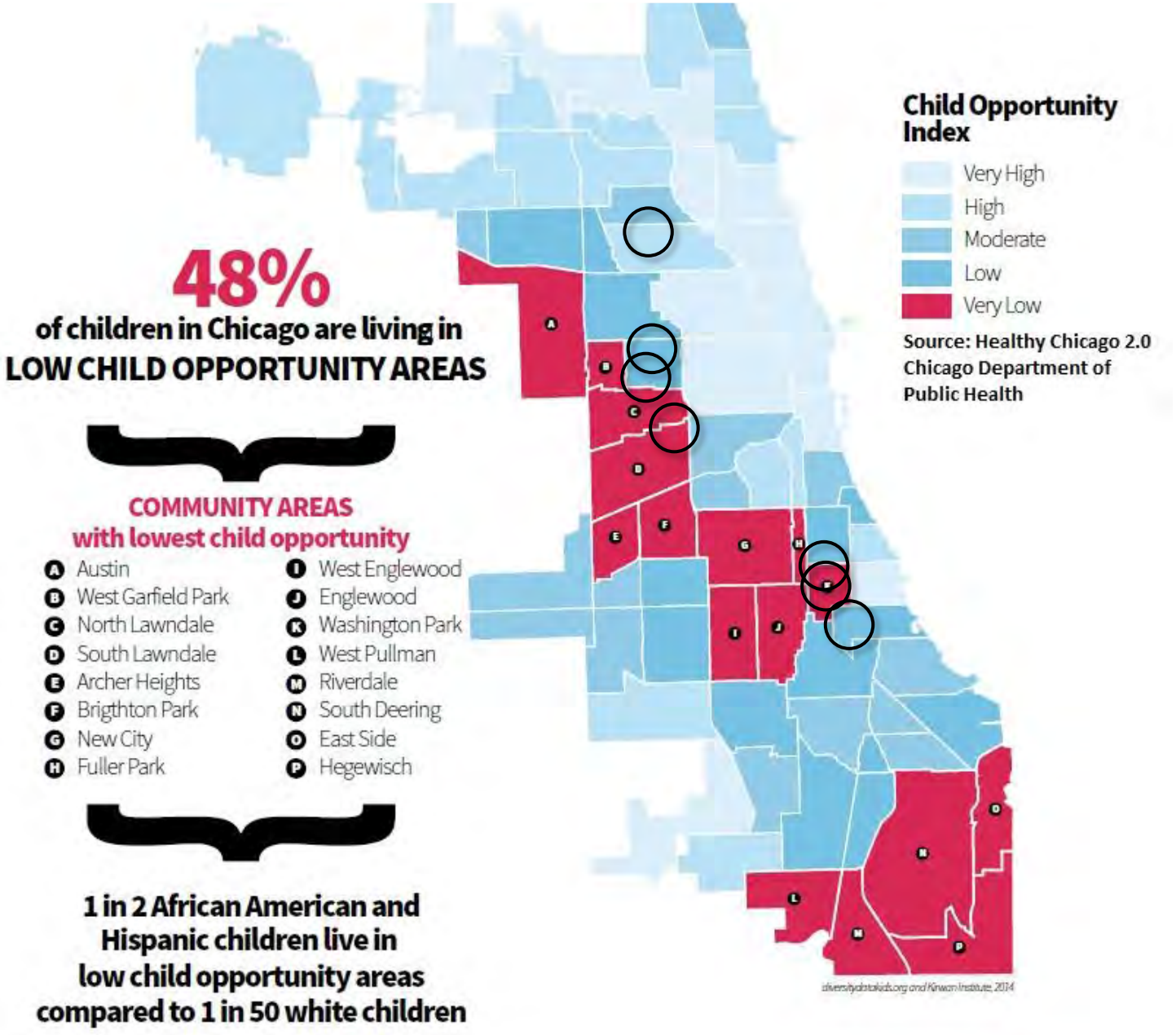
Map Series 1
1D. Economic Hardship by Chicago Community Area



Source: CDPH, Healthy Chicago 2.0 (2016), https://www.cityofchicago.org/content/dam/city/depts/cdph/CDPH/HC2.0Plan_3252016.pdf

The Economic Hardship Index compares social and economic conditions between Chicago communities. The hardship index looks at six indicators: (i) crowded housing; (ii) poverty (iii) unemployment; (iv) education achievement levels; (v) dependency; and (vi) income.

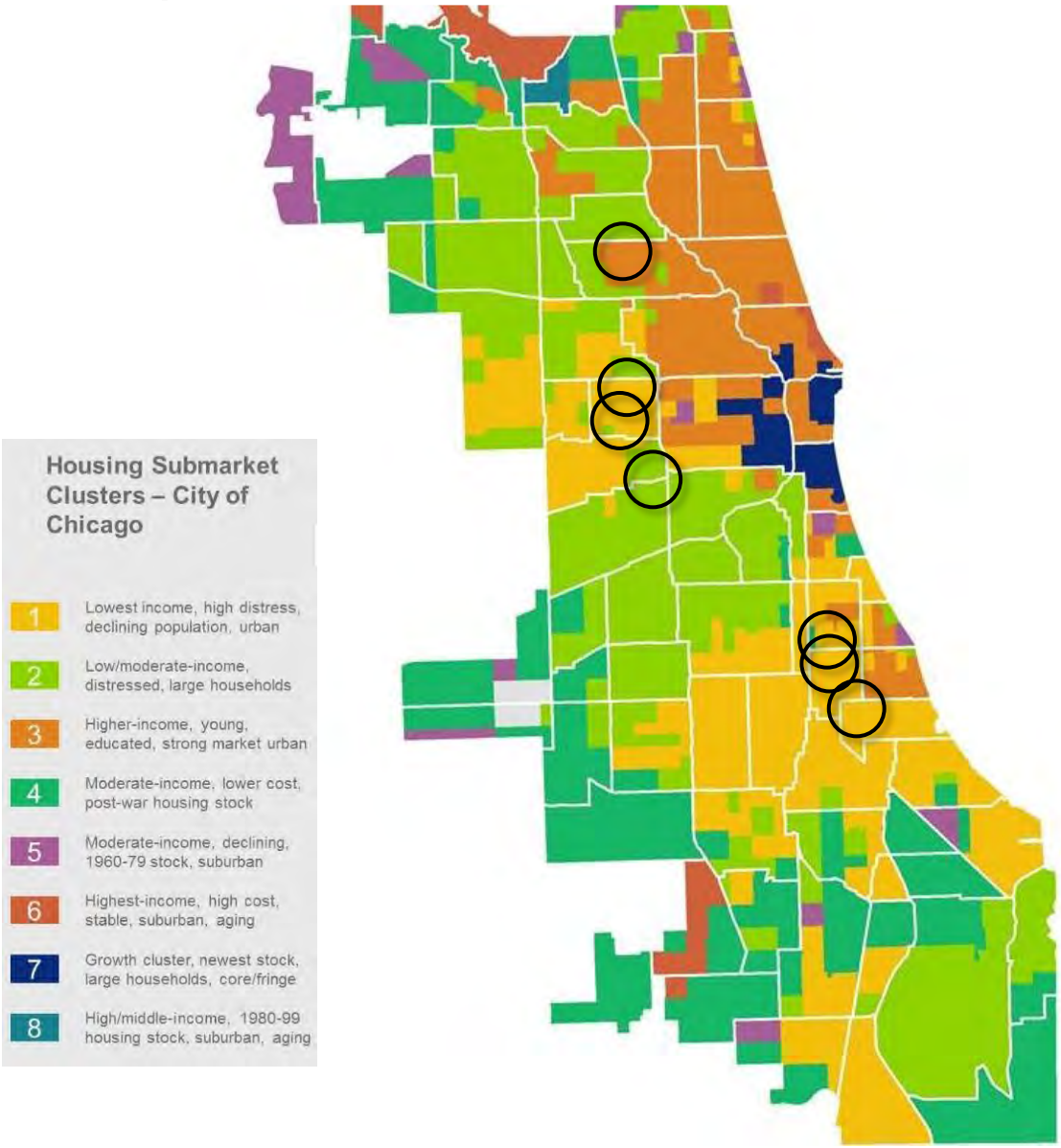
Map Series 1
1E. Child Opportunity Index by Chicago Community Area



Source: CDPH, Healthy Chicago 2.0 (2016), https://www.cityofchicago.org/content/dam/city/depts/cdph/CDPH/HC2.0Plan_3252016.pdf

The Child Opportunity Index measures community characteristics that influence a child's health and development. These features are organized into three overarching domains of opportunity: educational, health and environmental, and social and economic.

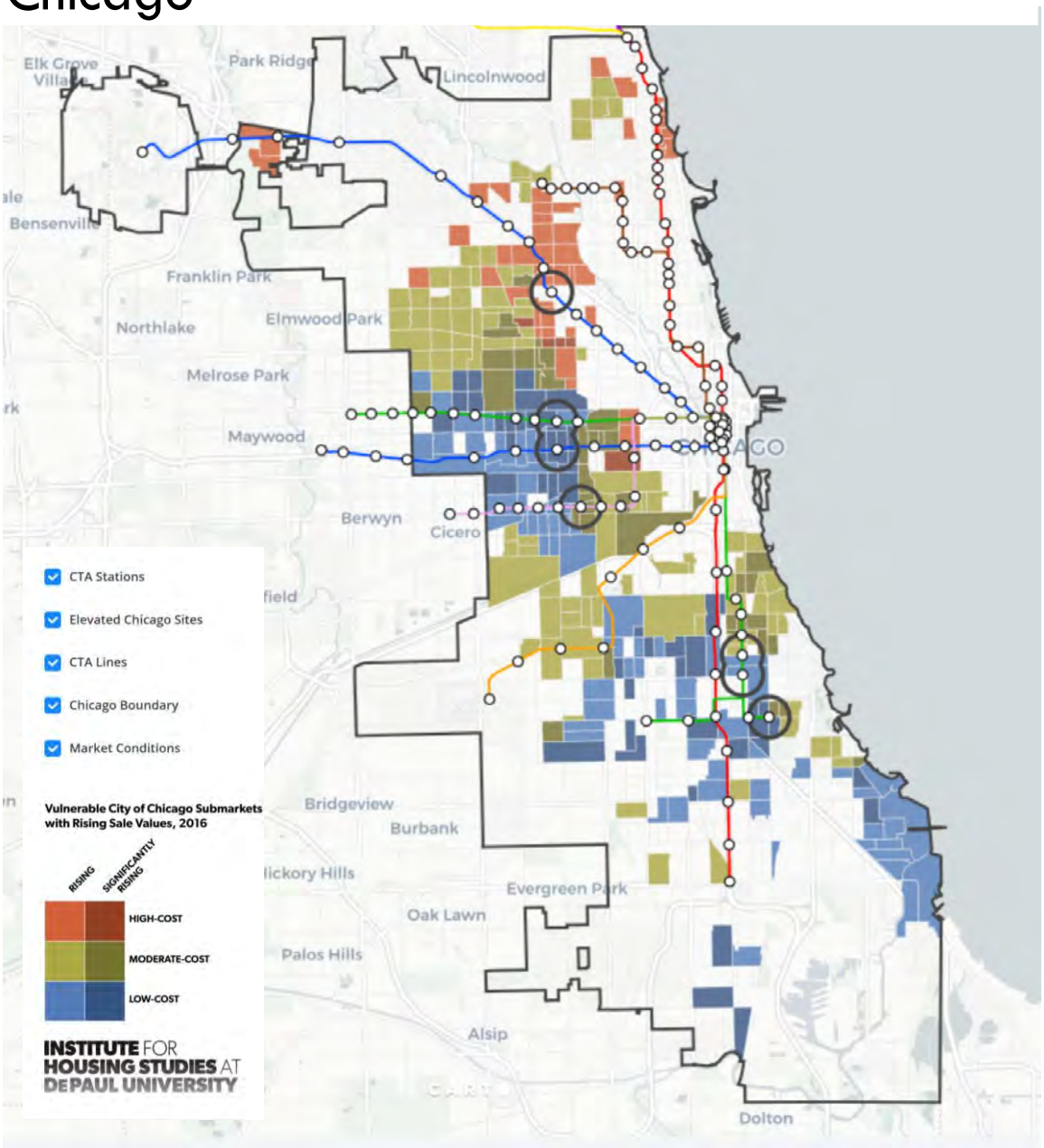
Map Series 1
1F. Housing Submarket by Chicago Community Area



Source: Regional Housing Solutions (2016), https://www.regionalhousingsolutions.org/submarkets

The Chicago Metropolitan Agency for Planning (CMAP), Metropolitan Mayors Caucus (MMC) and Metropolitan Planning Council (MPC) have partnered with DePaul University's Institute for Housing Studies (IHS) to identify the geography and characteristics of eight distinct subregional housing markets across northeastern Illinois. The clusters are characterized by a variety of issues. For example, Submarket 1 (in yellow) is a higher density urban area, with high foreclosure and vacancy rates, and a low-income population. By contrast, Submarket 3, also a higher density urban area, has high home prices and rents, low to no foreclosure, and a high-income population. The Regional Housing Solutions tools provides resources on how to addresses issues such as foreclosure in Submarket 1 and dealing with community resistance to new housing options (affordable, etc) in Submarket 3.

Map Series 1
1G. Mapping Displacement Pressure in Chicago



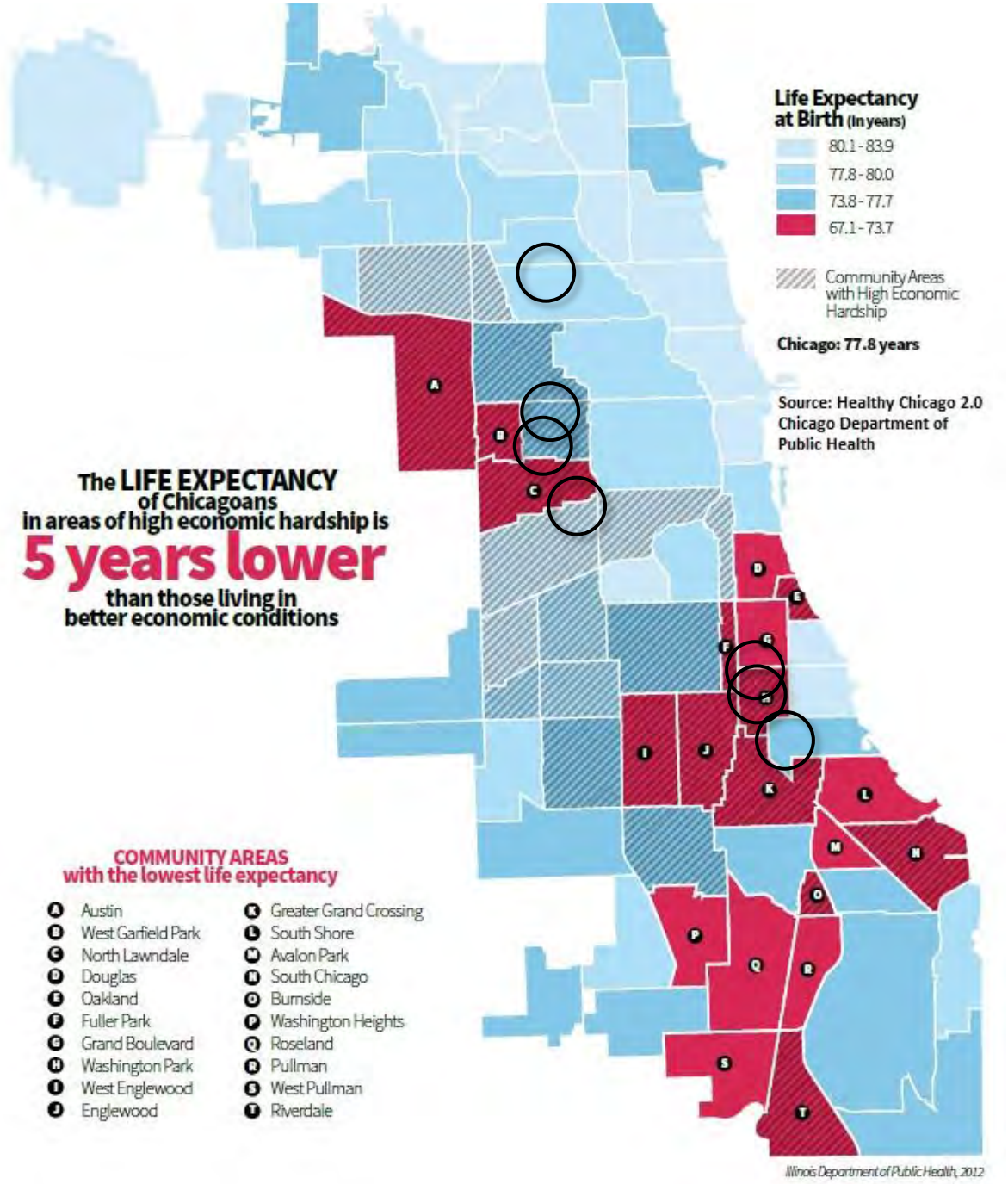
Source: DePaul University, Institute for Housing Studies (IHS), (2017), https://displacement-risk.housingstudies.org/

IHS' Displacement Vulnerability Index shows areas of the city that face a low, medium, and high risk of displacement. The light and dark red areas are at highest risk of displacement: these are high-cost neighborhoods where prices are rising rapidly and there is a high share of renters, families, and seniors who would impacted by increased housing costs. The light and dark blue area are at lowest risk. While housing prices might be rising, the starting values are too low to signal displacement.

Climate and Health Maps

Map Series 1

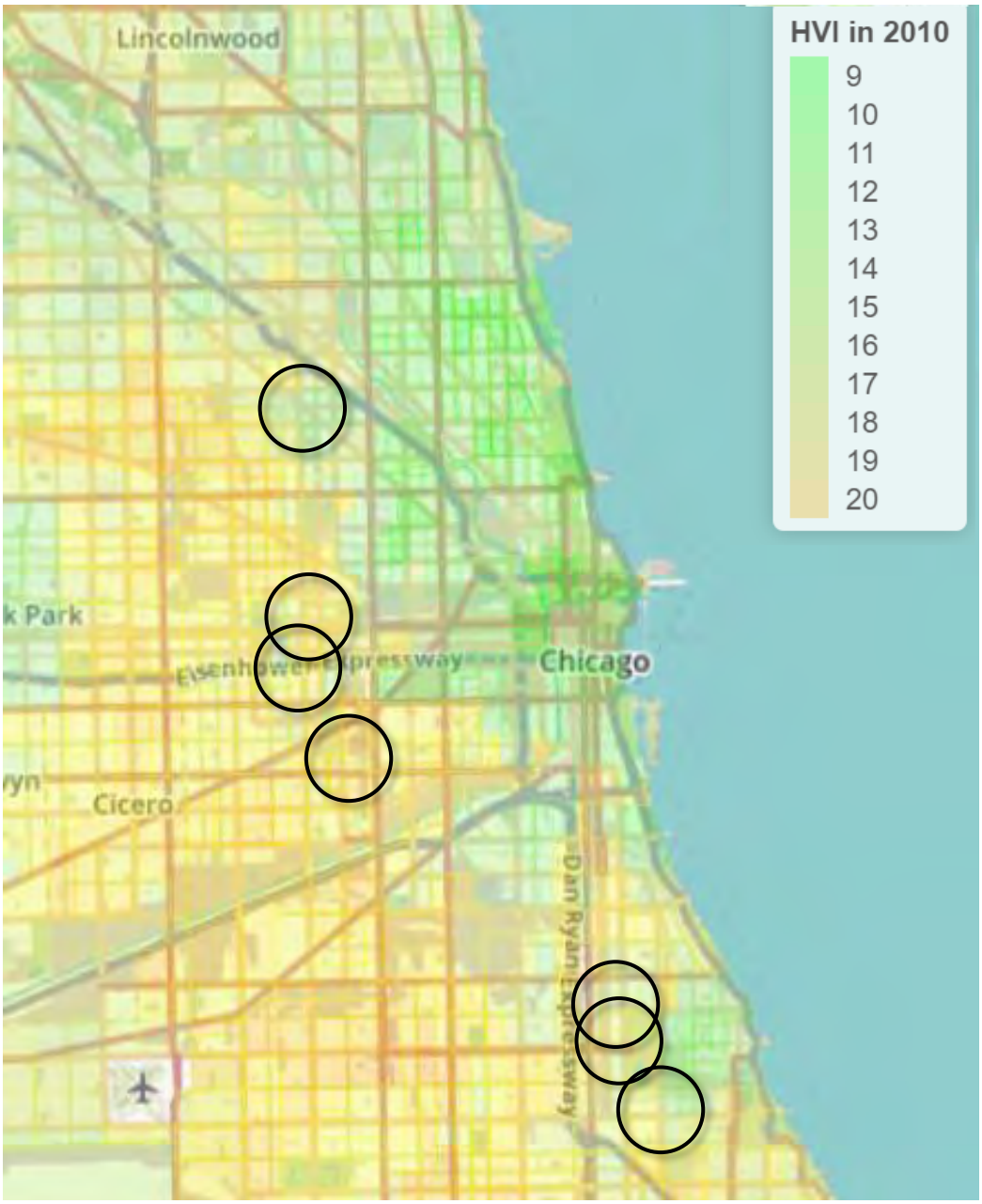
1K. Life Expectancy by Chicago Community Area



Source: CDPH, Healthy Chicago 2.0 (2016), https://www.cityofchicago.org/content/dam/city/depts/cdph/CDPH/HC2.0Plan_3252016.pdf

Map Series 1

11. Chicago Heat Vulnerability by Census Tract

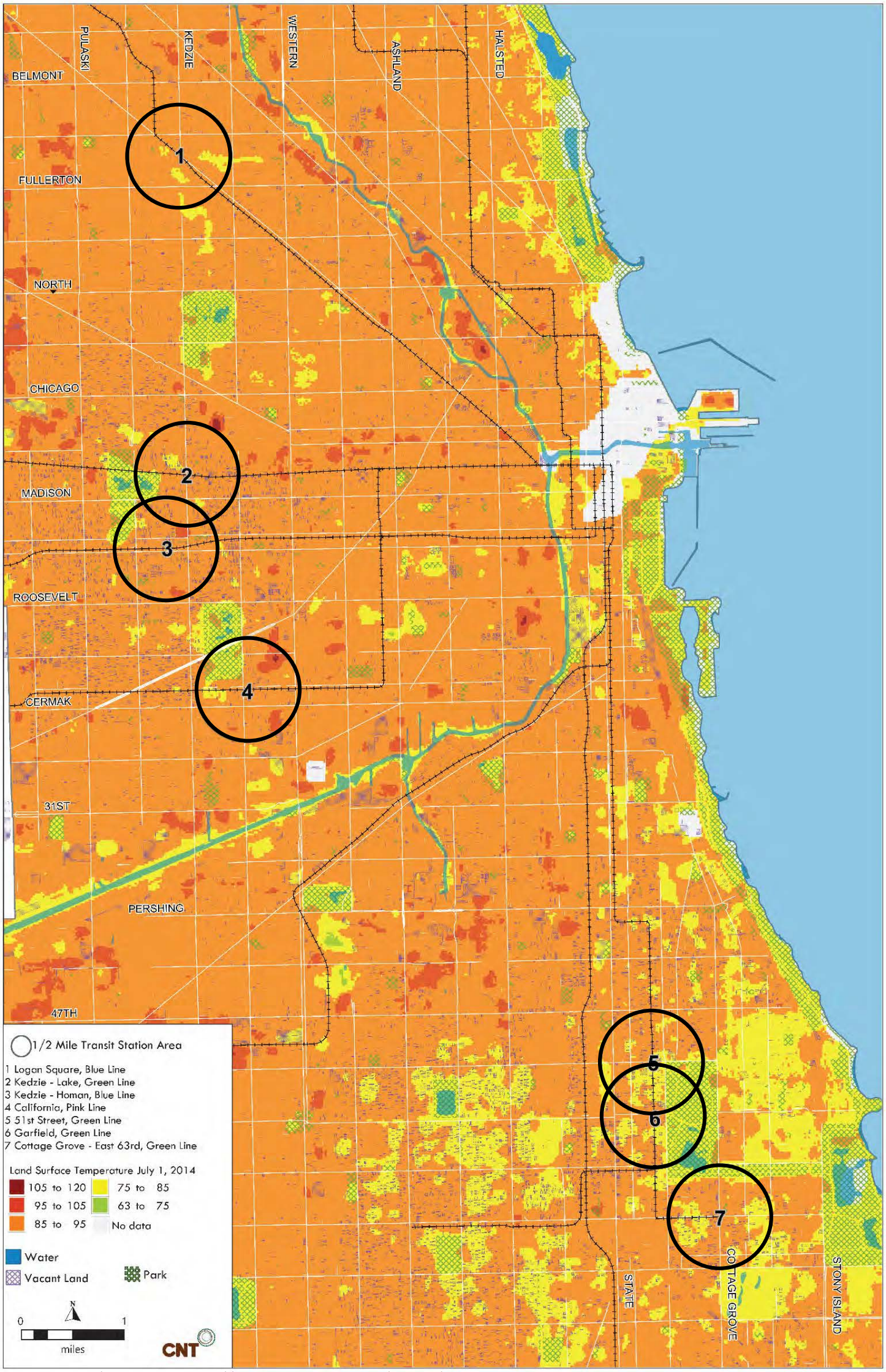


Source: University of Illinois - Urbana Champagne (2010) http://chicagoheatvulnerability.org/

The **Heat Vulnerability Index (HVI)** is based on data collected by the U.S. Census Bureau and measures where residents of the Chicago region with **high sensitivity** to heat and **low adaptive capacity** to heat are located. The yellow areas on the map show places in Chicago where the population is more vulnerable to high temperatures. Some of the factors that went into the vulnerability index include poverty rate, senior population, renter v owner population, racial demographics, and educational attainment.

Map Series 1

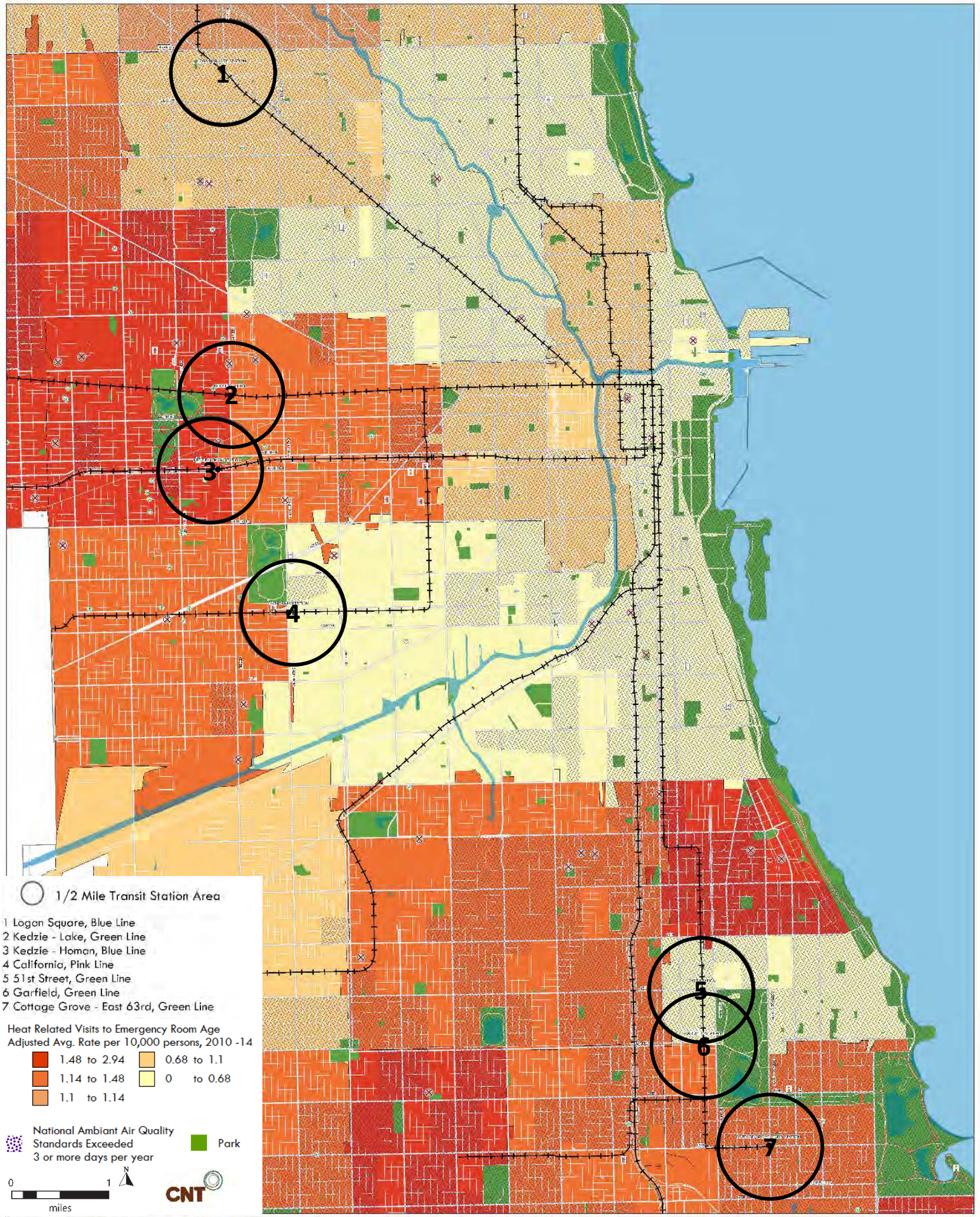
1J. Chicago Land Surface Temperature, 2014



Source: USGS/CMAP (2016) https://datahub.cmap.illinois.gov/dataset/land-surface-temperature-estimates-july-21-2014

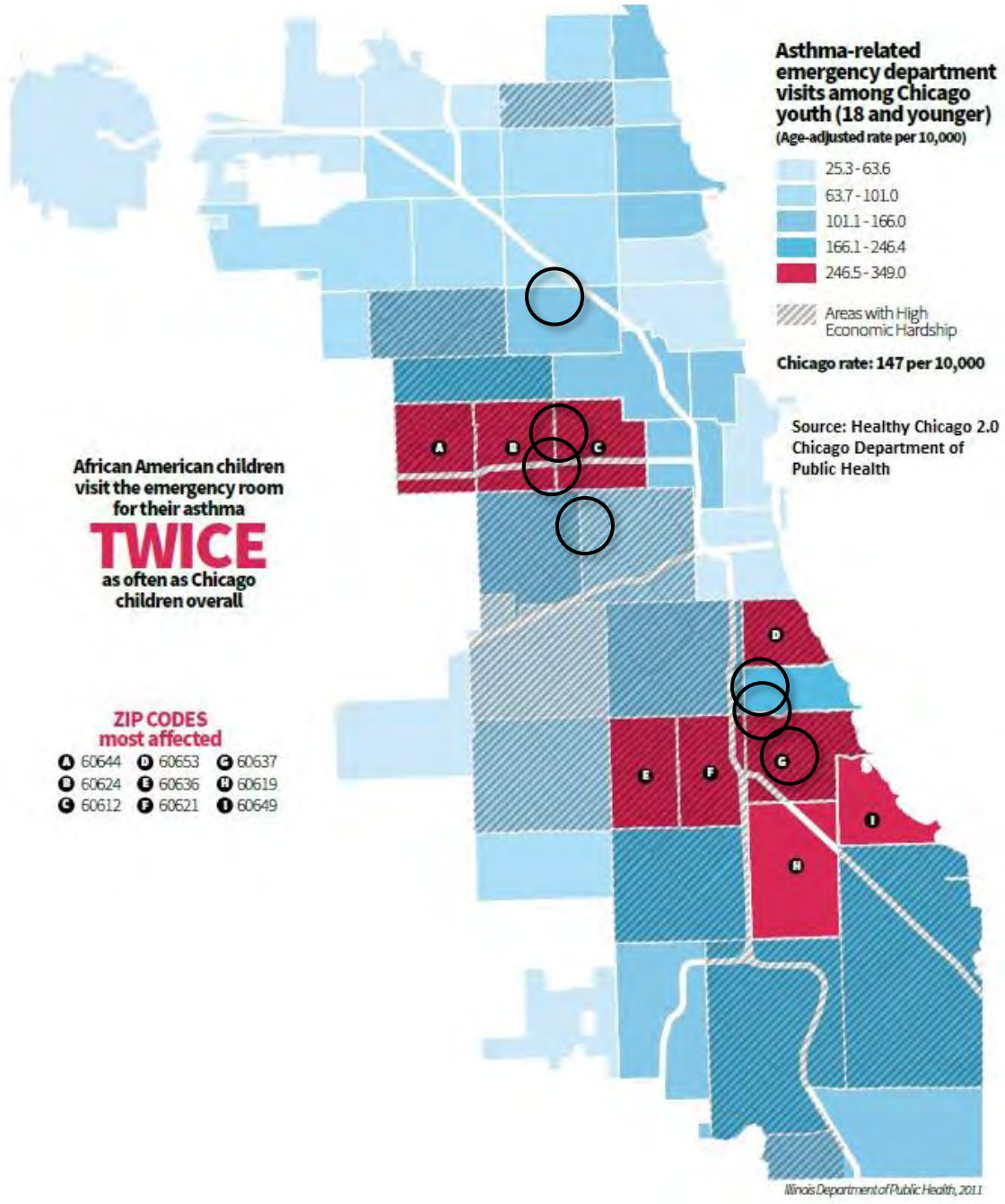
Map Series 1

1K. Heat-Related ER Visits by Zip Code and NAAQS Exceedances by Census Tract



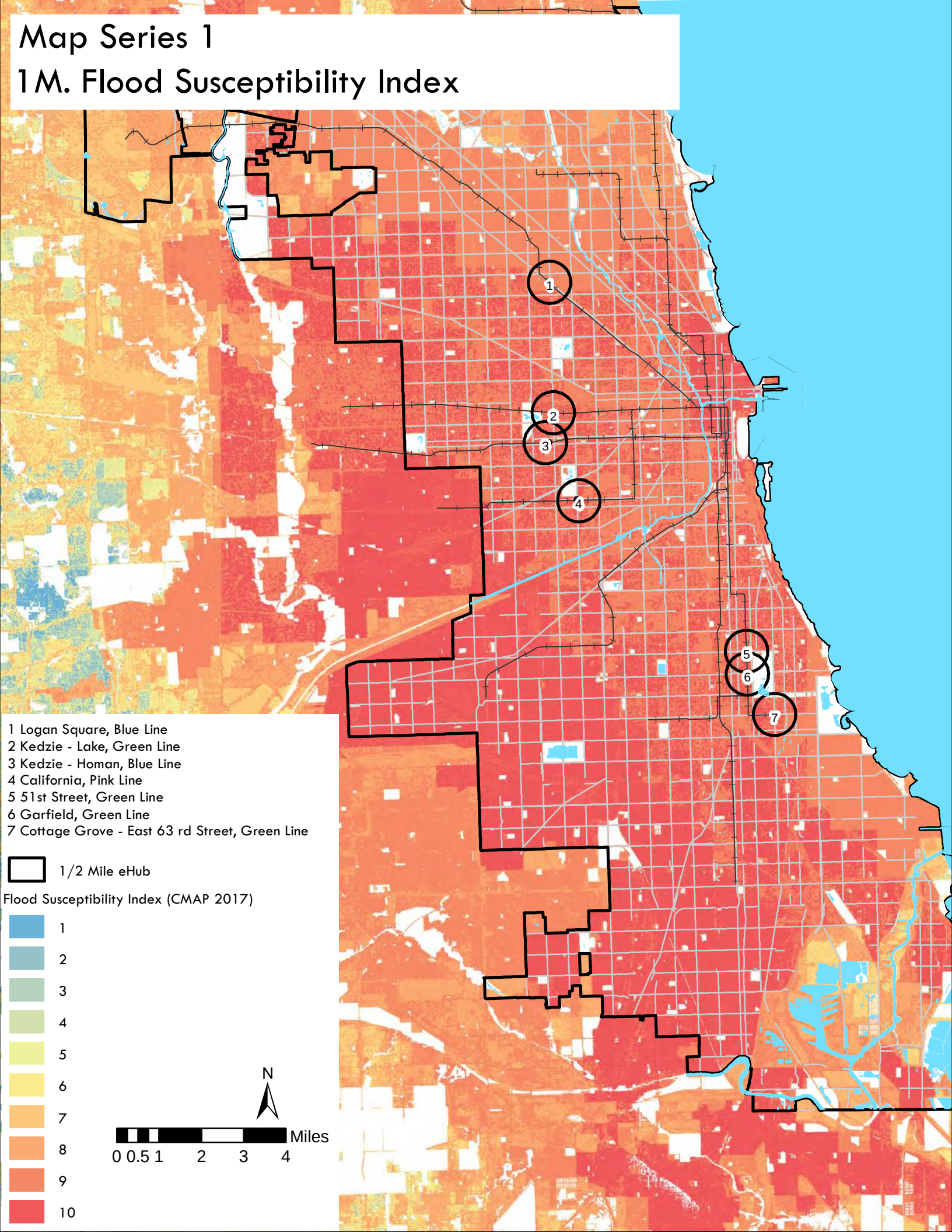
Source: CDPH, National Environmental Public Health Tracking Network

Map Series 1
1L. Asthma-Related ER Visits by Chicago Community Area



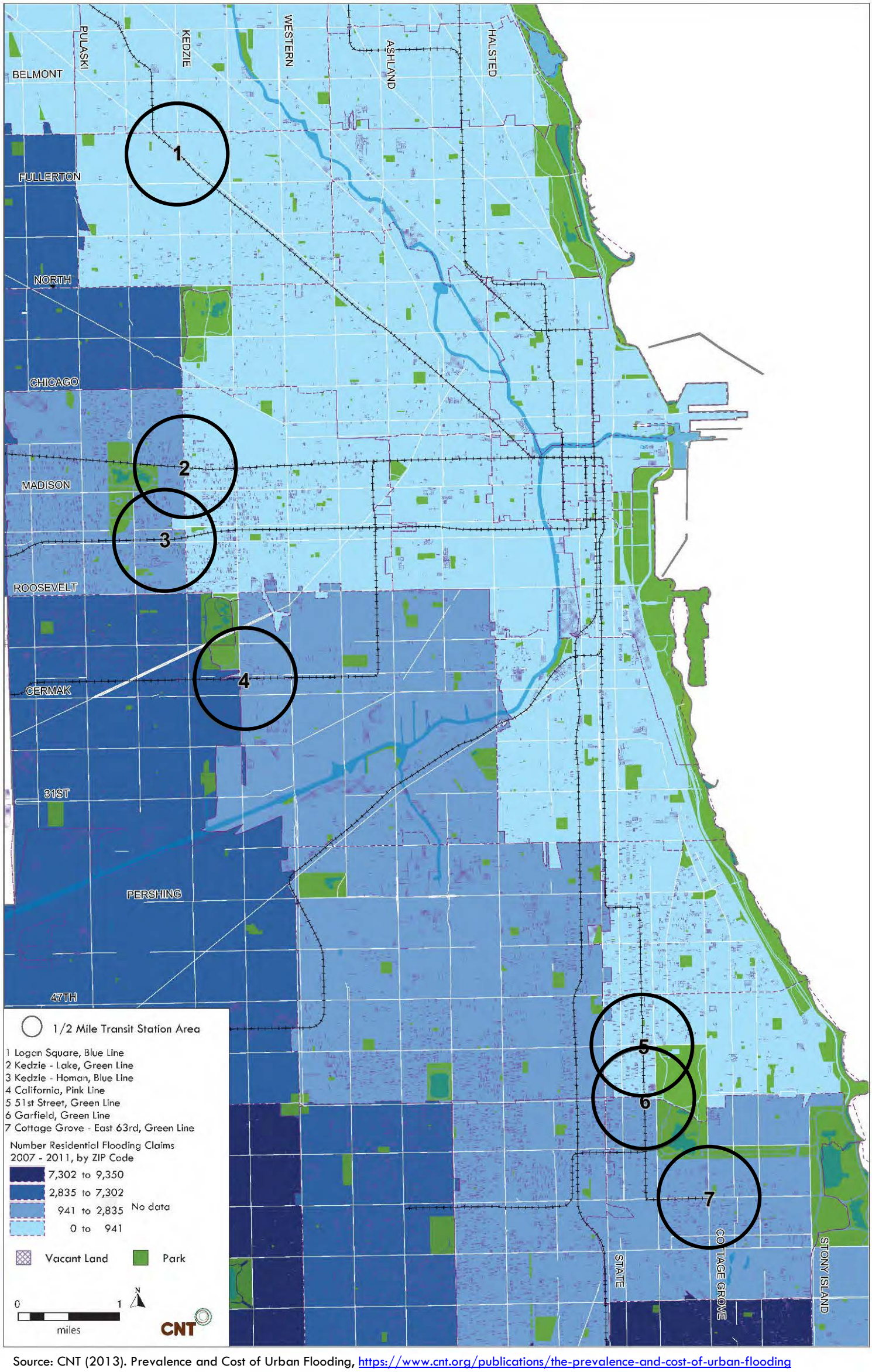
Source: CDPH, Healthy Chicago 2.0 (2016), https://www.cityofchicago.org/content/dam/city/depts/cdph/CDPH/HC2.0Plan_3252016.pdf

