



Madison Heights Health Impact Assessment: Final Report

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Acknowledgments

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Madison Heights Front Elevation, proposed



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Executive Summary

Quality, affordable housing not only helps fulfill the basic need for shelter, but can also have various community-wide impacts, including residential stability, economic development, increased sense of control and security, social cohesion, and improved short- and long-term health outcomes.¹ In this way, access to quality, affordable housing has positive implications for everyone in the surrounding community.

Madison Heights is an affordable housing community located in Avondale, Arizona owned and managed by the Housing Authority of Maricopa County (HAMC). Together with developer Gorman and Company, HAMC has proposed to redevelop Madison Heights in order to improve site facilities and surrounding infrastructure, as it has not seen major improvements since its construction in 1973. The proposal also includes the consolidation of two other affordable housing communities, Norton Circle and HM Watson Homes, located in Avondale and Buckeye, respectively, into the new Madison Heights, thereby doubling its capacity.

Following the completion of a previous health impact assessment for another affordable housing redevelopment, the Coffelt-Lamoreaux Public Housing Redevelopment Health Impact Assessment,² the HAMC and Gorman and Company requested that a health impact assessment be conducted to inform the process and promote the health and safety of residents as well as the surrounding neighborhood. As a result, individuals from the Maricopa County Department of Public Health (MCDPH), Local Initiatives Support Corporation of Phoenix (LISC), and Health in Policy and Practice (HIP2) worked together to conduct a health impact assessment on the Madison Heights affordable housing community and the surrounding neighborhood. The project was completed with the financial support of LISC Phoenix and a grant from the Health Impact Project, a collaboration of the Robert Wood Johnson Foundation and The Pew Charitable Trusts.

Health Impact Assessment Background

A health impact assessment (HIA) is a public health tool that helps guide decision makers to consider the possible health effects of a proposed project, policy, or plan—especially one not explicitly related to health. Using a combination of qualitative and quantitative methods, HIAs assess existing baseline conditions and potential health impacts in order to develop recommendations for decision makers. The goal is to maximize the positive health effects while minimizing negative outcomes.³ Community stakeholders, especially vulnerable populations, are engaged so that possible health impacts on all affected populations are assessed and considered before the proposal is put in place.

For the purpose of HIAs, “health” is defined as more than just the presence or absence of disease. Rather, it encompasses social, environmental, economic, and political factors that directly and indirectly impact physical and mental well-being, thereby placing health in a broader context. Keeping this perspective in mind, a health impact assessment is guided by the following principles:^{4,5}

Democracy – involvement and engagement of the public in order to emphasize the right of all people to participate in decisions that affect their life, both directly and through decision makers.

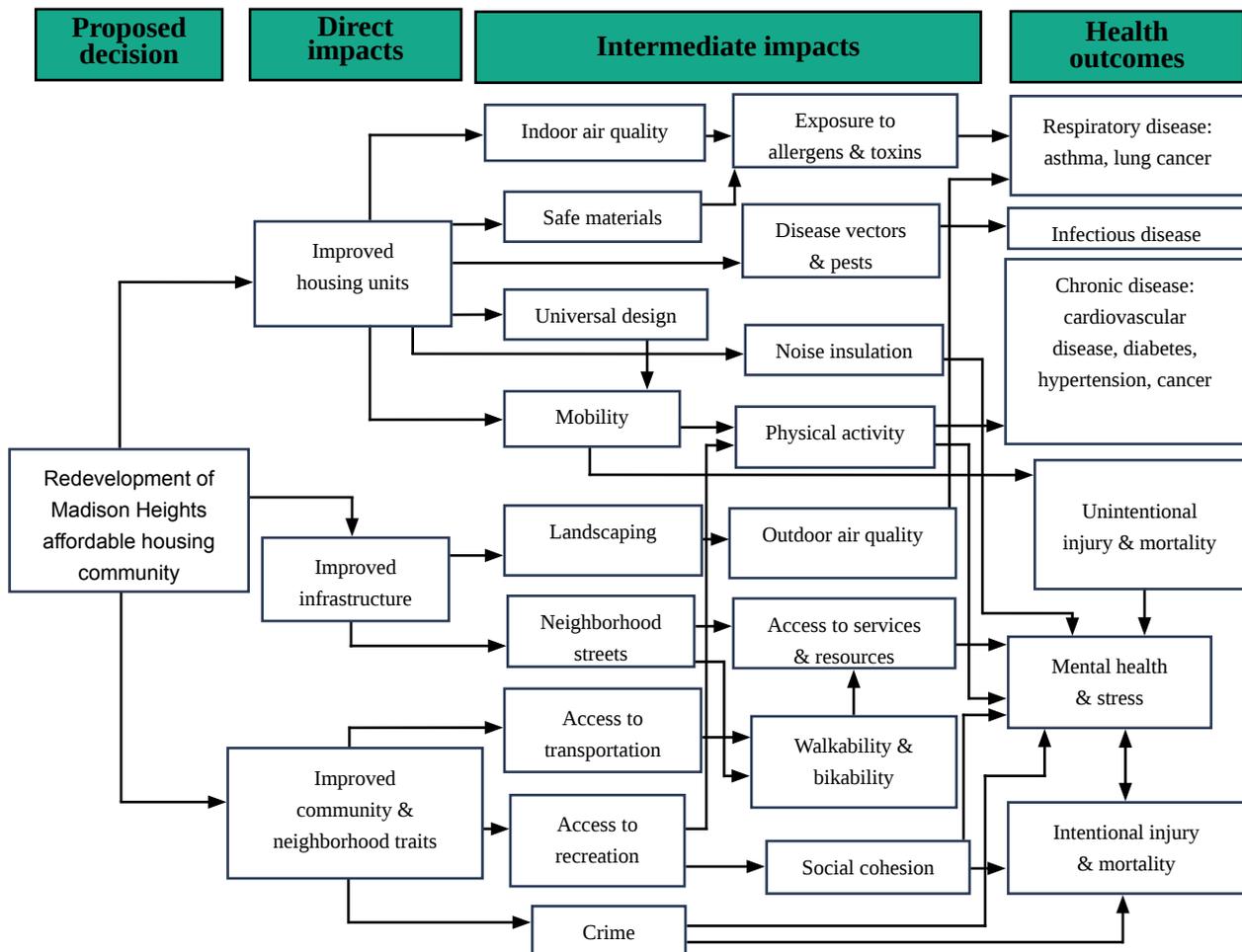
Equity – consideration of health impacts that affect all populations, especially vulnerable groups, in order to reduce inequities resulting from disparities among different population groups.

Sustainable development – assessment of both short- and long-term impacts in order to support development that meets the needs of both current and future generations.

Ethical use of evidence – use of a rigorous, transparent, and objective process to ensure that the best available evidence is utilized in assessing impacts and informing recommendations.

Comprehensive approach to health – consideration of all broader determinants of health in order to reinforce that a wide range of factors from all sectors of society interact to determine physical, mental, and social well-being.

Figure ES1
Pathway diagram



A pathway diagram (**Figure ES1**) is a schematic logic model that conceptualizes pathways through which the proposed decision could potentially affect downstream health outcomes. In this case, through improvements in housing units, infrastructure, and community characteristics, the redevelopment of Madison Heights has the potential to impact a variety of factors that directly and indirectly influence health outcomes, including physical activity, social cohesion, chronic disease, injury, and mental health.

Key Findings and Recommendations

Based on conversations with residents and other stakeholders, existing community health status, and evaluation of potential health impacts affected by the redevelopment, several overarching health issues and themes were identified: safe housing, particularly for older adults and people with disabilities; safe, active neighborhoods; access to healthy food and healthcare services; and thriving, resilient communities. Due to the overlapping nature of the various determinants of health, certain issues and recommendations fall into several categories and are therefore repeated in the full report. This only serves to underline the importance of integrating community efforts to address health as a whole, rather than addressing concerns individually.

Safe Housing

Safe, quality housing is an important determinant of health, as poor housing can result in a variety of adverse health outcomes. Because the three communities, Madison Heights, Norton Circle, and HM Watson Homes, have a disproportionately high number of older and disabled adults, this HIA focuses on how the redevelopment and relocation process could affect these particular populations. If certain features are included in the original design and construction, money can be saved on expensive future renovations and repairs while also increasing safety, mobility, and comfort of all residents. This report therefore recommends:

- Inclusion of universal design features to prevent falls and other unintentional injuries, for instance wider hallways and doorways, reinforced bathroom walls for future grab bar installation, zero-step entries, and easy-to-reach doorknobs, light switches, and thermostats;
- Improved noise insulation, especially considering the increased number and density of residents who will be living in the Madison Heights neighborhood; and
- Use of safe, non-toxic, and sturdy materials in the construction of the new Madison Heights.