Map Series 1
1M. Flood Susceptibility Index



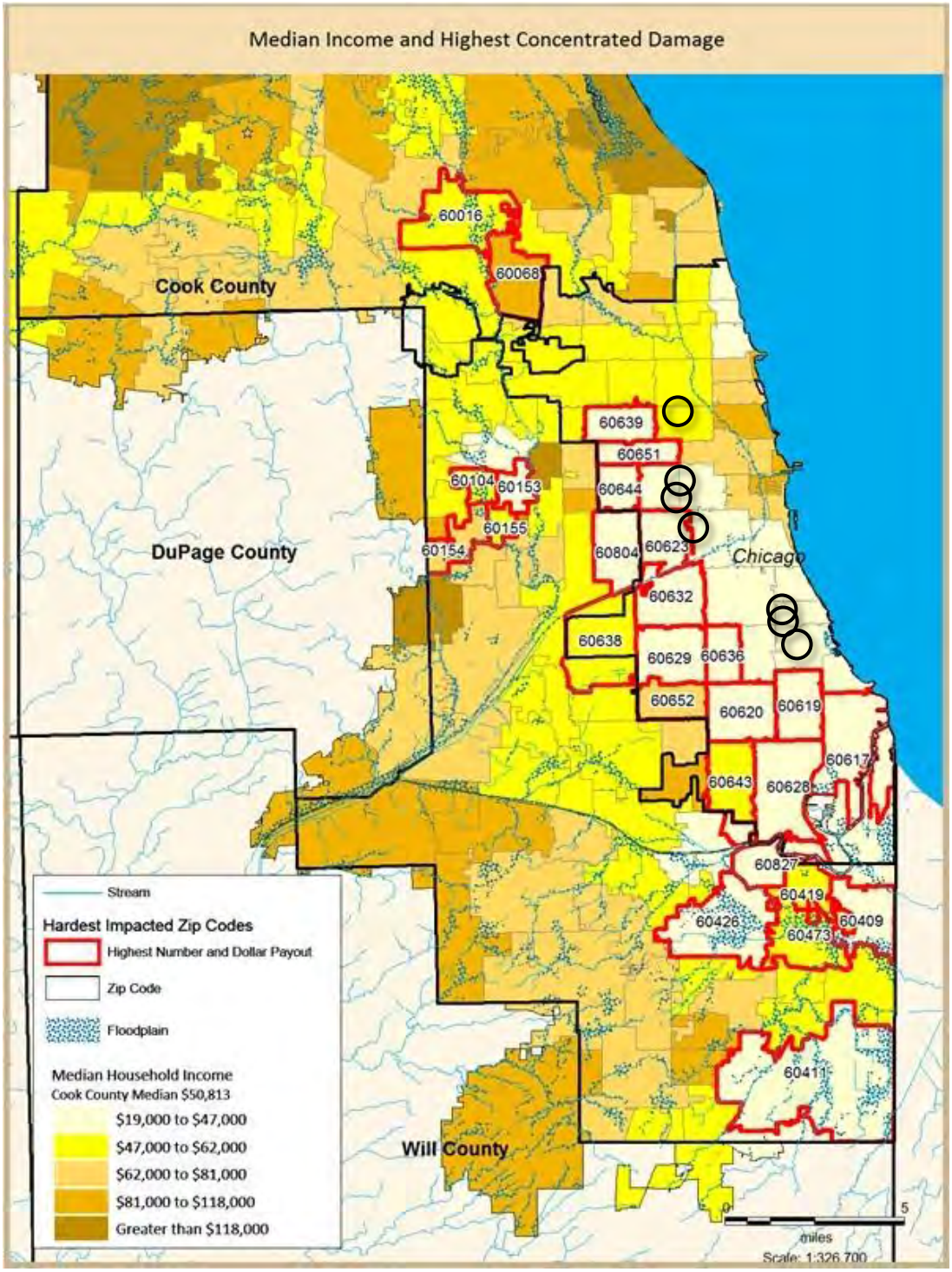
Map Series 1

1N. Residential Flood Insurance Claims by Zip Code



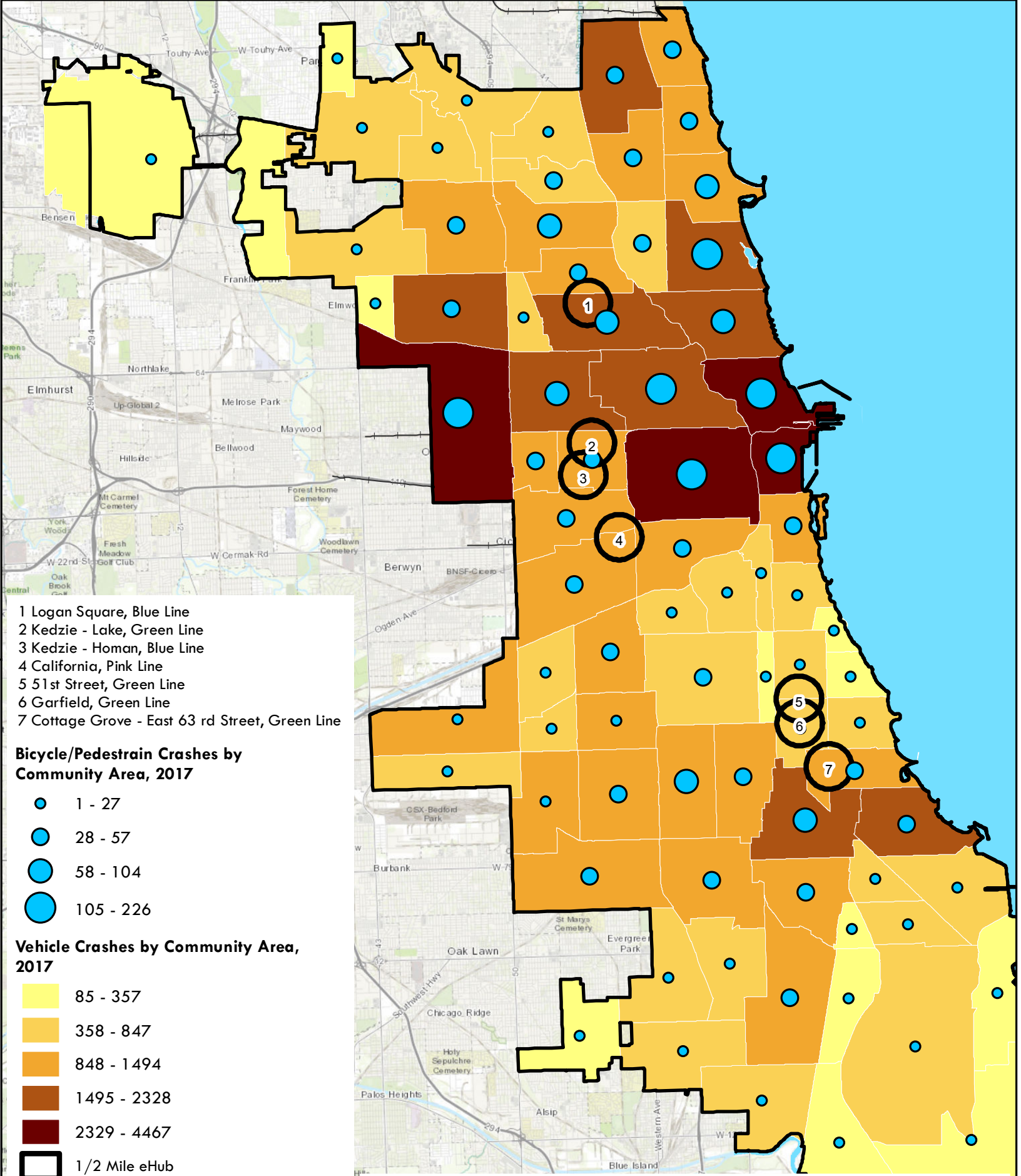
Source: CNT (2013). Prevalence and Cost of Urban Flooding, https://www.cnt.org/publications/the-prevalence-and-cost-of-urban-flooding

Map Series 1
10. Median Income and Flood-Related Insurance Payouts by Zip Code



Median Income and Highest Concentrated Damage by zip code, 2007 – 2011

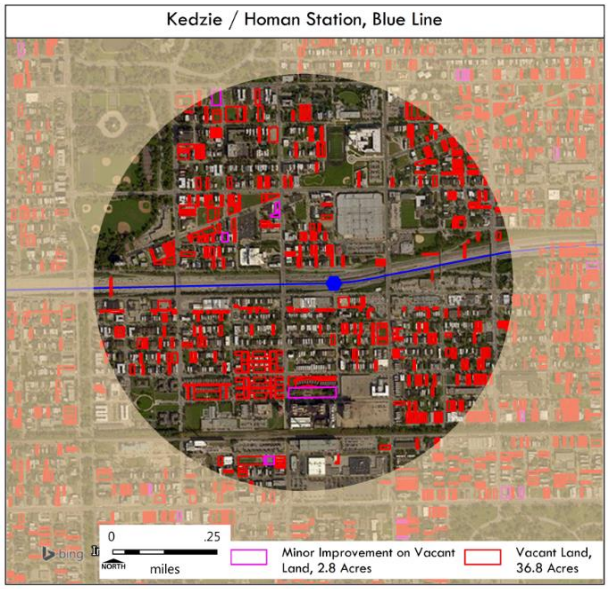
Source: CNT (2013). Prevalence and Cost of Urban Flooding
https://www.cnt.org/publications/the-prevalence-and-cost-of-urban-flooding

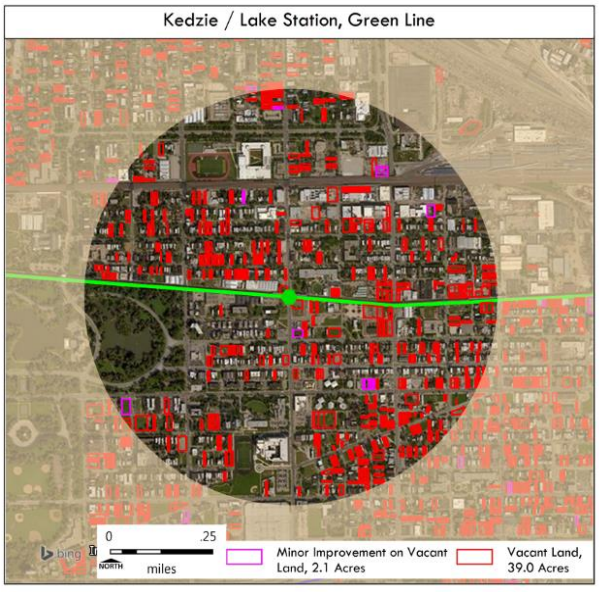

1 Logan Square, Blue Line
2 Kedzie - Lake, Green Line
3 Kedzie - Homan, Blue Line
4 California, Pink Line
5 51st Street, Green Line
6 Garfield, Green Line
7 Cottage Grove - East 63 rd Street, Green Line
Bicycle/Pedestrain Crashes by Community Area, 2017
1 - 27
28 - 57
58 - 104
105 - 226
Vehicle Crashes by Community Area, 2017
85 - 357
358 - 847
848 - 1494
1495 - 2328
2329 - 4467
1/2 Mile eHub
N
CNT
Miles
0 0.5 1 2 3 4
Data Sources: City of Chicago Crash Data, 2017
Map Series 1
1P. Traffic Crashes By Chicago Community Area

COMMUNITY PROFILE: KEDZIE CORRIDOR

The Kedzie Corridor, a predominantly black community on Chicago's West side, is rich in culture and art, but is experiencing long-term economic challenges. The community's vision for resilience includes clean air; healthy food; public safety; and jobs, training, and development, with a focus on youth, arts, and culture.

- Community Area(s): Humboldt Park; East Garfield Park; North Lawndale
- Neighborhood Names(s): Garfield Park, Homan Square
- eHub Station(s): Kedzie-Lake Green Line (3200 W. Lake); Kedzie-Homan Blue Line (530 S. Kedzie)





MAPS

Series 2: Kedzie Corridor Maps

- 2A. Sites Susceptible to Change Based on Land Use/Ownership (S.B. Friedman, 2018)
- 2B. Development Activity Asset Map (S.B. Friedman, 2018)
- 2C. Basement Flood Complaints and Renters (CNT, 2018)
- 2D. Kedzie-Lake eHub Brownfields, Heat-Related ER Visits by Zip Code, & NAAQS Exceedances by Census Tract (CNT, 2018)
- 2E. Kedzie-Homan eHub Brownfields, Heat-Related ER Visits by Zip Code, & NAAQS Exceedances by Census Tract (CNT, 2018)
- 2F. Kedzie-Lake eHub Land Surface Temperature, Tree Canopy, & Land Use (CNT, 2018)
- 2G. Kedzie-Homan eHub Land Surface Temperature, Tree Canopy, & Land Use (CNT, 2018)
- 2IH Traffic Crashes, Injuries, & Fatalities (CNT, 2018)
- 2I. Education & Workforce (S.B. Friedman, 2018)
- 2J. Other Community Anchors (S.B. Friedman, 2018)

AFFORDABILITY AND COMMUNITY OWNERSHIP

The Kedzie Corridor lies within community areas most impacted by economic hardship and limited opportunity (Map 1D, Map 1E). Over 40% of the population is under the poverty line (Table 1).

Nearly 78% of households rent. Since 2000, rent has increased about 80%. Low-income households are spending approximately a third of their income on housing, and another 20% of their income on transportation (Table 1).

The housing market is characterized as distressed (see Equity Map: DePaul, Housing Submarket Clusters). Relative to other neighborhoods, residents are not currently highly vulnerable to displacement at this time (Map 1G).

Nearly a third of all parcels (137 acres) are vacant, with 43% of vacant parcels owned by local government. Development activity in the corridor is limited (Map 2A, Map 2B).

Table 1. Affordability in the Kedzie Corridor

	Kedzie-Lake	Kedzie-Homan	
Median Income[1]	$12,750	$33,063	
Percent in Poverty[2]	43%	47%	
Housing Cost Burden[3]	32%	36%	
Housing & Transportation Cost Burden[4]	52%	57%	
	2000	**2009**	**2014**[5]
Percent Rental Households	72%	69%	78%
Median Rent: Kedzie-Lake	$489	$748	$766
Median Rent: Kedzie-Homan	$457	$788	$845

Notes:

1. Average Median Income (AMI, 2014) of the households within the eHub radius. Source: U.S. Census, *American Community Survey.*
2. Percentage of population under the poverty line (2014). Source: U.S. Census, *American Community Survey.*
3. The percentage of income spent on housing, for households earning 60% or less of the AMI (i.e., low-income households). Source: U.S. Census, *American Community Survey.*
4. The percentage of income spent on housing and transportation combined, for households earning less than 60% of the AMI. Source: CNT, *H+T Index.*
5. By comparison, the median gross rent for the City of Chicago, for 2012 – 2016, is $987. Source: U.S. Census Bureau, *QuickFacts Chicago, Illinois.*

ENVIRONMENT AND HEALTH

Corridor Residents are impacted by flooding, heat stress, asthma, and traffic crashes, among other health and safety issues.

Residents have been impacted by flooding (Map 2C, Table 2). Flood damages were reported to be over $1 million in each eHub, over a five-year period. Most 311 flood complaints are reported in areas with primarily rental housing. Flood complaint hot spots are observed near Garfield Park, south of Washington Boulevard, and south of Harrison Street. Flooding is expected to increase in the future, due to highly impervious land use, infrastructure conditions, and climate change (Map 1M, Table 2).

The Corridor has above average rates of heat-related emergency room visits (Map 2D, 2E), and residents are vulnerable to extreme heat (Map 1I). Urban heat island "hot spots" are present at the campus of Our Lady of Sorrows Basilica, and Lawndale Plaza and the east adjacent residential complex (Map 2F, 2G). Tree canopy coverage for the corridor is below average, compared to the city overall. However, Garfield Park provides some relief from urban heat island.

The rate of asthma-related emergency room visits by youth in the Corridor is approximately double the average for the City of Chicago. In fact, the Kedzie Corridor lies within two zip codes that are hardest hit by asthma, city-wide (Map 1L). Air monitoring data indicates that elevated levels of fine particulate matter (PM 2.5) and ozone are present in and near the Corridor. Potential air pollution sources include vehicle emissions from street traffic, the Eisenhower Expressway in the south part of the Corridor, and two rail yards located in the north part of the Corridor.

Over a quarter of Corridor residents commute by transit, although driving is more common in the south part of the Corridor. The Corridor is within three of the most traffic crash-affected communities in Chicago: Humboldt Park, East Garfield Park, and North Lawndale (Map 2H).[72]

Multiple potential sources of pollution are present in the corridor. A limited review of available environmental database information identified brownfields, as well as industrial facilities which released or handled pollutants.

Over a quarter of Corridor children are obese, and up to 10% have elevated blood lead levels (Table 2). Overall, life expectancy for residents in the southern part of the corridor are among the lowest in the city (Map 1K).

Table 2. Climate & Health in the Kedzie Corridor

	Kedzie-Lake eHub	Kedzie-Homan eHub
Urban Flooding[1]		
Impervious Surfaces	53%	56%
Est. Cost of Flood Damage to Homes	$1,113,562	$1,385,436
Extreme Heat		
Tree Canopy[2] Coverage	17%	15%
Land Surface Temperature[3]	87 degrees	88 degrees
Transportation & Air Pollution		
Commute to Work by Transit	30%	28%
Walk Score[4]	Very Walkable (81/100)	Very Walkable (72/100)
Avg GHG Emissions from Driving[5]	1.87 tons	3.54 tons
Air Pollution Limits Exceeded[6]	No	Yes
Land & Water Pollution		
Brownfield(s) Present[7]	Yes	Yes
Health & Safety		
Children under 3 with Elevated Blood Lead Levels (EBLL)	4.1-10.1%	4.1-10.1%
Childhood Obesity	25-27%	25-27%
Firearm-Related Homicide	10.6-29.6 per 100,000	10.6-29.6 per 100,000

Notes:

1. Reported residential insurance claims related to flooding, 2007-2011. Source: CNT, *The Prevalence and Cost of Urban Flooding.*
2. Source: Spatial Analysis Laboratory, University of Vermont *High-Resolution Land Cover, Cook County, 2010.* The Chicago Regional Trees Initiative reports the Chicago average for tree canopy coverage is 19%; the regional goal is 22% tree canopy coverage by 2050.
3. The average land surface temperature, as measured on 7/1/14. Source: USGS/CMAP, *Land Surface Temperature Estimates, July 21, 2014.*
4. Walkscore is based on the proximity of the transit station to amenities, such as shops and libraries. The score is relative to non-urban communities and may not fully reflect community conditions. (Source: walkscore.com)
5. The average emissions per household in the eHub, as calculated from average vehicle miles travelled (VMT). Source: CNT, *H+T Index.*
6. The table indicates "Yes" if any part of the eHub exceeded the National Ambient Air Quality Standards (NAAQS) on 3 or more days in 2012. Source: National Environmental Public Health Tracking Network.
7. Brownfields are properties whose development is complicated by known or potential contamination. This database includes only those properties reported to USEPA voluntarily or to fulfil grant requirements; many brownfields are not reported. Source: USEPA, 2018.

[72] *Vision Zero Chicago. (June 2017). Action Plan 2017-2019.*

COMMUNITY ASSETS

The Kedzie Corridor has several community assets and initiatives that could support an Ecodistrict (Map 2I, Map 2J).

- **Stakeholders and Social Networks:** Engaged stakeholders include community-based organizations and others leading resiliency efforts, including the North Lawndale Community Coordinating Council, the Garfield Park Community Council (GPCC); the Foundation for Homan Square; the School of the Art Institute; the Gardeners Community Group (GCG); IFF; ICNC; Accion Chicago; Homan Grown; Experimental Station; Boys & Girls Club; Merrilac House Social Services, and Inspiration Kitchens.
- **Institutions:** Institutional assets include several schools, religious congregations, and the Chicago Park District. An adjacent Community Area Garfield Park hosts one of the largest botanical conservatories in the nation.
- **Food and Health:** Several corner stores are located within the Corridor, and a grocery store is located south of the Corridor. Several food gardens, a plant nursery, and a hydroponic farm are in the Corridor. The Garfield Park Neighborhood Market sells food from neighborhood growers. The Garfield Park Eco Orchard is planned for construction along 5th Avenue, between Kedzie Avenue and Mozart Street. The adjacent Garfield Park historic field house hosts fitness and cultural activities.
- **Buildings:** Building assets include historic landmarks for the Waller Apartments, King-Nash House, Faraday Elementary School, and the Sears Roebuck building.
- **Transportation:** Transportation assets include two CTA train stations, several bus routes, and bike share stations. A new train station is planned for Damen Avenue, on the Green line, east of the Corridor. Vision Zero West Side, funded by a National Safety Council Grant, will create plans to address severe traffic crashes in the communities of East and West Garfield Park, North Lawndale, and the Near West Side.
- **Open Space:** The 185-acre Garfield Park and its lagoon are within the northwest part of the Corridor, as well as west adjacent to the Corridor. Several community gardens and school gardens are in the Corridor, primarily in the north and central areas. Green infrastructure landscaping is planned to be incorporated within the 5th Avenue community orchard project.

COMMUNITY-LED STRATEGIES

Stakeholders identified two main strategies for community control and ownership of an Ecodistrict. Stakeholders recommended purchasing vacant lots and employing residents to manage and develop the projects in those lots. Stakeholders emphasized that meaningful resident-centered community engagement must be conducted, using a grassroots approach that allows for community input and decision making regarding the new Ecodistrict developments.

Stakeholders identified several ongoing and proposed community-led projects and programs that align with Ecodistrict priorities:

- A geothermal field installation has been completed by Garfield Park Community Council (GPCC). GPCC is also retrofitting a building to be certified as LEED Platinum.
- A network of community gardens, including unused railroad land being repurposed for urban agriculture, is being managed by the Gardeners Community Group and Garfield Park Community Council.
- The Oaks of North Lawndale is an ongoing tree planting initiative led by the School of the Art Institute.
- Phase 2 of The Hatchery, a food business incubator at the intersection of Kedzie Avenue and Lake Street, is a proposed live/work space development with an arts and urban farming focus. The Hatchery is a project of IFF, Accion Chicago, and ICNC.
- The proposed C40 multi-family housing development in East Garfield Park would include renewable energy production.
- Other proposed programs include activation of vacant lots along Kedzie Avenue as pop-up shops, and climate resiliency programs that address community needs such as safety.

Kedzie Corridor

Sites Susceptible To Change Based On

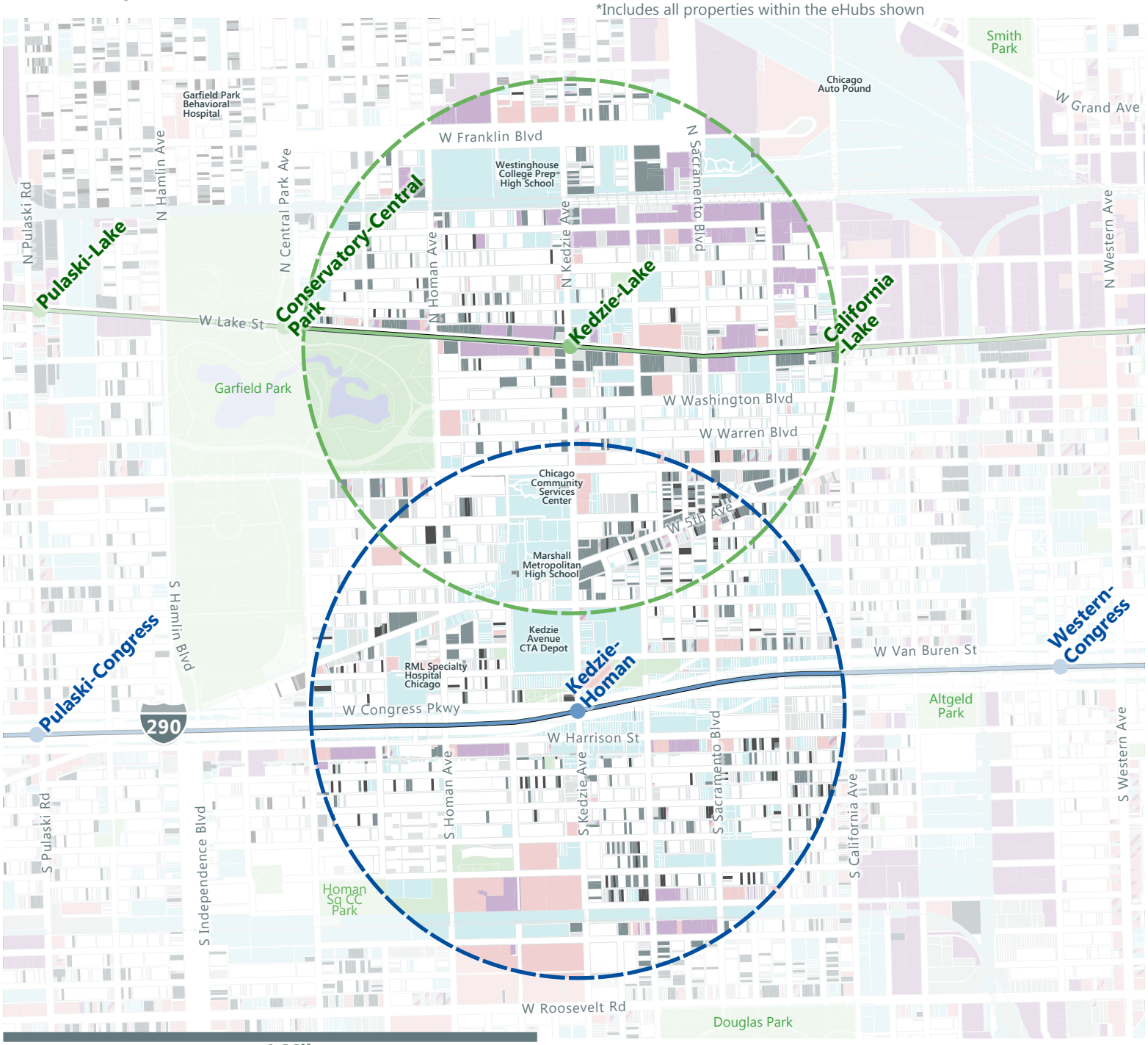
Land Use/Ownership

Asset Map

Vacant Land Inventory - Kedzie Corridor eHubs*

Cook County Land Bank-Owned	ACRES 10	2%	PARCELS 146	3%
City of Chicago-Owned	ACRES 49	8%	PARCELS 520	10%
Privately-Owned Vacant Land	ACRES 77	13%	PARCELS 884	17%
Total	ACRES 136	23%	PARCELS 1,550	29%

*Includes all properties within the eHubs shown



1 Mile

- Elevated Chicago eHub 1/2 Mile Buffer
- Vacant Cook County Land Bank-Controlled [1]
- Vacant City of Chicago-Owned

Land Use

- Commercial
- Exempt / Not For Profit
- Industrial
- Multiple Uses
- Privately-Owned Vacant
- Residential
- Parks

September 10, 2018

Sources:
City of Chicago
Cook County
Esri
SB Friedman

Map 2A

[1] Primarily properties for which Cook County Land Bank has acquired the tax certificate and has the option of taking the property to deed; also includes properties-owned by the Land Bank.

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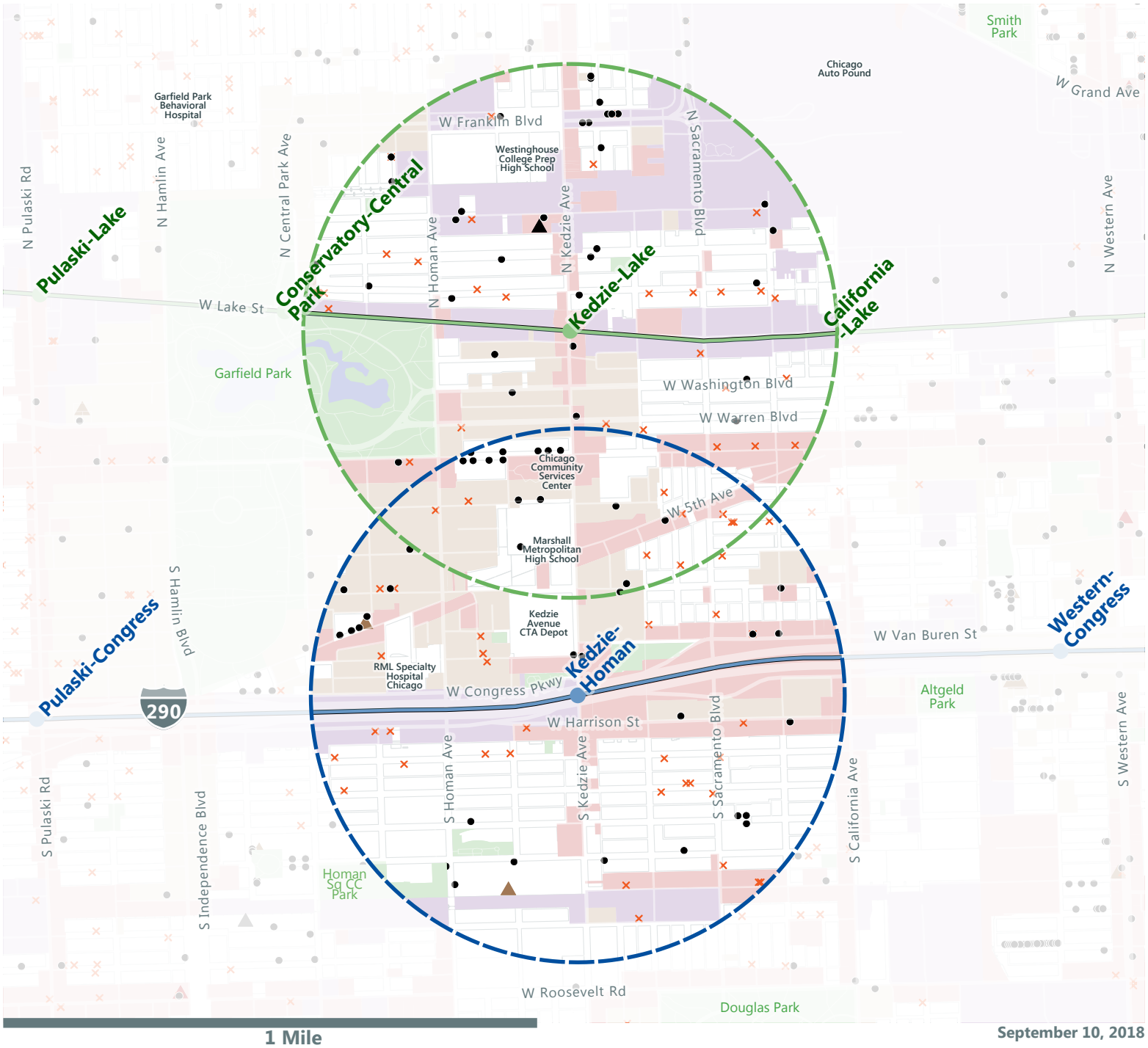
Development Activity

Asset Map

Market Conditions - Kedzie Corridor eHubs*
New/Proposed Development (Since 2013)

Multifamily	PROJECTS	2	UNITS	95
Retail	PROJECTS	1	SF	42,240
Industrial/Flex	PROJECTS	0	SF	0
Office	PROJECTS	0	SF	0

*Includes all properties within the eHubs shown



September 10, 2018

Selected Zoning Districts
- Commercial
- Industrial
- Multifamily (Medium to High Density)

New/Proposed Development Since 2013
- Retail
- Health Care
- Multi-Family
- Specialty

- Proposed Development

Permits
- Demolition
- New Construction/Renovation > $100,000

- Elevated Chicago eHub 1/2 Mile Buffer
- Parks

Sources:
City of Chicago
Cook County
CoStar
Esri
SB Friedman

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Map 2B

Kedzie Coriddor

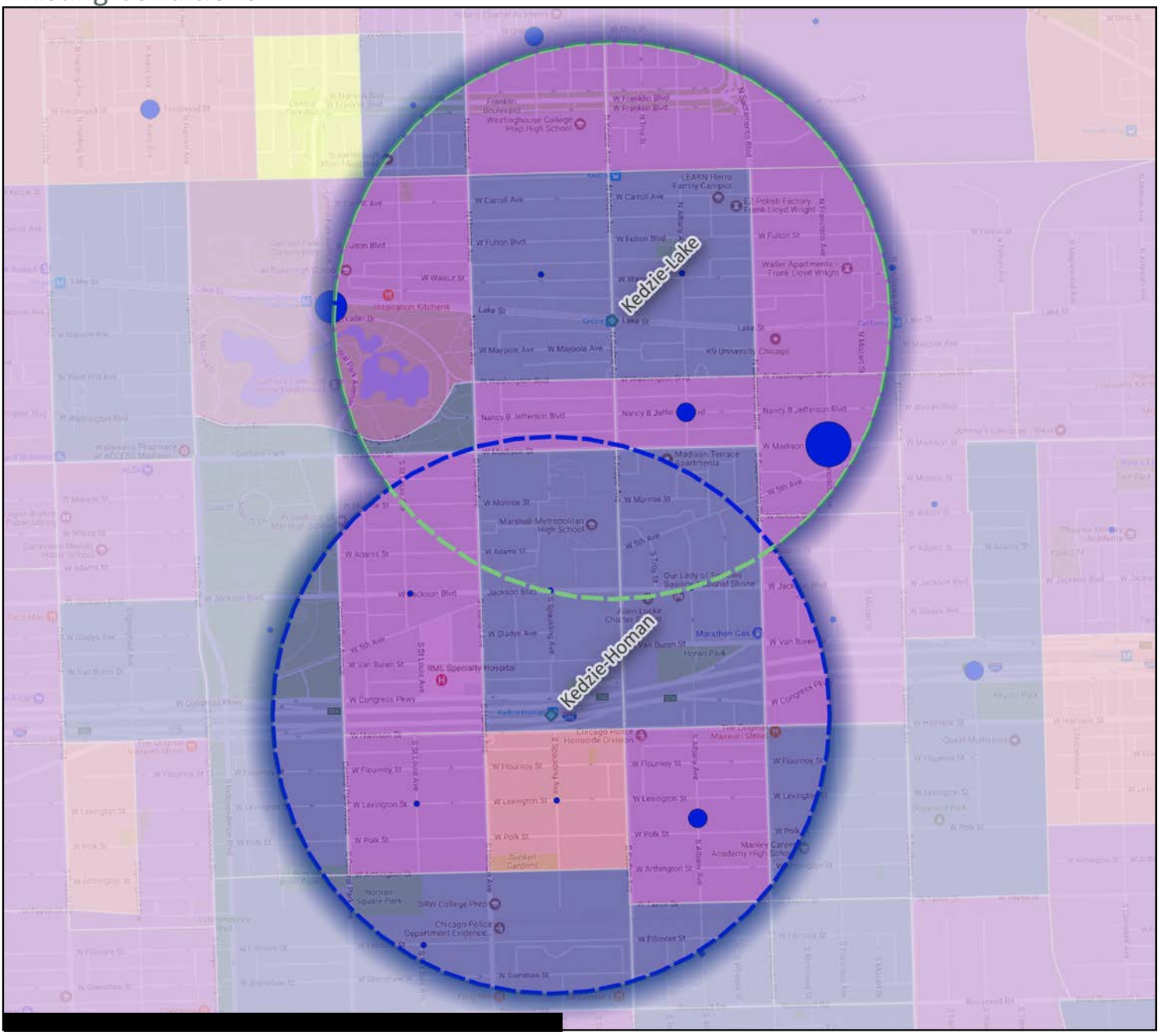
311 Flooding Calls: January 2016-June 2018

Basement Flood Complaints and Renters

Existing Conditions

Summary of Type of Flooding call within 1/2 Buffer

Station	Alley	Viaduct	Public Space	Basement	Street	Total
Kedzie-Homan	2	1	6	24	37	70
Kedzie-Lake	2	2	1	33	30	68



1 Mile

Percent Rental Households by Census Block Group

- Less than 25%
- 25% - 40%
- 40% - 60%
- 60% - 80%
- 80% - 100%

Number of Basement Flooding Calls per 1,000 Households in Block Group

- Less than 15
- 15 - 30
- 30 - 45
- 45 - 60
- 60 or More

CNT

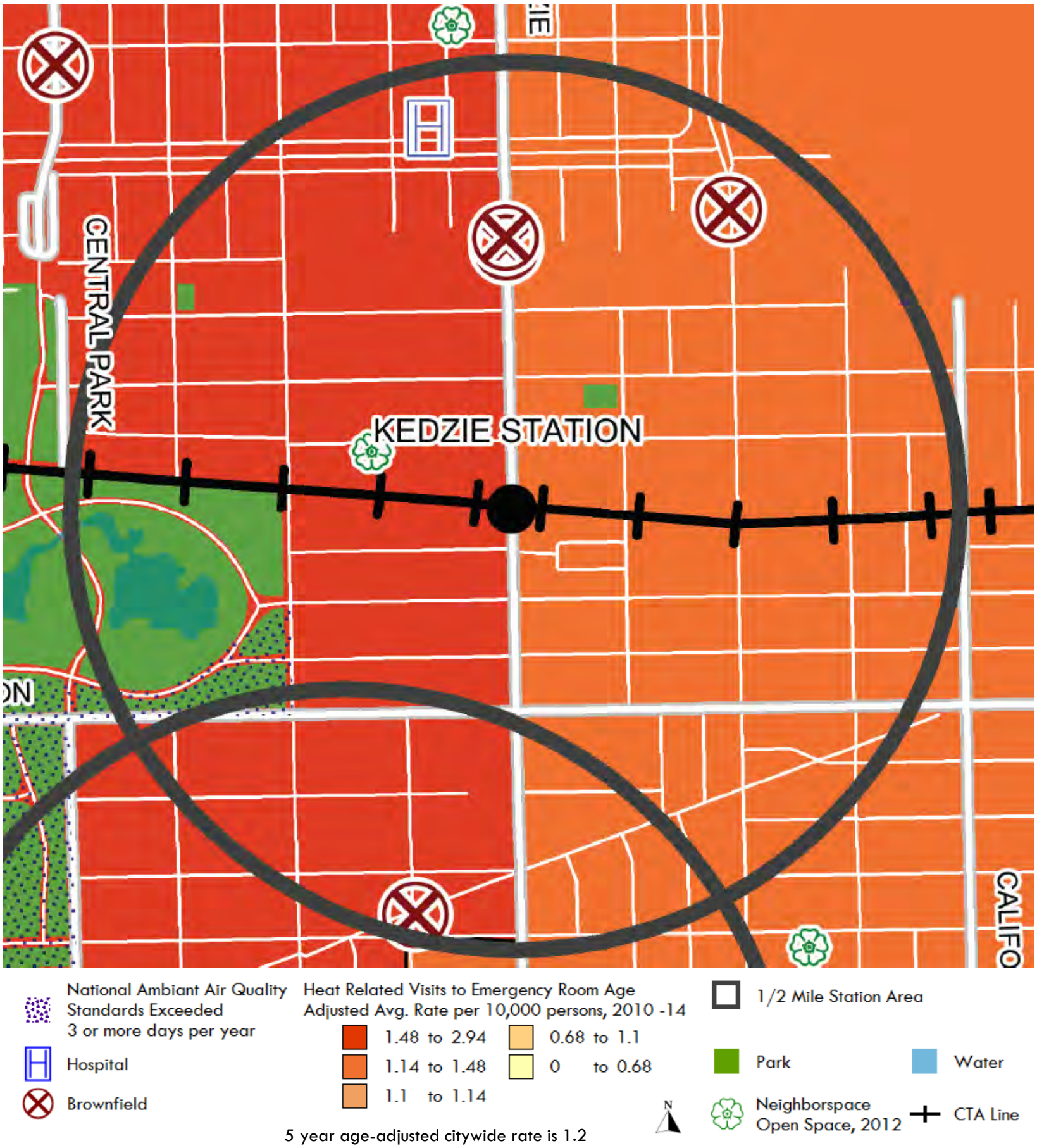
August 20, 2018

Source:
U.S. Census ACS 2016
City of Chicago 311 Call Center

Map 2C

Kedzie-Lake eHub Brownfields, Heat-Related ER Visits by Zip Code, & NAAQS Exceedances by Census Tract

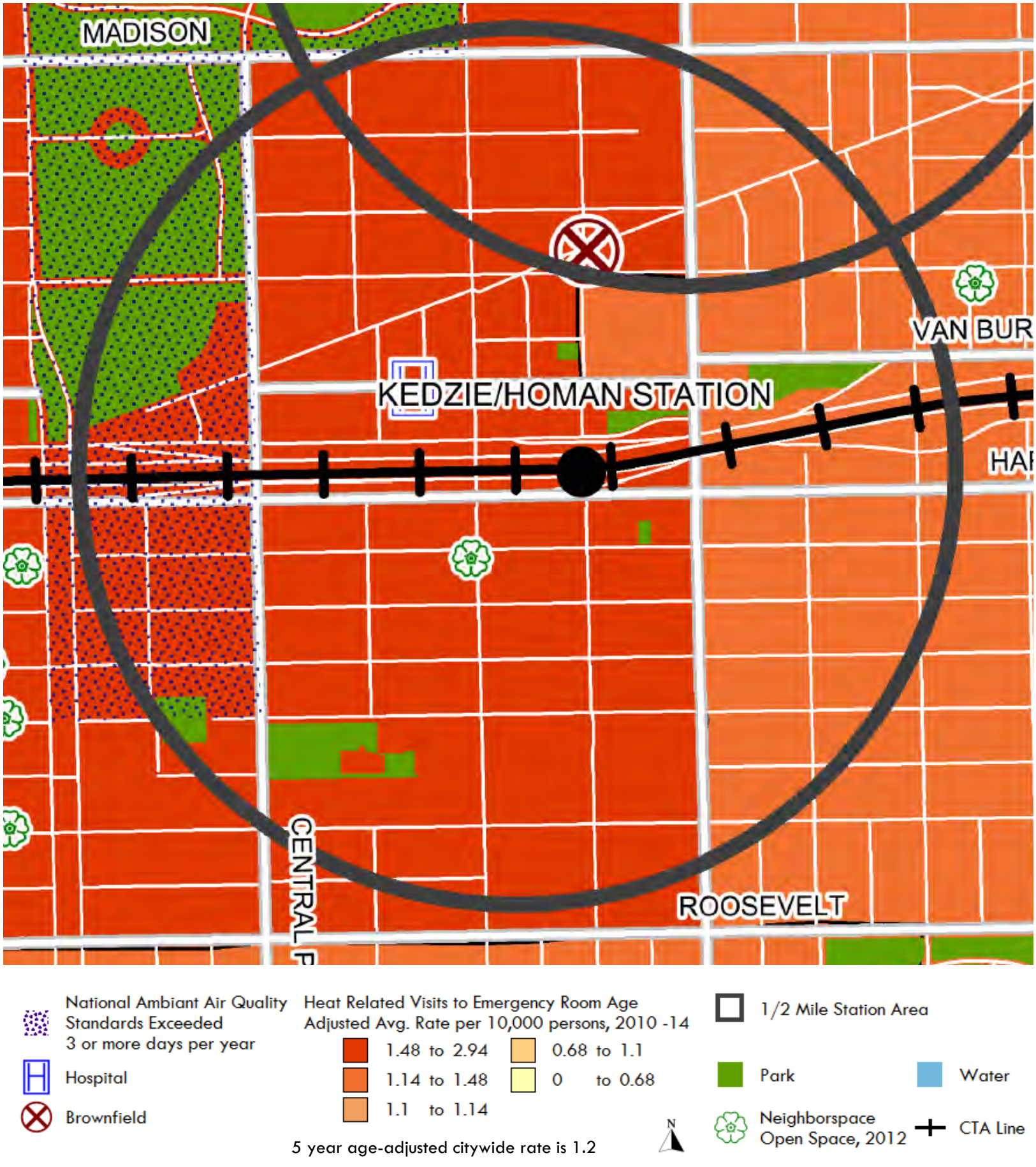
Data includes Heat-Related ER visits, Air Quality Standards Exceeded, and Brownfield Sites



Map 2D

Kedzie-Homan eHub Brownfields, Heat-Related ER Visits by Zip Code, & NAAQS Exceedances by Census Tract

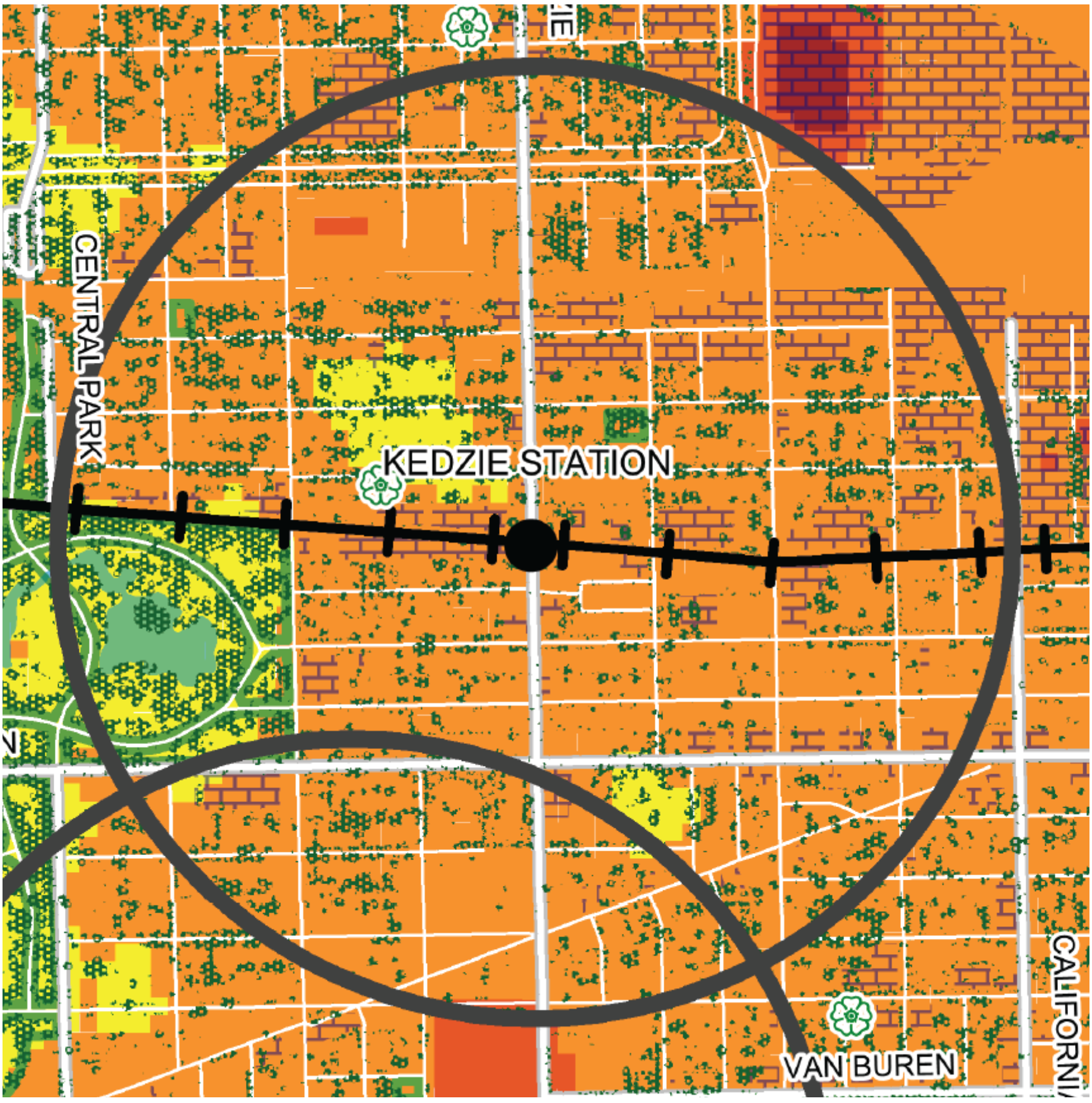
Data includes Heat-Related ER visits, Air Quality Standards Exceeded, and Brownfield Sites



Map 2E

Kedzie-Lake eHub Land Surface Temperature, Tree Canopy + Land Use

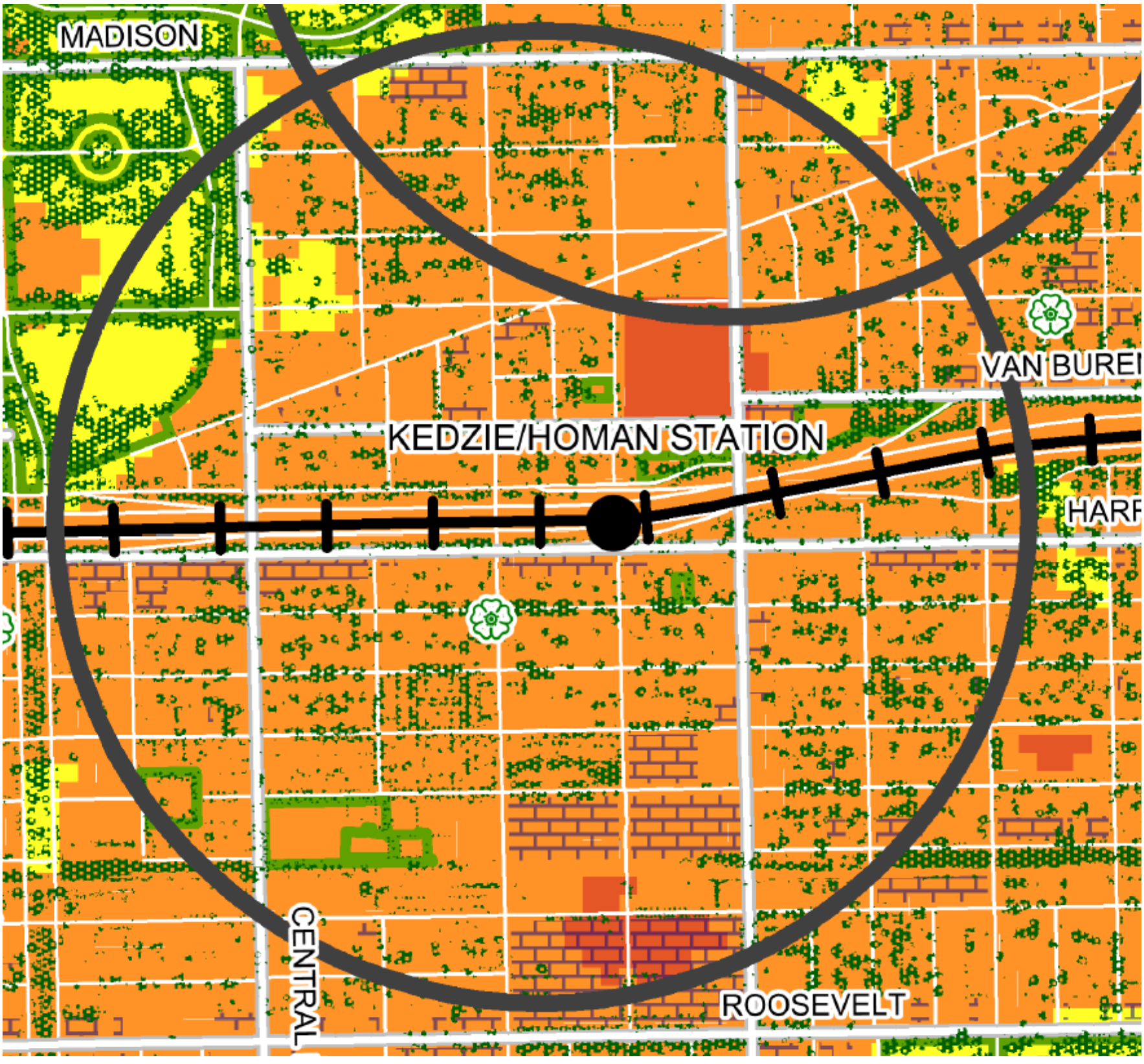
Data includes Land Surface Temperature, Commercial or Industrial Land Use, and Tree Canopy Cover



Map 2F

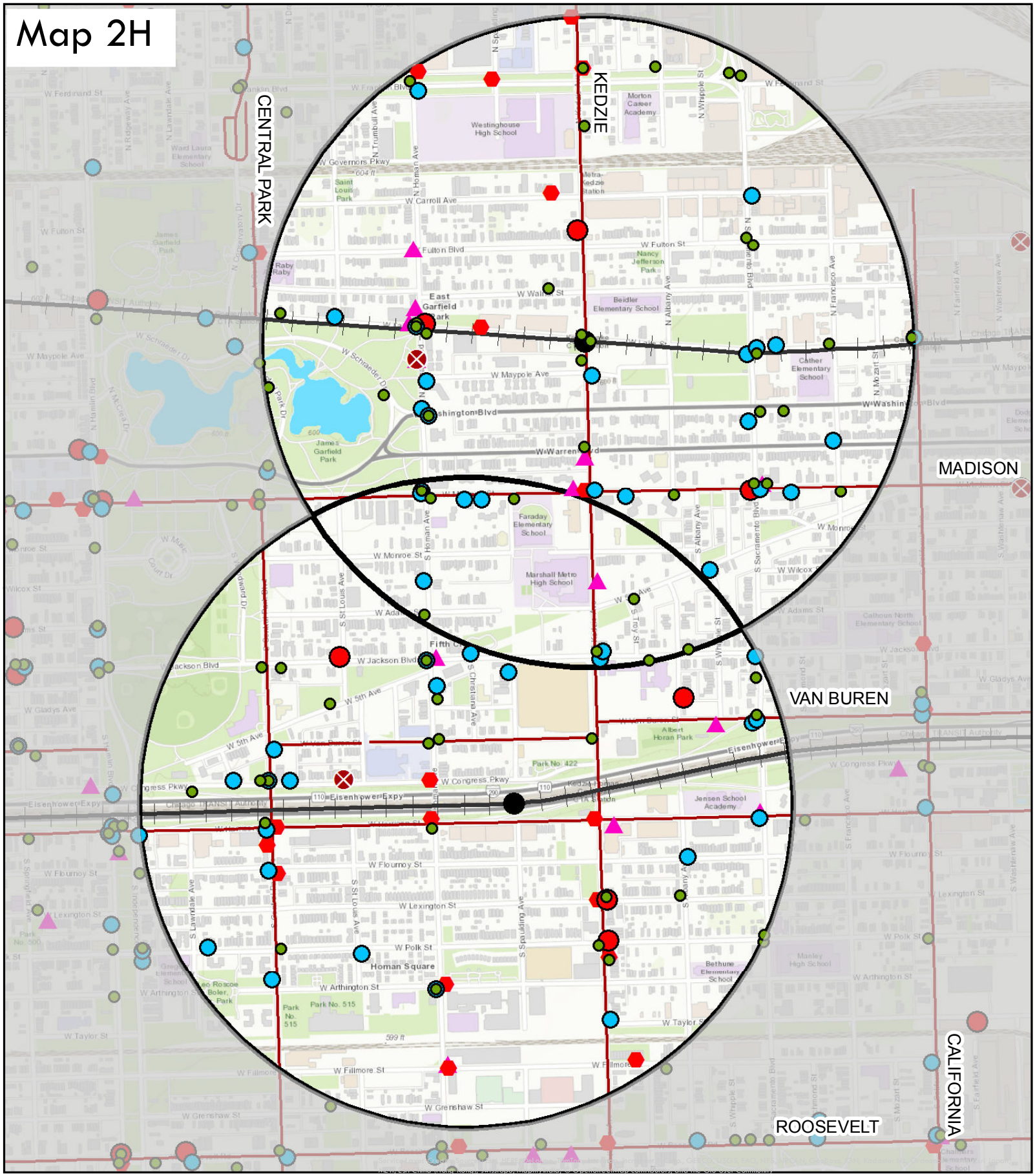
Kedzie-Homan eHub Land Surface Temperature, Tree Canopy + Land Use

Data includes Land Surface Temperature, Commercial or Industrial Land Use, and Tree Canopy Cover



Map 2G

Map 2H



Total Injuries - Vehicle Crashes, 2017

- 1
- 2 - 3
- 4 - 11
- Fatalities

Non Vehicle Crashes, 2017

- Bicycle Crash
- Pedestrian Crash
- 1/2 Mile eHub
- CTA Line

737 Vehicle Crashes, 0 Fatalities, 213 Injured
13 Bike Crashes, 1 Fatality, 6 Injured
20 Pedestrian Crashes, 1 Fatality, 20 Injured

CNT

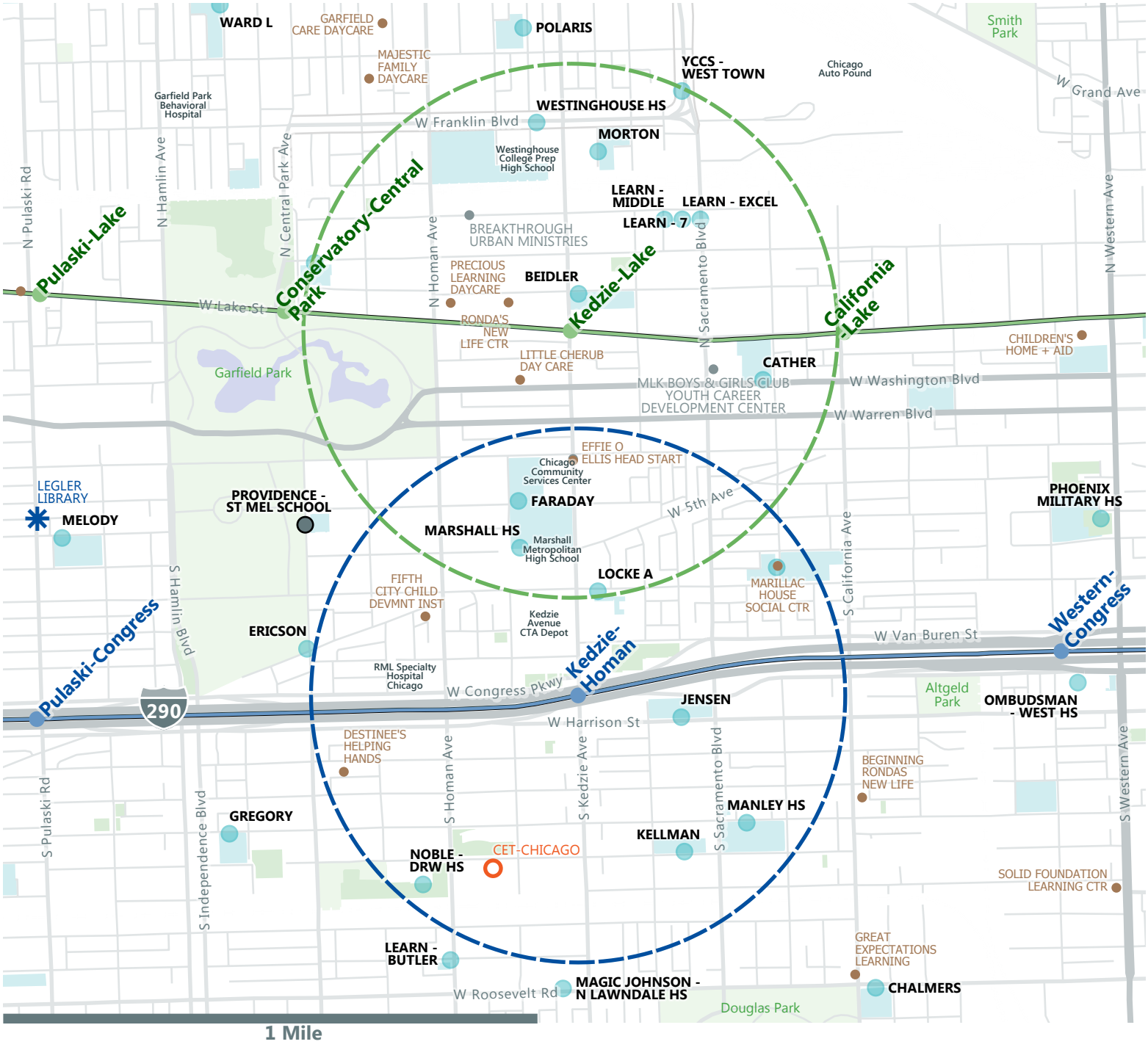
N

0 0.045 0.09 0.18 0.27 0.36 Miles

Data Source: City of Chicago Crash Data, 2017

Education + Workforce

Asset Map



- Elevated Chicago eHub 1/2 Mile Buffer
- Connect Chicago Location
- Shared Workspace
- City of Chicago Libraries
- Childcare Services
- Private School
- Public School
- School Grounds
- Postsecondary Institution
- Park

September 10, 2018

Sources:
Chicago Inno
City of Chicago
Cook County
Esri
National Center For Education Statistics
SB Friedman

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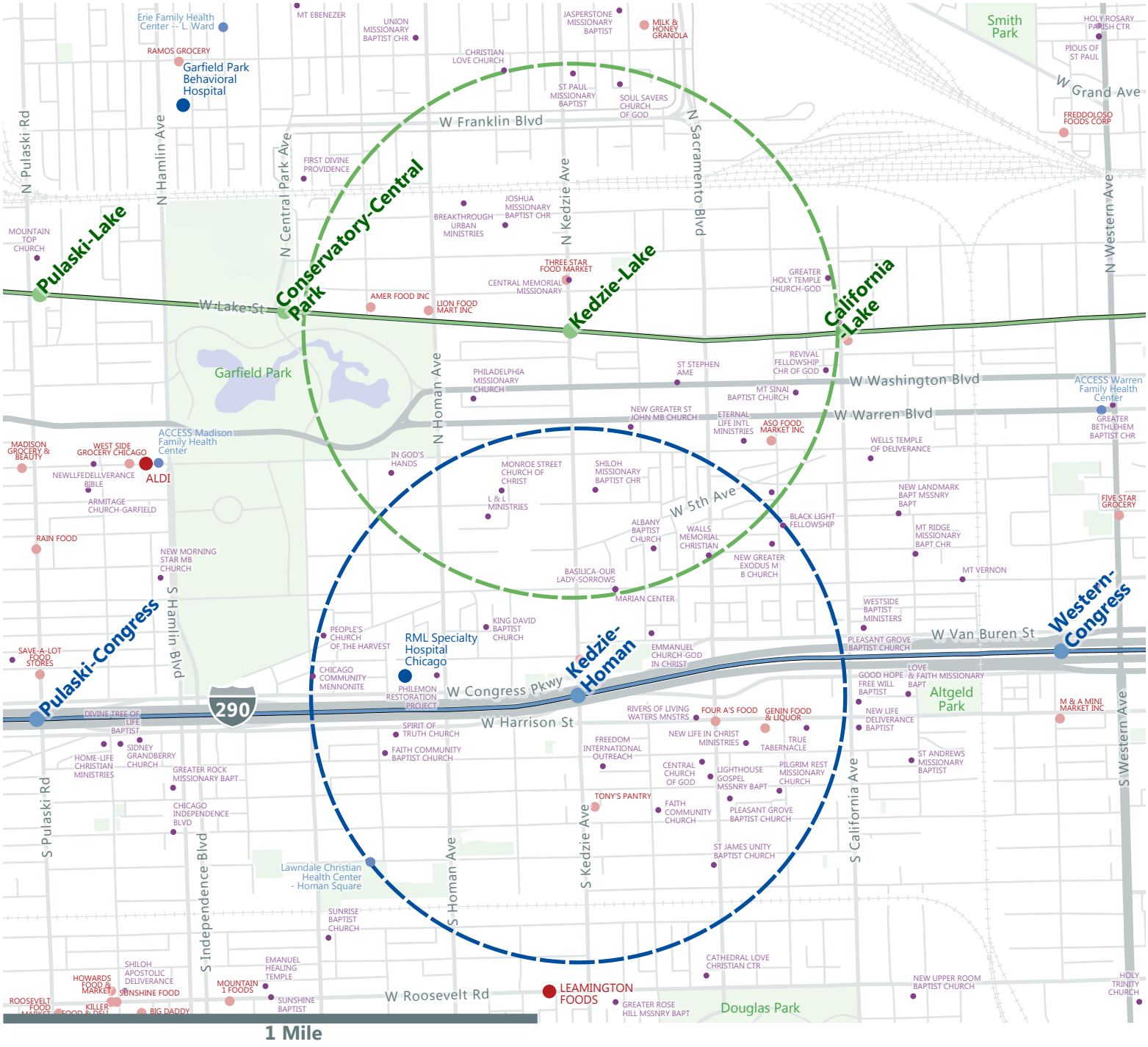
Map 21

Other Community Anchors

Asset Map



Map 2J

September 10, 2018

Sources:
American Hospital Directory
City of Chicago
Cook County
Esri
SB Friedman

- Elevated Chicago eHub 1/2 Mile Buffer
- Hospital
- Chicago Primary Care Community Health Clinic
- Religious Institution [1]
- Grocery Store [2]
- Corner Store [2]

[1] Data from Info USA via Esri Business Analyst. Records with the NAICs designation "Religious Organizations" were included.
[2] Data from InfoUSA via Esri Business Analyst. Establishments with the NAICs designation "Supermarkets and Other Grocery (except Convenience) Stores", were classified as either a (1)Grocery Store" or (2)Corner Store. Establishments with recorded sales greater than or equal to $5 million were classified as Grocery with all others classified as Corner. Reclassifications and omissions were made selectively for accuracy and clarity.

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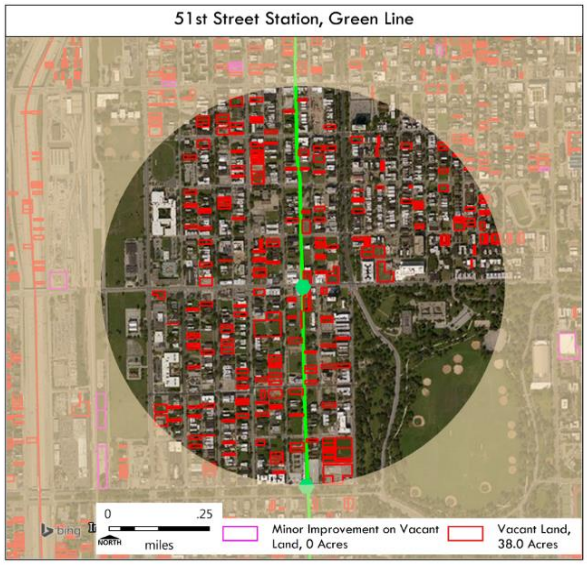
Enterprise

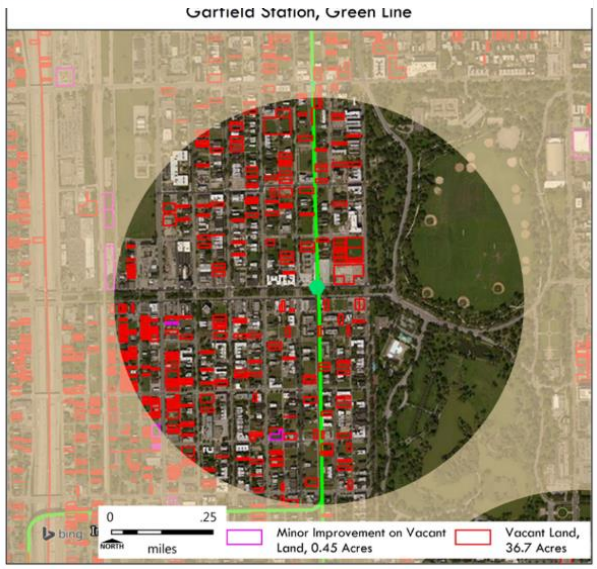
COMMUNITY PROFILE: GREEN LINE SOUTH CORRIDOR

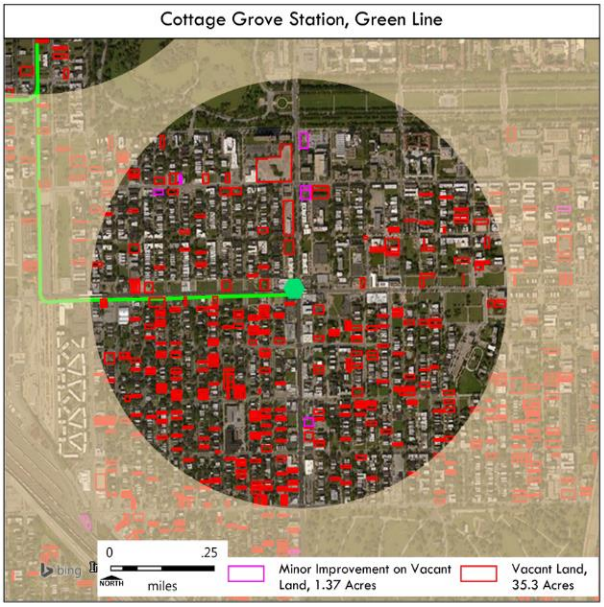
The Green Line South Corridor, a predominantly black community near the University of Chicago, has a historic legacy of arts and culture. The community's vision is an environment to meet with neighbors and friends, schools that are filled with a diverse population, a place for residents to enjoy arts and culture, and a community that attracts new residents with a sustainable development tax base.

When interviewed stakeholders were asked to describe their vision of an Ecodistrict, they said an Ecodistrict should commit to guiding district investments and community action, achieve ambitious sustainability performance goals, and track the results over time. Stakeholders said Ecodistrict neighborhoods seek out catalytic investments from local municipalities and utilities, private development, and public policy. It should include engaged residents who are motivated to bring about racial equity by way of improving the quality of life, economic opportunities, and environmental health of their own communities. Stakeholders characterized Ecodistricts as having equitable decision-making and investment; diversity, inclusion, and participation; health; positive environmental impacts; the well-being of the community; conservation and stewardship; and ample opportunity for participation and sharing of arts and culture.

- Community Area(s): Grand Boulevard; Washington Park; Hyde Park; Woodlawn
- eHub Station(s):
  - 51st Street Green Line (319 E. 51st St.)
  - Garfield Boulevard Green Line (320 E. Garfield Blvd.)
  - Cottage Grove – East 63rd Green Line (800 E. 63rd St.)







MAPS

Series 3: Green Line South Corridor Maps

- 3A. Sites Susceptible to Change Based on Land Use/Ownership (S.B. Friedman, 2018)
- 3B. Development Activity Asset Map (S.B. Friedman, 2018)
- 3C. Basement Flood Complaints and Renters (CNT, 2018)
- 3D. 51st Street eHub Brownfields, Heat-Related ER Visits by Zip Code, & NAAQS Exceedances by Census Tract (CNT, 2018)
- 3E. Garfield eHub Brownfields, Heat-Related ER Visits by Zip Code, & NAAQS Exceedances by Census Tract (CNT, 2018)
- 3F. Cottage Grove eHub Brownfields, Heat-Related ER Visits by Zip Code, & NAAQS Exceedances by Census Tract (CNT, 2018)
- 3G. 51st Street eHub Land Surface Temperature, Tree Canopy, & Land Use (CNT, 2018)
- 3H. Garfield eHub Land Surface Temperature, Tree Canopy, & Land Use (CNT, 2018)
- 3I. Cottage Grove eHub Land Surface Temperature, Tree Canopy, & Land Use (CNT, 2018)
- 3J. Traffic Crashes, Injuries, & Fatalities (CNT, 2018)
- 3K. Education & Workforce (S.B. Friedman, 2018)
- 3L. Other Community Anchors (S.B. Friedman, 2018)

AFFORDABILITY AND COMMUNITY OWNERSHIP

In recent years, the median rent in the corridor has almost doubled (Table 3), affecting the nearly 78% of households that rent. Most of the corridor is identified as a distressed housing market, with higher rates of foreclosure and vacancy, a higher percentage of subsidized housing, and increasing levels of housing cost burden (Map 1F). Overall, nearly a third of all parcels in the Corridor (191 acres) are vacant. Over half of these vacant parcels are owned by local government (Map 3A).

However, affordability and development pressure vary between the north (51st Street), central (Garfield) and south (Cottage Grove) eHubs that comprise the Green Line South Corridor.

In the northern part of the corridor (51st Street), 31% of residents are under the poverty line. This area is less cost-burdened, relative to other parts of the Corridor; residents spend 19% of their income on housing.

In the central and southern parts of the Corridor (Garfield and Cottage Grove), approximately 45% of residents are under the poverty line. Low-income households in these areas spend approximately a third of their income on housing.

The central part of the Green Line South Corridor (Garfield eHub) lies within community areas most impacted by economic hardship and limited opportunity (Map 1D, Map 1E).

Notably, portions of the north and southeast parts of the Corridor have a strong housing market (Map 1F). Residents in these areas are moderately vulnerable to displacement (Map 1G).

Recent development activity is clustered in the strong market areas, in the north and southeast (Map 3B).

Table 3. Affordability in the Green Line South Corridor

	51st St.	Garfield	Cottage Grove
Median Income[1]	$32,379	$17,974	$23,869
Percent in Poverty[2]	31%	45%	45%
Housing Cost Burden[3]	19%	33%	32%
Housing & Transportation Cost Burden[4]	34%	55%	53%
	2000	**2009**	**2014**[5]
Percent Rental Households	86%	76%	78%
Median Rent: 51st St.	$464	$723	$806
Median Rent: Garfield	$499	$751	$887
Median Rent: Cottage Grove	$466	$737	$840

1. Average Median Income (AMI, 2014) of the households within the eHub radius. Source: U.S. Census, *American Community Survey.*
2. Percentage of population under the poverty line (2014). Source: U.S. Census, *American Community Survey.*
3. The percentage of income spent on housing, for households earning 60% or less of the AMI (i.e., low-income households). Source: U.S. Census, *American Community Survey.*
4. The percentage of income spent on housing and transportation combined, for households earning less than 60% of the AMI. Source: CNT, *H+T Index.*
5. By comparison, the median gross rent for the City of Chicago, for 2012 – 2016, is $987. Source: U.S. Census Bureau, *QuickFacts Chicago, Illinois.*

ENVIRONMENT AND HEALTH

Residents are impacted by flooding, heat stress, asthma, and traffic crashes, among other health and safety issues.

Residents have been impacted by flooding (Map 3C). Reported flood damages increase from north to south, with over $300,000 reported in the 51st Street eHub, to over $800,000 reported in the Cottage Grove eHub, over a five-year period. Most 311 flood complaints are reported in areas with primarily rental housing. Flood complaint hot spots are observed throughout the Corridor. A Washington Park stakeholder identified Prairie Avenue, between 51st Street and 54th Street, as an area of concern for flooding. A Woodlawn stakeholder noted frequent flooding at her organization's office building, near 60th Street at St. Lawrence Avenue. Flooding is expected to increase in the future, due to highly impervious land use, infrastructure conditions, and climate change (Map 1M, Table 4).

The central and south parts of the Corridor have above-average rates of heat-related emergency room visits (Map 3D, 3E, 3F), and residents are vulnerable to extreme heat (Map 1I). Washington Park and the Midway Plaisance provide some relief from the urban heat island effect (Map 3G, 3H, 3I). However, tree canopy coverage for the corridor is below average, compared to the city overall, particularly in the north part of the corridor.

The rate of asthma-related emergency room visits by youth in the central and south part of the Corridor is approximately double the average for the city. These areas are among the hardest hit by asthma, city-wide (Map 1L). Air monitoring data indicates that elevated levels of fine particulate matter (PM 2.5) and ozone pollutants are present in and near the corridor. Potential air pollution sources include vehicle emissions from street traffic, the Norfolk Southern Intermodal Rail Yard (west adjacent to the south part Corridor, between 63rd Street and Marquette Road), and the Dan Ryan Expressway (west adjacent to the north part of the Corridor). Stakeholders identified the rail yard as a significant air quality concern for residents.

Between 30 and 40% of residents commute by transit, although driving is more common in the south central and part of the corridor. The corridor is within two of the most traffic crash-affected communities: Washington Park and Grand Boulevard (Map 3J).[73]

During a stakeholder interview for the Washington Park community, located in the center of the corridor, the interviewee stated that although asthma was often raised as a problem in the past, it seemed that basement and street flooding is more of a concern to residents currently.

During a stakeholder interview for the Woodlawn community, located in the south part of the Corridor, the interviewee ranked heat as the highest priority for health-related climate concerns, as it affected all residents, whereas flooding occurred in specific areas. The interviewee expressed that air quality was likely more of a concern on the west side of the corridor. The interviewee noted that food access was a high priority for residents until recently, but this changed because a large grocery store is being built in the community.

Over a quarter of children are obese, and up to 10% have elevated blood lead levels (Table 4). Overall, life expectancy for residents in the north and central part of the corridor are among the lowest in the city (Map 1H).

[73] *Vision Zero Chicago. (June 2017). Action Plan 2017-2019.*

Table 4. Climate & Health in the Green Line South Corridor

	51st St.	Garfield	Cottage Grove
Urban Flooding[1]			
Impervious Surfaces	49%	41%	56%
Est. Cost of Flood Damage to Homes	$335,453	$575,449	$809,795
Extreme Heat			
Tree Canopy[2] Coverage	16%	18%	18%
Land Surface Temperature[3]	84 degrees	83 degrees	85 degrees
Air Pollution			
Commute to Work by Transit	34%	40%	31%
Walk Score[4]	Somewhat Walkable (68/100)	Somewhat Walkable (68/100)	Very Walkable (82/100)
Avg GHG Emissions from Driving[5]	2.8 tons	5 tons	4.9 tons
Air Pollution Limits Exceeded[6]	Yes	Yes	Yes
Land & Water Pollution			
Brownfield(s) Present[7]	No	No	No
Health & Safety			
Children under 3 with Elevated Blood Lead Levels (EBLL)	2.5 - 4.0%	2.5 - 4.0%	2.5 - 4.0%
Childhood Obesity	22-24%	22-24%	22-24%
Firearm-Related Homicide	30.6-46.9 per 100,000	30.6-46.9 per 100,000	30.6-46.9 per 100,000

Notes:

1. Reported residential insurance claims related to flooding, 2007-2011. Source: CNT, *The Prevalence and Cost of Urban Flooding.*
2. Source: Spatial Analysis Laboratory, University of Vermont *High-Resolution Land Cover, Cook County, 2010.* The Chicago Regional Trees Initiative reports the Chicago average for tree canopy coverage is 19%; the regional goal is 22% tree canopy coverage by 2050.
3. The average land surface temperature, as measured on 7/1/14. Source: USGS/CMAP, *Land Surface Temperature Estimates, July 21, 2014.*
4. Walkscore is based on the proximity of the transit station to amenities, such as shops and libraries. The score is relative to non-urban communities, and may not fully reflect community conditions. (Source: walkscore.com)
5. The average emissions per household in the eHub, as calculated from average vehicle miles travelled (VMT). Source: CNT, *H+T Index*.
6. The table indicates "Yes" if any part of the eHub exceeded the National Ambient Air Quality Standards (NAAQS) on 3 or more days in 2012. Source: National Environmental Public Health Tracking Network.
7. Brownfields are properties whose development is complicated by known or potential contamination. This database includes only those properties reported to USEPA voluntarily or to fulfil grant requirements; many brownfields are not reported. Source: USEPA, 2018.

COMMUNITY ASSETS

The Green Line South Corridor has several community assets and initiatives that could support an Ecodistrict (Map 3K, 3L)

- **Stakeholders and Social Networks:** Engaged stakeholders include dedicated residents, community-based organizations, and others leading resiliency efforts, including the Greater Southwest Development Council, Blacks in Green (BIG), KLEO, 1Woodlawn, Urban Juncture, the University of Chicago, and Openlands. Assets include Sunshine Enterprises co-working space; Urban Juncture co-working space, Boxville Market and business incubator; the KLEO Community Family Life Center, XS Tennis and Education Center, Coppin House Social Services, Arts + Public Life Arts Incubator, YWCA Community Technology Center, and black-owned community businesses.
- **Institutions:** Institutional assets include several religious congregations, schools (including the University of Chicago), and public libraries. ComEd's "Community of the Future" initiative is occurring north of the eHub Corridor, in Bronzeville (33rd Street to 38th Street, State Street to King Drive); the initiative is planned to include solar energy and battery storage, a microgrid for critical facilities, electric vehicles, off-grid streetlights, and public WiFi.
- **Food and Health:** Food gardens are located within the Corridor. The Washington Park field house hosts fitness and cultural activities and the Windy City Harvest urban farm. A grocery store is under construction. Multiple health clinics are present in the corridor.
- **Buildings:** Building assets include historic landmarks at the Pate-Comiskey House, Chicago Orphan Asylum Building, Engine Company 61, Garfield Boulevard L Station and Overpass, Lorado-Taft Midway Studios, and Lorraine Hansberry House.
- **Transportation:** Transportation assets include CTA train stations, bus routes, bike share stations, and car share stations. University of Chicago is funding a Streetscape Master Plan project for 61st Street between Cottage Grove and Prairie Avenue, which will include sustainable development elements. A major renovation is planned for the Cottage Grove and King Drive CTA train stations. The Cottage Grove station is part of the federally funded Walk to Transit program; the project will improve the area around the station.
- **Open Space:** Open space assets include the 367-acre Washington Park, including a nature area and lagoon; and Midway Plaisance boulevard, located in and adjacent to the Corridor. There is a network of community gardens and green space, including Bronzeville Community Garden, Windy City Harvest, RTW Vet Center Garden, Washington Park Harvest Garden, Ellis View Cooperative Garden, POAH Senior Victory Garden at The Burnham, and BIG Great Migration Gardens and 61st Street tree canopy initiative.

COMMUNITY-LED STRATEGIES

Stakeholders expressed that community control and self-sufficiency would be achieved through equitable access to quality housing, education, healthcare, and resources to grow community wealth. Stakeholders also felt that aesthetic beauty was needed to reflect the beauty of both nature and the community.

Stakeholders stated that strong community engagement is crucial. Engagement efforts should be accessible for community members to attend and express their opinion. Stakeholders recommended that where possible, paid opportunities should be offered to community volunteers. Stakeholders spoke of the historic resilience of Black people, which can speak to and inspire current resilience activities. Stakeholders stated that community residents want to be trained, recruited, and offered contracting opportunities. KLEO was mentioned as an example of a strong engagement program.

Stakeholders suggested a variety of programs to enhance community control, such as:

- Inviting active community participation in all housing-development proposals
- Developing a housing education and assistance program
- Allowing dwelling units on top of garages, to be permanently designated as affordable housing
- Identifying and promoting potential locations for small businesses
- Developing a Community Benefits Agreement
- Providing entrepreneurship training
- A community-lead public safety plan
- Capacity building for community organizations
- Youth programs to provide life skills, and service learning opportunities in public safety and beautification

Stakeholders expressed varying preferences regarding land control models. Some advocated for a co-op development model, such as the New York co-op development model and the University-driven model in Cambridge, Massachusetts. Other stakeholders recommended land trusts, land banks and rent control as effective strategies.

Stakeholders identified several ongoing and proposed community-led projects and programs that align with Ecodistrict priorities:

- Greater Southwest Development Council is pursuing an Ecodistrict formation process for Washington Park, within the Elevated Chicago Project Area.
- Arts + Public Life, a community arts incubator, will be opening a new theater building, which will have cultural entrepreneurship programming in 2019
- Several community gardens initiatives are being managed by community-based organizations throughout the corridor, including BIG's Great Migration Gardens in Woodlawn.
- BIG's 61st Street Tree Canopy initiative is an ongoing project in Woodlawn. Urban Juncture and BIG are partnering together to plant trees along 51st Street.
- Greater Southwest Development Corporation created a sunflower phytoremediation and beautification installation on a half-block in Washington Park, as an interim use before housing development proceeds.
- The proposed Legacy of Washington Park housing campus development would include geothermal and photovoltaic renewable energy, bioswales and other stormwater retention features.
- The proposed Green Cathedral building in Woodlawn is being designed with sustainable building techniques.
- The proposed Overton School adaptive reuse project in Washington Park is converting a landmark building to a small business incubator. It could incorporate sustainable technology, such as a solar array carport, graywater reuse, and bike infrastructure.
- Other proposed strategies include
    - a nature trail that connects Lake Michigan to the community, and links to bioswales and native plantings underneath the Green Line elevated train tracks;
    - a pollinator corridor with art installations;
    - a residential rain barrel and stormwater reuse campaign ("a rain barrel in every home");
    - rooftop solar on new housing developments;
    - solar development on the former Robert Taylor Homes site;
    - green building construction and historic building preservation;
    - train-the-trainer wellness programs from the Chicago Department of Public Health to enable residents to lead local wellness classes;
    - community health worker programming;
    - resident-led resiliency awareness programs; and
    - convening resident artists for a community art project that celebrates local history and culture.