Safe, Active Neighborhoods

Regular physical activity is important to both physical and mental health, and can greatly reduce the risk of several chronic diseases. Making neighborhoods more walkable and bikable is an important step in ensuring that everyone has access to recreation and physical activity, particularly for those who are less mobile or otherwise lack access to recreational centers. Through a participatory mapping workshop and walking audits, residents identified that a combination of heavy, speeding traffic and inadequate shade cover makes the area

inhospitable to pedestrians and bicyclists—a finding further corroborated by the high mortality rate due to motor vehicle accidents. Considering the high pedestrian traffic, particularly by many children on their way to school, recommendations include:

- “Complete street” policies for Dysart Road and Central Avenue that include ample lighting and shade, bicycle lanes, and a buffer between the road and sidewalk to make these streets safe for all multimodal users;
- Installation of bicycle lockers in the Madison Heights complex;
- Added sidewalks along Palo Verde Drive and a crosswalk study at its intersection with La Canada Boulevard; and
- A joint-use agreement between the First Southern Baptist Church and the City of Avondale to improve and expand playgrounds and fields in the area surrounding Madison Heights.

Access to Healthy Foods and Healthcare Services

Healthy diet and nutrition are central to health and well-being, while access to quality healthcare services helps to ensure detection, treatment, and prevention of disease and disability. Cost and lack of transportation are often barriers to these vital resources, particularly in low-income neighborhoods. Fortunately, several grocery stores that sell fresh produce are within close proximity of the Madison Heights neighborhood, and many residents report eating multiple servings of fruits and vegetables per day. Similarly, residents do not report access to healthcare services as a problem, as there is a primary care clinic nearby. Consequently, the recommendations of this report focus primarily on:

- Publicizing the existing low and no cost resources and services, including public transportation options and farmer’s markets that could improve access to both healthy foods and services;
- A partnership with the Care 1st Resource Center to encourage resident participation in the new community garden slated to open there; and
- An on-site community garden to promote healthy eating and physical activity while contributing to a greater sense of community cohesion among Madison Heights residents.

Thriving, Resilient Communities

A thriving, resilient community is one in which its members are able to respond to and manage stress while feeling a sense of “togetherness” due to shared interests, action, and/or engagement. This sense of community—also called social cohesion—is important to both physical and mental health, and combined with resilience can

help protect against pain, discomfort, and disability. Current residents of Madison Heights, Norton Circle, and HM Watson Homes are very diverse, with people of varying ages, household structures, cultures, and levels of ability. Although diversity can sometimes prove a barrier to forging new, trusting relationships, it can become an asset in the new Madison Heights if residents are provided opportunities to form new, diverse social support networks. This can be done in a variety of ways:

- Formation of a resident council to improve communication, trust, and residents’ sense of autonomy and control;
- Creation of “neighborhood circles” in which groups of residents get to know each other in smaller, more intimate settings and watch out for one another;
- Design of multigenerational community areas that encourage safe recreation and physical activity for residents of all ages and abilities;
- Consistent and streamlined communication with residents regarding the status and timeline of the proposal to minimize uncontrollable stress;
- Limiting school transfers and instability for children during the construction and relocation process; and
- Continued meetings with HIA Advisory Committee members to identify new resources and build on existing partnerships.

Background

Housing and Health

Although usually thought of as the presence or absence of disease, “health,” as referred to in a health impact assessment, is placed within a broader context, taking into account social, environmental, economic, and political determinants that can directly and indirectly impact physical and mental health. Within this perspective, housing, where we live, is tied to health in various ways: 1) housing quality, or the physical conditions of homes; 2) physical neighborhood conditions; 3) social and community attributes; and 4) housing affordability.^{6,7} Healthy, safe, accessible, and affordable housing can reduce the risk of illness and injury while improving residential stability and freeing up family resources, thereby reducing stress and other adverse mental health outcomes.⁸ As the three housing communities affected by this proposal are by definition considered “affordable,” this health impact assessment will address the other three links between housing and health: physical housing conditions, neighborhood conditions, and community characteristics. These pathways are further broken down into intermediate and downstream impacts on health in **Figure ES1: Pathway Diagram**.

What is a Health Impact Assessment (HIA)?

A health impact assessment (HIA) is a public health tool that aims to make potential and unforeseen health impacts of a proposed policy, plan, or project explicit. Quantitative, qualitative, and participatory techniques are used in order to develop recommendations for decision makers, which strive to maximize the proposal’s positive health effects while mitigating negative health outcomes.⁹ The HIA uses a robust community engagement process to identify and address concerns, actively involving a wide range of stakeholders from the community including residents, local, city, and county agencies, community leaders, and the general public. Vulnerable populations in particular are engaged so that potential health impacts on affected populations are assessed and considered before the proposal is put in place.