Greenline South Corridor

Sites Susceptible To Change Based On

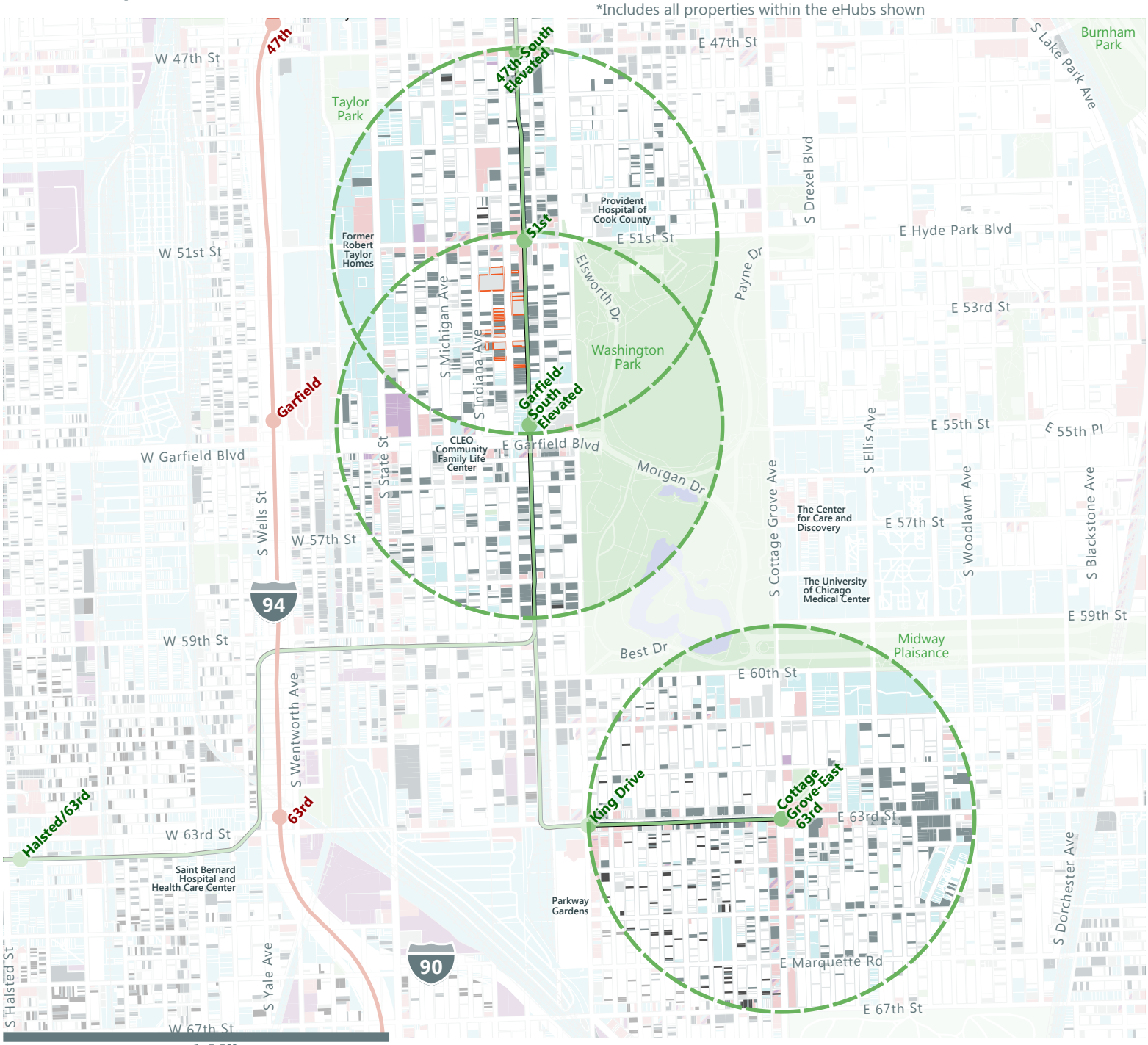
Land Use/Ownership

Asset Map

Vacant Land Inventory - Greenline South eHubs*

Cook County Land Bank-Owned	ACRES **5**	1%	PARCELS **67**	1.3%
City of Chicago-Owned	ACRES **96**	9%	PARCELS **659**	13%
Privately-Owned Vacant Land	ACRES **90**	8%	PARCELS **674**	13%
Total	ACRES **191**	18%	PARCELS **1,400**	27%

*Includes all properties within the eHubs shown



Elevated Chicago eHub 1/2 Mile Buffer

Vacant Cook County Land Bank-Controlled [1]

Vacant City of Chicago-Owned

Local Organization-Controlled [2]

Land Use

- Commercial
- Exempt / Not For Profit
- Industrial
- Multiple Uses
- Privately-Owned Vacant
- Residential
- Parks

September 10, 2018

Sources:
City of Chicago
Cook County
Esri
SB Friedman

Map 3A

[1] Primarily properties for which Cook County Land Bank has acquired the tax certificate and has the option of taking the property to deed; also includes properties-owned by the Land Bank.
[2] Includes property that is vacant or planned for redevelopment

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Greenline South Corridor

Development Activity

Asset Map

Map 3B

*Includes all properties within the eHubs shown

Market Conditions - Greenline South eHubs*
New/Proposed Development (Since 2013)

Multifamily	PROJECTS	2	UNITS	95
Retail	PROJECTS	1	SF	42,240
Industrial/Flex	PROJECTS	0	SF	0
Office	PROJECTS	0	SF	0

September 10, 2018

New/Proposed Development Since 2013

- Industrial/Flex
- Retail
- Health Care
- Hospitality
- Multi-Family
- Office
- Specialty
- Sports & Entertainment
- Proposed Development

Selected Zoning Districts

- Commercial
- Industrial
- Multifamily (Medium to High Density)

Permits

- Demolition
- New Construction/Renovation > $100,000

Elevated Chicago eHub 1/2 Mile Buffer

Parks

Sources:
City of Chicago
Cook County
CoStar
Esri
SB Friedman

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Greenline South Corridor

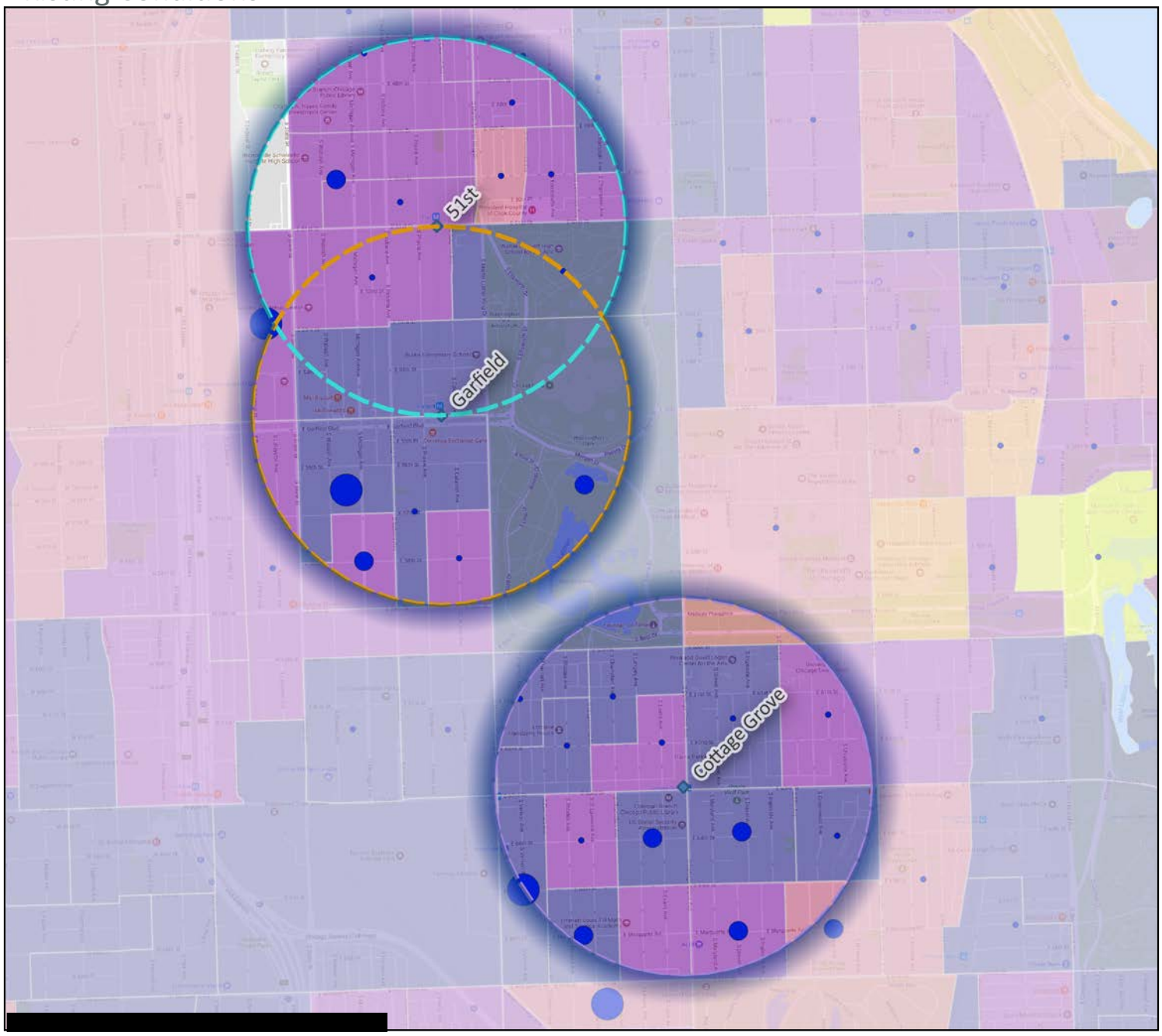
311 Flooding Calls: January 2016-June 2018

Basement Flood Complaints and Renters

Existing Conditions

Summary of Type of Flooding call within 1/2 Buffer

Station	Alley	Viaduct	Public Space	Basement	Street	Total
51st	0	0	8	29	51	88
Cottage Grove	6	1	6	45	81	139
Garfield	0	0	5	42	46	93



1 Mile

Percent Rental Households by Census Block Group

- Less than 25%
- 25% - 40%
- 40% - 60%
- 60% - 80%
- 80% - 100%

Number of Basement Flooding Calls per 1,000 Households in Block Group

- Less than 15
- 15 - 30
- 30 - 45
- 45 - 60
- 60 or More

CNT

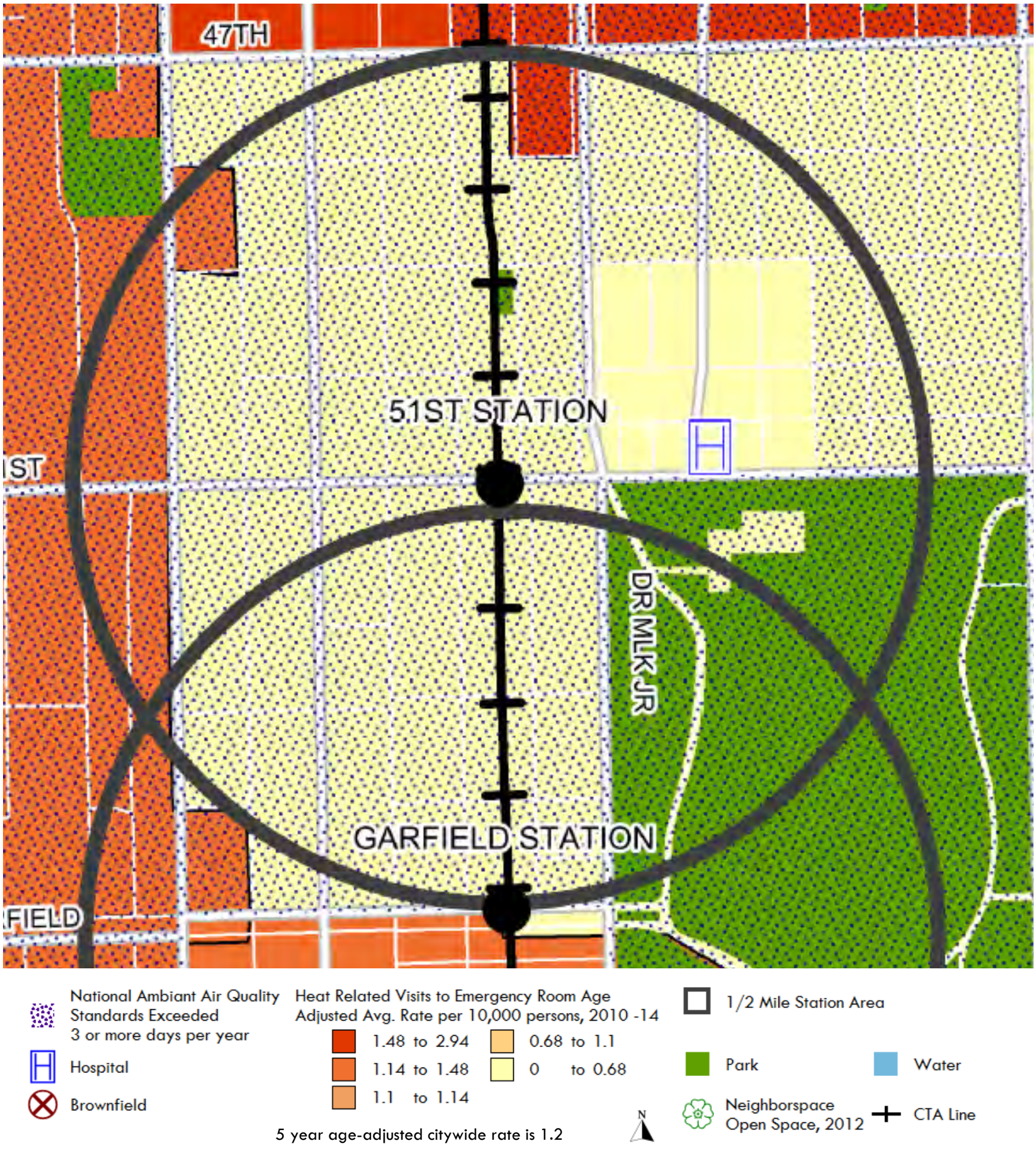
August 20, 2018

Source:
U.S. Census ACS 2016
City of Chicago 311 Call Center

Map 3C

51st St eHub Brownfields, Heat-Related ER Visits by Zip Code, & NAAQS Exceedances by Census Tract

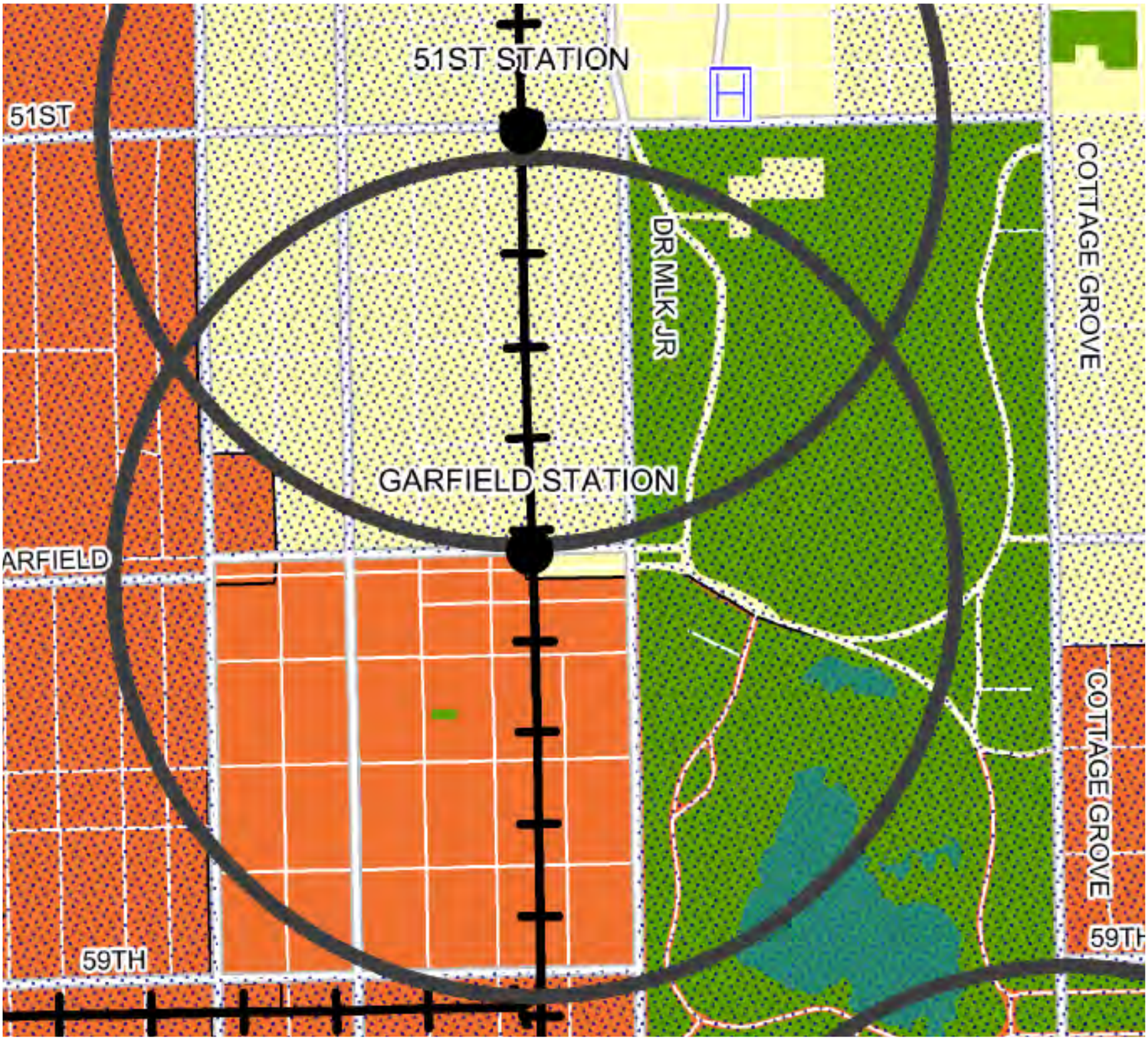
Data includes Air Quality Standards Exceeded and Heat-Related ER visits



Map 3D

Garfield eHub Brownfields, Heat-Related ER Visits by Zip Code, & NAAQS Exceedances by Census Tract

Data includes Air Quality Standards Exceeded and Heat-Related ER visits



National Ambiant Air Quality Standards Exceeded
3 or more days per year

Hospital

Brownfield

Heat Related Visits to Emergency Room Age Adjusted Avg. Rate per 10,000 persons, 2010 -14

- 1.48 to 2.94
- 1.14 to 1.48
- 1.1 to 1.14
- 0.68 to 1.1
- 0 to 0.68

5 year age-adjusted citywide rate is 1.2

1/2 Mile Station Area

Park

Water

Neighborspace Open Space, 2012

CTA Line

N

Map 3E

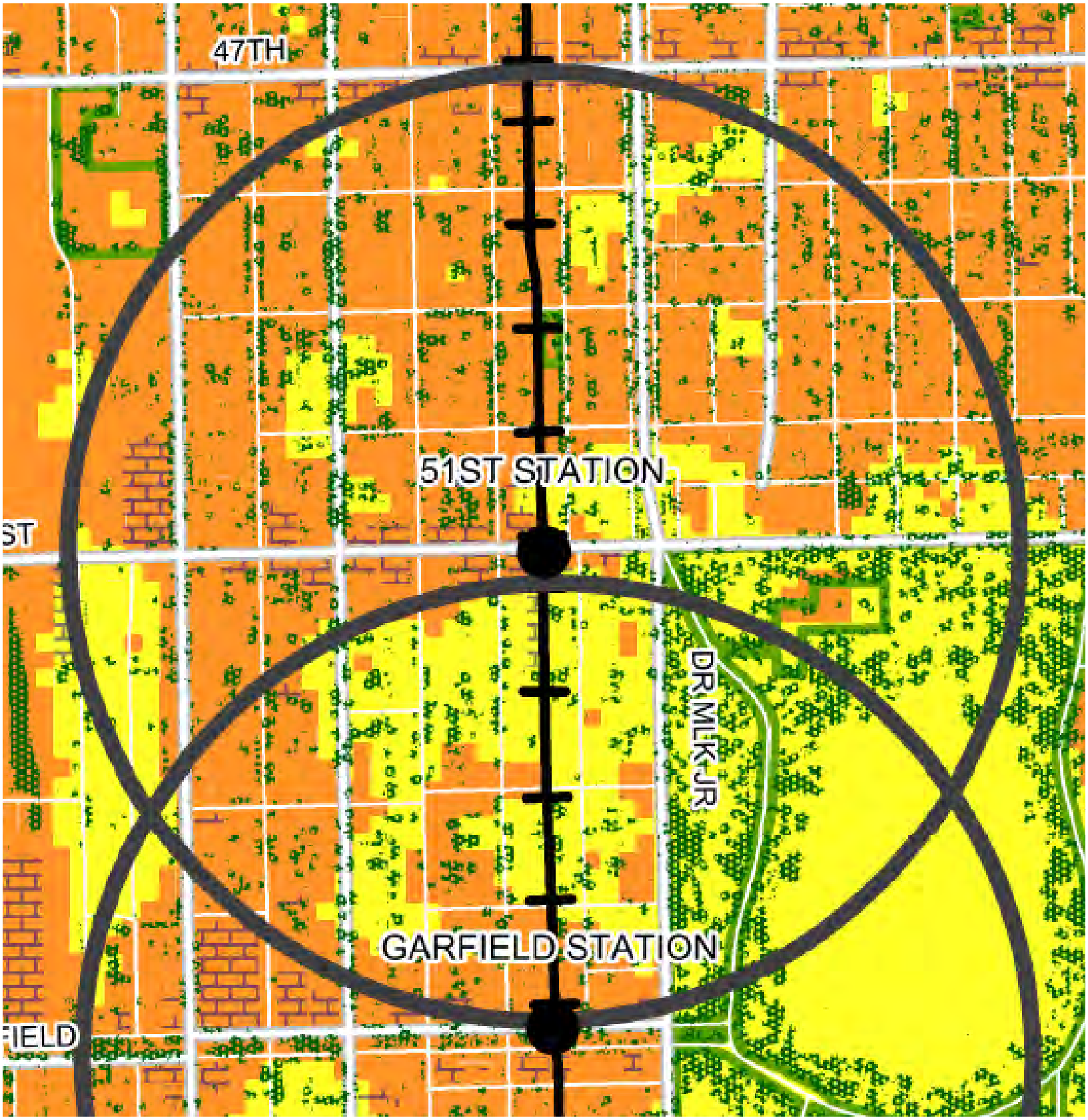
Cottage Grove - 63rd eHub Brownfields, Heat-Related ER Visits by Zip Code, & NAAQS Exceedances by Census Tract

Data includes Heat-Related ER visits and Air Quality Violations

Map 3F

51st St eHub Land Surface Temperature, Tree Canopy + Land Use

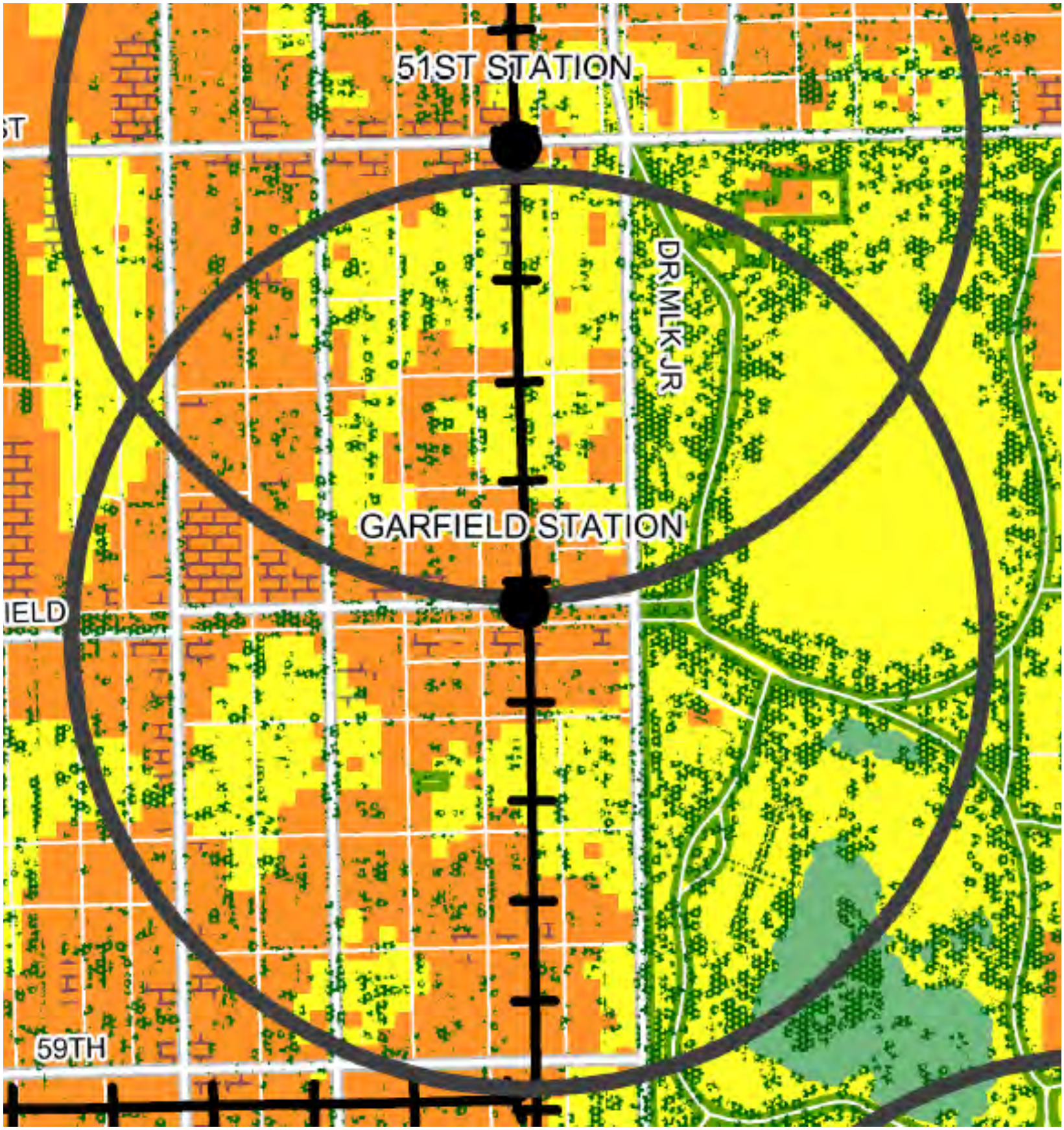
Data includes Land Surface Temperature, Commercial or Industrial Land Use, and Tree Canopy Cover



Map 3G

Garfield eHub Land Surface Temperature, Tree Canopy + Land Use

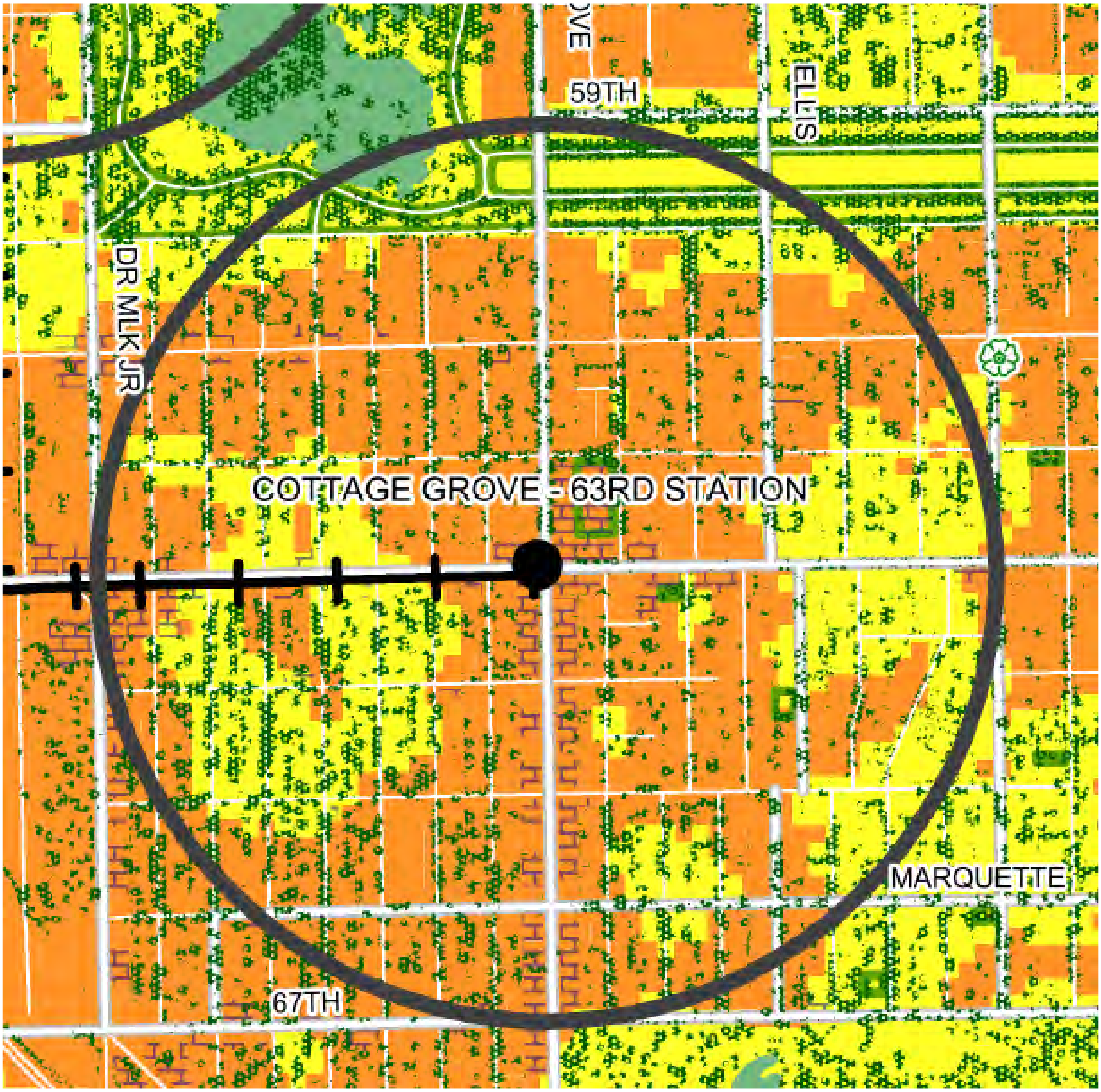
Data includes Land Surface Temperature, Commercial or Industrial Land Use, and Tree Canopy Cover



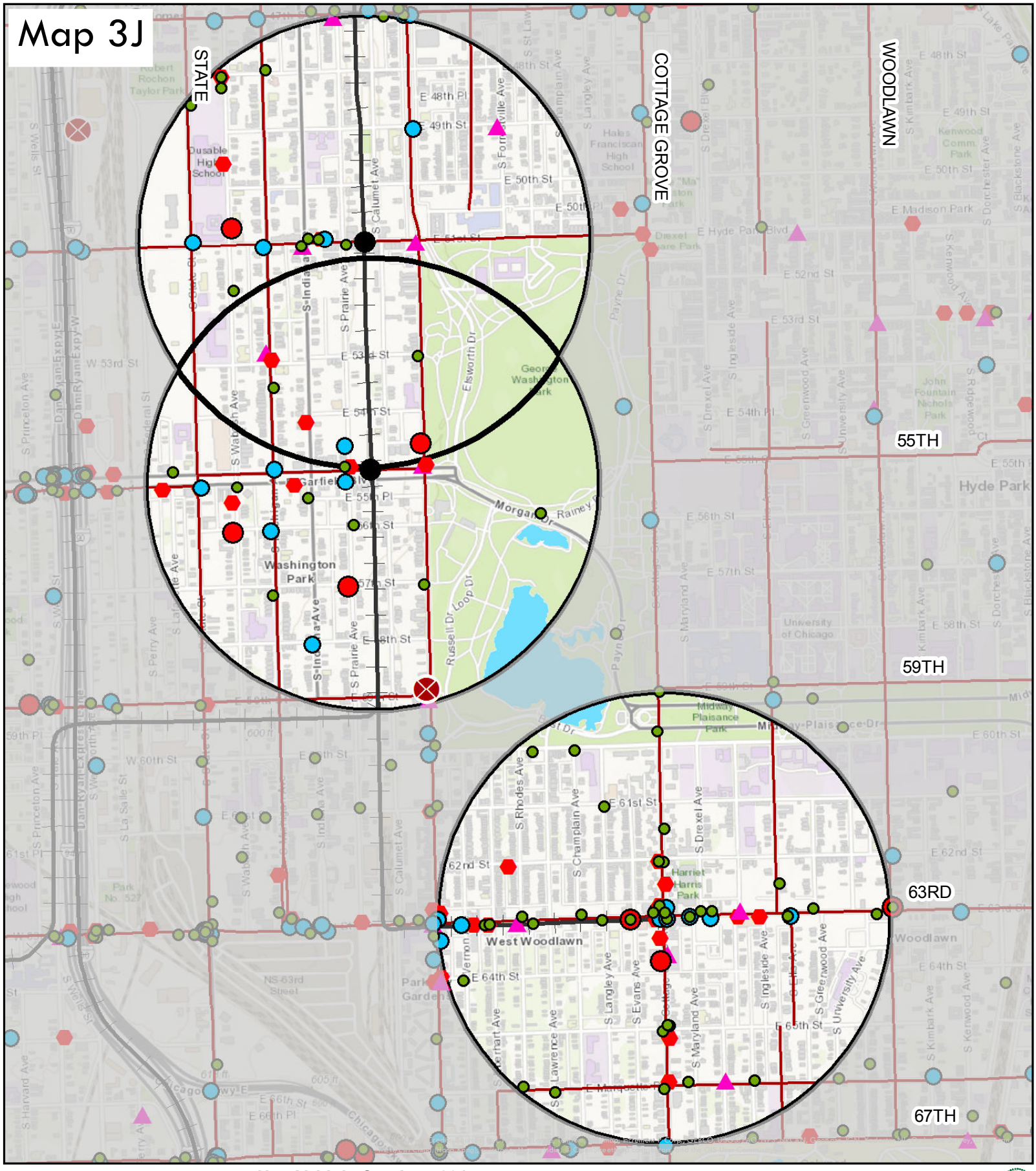
Map 3H

Cottage Grove-63rd eHub Land Surface Temperature, Tree Canopy + Land Use

Data includes Land Surface Temperature, Commercial or Industrial Land Use, and Tree Canopy Cover

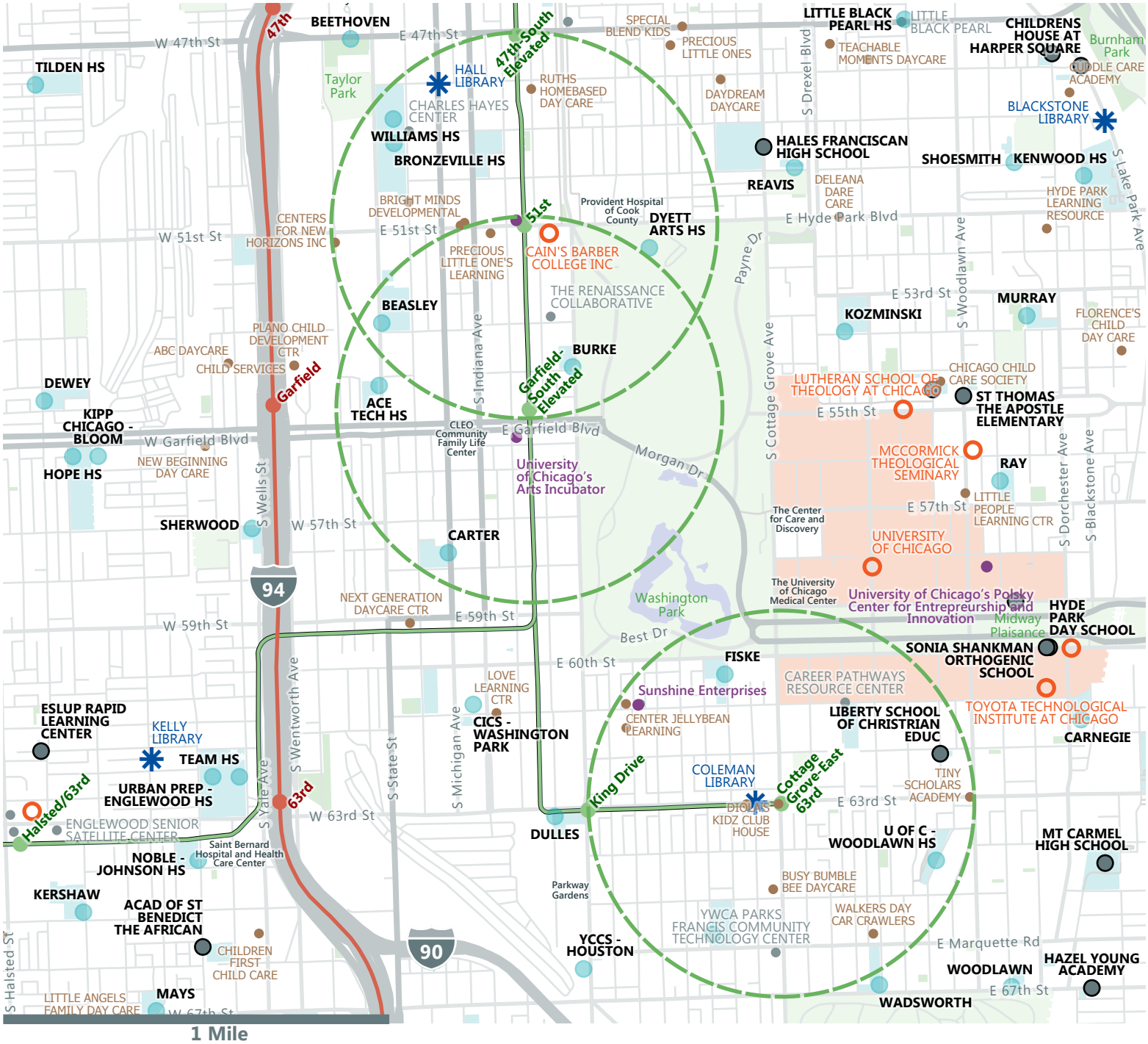


Map 3I


Map 3J
STATE
COTTAGE GROVE
WOODLAWN
55TH
59TH
63RD
67TH
Washington Park
West Woodlawn
Hyde Park
Total Injuries - Vehicle Crashes, 2017
1
2 - 3
4 - 11
Fatality
Non Vehicle Crashes, 2017
Bicycle Crash
Pedestrian Crash
1/2 Mile eHub
CTA Line
753 Vehicle Crashes, 1 Fatality, 140 Injured
12 Bike Crashes, 0 Fatalities, 6 Injured
27 Pedestrian Crashes, 0 Fatalities, 26 Injured
CNT
N
Miles
0 0.05 0.1 0.2 0.3 0.4
Data Source: City of Chicago Crash Data, 2017

Education + Workforce

Asset Map



- Elevated Chicago eHub 1/2 Mile Buffer
- Connect Chicago Location
- Shared Workspace
- City of Chicago Libraries
- Childcare Services
- Private School
- Public School
- School Grounds
- Postsecondary Institution
- Park

September 10, 2018

Sources:
Chicago Inno
City of Chicago
Cook County
Esri
National Center For Education Statistics
SB Friedman

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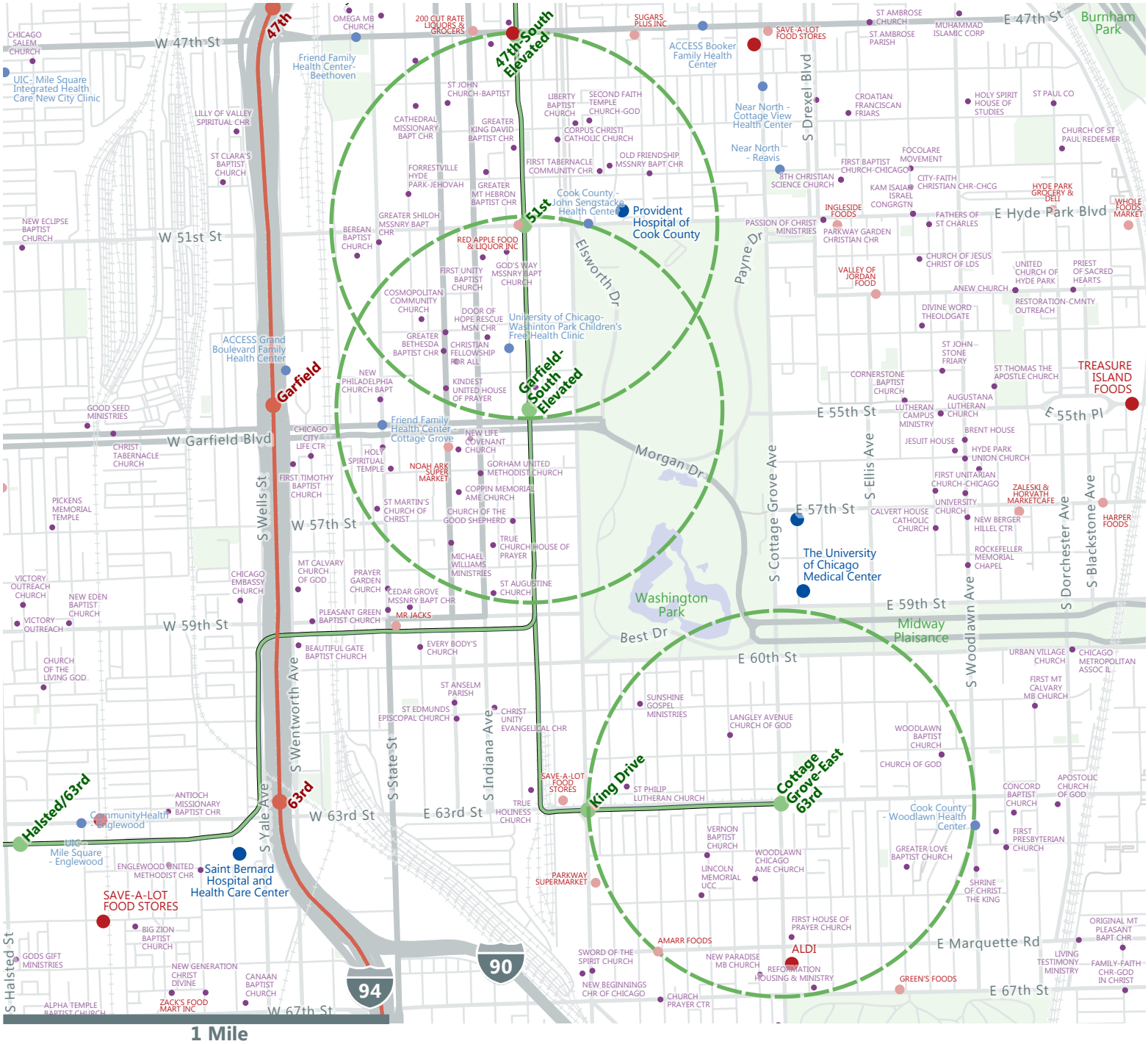
Map 3L

Other Community Anchors

Asset Map



Map 3K

- Elevated Chicago eHub 1/2 Mile Buffer
- Hospital
- Chicago Primary Care Community Health Clinic
- Religious Institution [1]
- Grocery Store [2]
- Corner Store [2]

September 10, 2018

Sources:
American Hospital Directory
City of Chicago
Cook County
Esri
SB Friedman

[1] Data from Info USA via Esri Business Analyst. Records with the NAICs designation "Religious Organizations" were included.
[2] Data from InfoUSA via Esri Business Analyst. Establishments with the NAICs designation "Supermarkets and Other Grocery (except Convenience) Stores", were classified as either a (1)Grocery Store" or (2)Corner Store. Establishments with recorded sales greater than or equal to $5 million were classified as Grocery with all others classified as Corner. Reclassifications and omissions were made selectively for accuracy and clarity.

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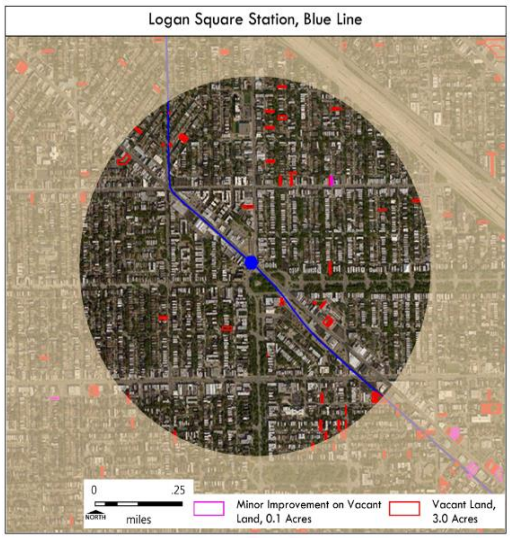
COMMUNITY PROFILE: LOGAN SQUARE BLUE LINE

The Logan Square Blue Line eHub is located within a predominantly Hispanic community on Chicago's northwest side. The community's vision for resilience includes providing opportunities and ecological building practices for both the commercial and residential housing stock, and bringing awareness to issues addressing resiliency.

One interviewed stakeholder stated that a corridor study is needed to decide whether disinvested areas with empty lots, or areas with high levels of displacement present Ecodistrict opportunities. If the latter is an opportunity, zones should be created near Logan Square with consideration given to who will benefit from the Ecodistrict. Equity issues should also be addressed. The stakeholder emphasized the importance of working with intermediary community-based organizations that are already engaging underrepresented groups.

- Community Area(s): Logan Square; Avondale
- eHub Station: Logan Square Blue Line (2620 N. Kedzie Ave.)[74]



MAPS

Series 4: Logan Square Blue Line Maps

- 4A. Sites Susceptible to Change Based on Land Use/Ownership (S.B. Friedman, 2018)
- 4B. Development Activity Asset Map (S.B. Friedman, 2018)
- 4C. Basement Flood Complaints and Renters (CNT, 2018)
- 4D. Logan Square eHub Brownfields, Heat-Related ER Visits by Zip Code, & NAAQS Exceedances by Census Tract
- 4E. Logan Square eHub Land Surface Temperature, Tree Canopy, & Land Use
- 4F. Traffic Crashes, Injuries, & Fatalities (CNT, 2018)
- 4G. Education & Workforce (S.B. Friedman, 2018)
- 4H. Other Community Anchors (S.B. Friedman, 2018)

[74] *For the purposes of this study, the Logan Square eHub was mapped as a 1-mile radius for research purposes, due to the limited availability of land within the ½-mile radius.*

AFFORDABILITY AND COMMUNITY OWNERSHIP

In recent years, the cost of housing in the Logan Square area has risen sharply (Table 5). Though most Logan Square residents still rent, the percent of households that rent has decreased over the years. Low-income households have a high housing cost burden, spending 46% of their income on housing. Almost one-fifth of residents are below the poverty line.

Most of the area is characterized as a strong housing market with a higher income population, but the northernmost area reflects an area with declining income, higher housing cost burden, and moderate levels of housing vacancy (Map 1F). Housing market conditions suggest that residents in Logan Square are highly vulnerable to displacement (Map 1G).

There is very little vacant land within one-half mile of the Blue Line CTA station. Within an expanded one-mile radius of the station, there are 25 acres of vacant land, nearly all of which is privately held (Map 4A). Logan Square has experienced a high level of development activity throughout the area (Map 4B).

Table 5. Affordability in the Logan Square eHub

Median Income[1]	$29,764		
Percent in Poverty[2]	20%		
Housing Cost Burden[3]	46%		
Housing & Transportation Cost Burden[4]	65%		
	2000	**2009**	**2014**[5]
Percent Rental Households	72%	61%	65%
Median Rent	$625	$896	$1,049

1. Average Median Income (AMI, 2014) of the households within the eHub radius. Source: U.S. Census, *American Community Survey*.
2. Percentage of population under the poverty line (2014). Source: U.S. Census, *American Community Survey*.
3. The percentage of income spent on housing, for households earning 60% or less of the AMI (i.e., low-income households). Source: U.S. Census, *American Community Survey*.
4. The percentage of income spent on housing and transportation combined, for households earning less than 60% of the AMI. Source: CNT, *HT Index*.
5. By comparison, the median gross rent for the City of Chicago, for 2012 – 2016, is $987. Source: U.S. Census Bureau, *QuickFacts Chicago, Illinois*.

ENVIRONMENT AND HEALTH

Residents have been impacted by flooding (Map 4C, Table 2). Over $400,000 in flood damages were reported in a five-year period. Flood complaints to 311 were reported throughout the eHub. Flooding is expected to increase in the future, due to highly impervious land use, infrastructure conditions, and climate change (Table 6). Future flooding risk is slightly higher in the south part of the eHub (Map 1M).

Overall, the eHub has approximately average or below-average rates of heat-related and asthma-related emergency room visits by youth (Map 4D).

The eHub enjoys a slightly above average percentage of tree canopy coverage. The boulevard and other tree canopy provides some relief from the urban heat island effect (Map 4E).

Air monitoring data indicates that elevated levels of fine particulate matter (PM 2.5) and ozone pollutants are present in and near the corridor. Potential air pollution sources include vehicle emissions from street traffic.

Nearly half of residents commute by transit – the highest of the Elevated Chicago eHubs. Bike ridership is also high within the community.[75] In 2017, eighteen crashes involving a cyclist and twelve crashes involving a pedestrian were reported; most bike crashes occurred on Milwaukee Avenue (Map 2F).

A limited review of available environmental database information identified several manufacturing facilities within one mile of the station, including some in violation of environmental permit requirements.

Nearly a third of children are obese, and up to 4% of children have elevated blood lead levels (Table 6). Overall, life expectancy for residents is in line with the city average (Map 1H).

Table 6. Climate & Health in the Logan Square Blue Line eHub

Urban Flooding[1]	
Impervious Surfaces	59%
Est. Cost of Flood Damage to Homes	$440,637
Extreme Heat	
Tree Canopy[2] Coverage	20%
Land Surface Temperature[3]	88 degrees
Air Pollution	
Commute to Work by Transit	46%
Walk Score[4]	Most Walkable (95/100)
Avg GHG Emissions from Driving[5]	2.51 tons
Air Pollution Limits Exceeded[6]	Yes
Land & Water Pollution	
Brownfield(s) Present[7]	No
Health & Safety	
Children under 3 with Elevated Blood Lead Levels (EBLL)	2.5 - 4.0%
Childhood Obesity	28-32%
Firearm-Related Homicide	4.2 - 5.6 per 100,000

Notes:

1. Reported residential insurance claims related to flooding, 2007-2011. Source: CNT, *The Prevalence and Cost of Urban Flooding.*
2. Source: Spatial Analysis Laboratory, University of Vermont *High-Resolution Land Cover, Cook County, 2010.* The Chicago Regional Trees Initiative reports the Chicago average for tree canopy coverage is 19%; the regional goal is 22% tree canopy coverage by 2050.
3. The average land surface temperature, as measured on 7/1/14. Source: USGS/CMAP, *Land Surface Temperature Estimates, July 21, 2014.*
4. Walkscore is based on the proximity of the transit station to amenities, such as shops and libraries. The score is relative to non-urban communities, and may not fully reflect community conditions. (Source: walkscore.com)
5. The average emissions per household in the eHub, as calculated from average vehicle miles travelled (VMT). Source: CNT, *H+T Index.*
6. The table indicates "Yes" if any part of the eHub exceeded the National Ambient Air Quality Standards (NAAQS) on 3 or more days in 2012. Source: National Environmental Public Health Tracking Network.
7. Brownfields are properties whose development is complicated by known or potential contamination. This database includes only those properties reported to USEPA voluntarily or to fulfil grant requirements; many brownfields are not reported. Source: USEPA, 2018.

[75] *Communication with Active Transportation Alliance (J. Gerasimenko, 8/8/8).*

COMMUNITY ASSETS

Logan Square has several community assets and initiatives that could support an Ecodistrict (Map 4G, Map 4H).

- **Stakeholders and Social Networks:** Engaged stakeholders include LUCHA, Logan Square Neighborhood Association and its several member organizations, Chicago United for Equity, Active Transportation Alliance, the Chicago Community Trust, and Passive House Institute US. Social networks include three co-working spaces.
- **Institutions:** Institutional assets include the local school system, religious congregations, and a public library.
- **Food and Health:** Grocery stores, corner stores, and health clinics are within the corridor.
- **Buildings:** Building assets include the historic landmark district along Logan Boulevard, Kedzie Boulevard, and Humboldt Boulevard; and three landmark buildings (Vassar Swiss Building, Kimball Trust Building, and John Rath House).
- **Transportation:** Transportation assets include the CTA blue line and bus lines, one bike share station, and eleven car share stations. A streetscaping project is planned for Milwaukee Avenue, between the Belmont and Logan Square CTA stations; Chicago United for Equity (CUE) and Logan Square Neighborhood Association (LSNA) are conducting a Racial Equity Impact Assessment of the project. The proposed Milwaukee Avenue streetscape does not currently include stormwater infiltration benefits.
- **Open Space:** Open space assets include the boulevards, scattered smaller parks, a network of community gardens, and the 606 multi-use trail and park south located to the south of the eHub.

COMMUNITY-LED STRATEGIES

Stakeholders identified government investment as a mechanism to preserve affordability. Stakeholders expressed that targeted outreach should be conducted for underrepresented groups, existing networks should be engaged, and the learning process should be a two-way street. Outreach efforts should help raise awareness of sustainable building practices, thereby allowing residents to make and support sustainable improvements in the community.

Stakeholders identified ongoing and proposed community-led projects and programs that align with Ecodistrict priorities:

- There is interest in pursuing a scattered-site community land trust.
- Ongoing programs include pursuing Enterprise Green Communities certification for LUCHA's housing developments, and wellness programs such as residential gardening and biking.
- The Logan Square Community Table is actively pursuing an Ecodistrict formation process for the Logan Square and Humboldt Park neighborhoods, extending beyond the Elevated Chicago eHub. The proposed geography extends from the Logan Square blue line stop at the northeast, south to the 606 multi-use trail, and west through the Micro Market Recovery Program zone. The Humboldt Park Ecodistrict proposed geography is between Talman and Rockwell, along Hirsch, outside of the eHub. Proposed strategies include:
    - Rooftop and community solar, to create off-grid housing;
    - Achieving zero carbon through waste reduction, specifically composting and solar trash receptacles; and
    - Ensuring safe and sustainable water by eliminating lead water services lines, reusing water, and mitigating stormwater flooding.

Logan Square

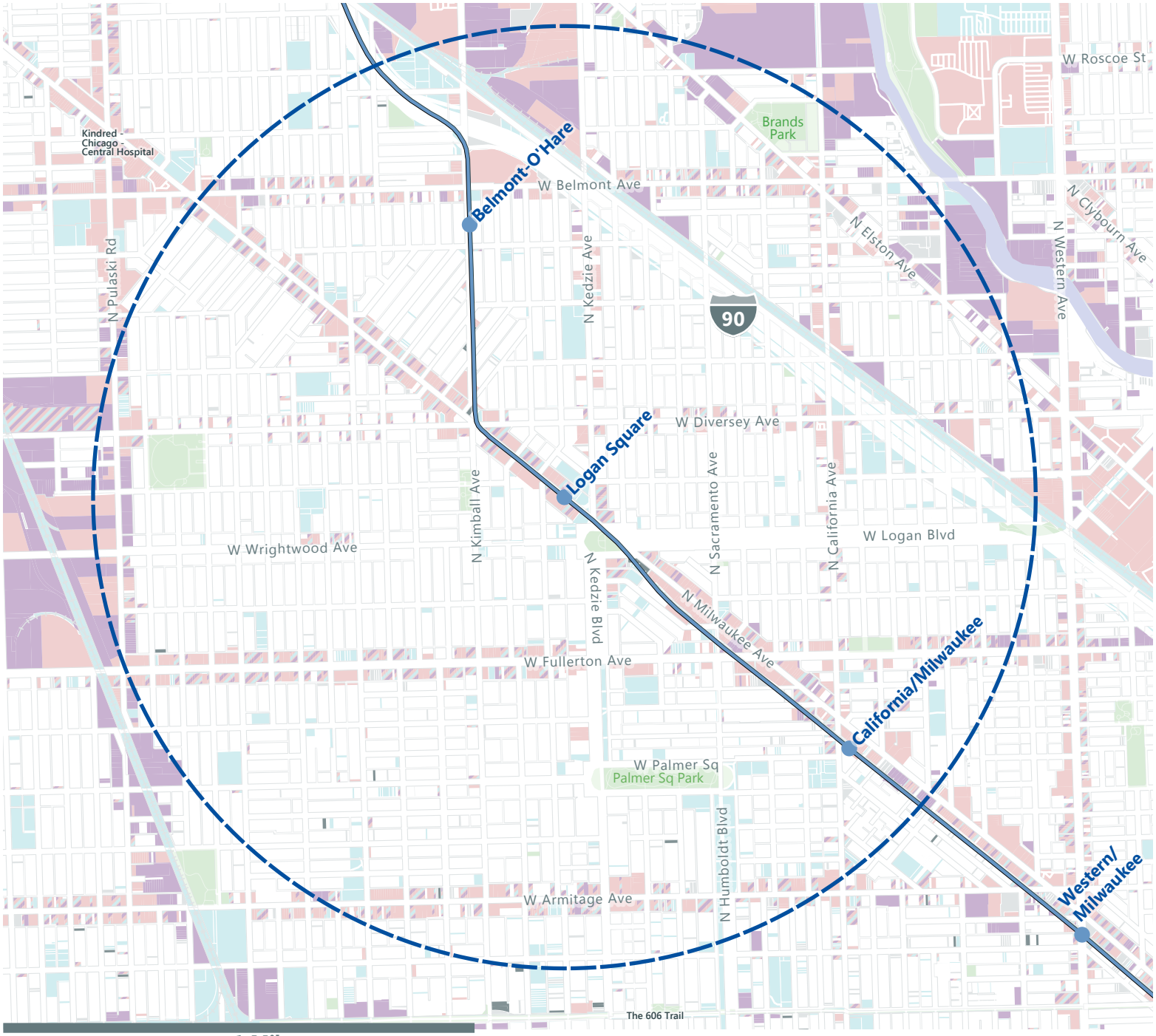
Sites Susceptible To Change Based On

Land Use/Ownership

Asset Map

Vacant Land Inventory - Logan Square eHub

Cook County Land Bank-Owned	ACRES 0	0%	PARCELS 0	0%
City of Chicago-Owned	ACRES 1	0%	PARCELS 14	0%
Privately-Owned Vacant Land	ACRES 24	2%	PARCELS 214	2%
Total	ACRES 25	2%	PARCELS 228	2%



Elevated Chicago eHub Mile Buffer

Vacant City of Chicago-Owned

Cook County Land Bank-Controlled [1]

Land Use

- Commercial
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- Multiple Uses
- Privately-Owned Vacant
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- Parks

September 10, 2018

Sources:
City of Chicago
Cook County
Esri
SB Friedman

Map 4A

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Enterprise

Logan Square

Development Activity

Asset Map

Market Conditions - Logan Square eHub

New/Proposed Development (Since 2013)

Multifamily	PROJECTS	2	UNITS	95
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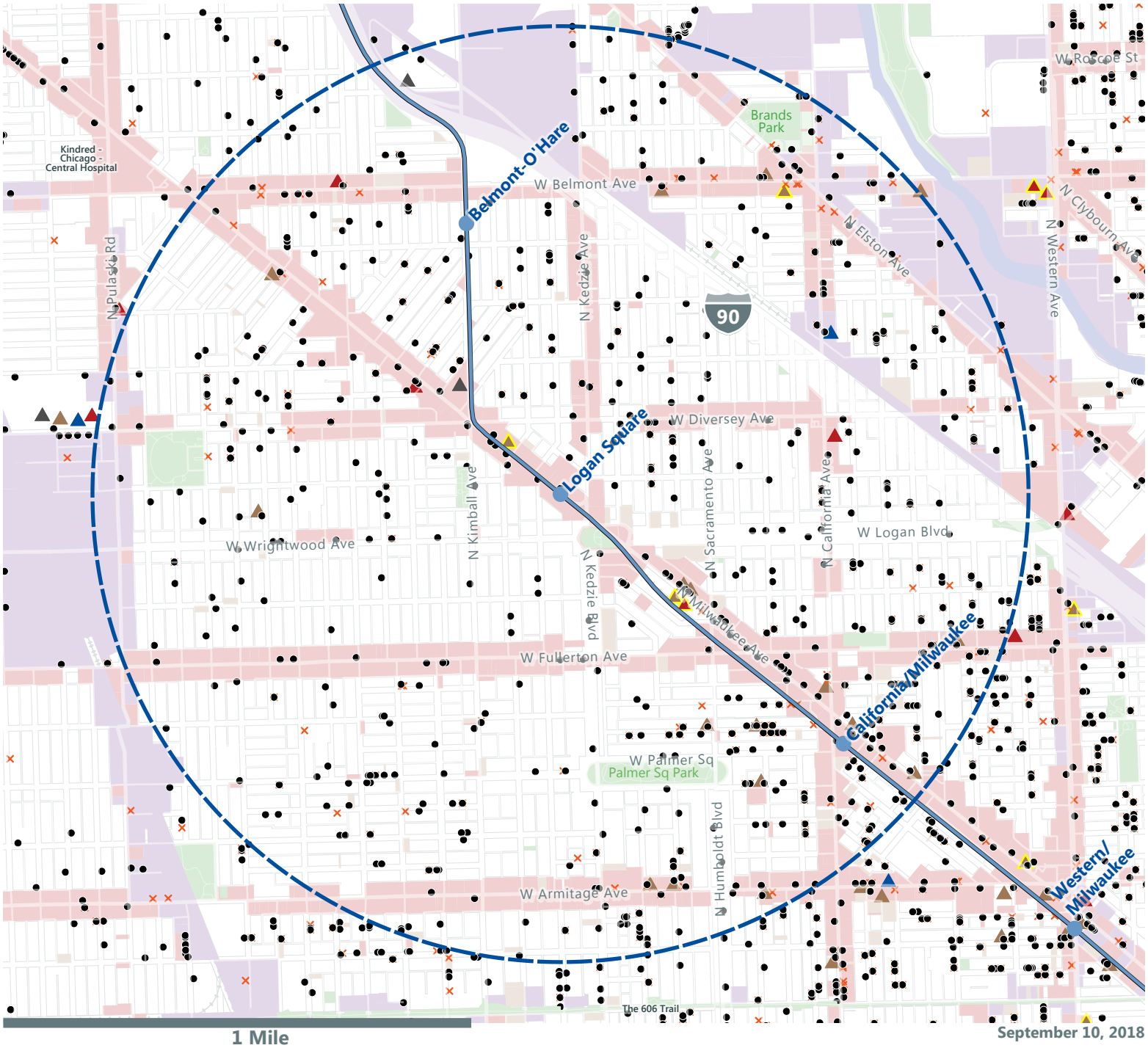


September 10, 2018

Selected Zoning Districts
- Commercial
- Industrial
- Multifamily (Medium to High Density)

New/Proposed Development Since 2013
- Retail
- Multi-Family
- Office
- Specialty

- Proposed Development

Permits
- Demolition
- New Construction/Renovation > $100,000

- Elevated Chicago eHub Mile Buffer
- Parks

Sources:
City of Chicago
Cook County
CoStar
Esri
SB Friedman

SBFRIEDMAN

Enterprise

Map 4B

Logan Square

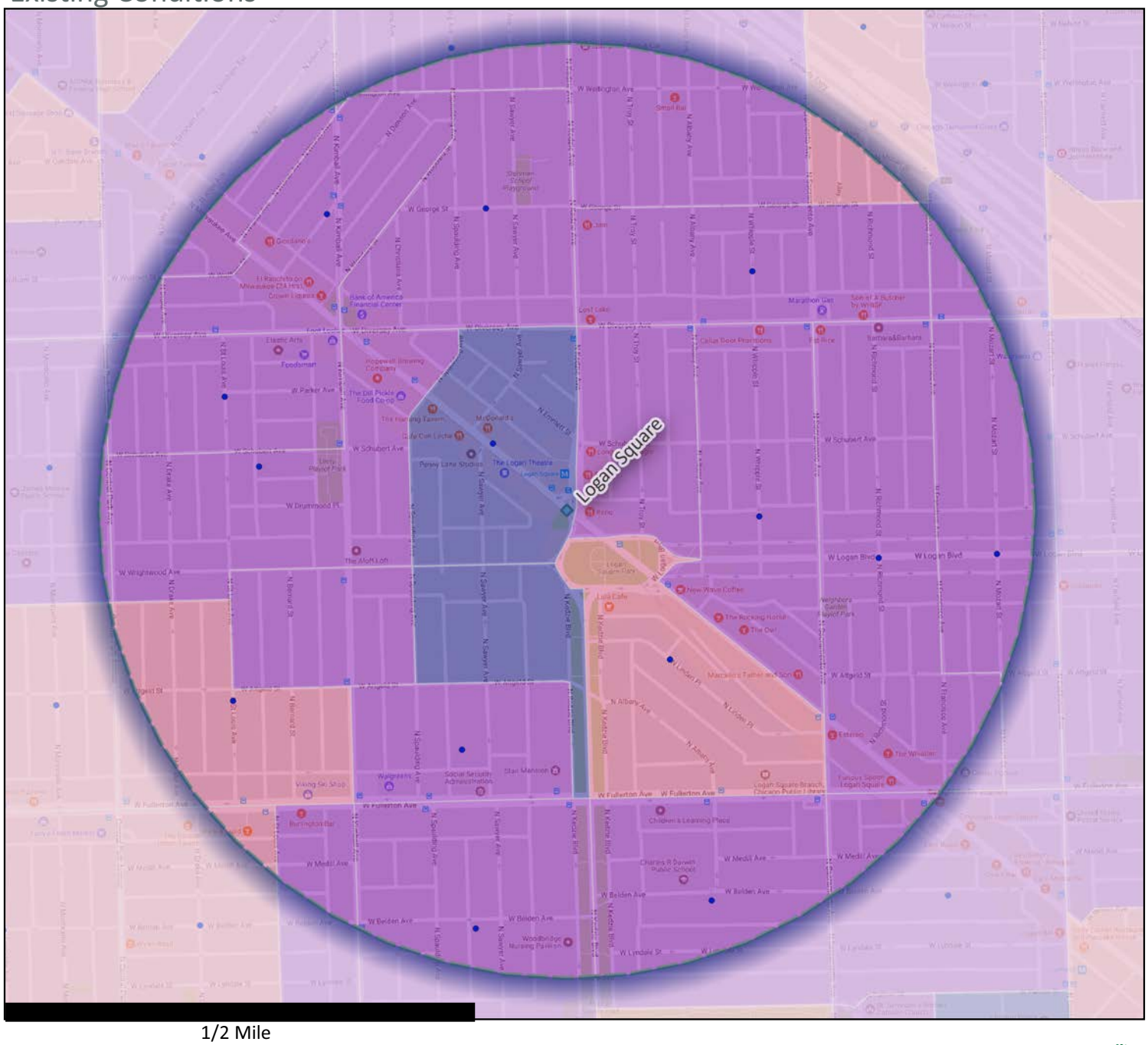
311 Flooding Calls: January 2016-June 2018

Basement Flood Complaints and Renters

Existing Conditions

Summary of Type of Flooding call within 1/2 Buffer

Station	Alley	Viaduct	Public Space	Basement	Street	Total
Logan Square	7	0	13	31	165	216



1/2 Mile

Percent Rental Households by Census Block Group

- Less than 25%
- 25% - 40%
- 40% - 60%
- 60% - 80%
- 80% - 100%

Number of Basement Flooding Calls per 1,000 Households in Block Group

- Less than 15
- 15 - 30
- 30 - 45
- 45 - 60
- 60 or More

CNT

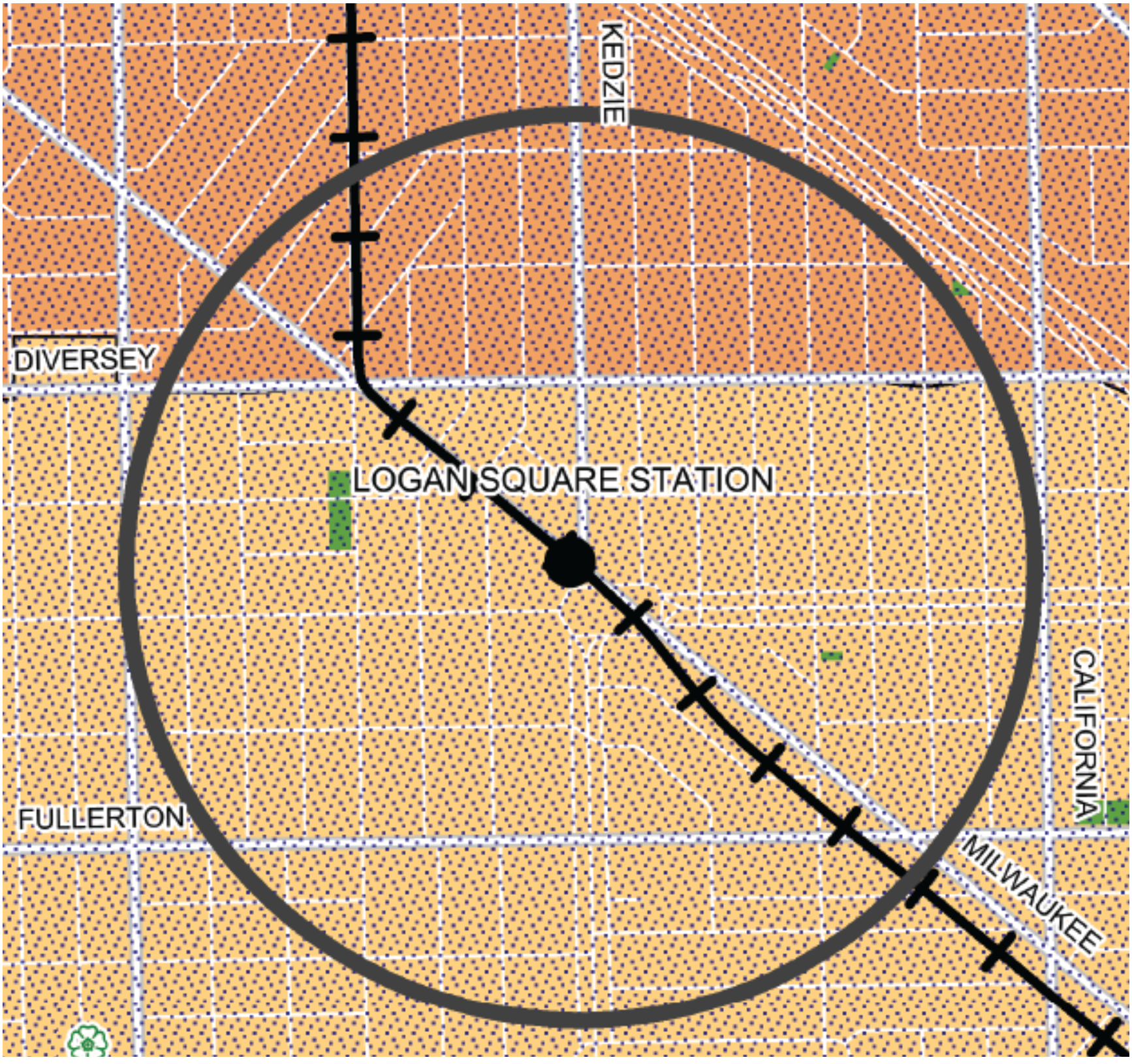
August 20, 2018

Source:
U.S. Census ACS 2016
City of Chicago 311 Call Center

Map 4C

Logan Square Blue Line eHub Brownfields, Heat-Related ER Visits by Zip Code, & NAAQS Exceedances by Census Tract

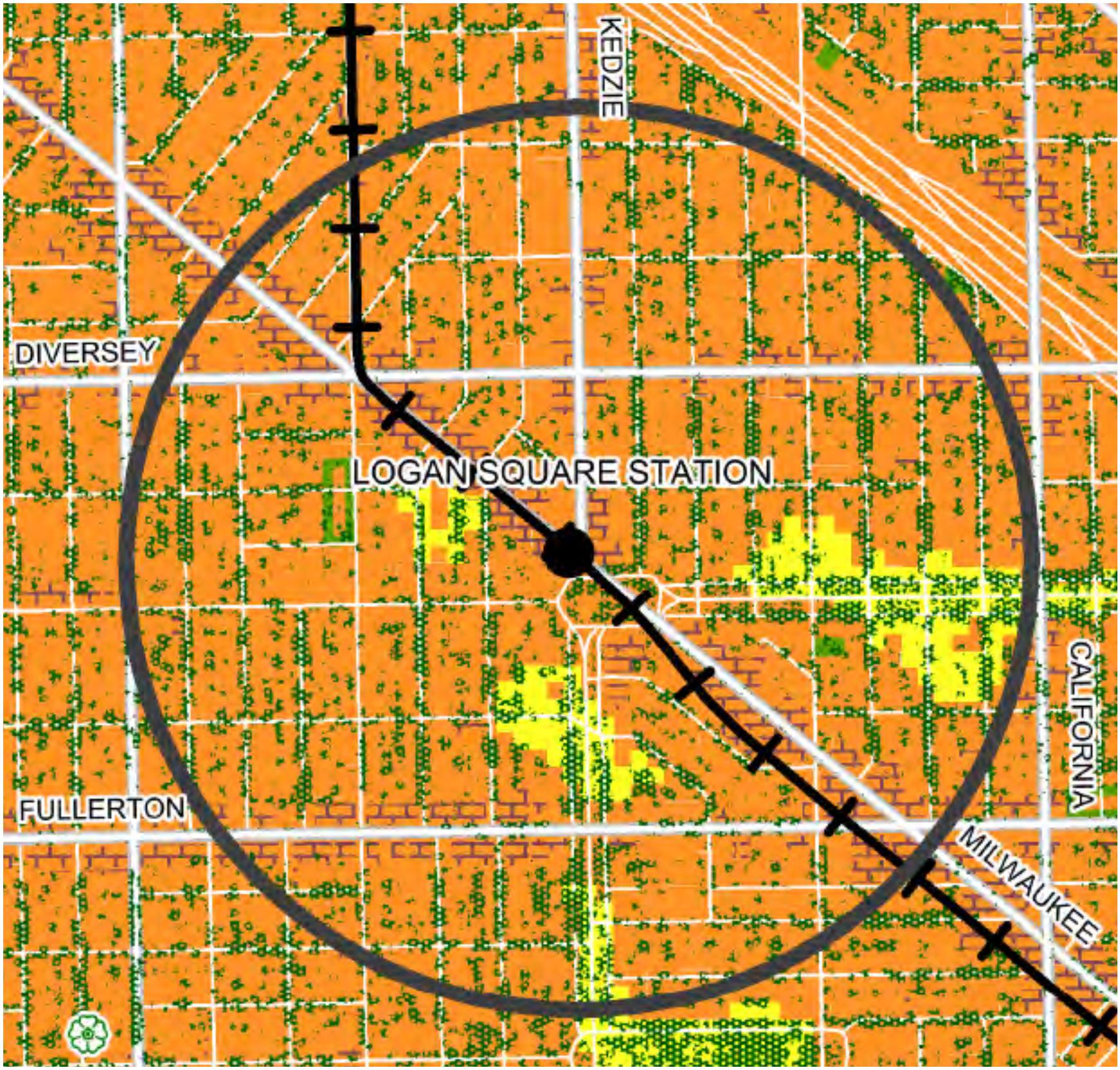
Variables include Heat-Related ER visits and Air Quality Standards Exceeded



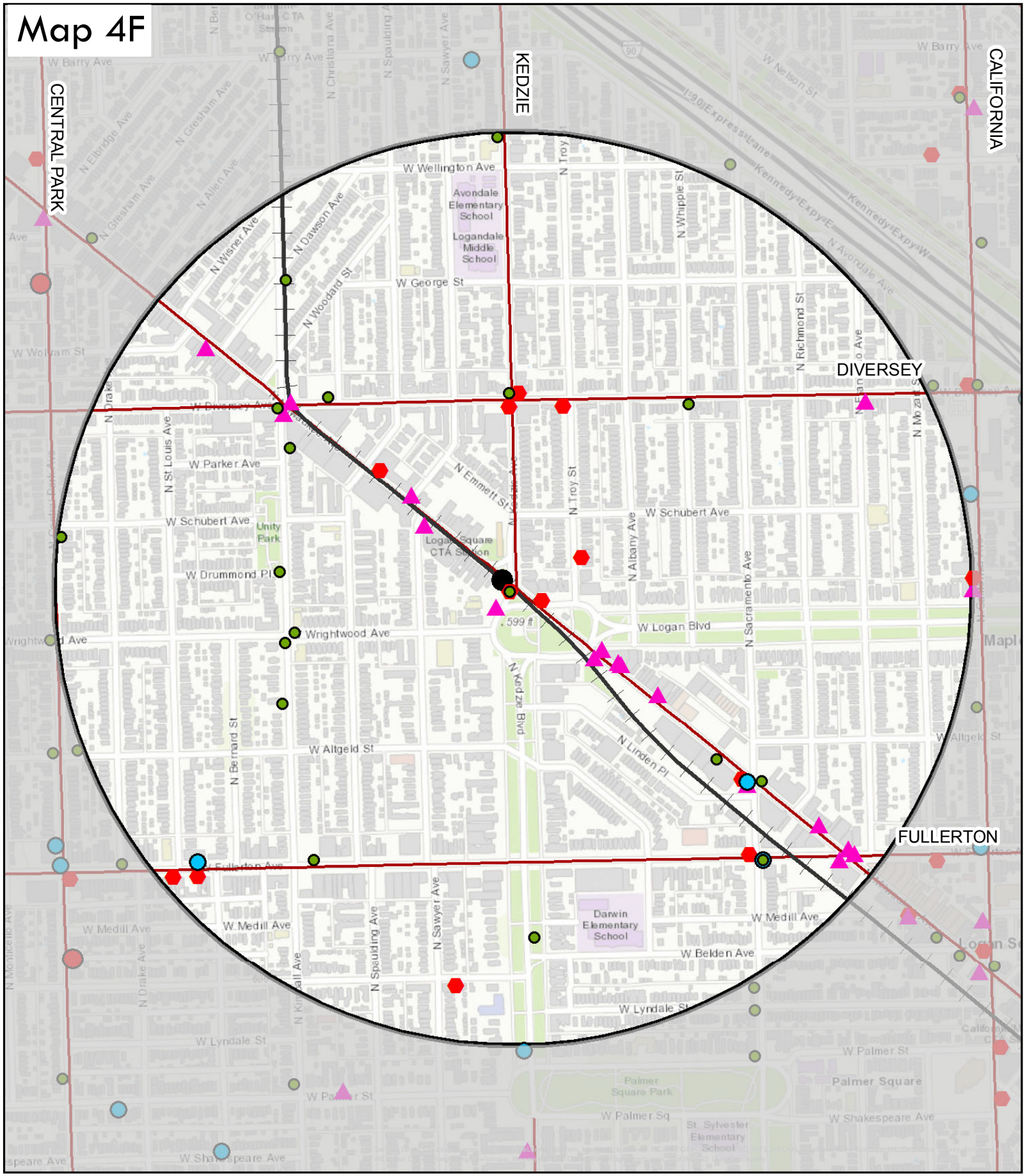
Map 4D

Logan Square eHub Land Surface Temperature, Tree Canopy + Land Use

Data includes Land Surface Temperature, Commercial or Industrial Land Use, and Tree Canopy Cover



Map 4E



Total Injuries - Vehicle Crashes, 2017

- 1
- 2 - 3
- 4 - 11

Non Vehicle Crashes, 2017

- Bicycle Crash
- Pedestrian Crash
- 1/2 Mile eHub
- CTA Line

382 Vehicle Crashes, 0 Fatalities, 25 Injured
18 Bike Crashes, 0 Fatalities, 13 Injured
12 Pedestrian Crashes, 0 Fatalities, 10 Injured

CNT

N

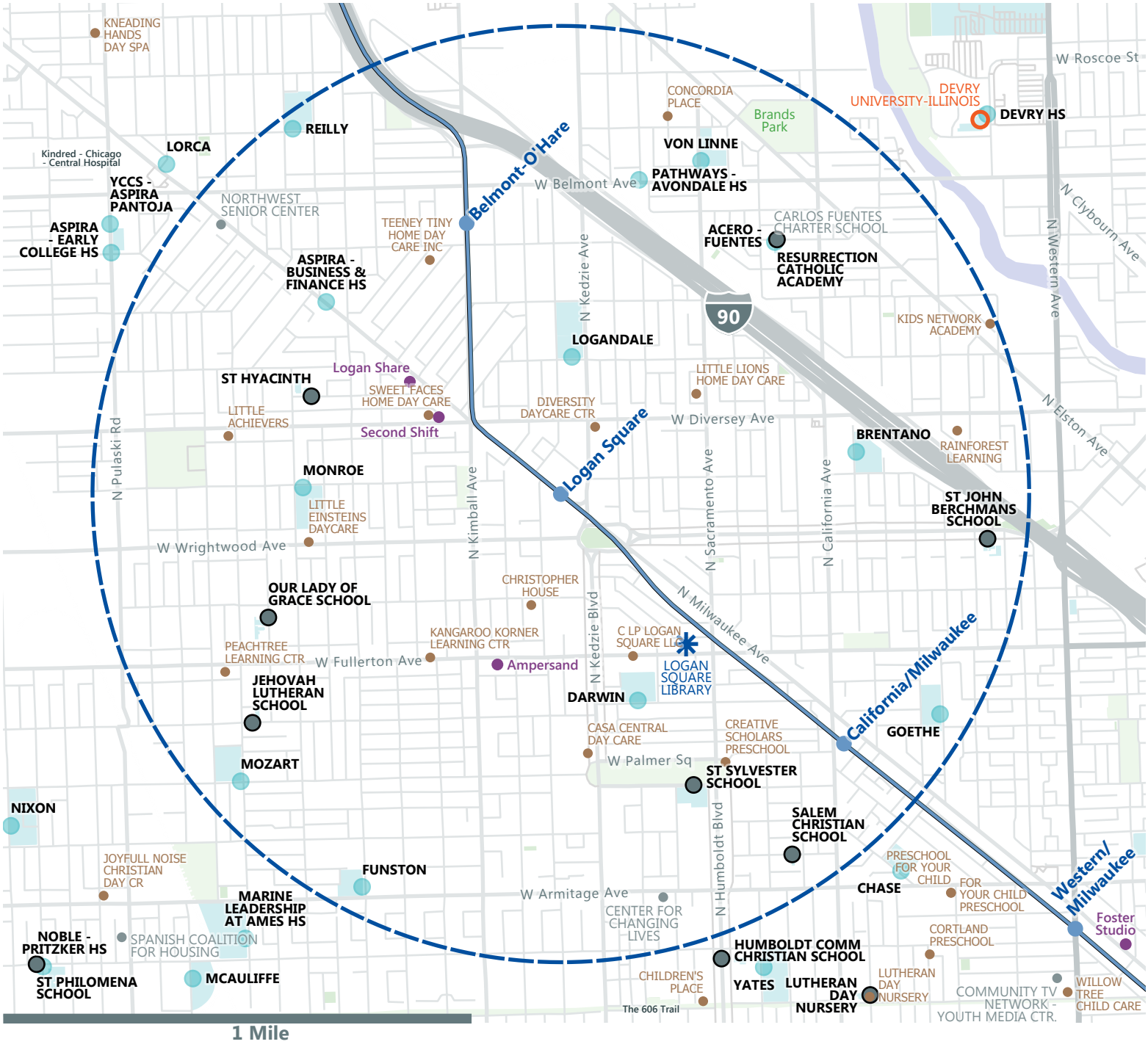
0 0.03 0.06 0.12 0.18 0.24 Miles

Data Source: City of Chicago Crash Data, 2017

Logan Square

Education + Workforce

Asset Map



- Elevated Chicago eHub Mile Buffer
- Connect Chicago Location
- Shared Workspace
- City of Chicago Libraries
- Childcare Services
- Private School
- Public School
- School Grounds
- Postsecondary Institution
- Park