In order to be considered a HIA, certain criteria must be met. A HIA must:¹⁰

- be conducted in advance of a proposed policy, plan, program, or project decision to inform a decision-making process;
- systematically consider potential health, social, environmental, and economic impacts;
- solicit and utilize stakeholder input;
- determines and describe baseline health conditions, particularly in relation to vulnerable sub-populations;
- use evidence to comprehensively analyze and describe potential impacts on health or health determinants;

- base analysis and recommendations on evidence and methodologies that are transparent in scope, uncertainty, and limitations;
- identify potential resources, partnerships, alternatives, and recommendations to enhance and promote health;
- propose a plan to monitor health outcomes and determinants through the decision’s implementation; and
- document methods, findings, sponsors, funding sources, and participants and make information transparent and publicly available.

Although methodology varies depending on the scope and proposal, HIAs typically follow a series of six stages:

1. **Screening** determines whether or not an HIA is feasible, timely, and would add value to the decision-making process.
2. **Scoping** creates plans for stakeholder engagement and communication; a timeline for identifying and examining priority issues and research questions; and a work plan that defines participants and their roles.
3. **Assessment** describes baseline conditions and uses both quantitative and qualitative methods to predict and evaluate potential health impacts.
4. **Recommendations** provide potential approaches for decision-makers to enhance positive impacts and/or reduce negative risks to health, including social and economic determinants of health.
5. **Reporting** creates a written and/or visual presentation to communicate HIA findings and recommendations to decision-makers and stakeholders.
6. **Monitoring/Evaluation** tracks the health impacts of the HIA both during the decision-making process and after its implementation, including impacts on the social and economic determinants of health.

Redevelopment of Madison Heights

This HIA examined the health impacts of the proposal to completely redevelop the Madison Heights affordable housing project in order to improve site facilities, enhance surrounding infrastructure, and increase capacity. Following redevelopment, the residents of Norton Circle and HM Watson Homes affordable housing communities will be moved into the new Madison Heights. The three affordable housing projects are currently owned and operated by the Housing Authority of Maricopa County (HAMC), and none have seen major capital improvements since their construction. The proposed redevelopment would almost double the number of housing units in Madison Heights, transforming the current configuration of scattered single-story duplexes into a more compact, modern two-story apartment complex (see Appendices A and B). This HIA studied the effects of redevelopment on key health issues identified during the scoping and assessment phases in order to develop recommendations for key decision makers HAMC and developer Gorman and Company. These recommendations will be used to inform the redevelopment process, slated to break ground in December 2014.

Screening and Scoping

This section describes the preliminary background information that helped to determine the feasibility and scope of the HIA while providing a fuller picture of the Madison Heights redevelopment, particularly its potential health impacts and affected populations. Further details on the relevance and significance of certain health determinants are presented together with their corresponding recommendations in **Assessment and Recommendations**.

How the Madison Heights HIA Came Together

The Madison Heights/Norton Circle/HM Watson HIA project team was composed of individuals from the Maricopa County Department of Public Health and the Local Initiatives Support Corporation of Phoenix, with technical support from the Arizona Department of Health Services, Dignity Health St. Joseph’s Hospital and Medical Center, and Health in Policy and Practice (HIP²). The project was funded in part by a grant from the Health Impact Project, a collaboration of the Robert Wood Johnson Foundation and The Pew Charitable Trusts, with additional financial support from the Local Initiatives Support Corporation of Phoenix (LISC).

Primary Research Questions

This HIA examined three primary research questions investigating the relationship between housing and health:

1. How will the redevelopment impact physical housing conditions of the Madison Heights property?
2. How will the redevelopment impact neighborhood conditions surrounding Madison Heights?
3. How will the redevelopment impact social and community traits of Madison Heights?

Using input from residents and other community stakeholders, research questions were further divided into key health issues and concerns. As evident in **Figure ES1**, these research questions are connected to various downstream health outcomes including infectious and respiratory diseases, chronic diseases, mental health, intentional and unintentional injury, and mortality.