September 10, 2018

Sources:
Chicago Inno
City of Chicago
Cook County
Esri
National Center For Education Statistics
SB Friedman

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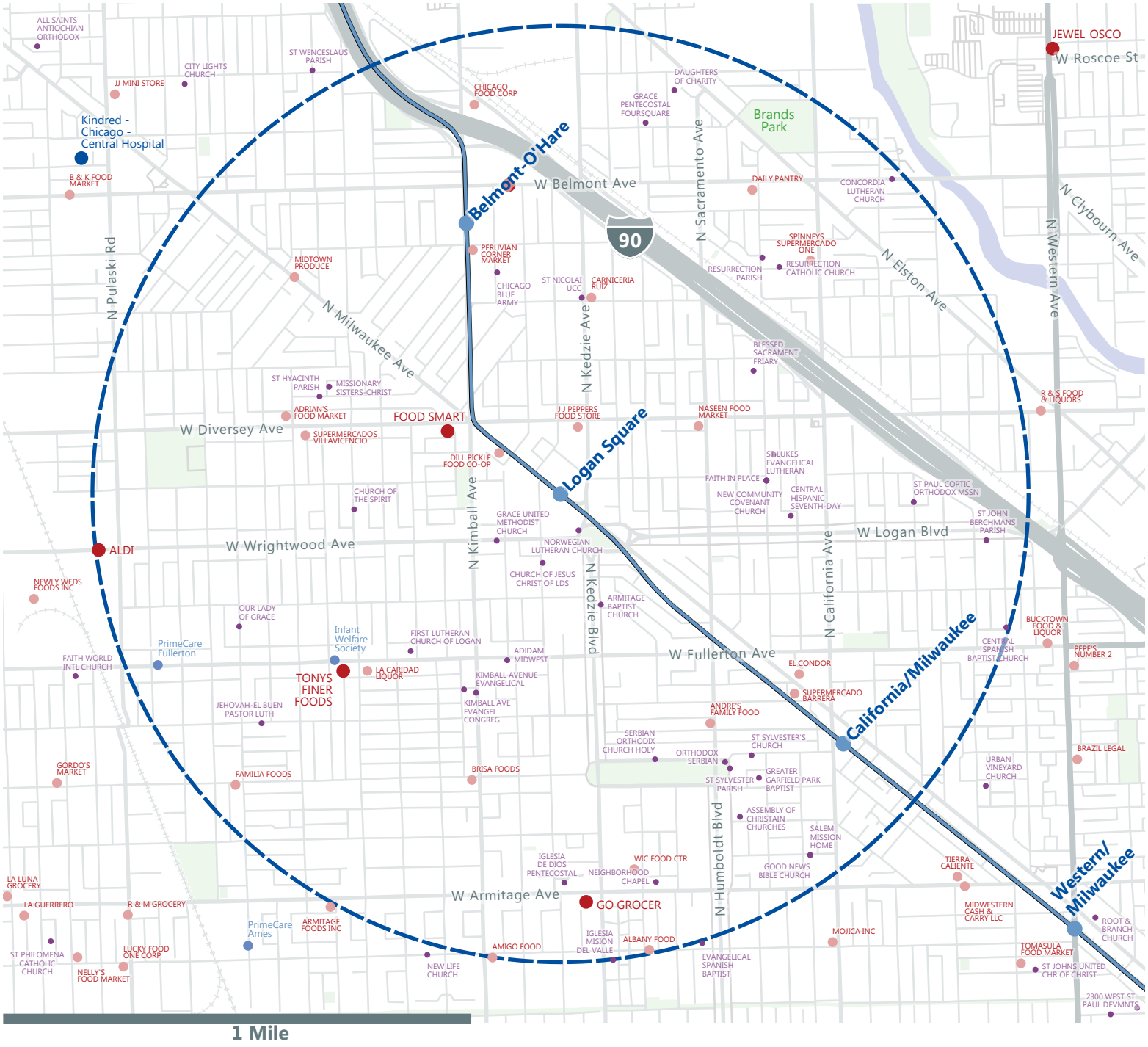
Enterprise

Map 4G

Other Community Anchors

Asset Map



Map 4H

September 10, 2018

- Elevated Chicago eHub Mile Buffer
- Hospital
- Chicago Primary Care Community Health Clinic
- Religious Institution [1]
- Grocery Store [2]
- Corner Store [2]

Sources:
American Hospital Directory
City of Chicago
Cook County
Esri
SB Friedman

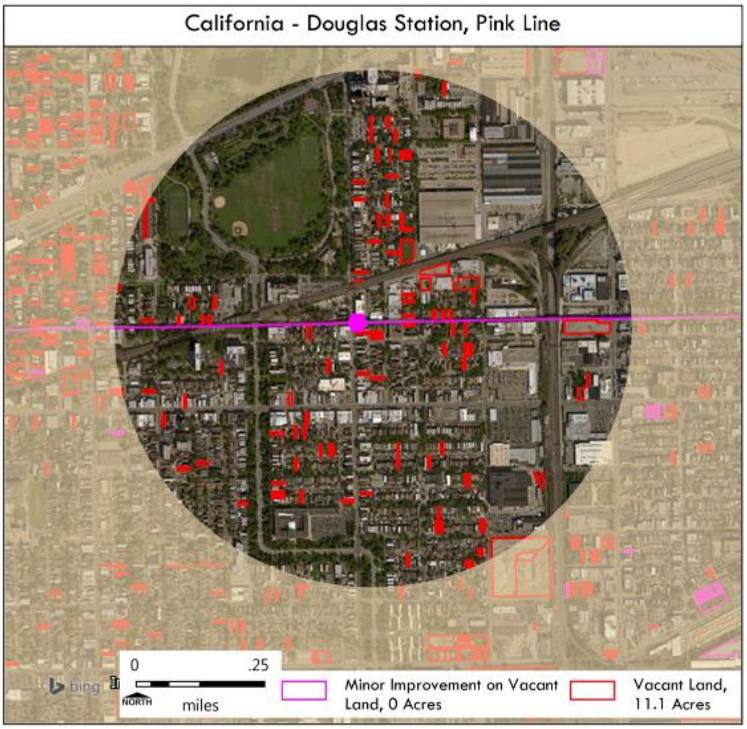
[1] Data from Info USA via Esri Business Analyst. Records with the NAICs designation "Religious Organizations" were included.
[2] Data from InfoUSA via Esri Business Analyst. Establishments with the NAICs designation "Supermarkets and Other Grocery (except Convenience) Stores", were classified as either a (1)Grocery Store" or (2)Corner Store. Establishments with recorded sales greater than or equal to $5 million were classified as Grocery with all others classified as Corner. Reclassifications and omissions were made selectively for accuracy and clarity.

COMMUNITY PROFILE: CALIFORNIA PINK LINE

This eHub is located within a predominantly Hispanic community on Chicago's southwest side. The community's vision is a walkable, pleasant area, where local businesses and residents work cooperatively on projects that benefit the community. However, residents fear sustainable development will trigger neighborhood gentrification.

The Pink Line-California Station Community Table Action Plan ("Community Table Action Plan") noted that large development projects do not engage residents at the outset to inform the decision-making process. Furthermore, negative health impacts from manufacturing and illegal dumping are often viewed as a personal responsibility. As a result, these issues do not drive policy decisions. The Community Table Action Plan also stated the community's rich cultural history is underrepresented.

- Community Area(s): North Lawndale; South Lawndale; Lower West Side
- Neighborhood Name(s): Little Village; Marshall Square
- eHub Station: California Pink Line (2011 South California)



MAPS

Series 5: California Pink Line Maps

- 5A. Sites Susceptible to Change Based on Land Use/Ownership (S.B. Friedman, 2018)
- 5B. Development Activity Asset Map (S.B. Friedman, 2018)
- 5C.1 California eHub Tree Canopy, Open Space, & Flood Insurance Claims by Zip Code
- 5C.2 Basement Flood Complaints and Renters (CNT, 2018)
- 5D. California eHub Brownfields, Heat-Related ER Visits by Zip Code, & NAAQS Exceedances by Census Tract
- 5E. California eHub Land Surface Temperature, Tree Canopy, & Land Use
- 5F. Traffic Crashes, Injuries, & Fatalities (CNT, 2017)
- 5G. Education & Workforce (S.B. Friedman, 2018)
- 5H. Other Community Anchors (S.B. Friedman, 2018)

AFFORDABILITY AND COMMUNITY OWNERSHIP

Income inequality, lack of affordable housing, and gentrification pressures are among the top priorities identified by the community. According to the Community Table Action Plan, development pressure continues to grow on the north, south, and east sides of the Pink Line, and neighborhood displacement seems inevitable for residents.

This area is among the most impacted by economic hardship and limited opportunity; nearly 40% of residents are under the poverty line (Map 1D, Map 1E).

Between 2000 and 2014, the median rent in the corridor has risen almost 70% (Table 7). This is a cost-burdened community: low-income households spend a third of their income on housing, and another 30% on transportation.

The housing market is characterized as having older homes with high foreclosure but moderate vacancy rates, with low/moderate income residents (Map 1F). Housing market conditions suggest that, relative to other neighborhoods, residents are moderately vulnerable to displacement, especially on the east side of the eHub (Map 1G).

Only 14 acres of vacant land exists in the area, nearly all of which is privately held (Map 5A). Some development activity is occurring in the eHub, mainly in the southern portion (Map 5B).

Table 7. Affordability in the California Pink Line eHub

Median Income[1]	$24,566		
Percent in Poverty[2]	40%		
Housing Cost Burden[3]	33%		
Housing & Transportation Cost Burden[4]	30%		
	2000	**2009**	**2014**[5]
Percent Rental Households	75%	73%	71%
Median Rent	$451	$678	$753

1. Average Median Income (AMI, 2014) of the households within the eHub radius. Source: U.S. Census, *American Community Survey*.
2. Percentage of population under the poverty line (2014). Source: U.S. Census, *American Community Survey*.
3. The percentage of income spent on housing, for households earning 60% or less of the AMI (i.e., low-income households). Source: U.S. Census, *American Community Survey*.
4. The percentage of income spent on housing and transportation combined, for households earning less than 60% of the AMI. Source: CNT, *H+T Index*.
5. By comparison, the median gross rent for the City of Chicago, for 2012 – 2016, is $987. Source: U.S. Census Bureau, *QuickFacts Chicago, Illinois*.

ENVIRONMENT AND HEALTH

The Elevated Chicago Community Table Action Plan lists health disparities among the community's top priorities. Residents are impacted by flooding, heat stress, air pollution, traffic crashes, and limited walkability, among other health and safety issues.

The western part of the eHub is one of the most flooding impacted areas in Chicago (Map 1O, Map 5C.1, 5C.2). Over $800,000 in flood damages were reported in a five-year period. During the site visit, some homes were observed to be located below the grade of the adjacent sidewalk, which increases the likelihood of floodwater entering under exterior doors. Flooding is expected to increase in the future, due to highly impervious land use, infrastructure conditions, and climate change (Map 1M, Table 8).

The western part of the eHub has above average rates of heat-related emergency room visits (Map 5D), and residents are vulnerable to extreme heat (Map 1I). Large urban heat island "hot spots" are present at rooftops and parking lots of industrial and institutional sites, such as Lagunitas Brewing, CineSpace Chicago, and Saucedo School. However, Douglas Park and other tree canopy provides some relief from urban heat island (Map 5E).

Overall, the eHub has approximately average or below-average rates of asthma-related emergency room visits by youth (Map 1L). However, air monitoring data indicates elevated levels of fine particulate matter (PM 2.5) and ozone pollutants are present in the northeast part of the eHub. Potential air pollution sources include vehicle emissions from street traffic, freight trucks, and freight trains; industrial and manufacturing facilities; and onsite power generation or waste handling activities at large institutional buildings. The Little Village Industrial Corridor planning process, located southwest of the eHub (31st to I-55, Pulaski to Kedzie), has identified the reduction of trucking diesel emissions as a priority for the broader community.

Less than a quarter of residents commute by transit – the lowest of the four Elevated Chicago community areas – and the area has relatively high greenhouse gas emissions from driving. Some residents cycle to local jobs in the industrial areas.[76] In 2017, five bike crashes and seven pedestrian crashes were reported, all on Cermak Road or California Avenue (Map 5F). The North Lawndale community area is one of the most traffic crash-affected communities in Chicago.[77]

In addition, the eHub is physically segmented by a rail road embankment and large industrial and institutional sites, which discourage or prevent cycling and walking. These physical barriers result in limited walkability, particularly in the northern part. Esperanza Health Center and Consortium to Lower Obesity in Chicago Children (CLOCC) are conducting a community-led walkability study. The results were not available as of the date of report publication.

A limited review of available environmental database information identified several former or current manufacturing and transportation facilities which release or handle pollutants.

Nearly a third of young residents are obese, and up to 10% have elevated blood lead levels (Table 8). Overall, life expectancy for residents in some parts of eHub are among the lowest in the city (Map 1H).

[76] *Communication with Active Transportation Alliance (J. Gerasimenko, 8/8/8).*

[77] *Vision Zero Chicago. (June 2017). Action Plan 2017-2019.*

Table 8. Climate & Health in the California Pink Line eHub

Urban Flooding[1]	
Impervious Surfaces	61%
Est. Cost of Flood Damage to Homes	$863,628
Extreme Heat	
Tree Canopy[2] Coverage	18%
Land Surface Temperature[3]	89 degrees
Air Pollution	
Commute to Work by Transit	22%
Walk Score[4]	Very Walkable (84/100)
Avg GHG Emissions from Driving[5]	5.24 tons
Air Pollution Limits Exceeded[6]	Yes
Land & Water Pollution	
Brownfield(s) Present[7]	No
Health & Safety	
Children under 3 with Elevated Blood Lead Levels (EBLL)	4.1 - 10.1%
Childhood Obesity	28-32%
Firearm-Related Homicide	5.8 - 10.5 per 100,000

Notes:

1. Reported residential insurance claims related to flooding, 2007-2011. Source: CNT, *The Prevalence and Cost of Urban Flooding*.
2. Source: Spatial Analysis Laboratory, University of Vermont *High-Resolution Land Cover, Cook County, 2010.* The Chicago Regional Trees Initiative reports the Chicago average for tree canopy coverage is 19%; the regional goal is 22% tree canopy coverage by 2050.
3. The average land surface temperature, as measured on 7/1/14. Source: USGS/CMAP, *Land Surface Temperature Estimates, July 21, 2014.*
4. Walkscore is based on the proximity of the transit station to amenities, such as shops and libraries. The score is relative to non-urban communities, and may not fully reflect community conditions. (Source: walkscore.com)
5. The average emissions per household in the eHub, as calculated from average vehicle miles travelled (VMT). Source: CNT, *H+T Index.*
6. The table indicates "Yes" if any part of the eHub exceeded the National Ambient Air Quality Standards (NAAQS) on 3 or more days in 2012. Source: National Environmental Public Health Tracking Network.
7. Brownfields are properties whose development is complicated by known or potential contamination. This database includes only those properties reported to USEPA voluntarily or to fulfil grant requirements; many brownfields are not reported. Source: USEPA, 2018.

COMMUNITY ASSETS

Several community assets and initiatives that could support an Ecodistrict are already present in the corridor (Map 5G, Map 5H).

- **Stakeholders and Social Networks:** Stakeholders include Latinos Progresando, Open Center for the Arts, Esperanza Health Centers, New Covenant Development Corporation. Openlands, the Chicago Park District, and members of the Marshall Square Resource Network, including Our Lady of Tepeyac Food Pantry, Marquette Bank, Taller de José, Enlace Chicago, Boys and Girls Club of Chicago, Saint Anthony Hospital, Sinai Health System, United Way of Metropolitan Chicago, and SGA Youth and Family Services.
- **Institutions:** Institutional assets include multiple hospitals, several schools, and religious congregations.
- **Food and Health:** Grocery stores, a food pantry, and health clinics are located within the eHub.
- **Buildings:** Building assets include the Pilsen Historic District at the easternmost edge of the eHub.
- **Transportation:** Transportation infrastructure includes the CTA train station and bus routes, bike share stations, two car share stations. A pedestrian-only street is proposed for the CineSpace campus, between 14th Street and 16th Street. Vision Zero West Side, funded by a National Safety Council Grant, will create plans to address severe traffic crashes in the communities of East and West Garfield Park, North Lawndale, and the Near West Side.
- **Open Space:** Open space assets include the 218-acre Douglas Park and the boulevard, located within and adjacent to the eHub. Community gardens and school gardens are also within the eHub.

COMMUNITY-LED STRATEGIES

Stakeholders emphasized that community ownership of space should be developed in ways that affirm identity and agency. Stakeholders identified the following community control strategies:

- Recommended land control strategies include cooperatives, land trusts, and land banks, and related policy initiatives.
- The vacant 2724 West Cermak site is proposed for redevelopment as the Latinos Progresando Community Resource Center. The proposed center would provide wellness services, small business support services, and cultural and educational opportunities
- Planning entities should provide an overview of discrete planning efforts, connecting singular projects to the whole. Planning entities should increase community engagement in existing planning efforts. Current planning efforts are mainly focused on the Chicago River and Collateral Channel south of the eHub.
- Leveraging the expertise of the Marshall Square Resource Network to understand community issues, and increase staff capacity to address these issues
- Engaging residents in visioning exercises aimed at creating an equitable community
- Developing co-created community events in partnership with community development organizations, and hiring staff from the community to create economic security
- Enhanced funding for authentic community engagement efforts

Stakeholders suggested that an Ecodistrict could develop green infrastructure underneath the CTA elevated tracks, the boulevard, and vacant land around the CTA station and park.

California-Douglas

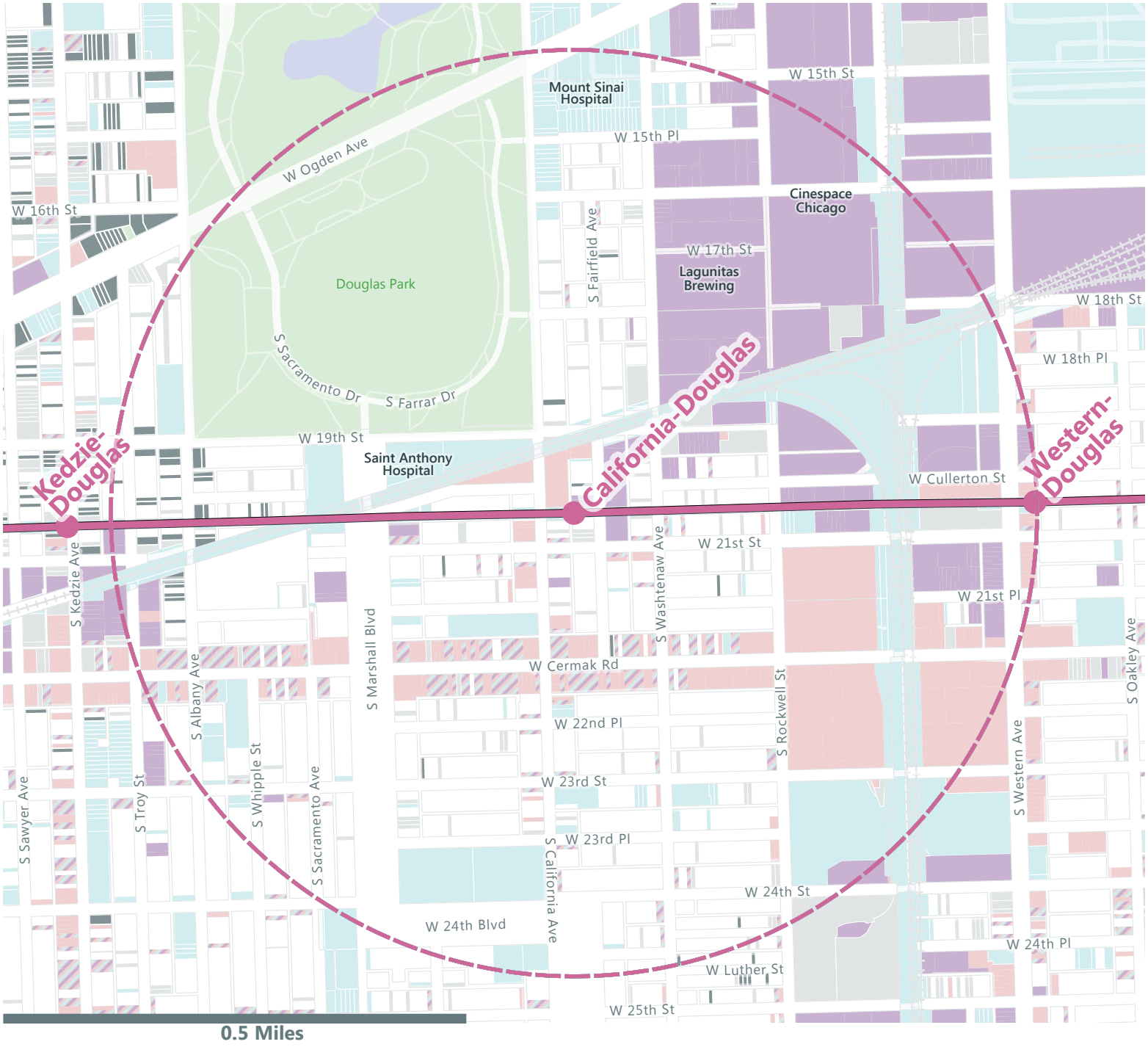
Sites Susceptible To Change Based On

Land Use/Ownership

Asset Map

Vacant Land Inventory - California-Douglas eHub

Cook County Land Bank-Controlled	ACRES 0	0%	PARCELS 0	0%
City of Chicago-Owned	ACRES 3	1%	PARCELS 37	2%
Privately-Owned Vacant Land	ACRES 11	3%	PARCELS 100	5%
Total	ACRES 14	4%	PARCELS 137	7%



Elevated Chicago eHub 1/2 Mile Buffer

Vacant City of Chicago-Owned

Land Use

- Commercial
- Exempt / Not For Profit
- Industrial
- Multiple Uses
- Privately-Owned Vacant
- Residential
- Parks

Map 5A

[1] Primarily properties for which Cook County Land Bank has acquired the tax certificate and has the option of taking the property to deed; also includes properties-owned by the Land Bank.

September 10, 2018

Sources:
City of Chicago
Cook County
Esri
SB Friedman

SBFRIEDMAN

Enterprise

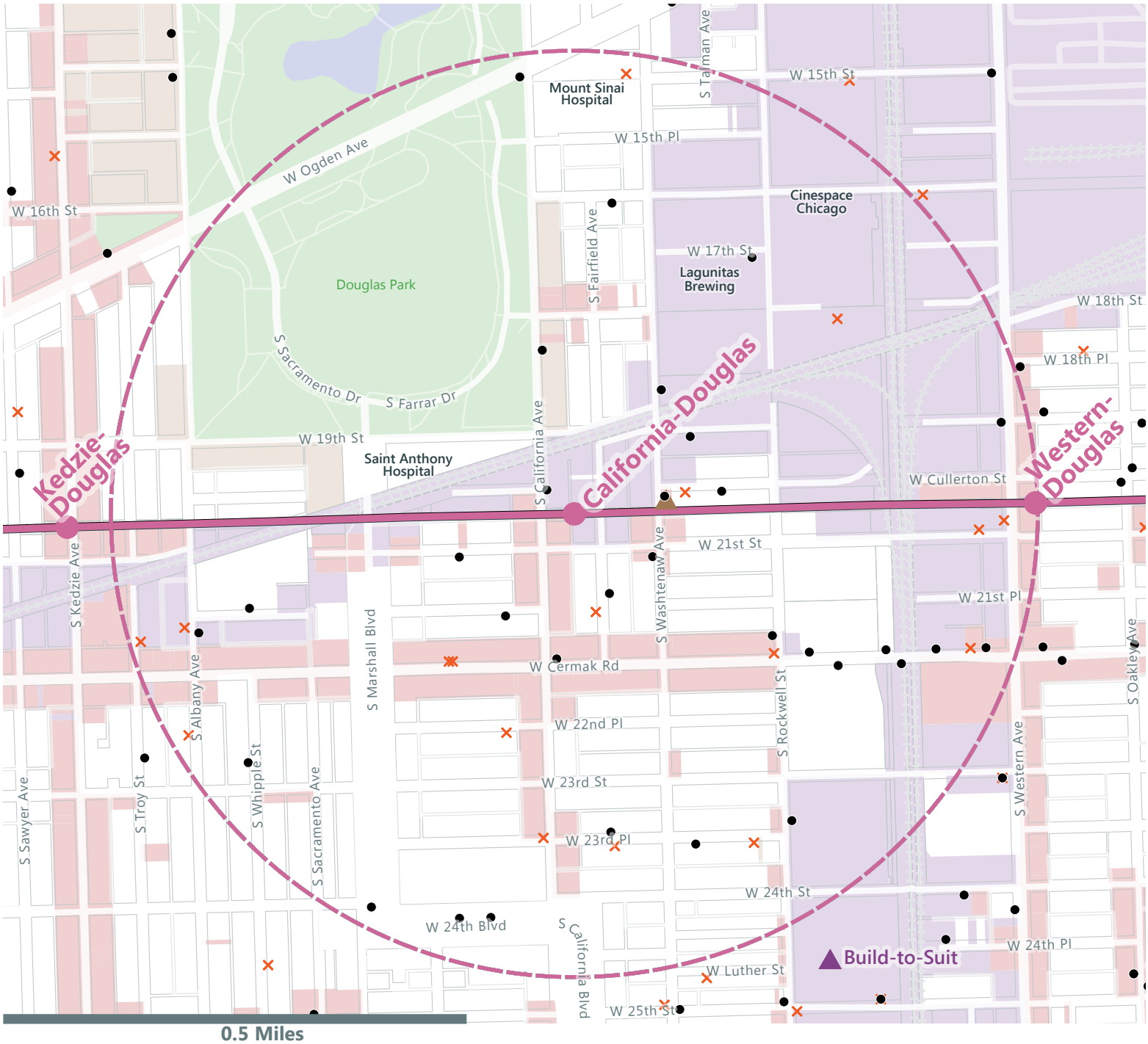
California-Douglas

Development Activity

Asset Map

Market Conditions - California-Douglas eHub
New/Proposed Development (Since 2013)

Multifamily	PROJECTS	1	UNITS	5
Retail	PROJECTS	0	SF	0
Industrial/Flex	PROJECTS	0	SF	0
Office	PROJECTS	0	SF	0



Selected Zoning Districts

- Commercial
- Industrial
- Multifamily (Medium to High Density)

New/Proposed Development Since 2013

- Industrial/Flex
- Multi-Family
- Proposed Development

Permits

- Demolition
- New Construction/Renovation > $100,000

Elevated Chicago eHub 1/2 Mile Buffer

Parks

September 10, 2018

Sources:
City of Chicago
Cook County
CoStar
Esri
SB Friedman

SBFRIEDMAN

Enterprise

Map 5B

California eHub Tree Canopy, Open Space + Flood Insurance Claims by Zip Code

Data includes Number of Residential Flooding Claims by Zip Code, Tree Canopy Cover, and Percent Impervious Surface Area

Map 5C.1

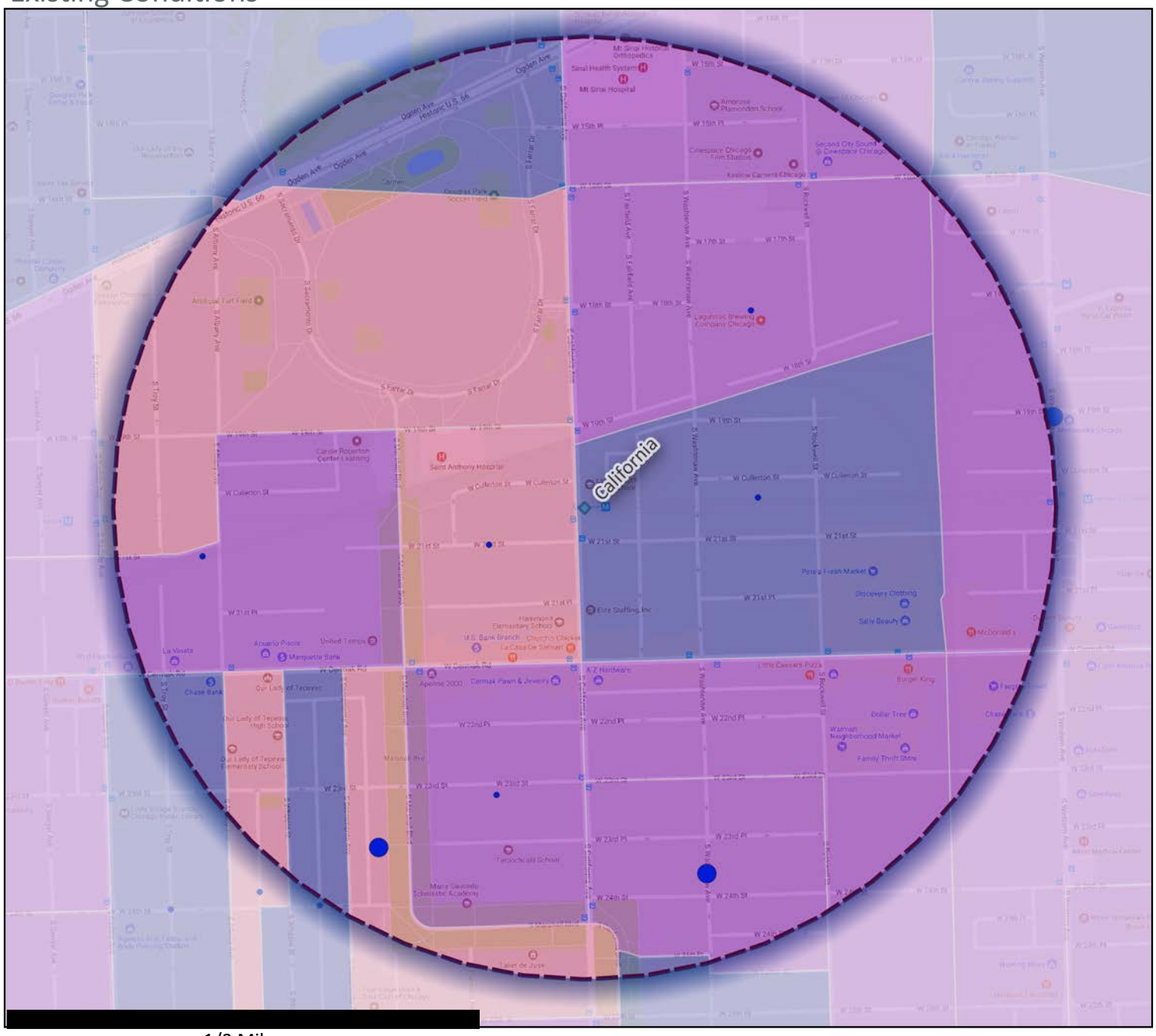
California-Douglas

311 Flooding Calls: January 2016-June 2018

Basement Flood Complaints and Renters

Existing Conditions

Summary of Type of Flooding call within 1/2 Buffer						
Station	Alley	Viaduct	Public Space	Basement	Street	Total
California	2	5	3	32	48	90



1/2 Mile

Percent Rental Households by Census Block Group

- Less than 25%
- 25% - 40%
- 40% - 60%
- 60% - 80%
- 80% - 100%

Number of Basement Flooding Calls per 1,000 Households in Block Group

- Less than 15
- 15 - 30
- 30 - 45
- 45 - 60
- 60 or More

CNT

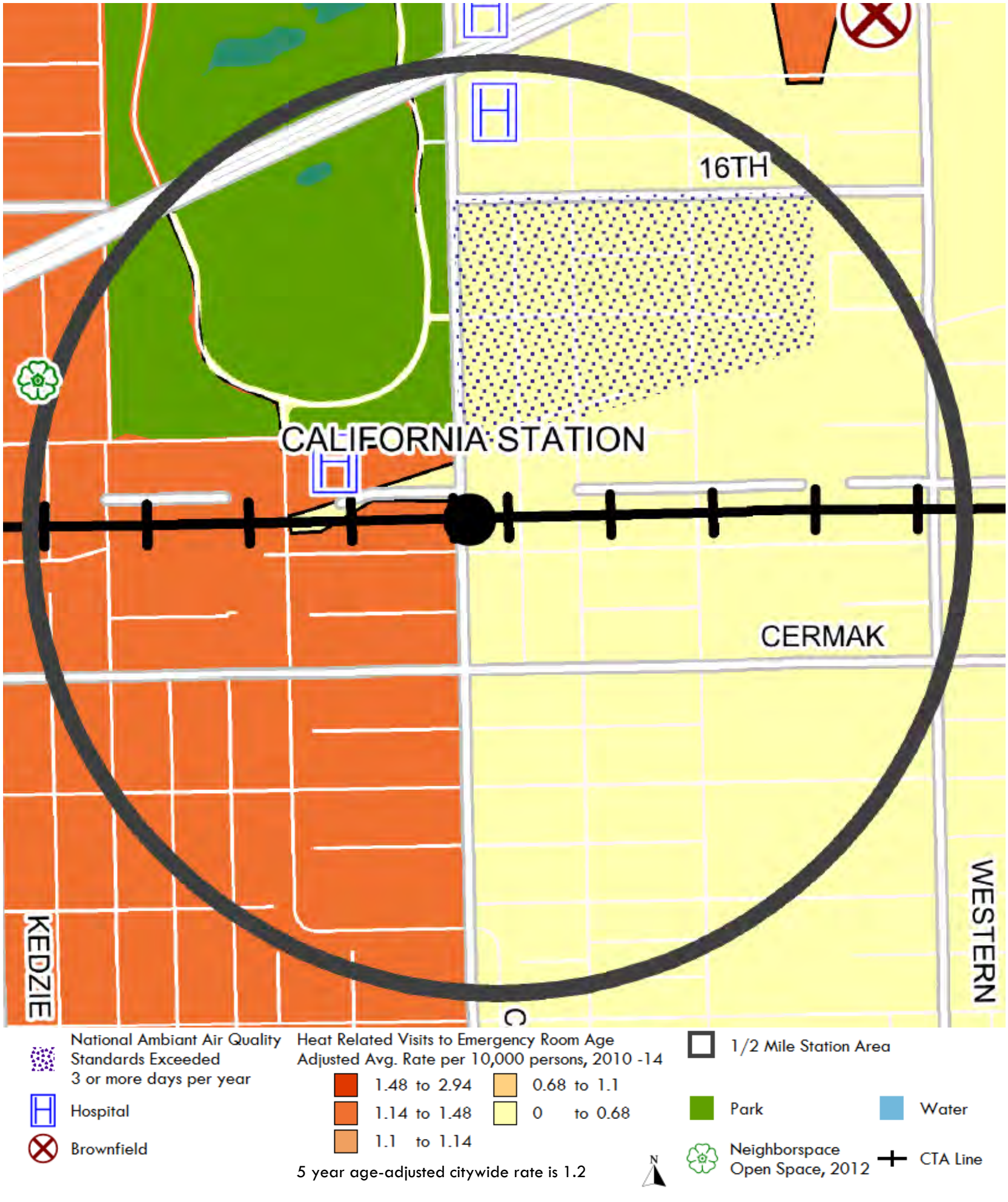
August 20, 2018

Source:
U.S. Census ACS 2016
City of Chicago 311 Call Center

Map 5C.2

California eHub Brownfields, Heat-Related ER Visits by Zip Code, & NAAQS Exceedances by Census Tract

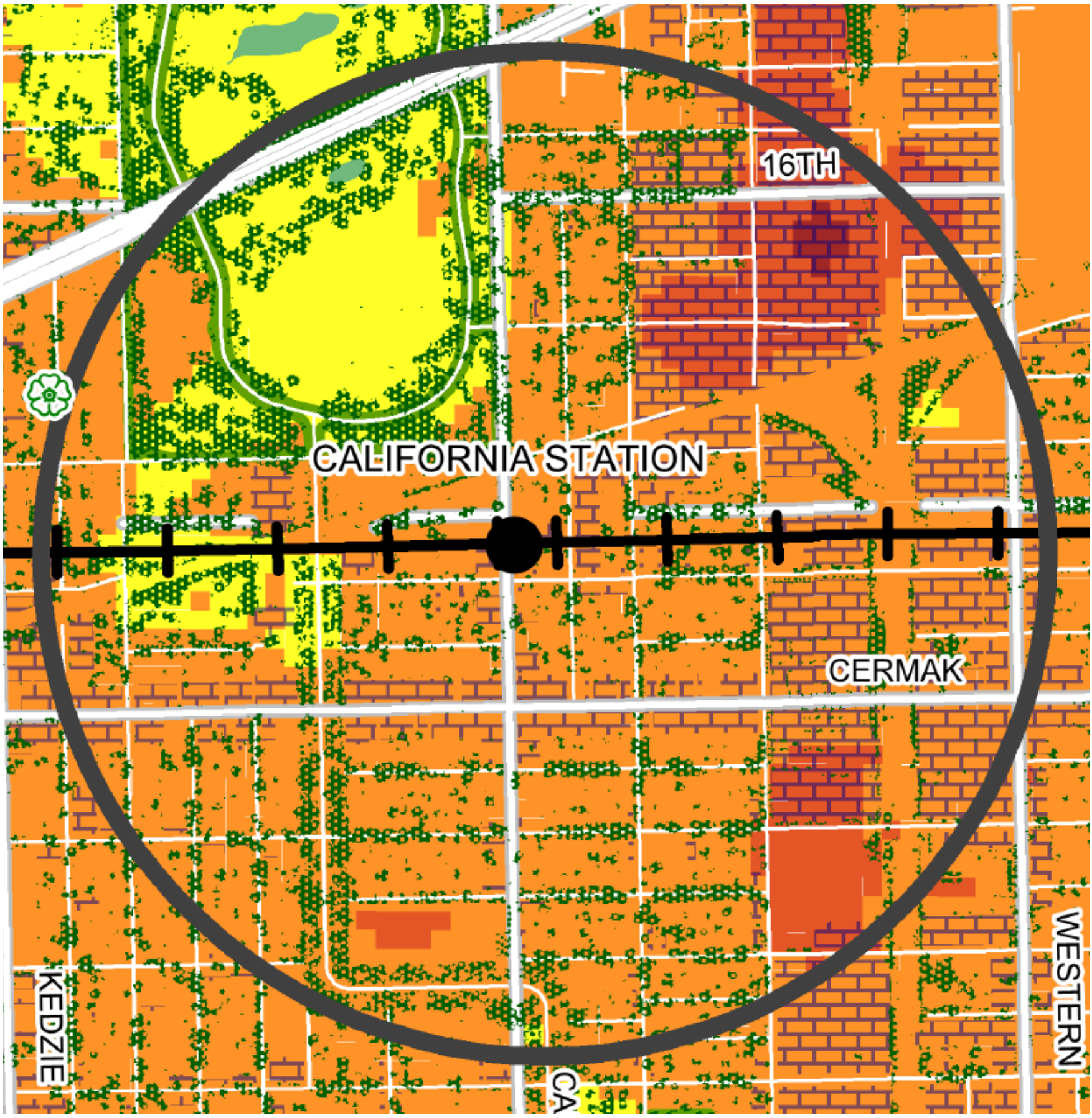
Data includes Heat-Related ER visits, Air Quality Standards Exceeded, and Brownfield Sites



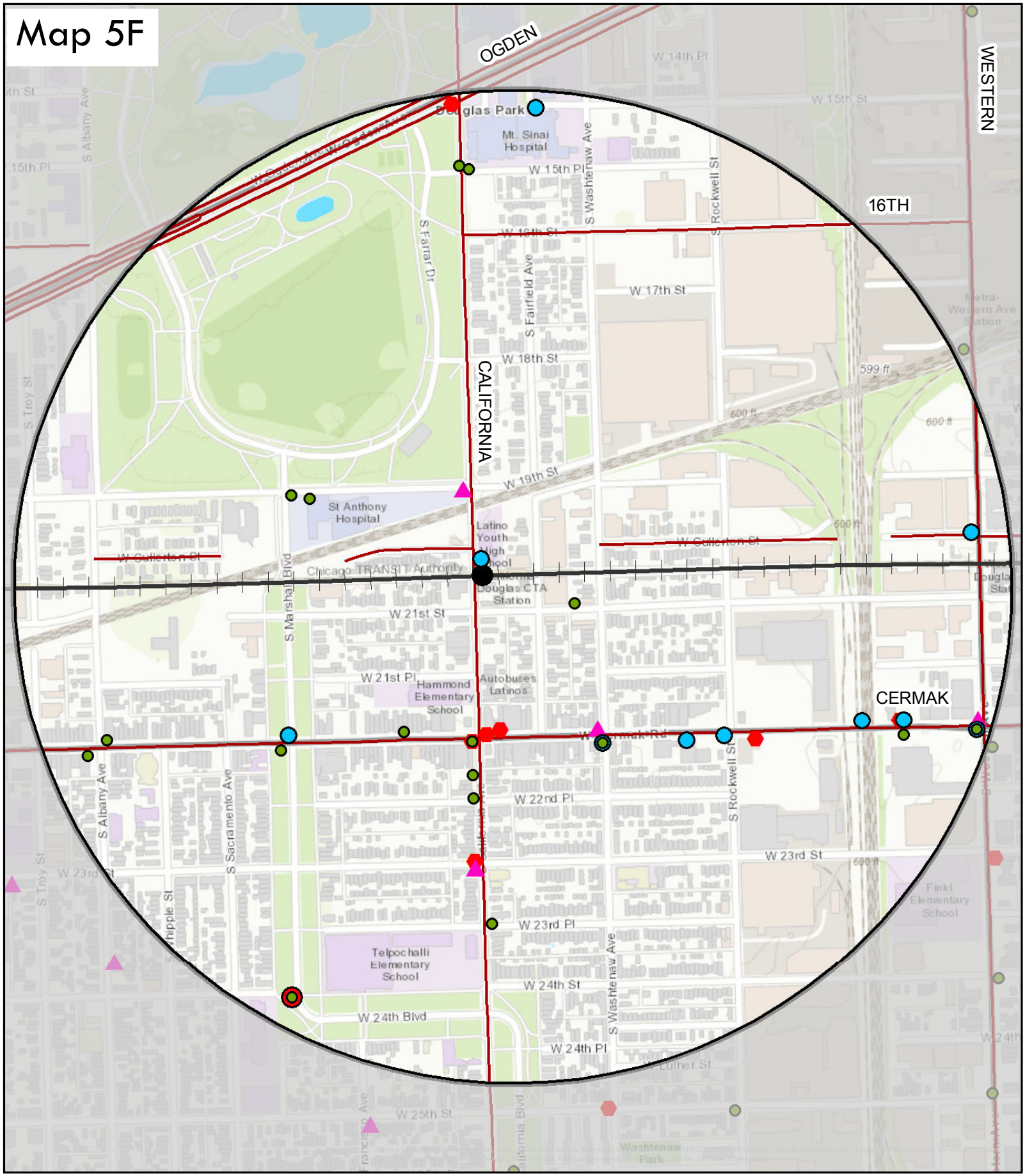
Map 5D

California eHub Land Surface Temperature, Tree Canopy + Land Use

Data includes Land Surface Temperature, Commercial or Industrial Land Use, and Tree Canopy Cover



Map 5E



Total Injuries - Vehicle Crashes, 2017

- 1
- 2 - 3
- 4 - 11

Non Vehicle Crashes, 2017

- Bicycle Crash
- Pedestrian Crash
- 1/2 Mile eHub
- CTA Line

337 Vehicle Crashes, 0 Fatalities, 47 Injured
5 Bike Crashes, 0 Fatalities, 3 Injured
7 Pedestrian Crashes, 0 Fatalities, 5 Injured

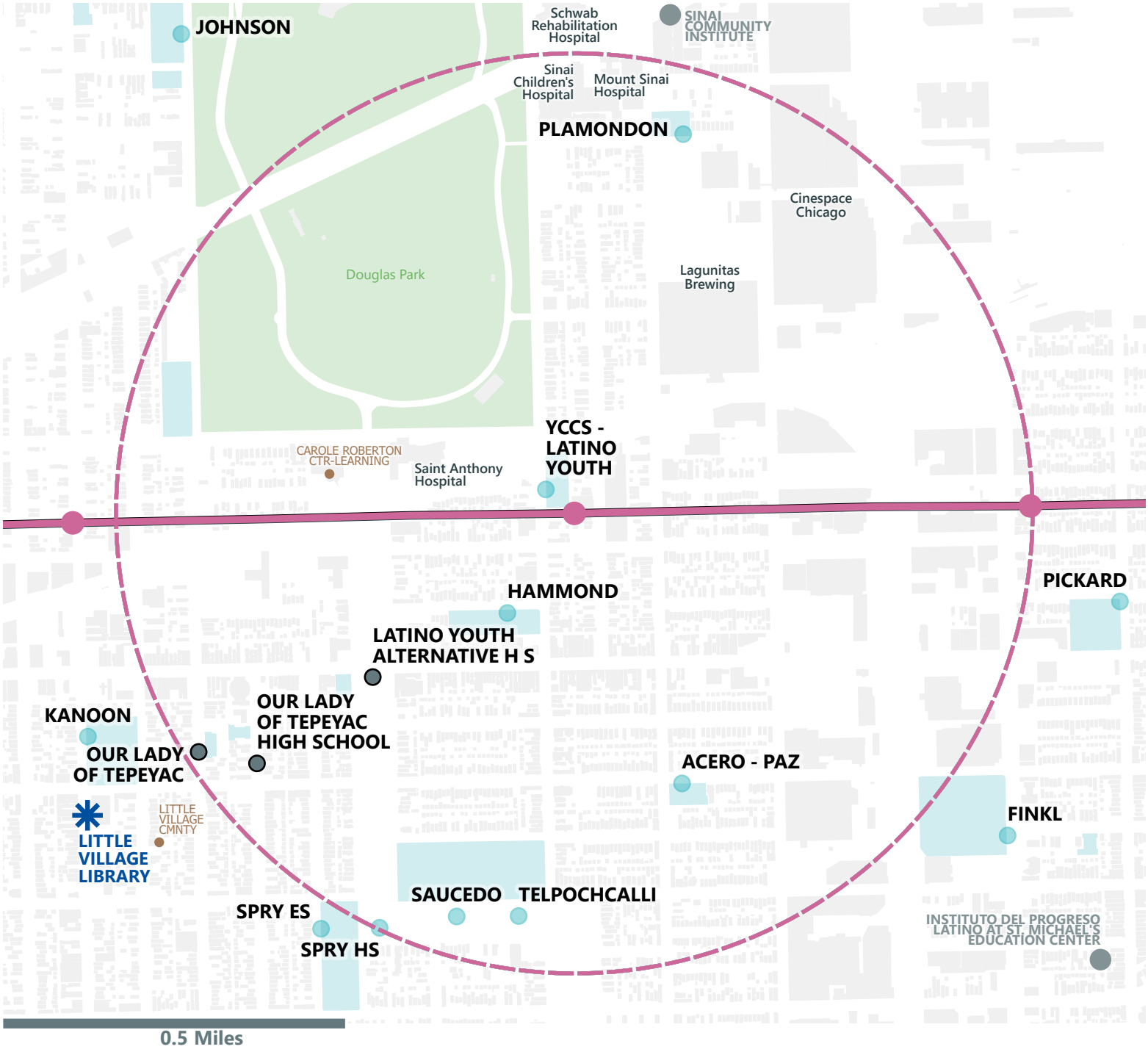
N CNT

0 0.0275 0.055 0.11 0.165 0.22 Miles

Data Source: City of Chicago Crash Data, 2017

Education + Workforce

Asset Map



Map 5G

- Elevated Chicago eHub 1/2 Mile Buffer
- Connect Chicago Location
- Shared Workspaces
- City of Chicago Library
- Childcare Services
- Public School
- Private School
- School Grounds
- Postsecondary Institution

September 10, 2018

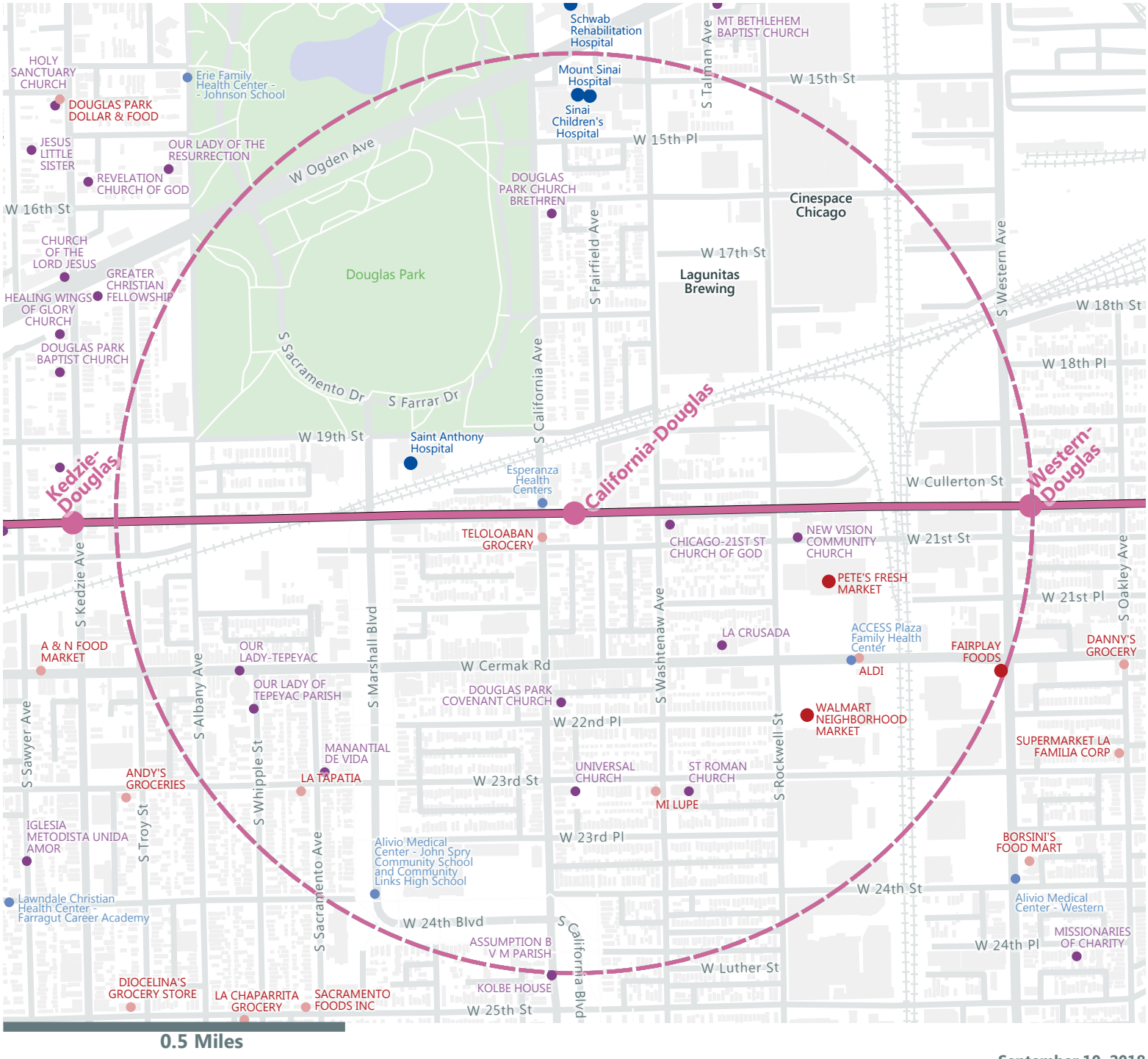
Sources:
Chicago Inno
City of Chicago
Cook County
Esri
National Center For Education Statistics
SB Friedman

SBFRIEDMAN

Enterprise

Other Community Anchors

Asset Map



Map 5H

- Elevated Chicago eHub 1/2 Mile Buffer
- Hospital
- Chicago Primary Care Community Health Clinic
- Religious Institution [1]
- Grocery Store [2]
- Corner Store [2]

September 10, 2018

Sources:
American Hospital Directory
City of Chicago
Cook County
Esri
SB Friedman

[1] Data from Info USA via Esri Business Analyst. Records with the NAICs designation "Religious Organizations" were included.
[2] Data from InfoUSA via Esri Business Analyst. Establishments with the NAICs designation "Supermarkets and Other Grocery (except Convenience) Stores", were classified as either a (1)Grocery Store" or (2)Corner Store. Establishments with recorded sales greater than or equal to $5 million were classified as Grocery with all others classified as Corner. Reclassifications and omissions were made selectively for accuracy and clarity.

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Enterprise

RECOMMENDATIONS

Elevated Chicago could adopt a long-term strategy of pursuing many or all the Ecodistrict strategies presented in this Feasibility Scan. Communities can use the chart below to assist in selecting and prioritizing strategies. The chart summarizes potential benefits for each strategy. Actual benefits achieved will be dependent on site-specific considerations, as well as design, construction, and maintenance practices.

Ecodistrict Strategies and Benefits

	Community Health						Local Economy			Climate Resiliency			Climate Protection		
Potential Benefit	Reduces Air Pollution	Reduces Obesity	Reduces Traffic Crash Fatalities / Injuries	Lowers Noise Pollution	Offers Community Gathering / Recreation Space	Relieves Stress + Aggression	Supports Workforce Development / Job Creation	Lowers Household Expenses	Reactivates Vacant Land	Increases Energy Reliability + Independence	Reduces Flooding	Lessens Heat Stress	Reduces Greenhouse Gases	Protects Drinking Water Source	Lowers Energy Demand
Strategy															
Community Solar	●						●	●	●	●		●	●		
District Energy	●						●			●			●		●
Urban Agriculture		●			●	●	●	●	●			●	●		
District Stormwater	●				●	●	●		●		●	●	●	●	
Complete Streets	●	●	●					●					●		
Buffer Parks	●			●	●	●	●				●	●	●		●
Sustainable Manufacturing	●		●	●									●		●

STRATEGY SELECTION

Each Elevated Chicago eHub has distinct challenges, assets, and conditions. This section provides a list of strategies to address health and community development concerns unique to each eHub. Each highlighted strategy can address multiple challenges within one high-impact project.

A lens of Development Focus or Preservation Focus has been applied to each community, based on existing conditions. A Development Focus prioritizes new investment and development of assets; residents are at lower risk of displacement. A Preservation Focus prioritizes community affordability and protection of existing assets; residents are at moderate to high risk of displacement.

Development Focus

- Kedzie Corridor
- Green Line South Corridor

Preservation Focus

- Logan Square Blue Line
- California Pink Line

Although Ecodistrict improvements may increase property values, the risk of displacing long-time residents and businesses can be reduced. All Ecodistrict projects should incorporate a Community Benefits Agreement or other mechanism to ensure long-term benefit and ownership for residents, such as local hire requirements and transference of assets to community-based groups. Please see this report's companion publication, *Strategies for Community Control and Affordability Preservation*, for a full discussion.

KEDZIE CORRIDOR ECODISTRICT RECOMMENDATIONS

High-impact health and economic challenges in the Kedzie Corridor include:

1. Asthma / Air Pollution
2. Heat Stress
3. Flooding
4. Obesity
5. Traffic Crashes
6. Public Safety
7. Economic Hardship
8. Underutilized Land / Vacant Land

Each challenge can be addressed by one or more Ecodistrict strategies listed in the table below. See the Strategies section of the Feasibility Scan for more information about each strategy.

Strategy	Reduces Air Pollution	Reduces Flooding	Lessens Heat Stress	Reduces Obesity	Reduces Traffic Crashes	Relieves Stress + Aggression	Supports Workforce Development / Jobs	Lowers Household Expenses	Reactivates Vacant Land
Community Solar	●		●				●	●	●
Urban Agriculture			●	●		●	●	●	●
District Stormwater	●	●	●			●	●		●
Complete Streets	●			●	●			●	
Buffer Park	●	●	●			●	●		

Community Solar supports workforce development and local jobs, reduces air pollution, lowers household energy expenses, and activates underutilized buildings and land. In addition, solar canopies lessen urban heat island effect by shading large rooftops and parking lots. Sites must be carefully designed to avoid potential negative impacts to neighbors.

Recommendations include supporting the existing and proposed building-level clean energy projects in the area, such as the geothermal field and the C40 housing development, as important tools for community visibility.

See the Ecodistrict Opportunities Map for potential solar project locations. Solar canopies may be possible at urban heat island hot spots such as Our Lady of Sorrows Basilica, Lawndale Plaza, and adjacent residential complex. A solar developer should be engaged early on to lead site selection, financing, and engineering.

Urban agriculture reduces obesity, relieves stress, supports workforce development, lowers household expenses, reactivates vacant land, and lessens heat stress. Recommendations include supporting the robust, community-led urban agriculture network already operating in the corridor. The proposed EcoOrchard project presents an opportunity to engage with local government to advance community ownership goals, such as local hire and local contracting opportunities.

District stormwater reduces the risk of flooding. District stormwater, which uses vegetation-based practices (such as bioswales), also reduces heat stress, air pollution, and mental stress. Vegetation also provides opportunities for local landscaping jobs and workforce development. Larger-scale practices, such as stormwater parks, can reactivate vacant land. Smaller-scale practices, such a home rain garden and flood retrofit program, lower household expenses by reducing the potential for costly flood damage repairs to buildings.

See the Ecodistrict Opportunities Map for potential project locations. Potential partners for implementing district stormwater practices include Chicago Department of Transportation, Chicago Department of Planning and Development, Chicago Department of Water Management, Metropolitan Water Reclamation District, the Chicago Park District, and the Cook County Land Bank. Potential locations for large stormwater elements could include Garfield Park, vacant parcels owned by local government, large parking lots, and streets and alleys.

A combined district stormwater and urban heat island engineering study and site plan is recommended to optimally site large stormwater infiltration elements and tree canopy. The site plan should address future conditions, as flooding will likely increase when vacant parcels are developed by builders, and due to more intense storms. The site plan should include the anticipated stormwater benefits of the Oaks of North Lawndale, EcoOrchard, and 5th Avenue Resilience Corridor projects.

Complete streets are essential for reducing the high rates of traffic crashes, injuries, and fatalities. Complete streets can also reduce obesity, air pollution, and household expenses, by reducing residents' need to drive. Traffic calming street retrofits, and protective measures such as refuge islands, should be pursued to increase traffic safety in the corridor. Complete street improvements could be incorporated in all planned and proposed projects, such as The Hatchery and Resilience Corridor. Potential implementation partners include the Chicago Department of Transportation and the Vision Zero initiative.

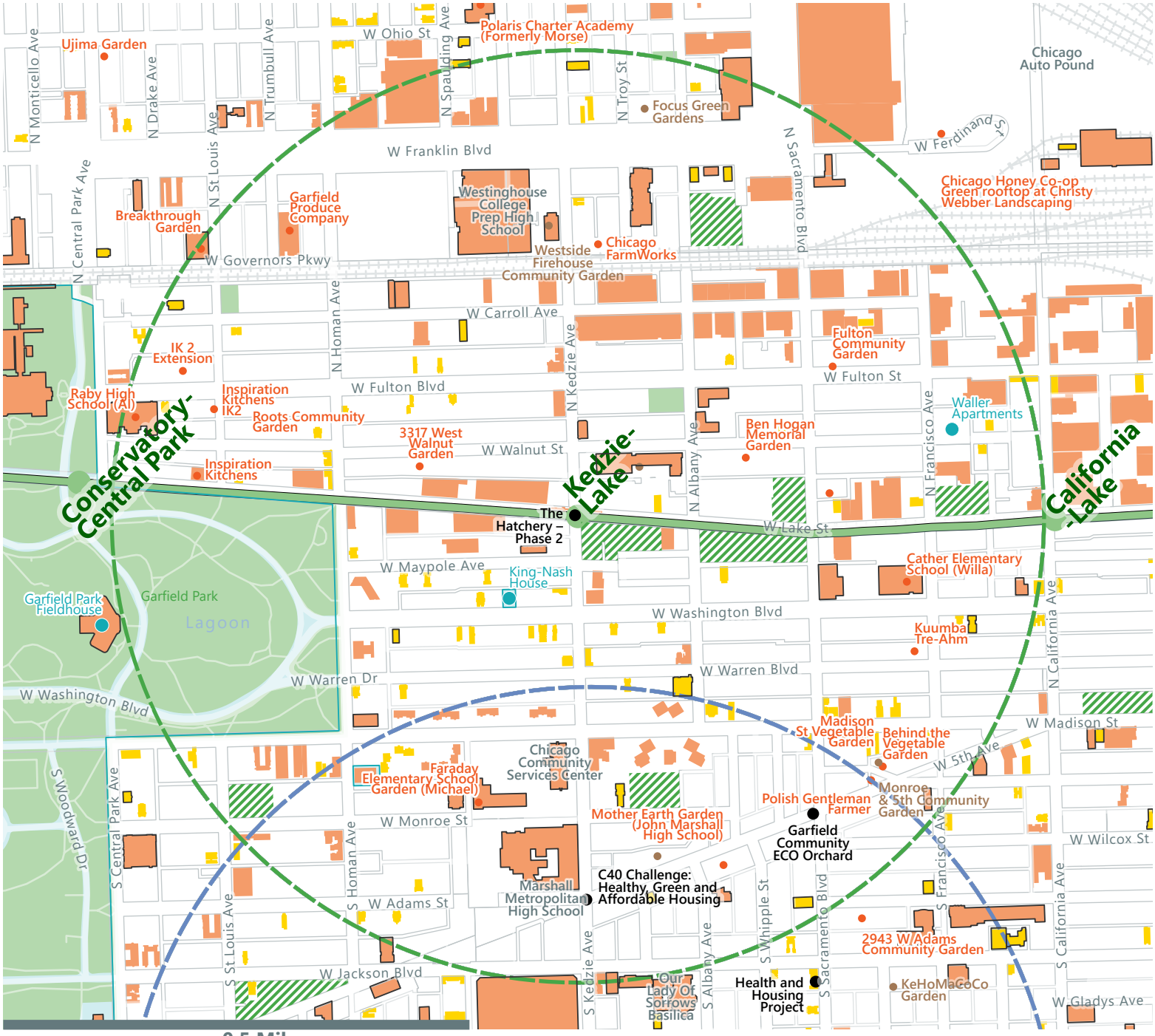
Buffer parks protect residents by creating a physical barrier against air pollution from vehicles, manufacturing facilities, and other sources. The vegetation also relieves mental stress, lessens heat stress, and can provide local economic opportunities through local hire and jobs training for landscape installation and maintenance.

An air quality study is recommended to optimally site the buffer park. Potential partners for air quality monitoring include the Array of Things sensor initiative, IEPA's Ambient Air Monitoring Network, and/or UIC's citizen scientist air monitoring program. Potential locations for a buffer park could include corridors along the expressway, railyards, and streets, and surrounding local manufacturing sites.

Kedzie-Lake

Ecodistrict Opportunities

Asset Map



0.5 Miles

September 10, 2018

Elevated Chicago eHub 1/2 Mile Buffer

Historic Landmarks (National Register)

Historic Landmarks (City)

[1] From Elevate Energy: Estimate of technical potential for PV, i.e. the maximum feasible capacity of a PV system based on available area at site, accounting for shading, obstructions and other site features. We assume PV capacity at 1 kW per 10 square meters or approximately 1 kW per 100 square feet.

Community Gardens

Food-Producing

Not Food-Producing/ Unknown

Parks

Contiguous Vacant Parcels Suitable For Stormwater Infrastructure (>1 acre)

Solar Capacity By Building Or Site [2]

25-99 kW

100-999 kW

1-4.99 MW

5+ MW

Exempt Building/Site Suitable For Solar

Proposed Elevated Chicago Capital Project

Sources:
American Hospital Directory
Chicago Urban Agriculture Mapping Project (CUAMP)
City of Chicago
Cook County
Elevate Energy
Elevated Chicago
Esri
SB Friedman

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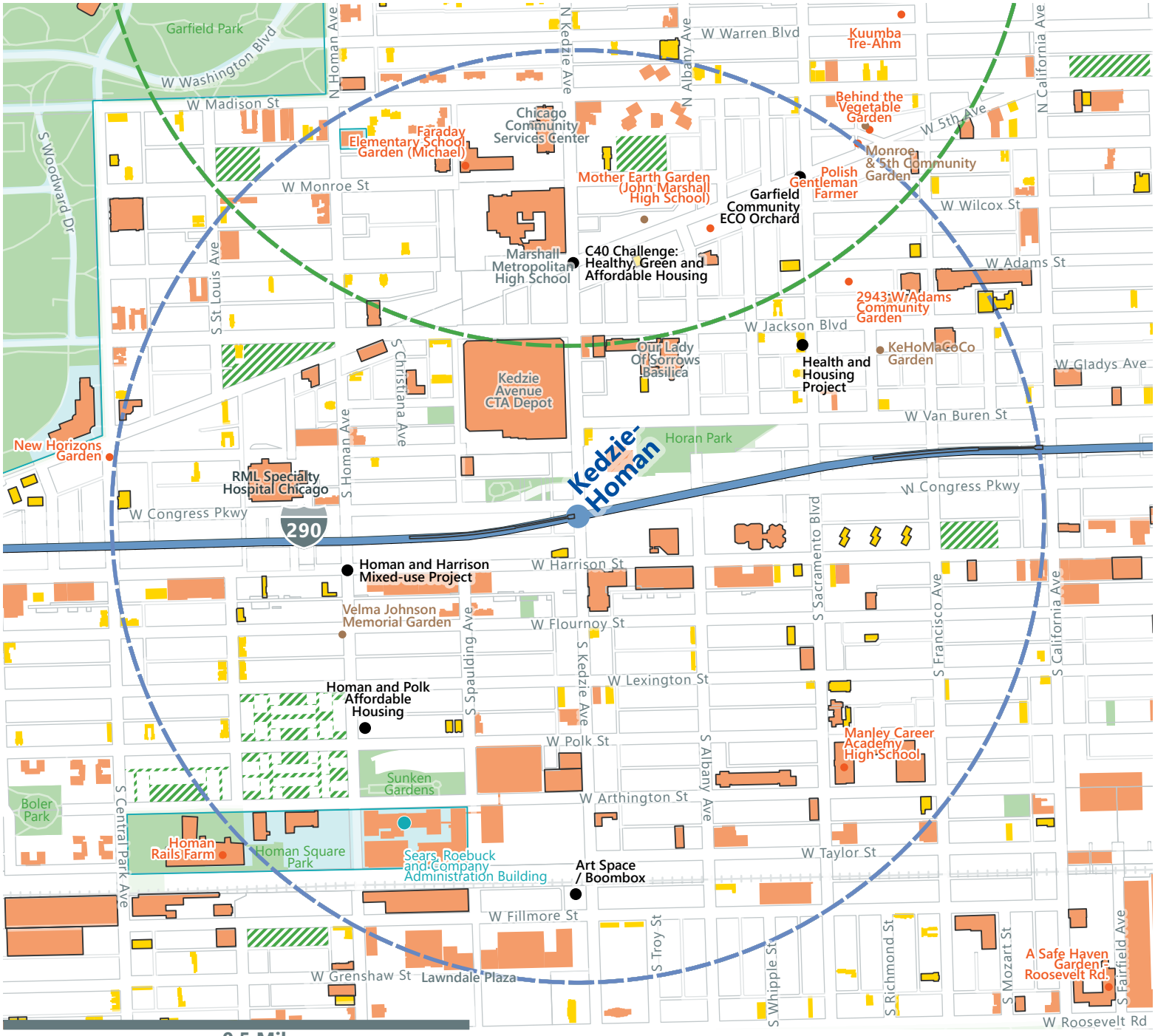
Kedzie-Homan

Ecodistrict Opportunities

Asset Map



0.5 Miles

- Elevated Chicago eHub 1/2 Mile Buffer
- Historic Landmarks (National Register)
- Historic Landmarks (City)

[1] Excludes residential buildings
[2] From Elevate Energy: Estimate of technical potential for PV, i.e. the maximum feasible capacity of a PV system based on available area at site, accounting for shading, obstructions and other site features. We assume PV capacity at 1 kW per 10 square meters or approximately 1 kW per 100 square feet.

Community Gardens

- Food-Producing
- Not Food-Producing/ Unknown
- Parks
- Contiguous Vacant Parcels Suitable For Stormwater Infrastructure (>1 acre)

Solar Capacity By Building Or Site [2]

- 25-99 kW
- 100-999 kW
- 1-4.99 MW
- 5+ MW
- Exempt Building/Site Suitable For Solar
- Proposed Elevated Chicago Capital Project

September 10, 2018

Sources:
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Chicago Urban Agriculture Mapping Project (CUAMP)
City of Chicago
Cook County
Elevate Energy
Elevated Chicago
Esri
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GREEN LINE SOUTH CORRIDOR ECODISTRICT RECOMMENDATIONS

High-impact health and economic challenges in the Green Line South Corridor include:

1. Asthma / Air Pollution
2. Heat Stress
3. Flooding
4. Obesity
5. Traffic Crashes
6. Public Safety
7. Economic Hardship
8. Underutilized Land / Vacant Land

Each challenge can be addressed by one or more Ecodistrict strategies listed in the table below. See the Strategies section of the Feasibility Scan for more information about each strategy.

Implementation of Ecodistrict practices within the Green Line South Corridor should be coordinated with the Washington Park eHub, which is considering Ecodistrict formation.

Strategy	Reduces Air Pollution	Reduces Flooding	Lessens Heat Stress	Reduces Obesity	Reduces Traffic Crashes	Relieves Stress + Aggression	Supports Workforce Development / Jobs	Lowers Household Expenses	Reactivates Vacant Land
Community Solar	●		●				●	●	●
District Stormwater	●	●	●			●	●		●
Complete Streets	●			●	●			●	
Buffer Park	●	●	●			●	●		
Sustainable Manufacturing	●				●				

Community Solar supports workforce development and local jobs, reduces air pollution, lowers household energy expenses, and activates underutilized buildings and land. In addition, solar canopies lessen urban heat island effect by shading large rooftops and parking lots. Sites must be carefully designed to avoid potential negative impacts to neighbors.

Recommendations include supporting proposed community-led building-level clean energy projects such as the Green Cathedral and the Legacy of Washington Park developments, as important tools for community visibility.

See the Ecodistrict Opportunities Map for potential solar project locations. Several institutional campuses may be able to host a community solar array. Solar canopies may be possible at urban heat island hot spots such as parking lots.

Potential project partners include ComEd, which is implementing a "Community of the Future" initiative to the north of the Green Line South Corridor, in Bronzeville. A solar developer should be engaged early on to lead site selection, financing, and engineering.

District stormwater reduces the risk of flooding. District stormwater, which uses vegetation-based practices (such as bioswales), also reduces heat stress, air pollution, and mental stress. Vegetation also provides opportunities for local landscaping jobs and workforce development. Larger-scale practices, such as stormwater parks, can reactivate vacant land. Smaller-scale practices, such a home rain garden and flood retrofit program, lower household expenses by reducing the potential for costly flood damage repairs to buildings.

See the Ecodistrict Opportunities Map for potential project locations. Potential partners for implementing district stormwater practices include Chicago Department of Transportation, Chicago Department of Planning and Development, Chicago Department of Water Management, Metropolitan Water Reclamation District, the Chicago Park District, and the Cook County Land Bank. Potential locations for large stormwater elements could include Washington Park, vacant parcels owned by local government, large parking lots, the planned CTA station renovation, and streets and alleys.

A combined district stormwater and urban heat island engineering study and site plan is recommended to optimally site large stormwater infiltration elements and tree canopy. The site plan should address future conditions, as flooding will likely increase when vacant parcels are developed by builders, and due to more intense storms. The site plan should include the anticipated stormwater benefits of the BIG tree canopy and community garden initiatives, the GSDC sunflower phytoremediation project, and the 61st Street streetscaping project.

Complete streets are essential for reducing the high rates of traffic crashes, injuries, and fatalities. Complete streets can also reduce obesity, air pollution, and household expenses, by reducing residents' need to drive. Traffic calming street retrofits, and protective measures such as refuge islands, should be pursued to increase traffic safety in the corridor. Complete street improvements could be incorporated in all planned and proposed projects, such as the 61st Street streetscaping. Potential implementation partners include the Chicago Department of Transportation and the Vision Zero initiative.

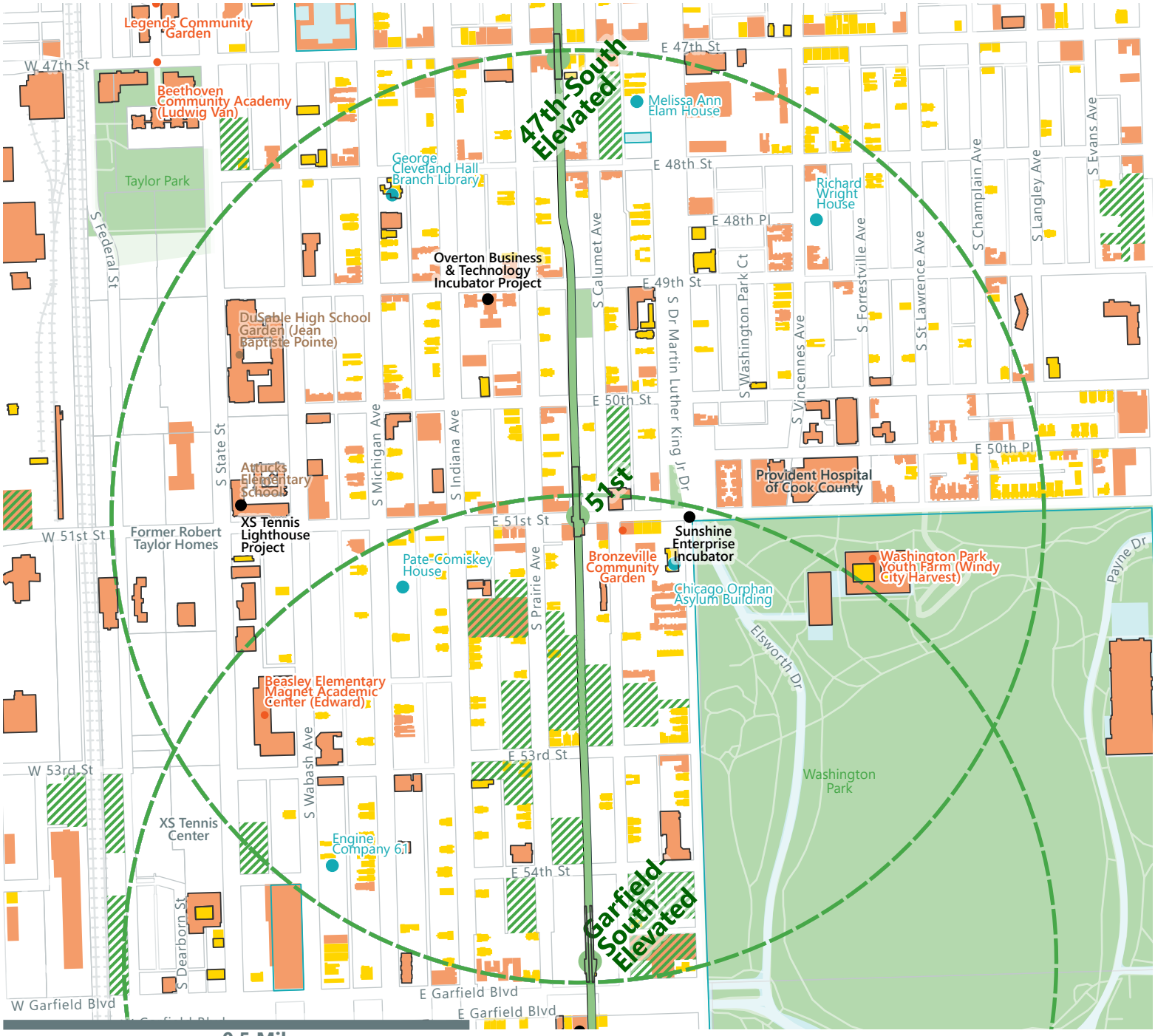
Buffer parks protect residents by creating a physical barrier against air pollution from vehicles, manufacturing facilities, and other sources. The vegetation also relieves mental stress, lessens heat stress, and can provide local economic opportunities through local hire and jobs training for landscape installation and maintenance.

An air quality study is recommended to optimally site the buffer park. Potential partners for air quality monitoring include the Array of Things sensor initiative, IEPA's Ambient Air Monitoring Network, and/or UIC's citizen scientist air monitoring program. Potential locations for a buffer park could include corridors along the expressway, railyards, and streets, and surrounding local manufacturing sites.

Sustainable manufacturing and freight practices protect residents by reducing the amount of air pollution emitted by these facilities. These practices can also improve traffic safety by separating freight movement from residents. Potential implementation partners include Norfolk Southern Rail and other manufacturing facilities who could add a vegetated barrier on their campuses, improve loading and parking areas and practices, and transition to a cleaner fleet of vehicles.

Ecodistrict Opportunities

Asset Map



0.5 Miles

- Elevated Chicago eHub 1/2 Mile Buffer
- Historic Landmarks (National Register)
- Historic Landmarks (City)

[1] Excludes residential buildings
[2] From Elevate Energy: Estimate of technical potential for PV, i.e. the maximum feasible capacity of a PV system based on available area at site, accounting for shading, obstructions and other site features. We assume PV capacity at 1 kW per 10 square meters or approximately 1 kW per 100 square feet.

Community Gardens

- Food-Producing
- Not Food-Producing/ Unknown
- Parks
- Contiguous Vacant Parcels Suitable For Stormwater Infrastructure (>1 acre)

Solar Capacity By Building Or Site [2]

- 25-99 kW
- 100-999 kW
- 1-4.99 MW
- 5+ MW
- Exempt Building/Site Suitable For Solar
- Proposed Elevated Chicago Capital Project

September 10, 2018

Sources:
American Hospital Directory
Chicago Urban Agriculture Mapping Project (CUAMP)
City of Chicago
Cook County
Elevate Energy
Elevated Chicago
Esri
SB Friedman

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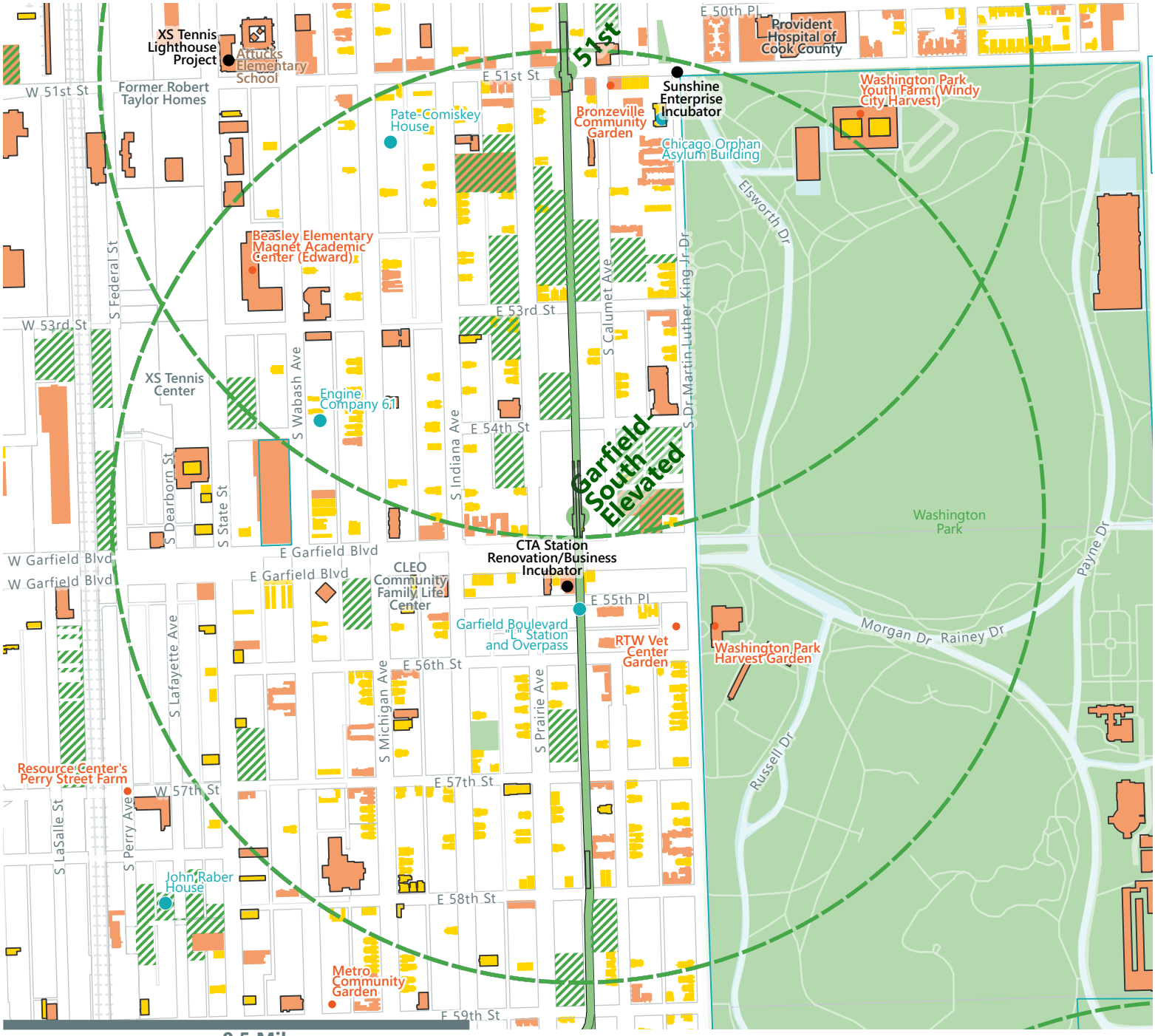
Ecodistrict Opportunities

Asset Map



0.5 Miles

- Elevated Chicago eHub 1/2 Mile Buffer
- Historic Landmarks (National Register)
- Historic Landmarks (City)

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Community Gardens

- Food-Producing
- Not Food-Producing/ Unknown
- Parks
- Contiguous Vacant Parcels Suitable For Stormwater Infrastructure (>1 acre)

Solar Capacity By Building Or Site [2]

- 25-99 kW
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Esri
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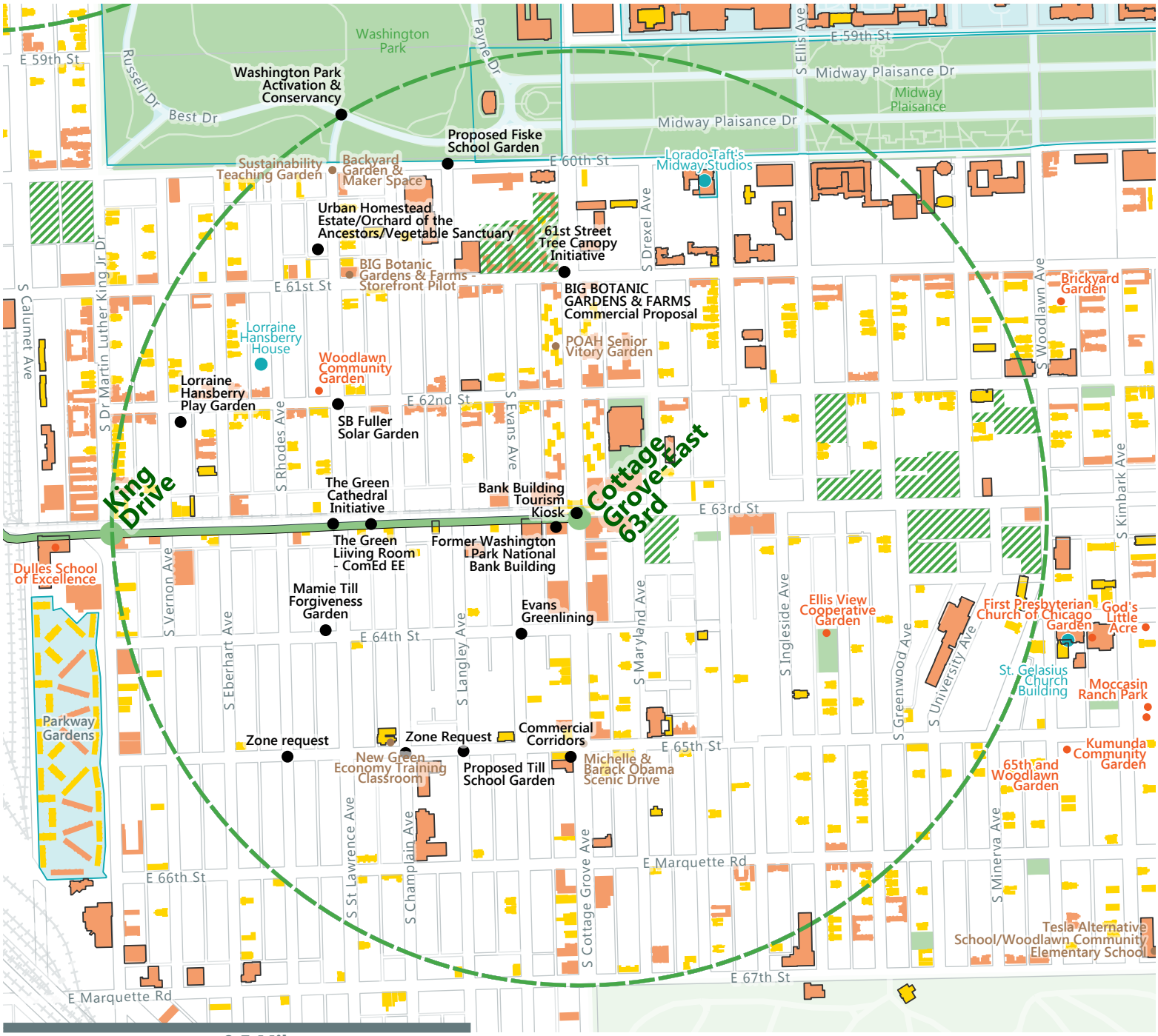
Ecodistrict Opportunities

Asset Map



- Elevated Chicago eHub 1/2 Mile Buffer
- Historic Landmarks (National Register)
- Historic Landmarks (City)

[1] Excludes residential buildings
[2] From Elevate Energy: Estimate of technical potential for PV, i.e. the maximum feasible capacity of a PV system based on available area at site, accounting for shading, obstructions and other site features. We assume PV capacity at 1 kW per 10 square meters or approximately 1 kW per 100 square feet.

Community Gardens

- Food-Producing
- Not Food-Producing/ Unknown
- Parks
- Contiguous Vacant Parcels Suitable For Stormwater Infrastructure (>1 acre)

Solar Capacity By Building Or Site [2]

- 25-99 kW
- 100-999 kW
- 1-4.99 MW
- 5+ MW
- Exempt Building/Site Suitable For Solar
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September 10, 2018

Sources:
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Chicago Urban Agriculture Mapping Project (CUAMP)
City of Chicago
Cook County
Elevate Energy
Elevated Chicago
Esri
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LOGAN SQUARE BLUE LINE ECODISTRICT RECOMMENDATIONS

High-impact health and economic challenges in the Logan Square eHub include:

1. Air Pollution
2. Flooding
3. Obesity
4. Traffic Crashes
5. Affordability

Each challenge can be addressed by one or more Ecodistrict strategies listed in the table below. See the *Strategies* section of the *Feasibility Scan* for more information about each strategy.

Implementation of Ecodistrict practices should be coordinated with the Logan Square Community Table, which is pursuing Ecodistrict formation. The Logan Square Community Table has identified several Ecodistrict strategies to pursue, which are included in the chart below.

Strategy	Reduces Air Pollution	Reduces Flooding	Lessens Heat Stress	Reduces Obesity	Reduces Traffic Crashes	Relieves Stress + Aggression	Lowers Household Expenses
Community Solar	●		●				●
District Energy	●						
Urban Agriculture			●	●		●	●
District Stormwater	●	●	●			●	
Complete Streets	●			●	●		●
Sustainable Manufacturing	●				●		

Community Solar supports workforce development and local jobs, reduces air pollution, lowers household energy expenses, and activates underutilized buildings. In addition, solar canopies lessen urban heat island effect by shading large rooftops and parking lots. Sites must be carefully designed to avoid potential negative impacts to neighbors.

See the Ecodistrict Opportunities Map for potential solar project locations on existing development. Rooftop solar may also be possible at new development. Solar canopies may be possible at urban heat island hot spots such as parking lots. A solar developer should be engaged early on to lead site selection, financing, and engineering.

District energy reduces air pollution, supports local jobs, and increases energy independence. The Logan Square Community Table is interested in pursuing a District Energy strategy, utilizing a local school campus.

Urban agriculture addresses obesity, relieves stress, supports workforce development, and lowers household expenses. Composting is the final step in a sustainable local food system. The Logan Square Community Table identified a zero-waste composting program as a priority. Compost can be used by existing community garden initiatives, shared with other Elevated Chicago communities, or perhaps packaged and sold by a local social enterprise.

District stormwater reduces the risk of flooding. District stormwater, which uses vegetation-based practices (such as bioswales), also reduces heat stress, air pollution, and mental stress. Vegetation also provides opportunities for local landscaping jobs and workforce development. Larger-scale practices, such as stormwater parks, can reactivate vacant land. Smaller-scale practices, such a home rain garden and flood retrofit program, lower household expenses by reducing the potential for costly flood damage repairs to buildings.

See the Ecodistrict Opportunities Map for potential project locations. Potential partners for implementing district stormwater practices include Chicago Department of Transportation, Chicago Department of Planning and Development, Chicago Department of Water Management, Metropolitan Water Reclamation District, the Chicago Park District, and the Cook County Land Bank. Potential locations for large stormwater elements could include parking lots, streets, and alleys.

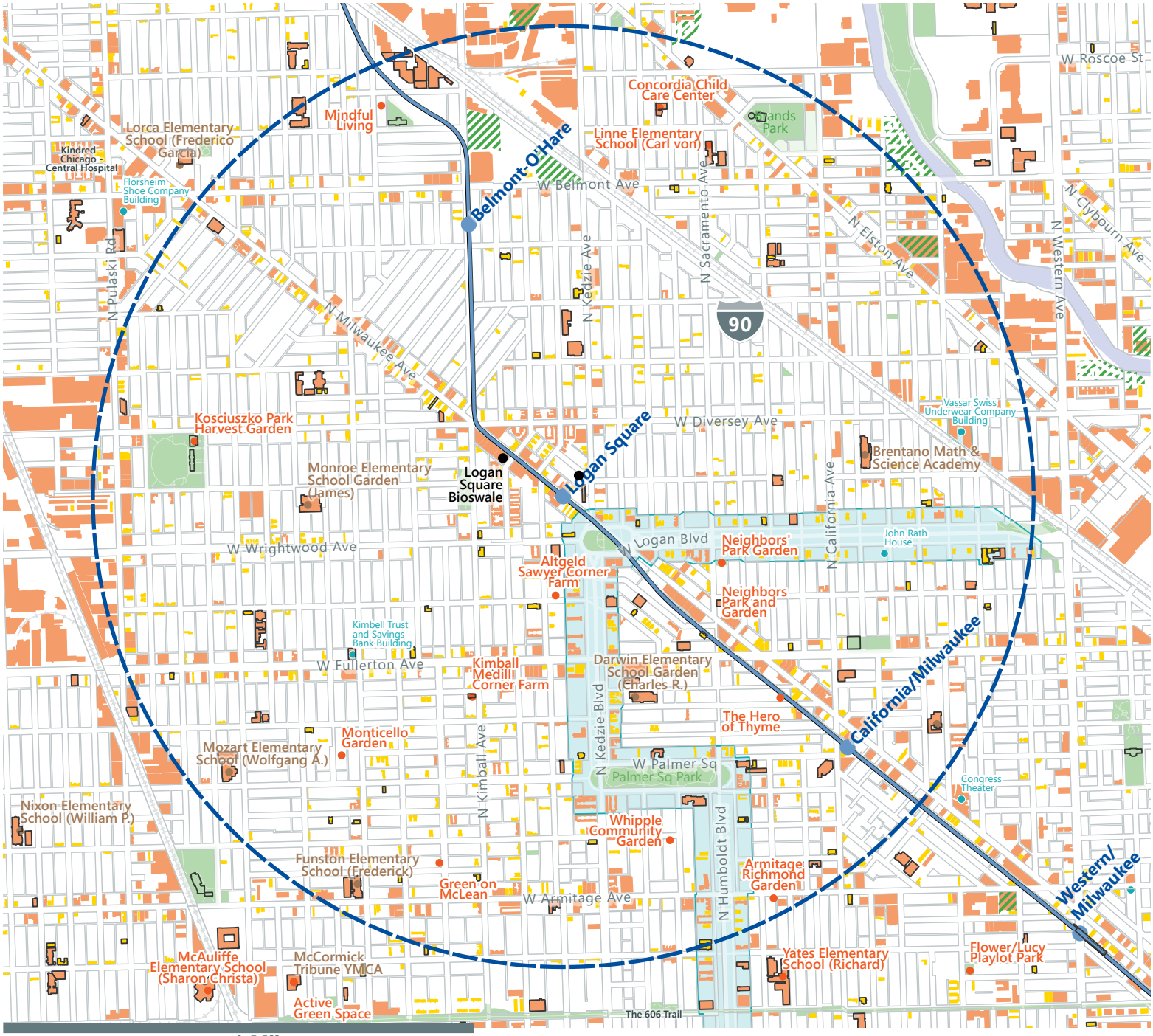
A combined district stormwater and urban heat island engineering study and site plan is recommended to optimally site large stormwater infiltration elements and tree canopy. The site plan should address future conditions, as flooding will likely increase due to more intense storms predicted by climate change forecasts.

Complete streets are essential for reducing the high rates of traffic crashes, injuries, and fatalities. Complete streets can also reduce obesity, air pollution, and household expenses, by reducing residents' need to drive. Bike lanes and trails, refuge islands, and traffic calming designs should be considered to increase traffic safety in the corridor. Potential implementation partners include the Chicago Department of Transportation. The planned Milwaukee Avenue streetscaping project presents an opportunity to engage with local government to advance community ownership and sustainability goals.

Sustainable manufacturing and freight practices protect residents by reducing the amount of air pollution emitted by these facilities. These practices can also improve traffic safety by separating freight movement from residents. Potential implementation partners include manufacturing facilities who could add a vegetated barrier on their campuses, improve loading and parking areas and practices, and transition to a cleaner fleet of vehicles.

Ecodistrict Opportunities

Asset Map



1 Mile

- Elevated Chicago eHub Mile Buffer
- Historic Landmarks (National Register)
- Historic Landmarks (City)

[1] Excludes residential buildings
[2] From Elevate Energy: Estimate of technical potential for PV, i.e. the maximum feasible capacity of a PV system based on available area at site, accounting for shading, obstructions and other site features. We assume PV capacity at 1 kW per 10 square meters or approximately 1 kW per 100 square feet.

Community Gardens

- Food-Producing
- Not Food-Producing/ Unknown
- Parks
- Contiguous Vacant Parcels Suitable For Stormwater Infrastructure (>1 acre)

Solar Capacity By Building/Site [2]

- 25-99 kW
- 100-999 kW
- 1-4.99 MW
- 5+ MW
- Exempt Building/Site Suitable For Solar
- Proposed Elevated Chicago Capital Project

September 10, 2018

Sources:
American Hospital Directory
Chicago Urban Agriculture Mapping Project (CUAMP)
City of Chicago
Cook County
Elevate Energy
Elevated Chicago
Esri
SB Friedman

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CALIFORNIA PINK LINE ECODISTRICT RECOMMENDATIONS

High-impact health and economic challenges in the California Pink Line eHub include:

1. Asthma / Air Pollution
2. Heat Stress
3. Flooding
4. Obesity
5. Traffic Crashes
6. Public Safety
7. Affordability

Each challenge can be addressed by one or more of the Ecodistrict strategies listed in the table below. See the *Strategies* section of the *Feasibility Scan* for more information about each strategy.

Strategy	Reduces Air Pollution	Reduces Flooding	Lessens Heat Stress	Reduces Obesity	Reduces Traffic Crash Fatalities / Injuries	Relieves Stress + Aggression	Lowers Household Expenses	Reduces Flooding	Lessens Heat Stress
Community Solar	●		●				●		●
Urban Agriculture			●	●		●	●		●
District Stormwater	●	●	●			●		●	●
Complete Streets	●			●	●		●		
Sustainable Manufacturing	●				●				

Community Solar supports workforce development and local jobs, reduces air pollution, lowers household energy expenses, and activates underutilized buildings. In addition, solar canopies lessen urban heat island effect by shading large rooftops and parking lots. Sites must be carefully designed to avoid potential negative impacts to neighbors.

See the Ecodistrict Opportunities Map for potential solar project locations on existing development. Solar canopies may be possible at urban heat island hot spots such as rooftops and parking lots of the industrial/commercial and institutional campuses. A solar developer should be engaged early on to lead site selection, financing, and engineering.

Urban agriculture addresses obesity, relieves stress, supports workforce development, and lowers household expenses. New urban agriculture projects should consider site suitability; sites with known or likely soil or water contamination should be avoided. Potential partners for implementing urban agriculture practices include the Chicago Park District and existing urban agriculture practitioners in the broader community. Potential project locations include Douglas Park.

District stormwater reduces the risk of flooding. District stormwater, which uses vegetation-based practices (such as bioswales), also reduces heat stress, air pollution, and mental stress. Vegetation also provides opportunities for local landscaping jobs and workforce development. Larger-scale practices, such as stormwater parks, can reactivate vacant land. Smaller-scale practices, such a home rain garden and flood retrofit program, lower household expenses by reducing the potential for costly flood damage repairs to buildings.

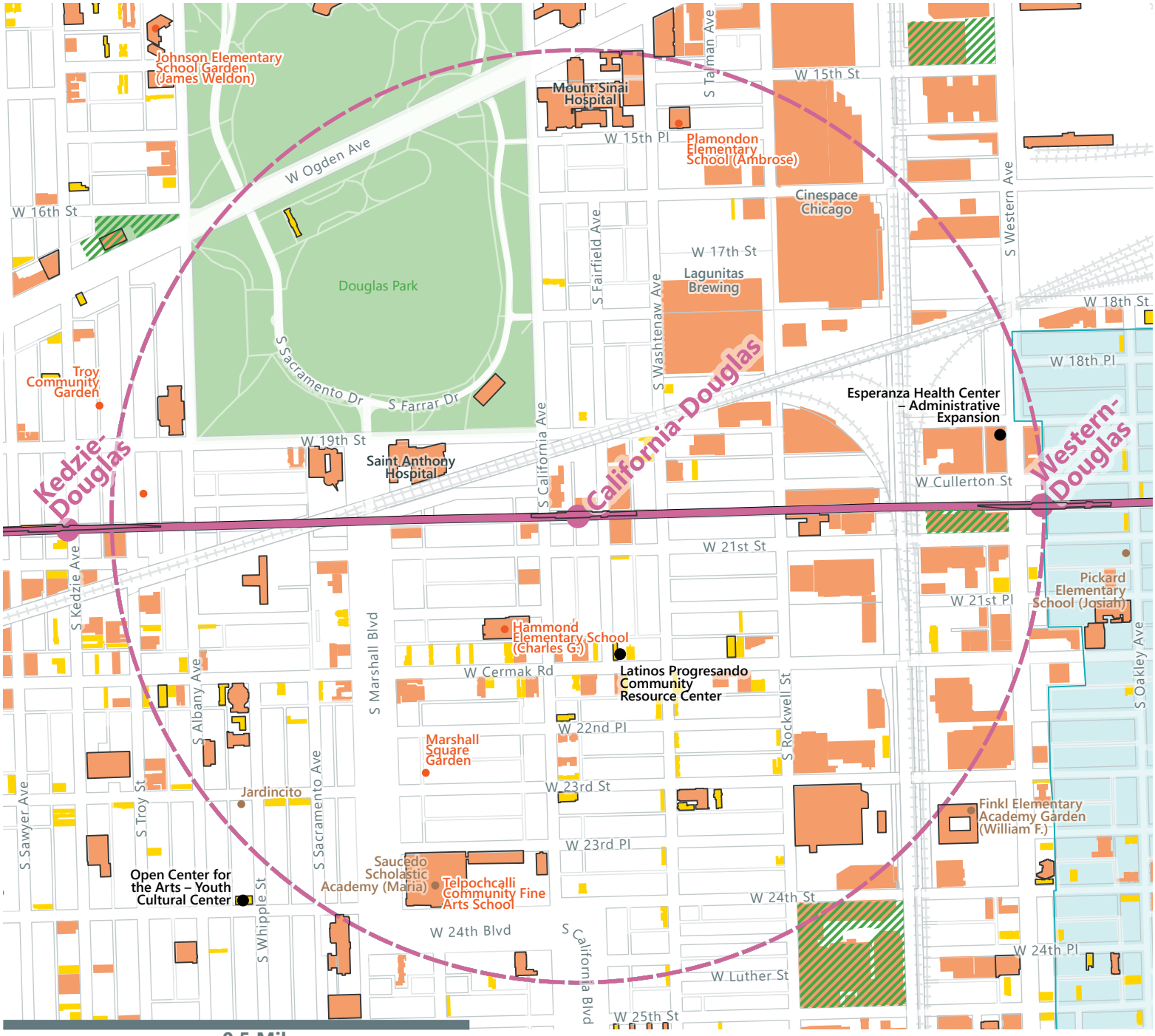
See the Ecodistrict Opportunities Map for potential project locations. Potential partners for implementing district stormwater practices include Chicago Department of Transportation, Chicago Department of Planning and Development, Chicago Department of Water Management, Metropolitan Water Reclamation District, the Chicago Park District, and the Cook County Land Bank. Potential locations for large stormwater elements could include Douglas Park, institutional and commercial properties with large campuses, parking lots, streets, and alleys.

Complete streets are essential for reducing the high rates of traffic crashes, injuries, and fatalities. Complete streets can also reduce obesity, air pollution, and household expenses, by reducing residents' need to drive. Truck routing, bike lanes, refuge islands, and traffic calming designs should be considered to increase traffic safety in the corridor. Potential implementation partners include the Chicago Department of Transportation and local fleet owners.

Sustainable manufacturing and freight practices protect residents by reducing the amount of air pollution emitted by these facilities. These practices can also improve traffic safety by separating freight movement from residents. Potential implementation partners include manufacturing and institutional facilities who could add a vegetated barrier on their campuses, improve loading and parking areas and practices, and transition to a cleaner fleet of vehicles.

Ecodistrict Opportunities

Asset Map



Elevated Chicago eHub 1/2 Mile Buffer

Historic Landmarks (National Register)

Historic Landmarks (City)

[1] Excludes residential buildings

[2] From Elevate Energy: Estimate of technical potential for PV, i.e. the maximum feasible capacity of a PV system based on available area at site, accounting for shading, obstructions and other site features. We assume PV capacity at 1 kW per 10 square meters or approximately 1 kW per 100 square feet.

Community Gardens

Food-Producing

Not Food-Producing/ Unknown

Parks

Contiguous Vacant Parcels Suitable For Stormwater Infrastructure (>1 acre)

Solar Capacity By Building Or Site [2]

25-99 kW

100-999 kW

1-4.99 MW

5+ MW

Exempt Building/Site Suitable For Solar

Proposed Elevated Chicago Capital Project

September 10, 2018

Sources:
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GOVERNANCE AND ENGAGEMENT

A successful Ecodistrict is a collaboration of a wide range of stakeholders, service providers, developers, and landowners. Ecodistricts must have entities for governance, asset ownership, and management. Some Ecodistricts have found it useful to create a new legal entity for Ecodistrict management.

Engagement is also critical to Ecodistrict success. The support and actions of residents, businesses, and other organizations will determine whether the Ecodistrict achieves catalytic transformation.

Externally, engaging surrounding neighborhoods and local government decisionmakers will help raise the profile of the Ecodistrict. Engagement and partnership with the City of Chicago, its sister agencies, and regional utilities, will be essential to implementing the strategies, particularly those proposed for City-owned land.

As Elevated Chicago is structured as a collaborative and has representation from many of the actors shown in Figure 2, it is well-positioned to become the governance and engagement entity for four potential Ecodistricts at the four eHubs. Elevated Chicago could facilitate the Ecodistricts by developing and implementing a finance strategy to support community-led projects. Once the Ecodistrict is formed, Elevated Chicago could coordinate the various stakeholders, work to remove policy barriers, and promote the work to external parties.

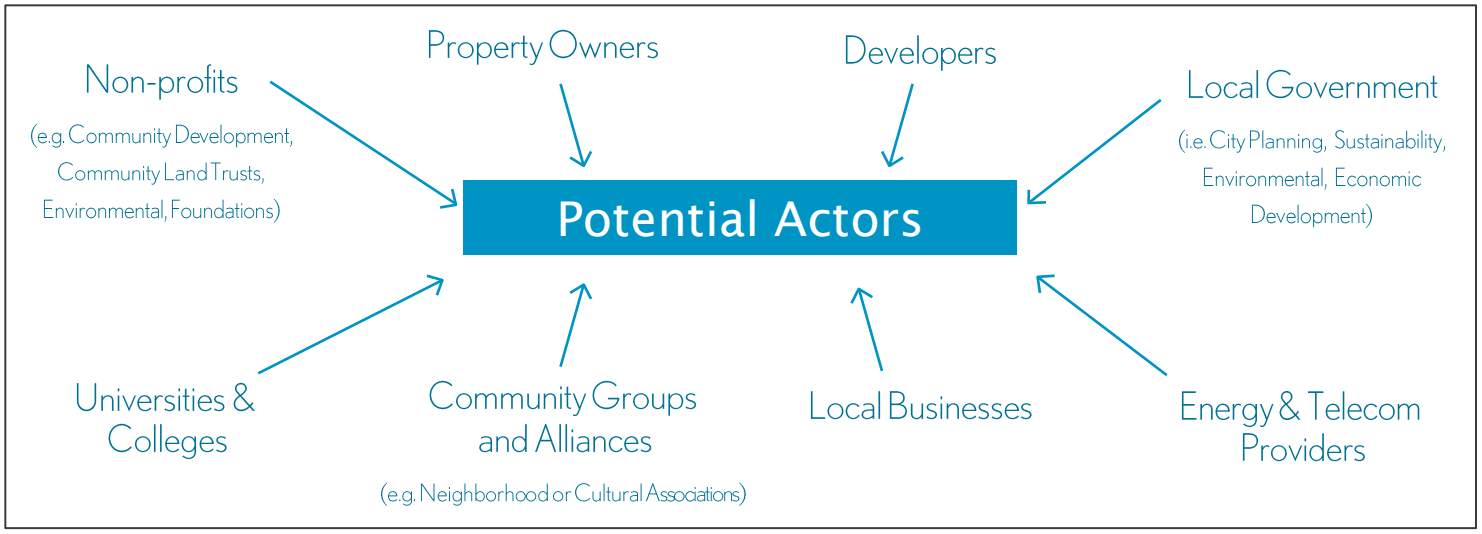

FIGURE 2
Potential Ecodistrict Actors

FINANCING

Where available, the *Ecodistrict Strategies* section of this report outlines typical project costs. The exact cost of a project will vary depending on specific site conditions, selected technologies, and desired level of benefit. While a building-level efficiency retrofit may cost tens of thousands of dollars, an infrastructure-level approach incorporating district energy, food production, district stormwater, and streetscaping will cost millions of dollars.[78] It's important, however, to consider the full level of costs and benefits of a proposed investment, incorporating quantitative and qualitative impacts such as public health benefits, local economic improvements, and quality of life improvements. Return on investment (ROI) should also be calculated using the full range of impacts. Finally, the cost of investment should be compared against the "Do Nothing" scenario – what is the cost of business as usual?

Following is a list of options that may provide a path forward for financing Elevate Chicago Ecodistrict strategies. Financing resources for specific types of projects can also be found in the *Resources* portion of the *Ecodistrict Strategies* section of this report.

The cost of financing Ecodistrict strategies can be lowered by adopting standard contracts, such as those used by the solar industry.[79] If multiple Elevated Chicago eHubs pursue Ecodistrict formation, project costs and timelines can be further reduced by coordinating efforts and leveraging economies of scale.

1. **TAX INCREMENT FINANCING (TIF)**
   Tax Increment Financing (TIF) borrows against the future stream of additional tax revenue a project is expected to generate to finance improvements. The use of TIF for sustainable infrastructure is somewhat novel. TIF districts are present in portions of the Logan Square, Green Line Corridor, Kedzie Corridor, and California Pink Line eHubs.
2. **REVOLVING LOAN FUNDS (RLF)**
   RLF are used for investments that will create a direct financial savings or revenue stream that a revolving loan fund can provide as an ongoing source of capital. Once the fund is established and lent out, new projects are paid for with funds repaid by borrowers. The Illinois Clean Water State Revolving Loan is one such example.[80]
3. **IMPACT FEES**
   Impact fees are charges on developments and renovations that trigger the requirements. The fees pay for the additional demand on city services and infrastructure which results from the new development. For example, the Chicago Open Space Impact Fee charges a fee for new residential development. The collected fees are allocated to pay for park land acquisition and improvement.
4. **INFRASTRUCTURE INVESTMENT FUNDS & INFRASTRUCTURE BANKS**
   An infrastructure investment fund or an infrastructure bank is a lending program specifically designed for the needs of infrastructure, which may have long construction times and long pay back periods. For example, Connecticut's Green Bank provides financing for local green energy and energy efficiency projects.[81] The Chicago Infrastructure Trust, created in 2012 by the City of Chicago, cites its mission as "providing alternative financing and project delivery for transformative infrastructure projects."[82]
5. **PRE-DEVELOPMENT FUND**
   Pre-development funds support development in targeted urban areas needing reinvestment. Financing is used for early-stage project costs that facilitate acquisition of more conventional financing. These funds might support environmental studies, engineering, and community engagement efforts. Financing is typically secured from private sector investors. For example, pre-development funds in Detroit and Kansas City target catalytic urban projects for flexible, low-cost financing.[83]
6. **PUBLIC-PRIVATE PARTNERSHIPS (P3s)**
   P3s bring private capital to a project, sharing the risk between the local government and private investors. Several considerations must be weighed before entering a P3. For example, the risk sharing arrangement may place the public at undue risk of financial burden if the project underperforms. In addition, the public may not accept private ownership of public assets.[84]

[78] *"The Deep Green" scenario for a proposed Phoenix Ecodistrict was estimated to cost $81 million. (Beyond TIF: a Finance Model for the Phoenix Gateway and Beyond, 2016 Ecodistrict Summit)*

[79] *Zachary Shahan, "Solar Contract Templates Developed By NREL & Partners," CleanTechnica, November 23, 2013.*

[80] *Illinois EPA. "Grants and Loans," Accessed 8/18.*

[81] *Connecticut Green Bank, "About Us," Accessed 5/17.*

[82] *Chicago Infrastructure Trust, "How it Works," Accessed 8/18.*

[83] *Invest Detroit, "Predevelopment Loan Fund," Accessed 8/18. Greater Kansas City LISC, "Catalytic Urban Predevelopment Fund," Accessed 8/18.*

[84] *U.S. Department of Transportation, Federal Highway Administration, "Types of Public-Private Partnerships (P3s)," 2017.*

7. **MINI BONDS**
Compared to traditional municipal or corporate bonds, mini-bonds are smaller and more consumer-focused. Mini-bonds can act as a crowdfunding mechanism that enables the broader community to show support for a project.

8. **GREEN BONDS**
Green bonds are debt-financing for projects that have positive environmental benefits. Green bonds appeal to investors with environmental interests or screens. Green bonds are an $800 billion global market, with a 50 – 150% annual growth projection. Water and transportation projects are the dominant type. Green bonds require certification of impacts over time.[85]

9. **SOCIAL IMPACT BONDS**
Social impact bonds, including environmental impact bonds, finance programs that create net economic benefits for governments, but lack a value capture mechanism. The DC Water Environmental Impact Bond, in Washington, DC, uses a pay-for-performance model to fund green infrastructure developed to avoid stormwater runoff and achieve regulatory compliance.[86]

10. **RESILIENCE BONDS**
Resilience bonds are used to capture the value of avoided losses from a disaster.[87] For example, a resilience bond can link catastrophe insurers and developers to finance district stormwater designed to reduce flooding.

11. **PROPERTY ASSESSED CLEAN ENERGY (PACE)**
Property Assessed Clean Energy (PACE) financing allows property owners to pay for energy improvements, such as solar energy, through property tax assessments.[88] PACE requires enabling legislation. Illinois does not currently have PACE.

12. **CREDIT ENHANCEMENT**
Credit enhancement can be used to help borrowers who may not otherwise qualify for cost-effective financing. This tool can improve equitable access to Ecodistrict strategies. For example, a small business could use credit enhancement to access an energy efficiency program that requires upfront investment but yields a return on investment over time. Loan loss reserves and loan guarantees are both examples of credit enhancements.[89,90]

[85] *American Planning Association 2018 National Conference. (4/21/18). Climate Change, Credit Ratings, and Investment.*

[86] *U.S. Environmental Protection Agency, "DC Water's Environmental Impact Bond: A First of its Kind," April 2017.*

[87] *Refocus Partners, 2017. A Guide for Public-Sector Resilience Bond Sponsorship.*

[88] *American Council for an Energy Efficient Economy, "Property Assessed Clean Energy (PACE)," Accessed May 2017.*

[89] *The State and Local Energy Efficiency Action Network, "Credit Enhancement Overview Guide," January 2014.*

[90] *See "How to Optimize On-Bill Financing to Help Illinois Building Owners Invest in Energy Efficiency" for a discussion of energy financing. M. Bondie Keenan, (2/11/15). Elevate Energy Blog.*

POLICY

Elevated Chicago can take a leadership role in promoting policy change that enables the adoption of Ecodistrict strategies and financing mechanisms. Once specific Ecodistrict strategies are selected, an assessment of policy barriers and proposed changes should be conducted. Policy barriers to innovative infrastructure strategies may include:

- Authority for land use regulation.

Each potential project must identify the legal identity that has the authority over how the land may be used, and their specific powers and responsibilities. For example, in the case of stormwater management, various powers and responsibilities may be held by MWRD, the Chicago Department of Water Management, and the Chicago Department of Planning and Development.

- Authority for district creation.

Elevated Chicago may choose to pursue the creation of a new district entity, for the purpose of financing and managing ecodistrict services, similar to a TIF or SSA. A new type of district may be vulnerable to legal challenge, if it is formed without specific authorizing legislation. However, stormwater utility fee districts are already authorized and in existence in other Illinois municipalities.

DOCUMENTING BENEFITS

Documenting the benefits of Ecodistricts is crucial to garnering long-term financing and public support. Desired outcomes, and the associated verifiable metrics, should be selected at the beginning of the project, so they can be incorporated into the project design and maintenance plan. The metrics should be benchmarked annually, to better understand whether strategies are working, and identify management practices needing improvement. Metrics should go beyond traditional measures of short-term financial return and incorporate the valuation of long-term economic and non-financial impacts, such as health and climate protection.[91]

[91] *See CNT's The Value of Green Infrastructure (2011) for guidance on measuring a range of community benefits.*

PRACTITIONERS + ALLIED ORGANIZATIONS

This section provides a list of practitioners and allied organizations working in one or more of the Ecodistrict strategy areas. This list is not exhaustive and may be updated in the future. The service descriptions are taken directly from organizations' websites.

Many Ecodistrict strategies require specialized technical services such as engineering. A formal procurement process is recommended to achieve the best value for these types of professional services.

ENERGY

1. District Energy

District Energy St. Paul.
In the district energy field, District Energy St. Paul is considered the most notable in the United States for its use of renewable energy sources and implementation of energy conservation measures.
http://www.districtenergy.com/

International District Energy Association (IDEA)
The International District Energy Association (IDEA) works actively to foster the success of our members as leaders in providing reliable, economical, efficient, and environmentally sound district heating, district cooling, and combined heat and power.
https://www.districtenergy.org/home

2. Community Solar

Capitol Hill Housing.
CHH builds vibrant and engaged communities through affordable housing and community development.
https://www.capitolhillhousing.org/

Denver Housing Authority. Contact: Chris Jedd.
DHA's mission is to serve the residents of Denver by developing, owning, and operating safe, decent, and affordable housing in a manner that promotes thriving communities.
http://www.denverhousing.org/Pages/default.aspx

Elevate Energy. Contact: Vito Greco.
We design and implement programs that reduce costs, protect people and the environment, and ensure the benefits of clean and efficient energy use reach those who need them most.
https://www.elevateenergy.org/

Groundswell.
Groundswell develops community solar projects and programs that connect solar power with economic empowerment.
https://groundswell.org/

Illinois Solar Energy Association.
The Illinois Solar Energy Association (ISEA) is a non-profit organization that promotes the widespread application of solar and other forms of renewable energy through our mission of education and advocacy.
https://www.illinoissolar.org/

Microgrid Energy. Contact: Mat Elmore.
Microgrid is a national leader in the development of onsite solar projects and small utility solar projects, including community solar.
https://www.microgridenergy.com/

Trajectory Energy.
Trajectory Energy Partners brings together communities, organizations, and landowners to develop clean energy projects with strong local support.
https://trajectoryenergy.com/

FOOD

Advocates for Urban Agriculture.
Advocates for Urban Agriculture. Advocates for Urban Agriculture (AUA) is a coalition of individuals, organizations & businesses work to support sustainable agriculture in Chicago.
https://auachicago.org

Bolton Bees; The Solar Honey Company. Contact: Chiara and Travis Bolton.
The Solar Honey Company's (SHC) mission is to promote the productive use of land under and around ground mounted solar panels.
http://boltonbees.com/solar-honey-1/

Bubbly Dynamics LLC; The Plant.
Bubbly Dynamics, LLC ("Bubbly") is a social enterprise whose mission is to create replicable models for ecologically responsible and sustainable urban industrial development.
https://www.bubblydynamics.com/

Chicago Botanic Garden; Windy City Harvest.
The Chicago Botanic Garden's urban agriculture education and jobs-training initiative to help build a local food system, healthier communities, and a greener economy.
https://www.chicagobotanic.org/urbanagriculture/

Community Food Forests.
Collaboratively growing & harvesting food in forest-like ecosystems
https://communityfoodforests.com/

Experimental Station; Garfield Produce Co.
Garfield Produce Company is an urban hydroponic farm located in Chicago's west side that seeks to empower our community through wealth creation.
https://experimentalstation.org/garfieldproduce/

Gardeneers.
Designed to give students in food desert communities equal access to healthy fruits and vegetables, Gardeneers is dedicated to school garden education in Chicago.
gardeneers.org/

Gotham Greens.
Our technologically advanced, urban greenhouse facilities, located in New York City and Chicago, provide our customers with a year-round, local supply of premium quality, pesticide-free produce grown under the highest standards of food safety and environmental sustainability.
gothamgreens.com/

Growing Home.
Growing Home supports healthy people & communities through our urban farm and job training program.
growinghomeinc.org/

Herban Produce.
Herban Produce is a non-profit urban farm that provides year-round fresh produce to Garfield Park and neighboring communities.
https://www.herbanproduce.com/

Homan Grown; Homan Rails Farm. Contact: Jeff Levant.
Homan Grown is a social enterprise, wholesale perennial & tree nursery offering landscape design/build services – coming to North Lawndale this Fall.
https://www.homangrown.org/

North Lawndale Employment Network; Sweet Beginnings.
It offers full-time transitional jobs to citizens returning from incarceration in a green industry—the production and sales of all-natural skin care products featuring its own urban honey under the beelove™ brand.
http://www.nlen.org/employers/sweet-beginnings/

NeighborSpace.
NeighborSpace is the only nonprofit urban land trust in Chicago that preserves and sustains gardens on behalf of dedicated community groups.
http://neighbor-space.org/

Urban Growers Collective.
We operate seven urban farms on 11-acres of land predominately located on Chicago's south-side. These farms are production oriented with staff integrating education, training, and production to meet program goals.
https://urbangrowerscollective.org/

U.S. Forestry Service; Chicago Urban Field Station. Contact: Drew Hart.
Today, the Chicago Urban Field Station is a partnership across all parts of the US Forest Service – the Northern Research Station, the Northeastern Area of State & Private Forestry, and the Midewin National Tallgrass Prairie of the National Forest System. The Chicago Urban Field Station is also a partnership between local partners, including Chicago Wilderness, The Field Museum, Openlands, and the Morton Arboretum.
https://www.nrs.fs.fed.us/chicago/

WATER

Center for Neighborhood Technology; RainReady. Contact: Marcella Bondie Keenan.
Our RainReady℠ initiative helps individuals, businesses and communities find solutions to the problem of inland flooding.
https://www.cnt.org/rainready

Greencorps Chicago.
Greencorps Chicago is the City of Chicago's green job training program for individuals with barriers to employment.
https://greencorpschicago.org/

Greenprint Partners.
Greenprint Partners is a long-term green infrastructure delivery partner that helps cities achieve high-impact, community-driven stormwater solutions at scale.
https://www.greenprintpartners.com/

Illinois Association for Floodplain and Stormwater Management.
Encouraging effective and innovative approaches to managing the Illinois' floodplain and stormwater management systems.
https://www.illinoisfloods.org/

OAI; High Bridge. Contact: Molly Dowling.
We focus our efforts where the benefits to people, business, and society are greatest: individuals and communities affected by poverty or lacking necessary resources, companies facing a vanishing labor pool, and people for whom language or culture is a barrier to participation. High Bridge is OAI's first social enterprise company. It's also Chicago Southland's premier landscape design, installation, and maintenance firm.
https://oaiinc.org/high-bridge/

AIR

1. Complete Streets

Chicago Metropolitan Agency for Planning (CMAP); Local Technical Assistance.
CMAP established the Local Technical Assistance (LTA) program to direct resources to communities pursuing planning work that helps to implement GO TO 2040. Beginning with the next call for projects, the agency will now focus efforts on implementing ON TO 2050.
http://www.cmap.illinois.gov/programs/lta

2. Buffer Parks

Blacks in Green.
Blacks in Green (BIG) is an environmental organization whose vision is to create self-sustaining African diaspora communities.
http://blacksingreen.org

Community Action to Promote Health Environments (CAPHE).
Community Action to Promote Healthy Environments (CAPHE) is a community-based participatory research partnership that includes community-based organizations, the health practice community, environmental organizations, and academic researchers.
caphedetroit.sph.umich.edu/

Morton Arboretum; Chicago Regional Trees Initiative. Contact: Melissa Caustic.
The Chicago Region Trees Initiative (CRTI) is a unique and collaborative coordinated response to key issues facing trees.
www.mortonarb.org/chicago-region-trees-initiative

North Lawndale Greening Committee; CCA Gardens for the People.
The North Lawndale Greening Committee helps residents, businesses, organizations, block clubs, and churches beautify the community and grow produce.
http://nlgreeningcommittee.org/

Openlands; TreeKeepers.
Since 1991, more than 1,800 trained volunteers have provided eyes and ears on the ground year-round in neighborhoods all over Chicagoland to identify potential tree-related problems and lead neighbors in tree planting and tree care.
https://openlands.org/trees/treekeepers

School of the Art Institute; Oaks of North Lawndale.
Oaks of North Lawndale is an aspirational project that brings together the School of the Art Institute of Chicago, the city of Chicago and the North Lawndale community to reimagine the neighborhood as a verdant, peaceful, and tree-lined place.
https://www.facebook.com/oaksofnorthlawndale/

U.S. Forestry Service; Chicago Urban Field Station. Contact: Drew Hart.
The Chicago Urban Field Station is also a partnership between local partners, including Chicago Wilderness, The Field Museum, Openlands, and the Morton Arboretum.
https://www.nrs.fs.fed.us/chicago/

3. Sustainable Manufacturing & Freight Movement

Bubbly Dynamics LLC; The Plant; Chicago Sustainable Manufacturing Center.
Bubbly Dynamics, LLC ("Bubbly") is a social enterprise whose mission is to create replicable models for ecologically responsible and sustainable urban industrial development.
https://www.bubblydynamics.com/

Chicago Department of Transportation; Clean Transportation Program, Chicago Area Clean Cities. Contact: Samantha Bingham.
Chicago Area Clean Cities (CACC) coalition is a voluntary, locally-based coalition dedicated to encouraging the use of clean fuels and clean fuel vehicles in the Chicago metropolitan area.
https://www.cityofchicago.org/city/en/depts/cdot/supp_info/chicago_area_cleancities.html

Method Products; Pullman Soap Factory.
method believes in using the power of our business to create positive social and environmental change.
https://methodhome.com/beyond-the-bottle/soap-factory/

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