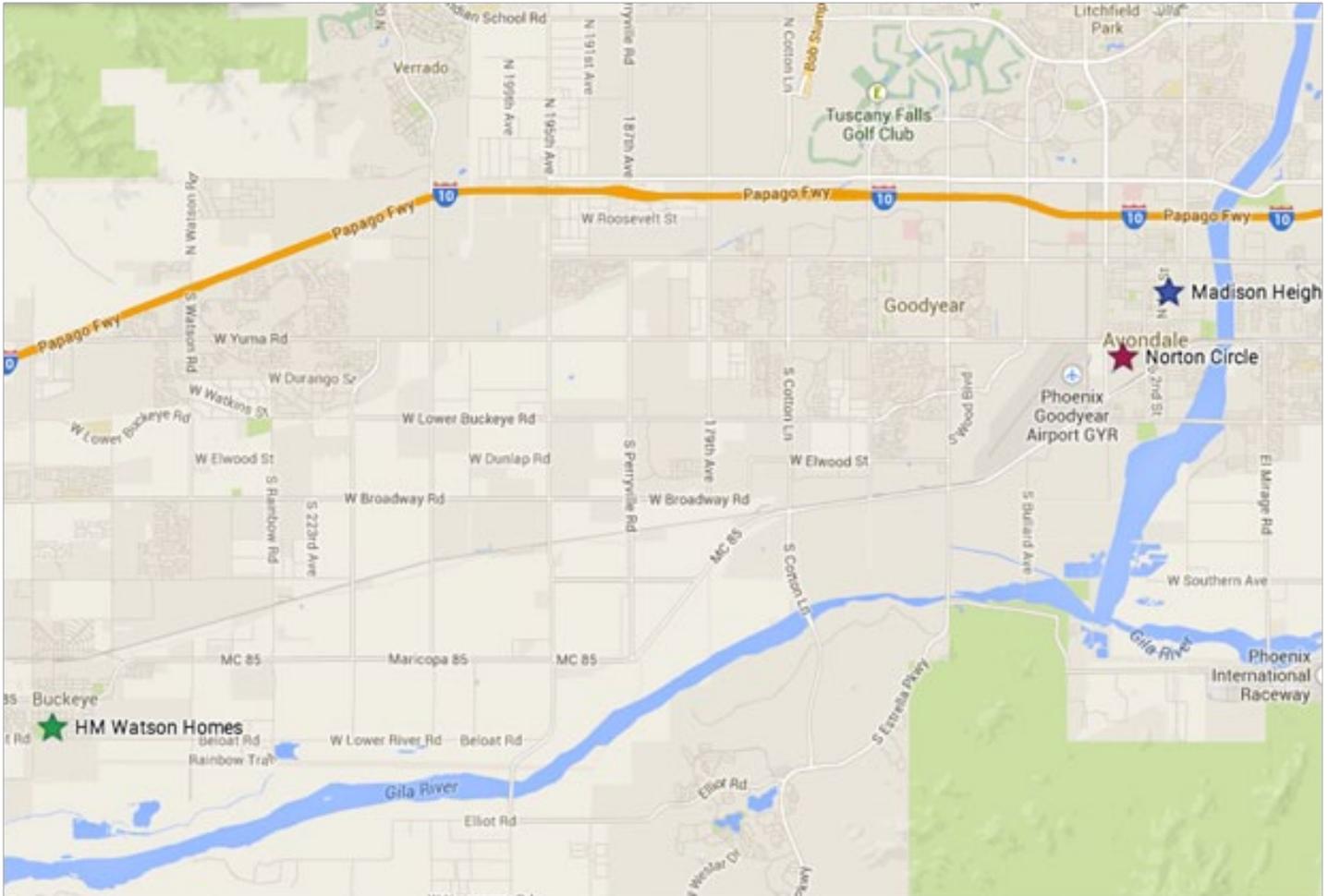
Methodology

Qualitative interviews with various community stakeholders were conducted during the screening and scoping phases in order to preliminarily determine possible health issues and concerns. Stakeholders included property managers and residents of all three communities, as well as individuals from local schools, the police department, and local resource centers including the First Southern Baptist Church, Boys and Girls Club, and Care 1st Resource Center. Additional information on stakeholder involvement is included in **HIA Process and Methods** and **Appendices C and D**.

Map 1

Location of all three neighborhoods

Courtesy of Google Maps



About the Properties

All three affordable housing communities, Madison Heights, Norton Circle, and HM Watson Homes, are currently owned and operated by the Housing Authority of Maricopa County (HAMC). Madison Heights and Norton Circle are located in Avondale, while HM Watson Homes is more remote, located approximately 20 miles southwest in Buckeye (see **Map 1**).

Map 2
Madison Heights neighborhood and surrounding area

Courtesy of Apple Maps



LEGEND

 Madison Heights neighborhood

Map 3
General Plan Land Uses

Adapted from City of Avondale General Plan¹¹



LEGEND

-  Madison Heights neighborhood
-  Medium density residential
-  High density residential
-  Commercial
-  Education
-  Open space and parks

Map 4
Norton Circle neighborhood and surrounding area

Courtesy of Google Earth



LEGEND

 Norton Circle neighborhood

Map 5
HM Watson Homes neighborhood and surrounding area

Courtesy of Google Earth



LEGEND

 HM Watson Homes neighborhood

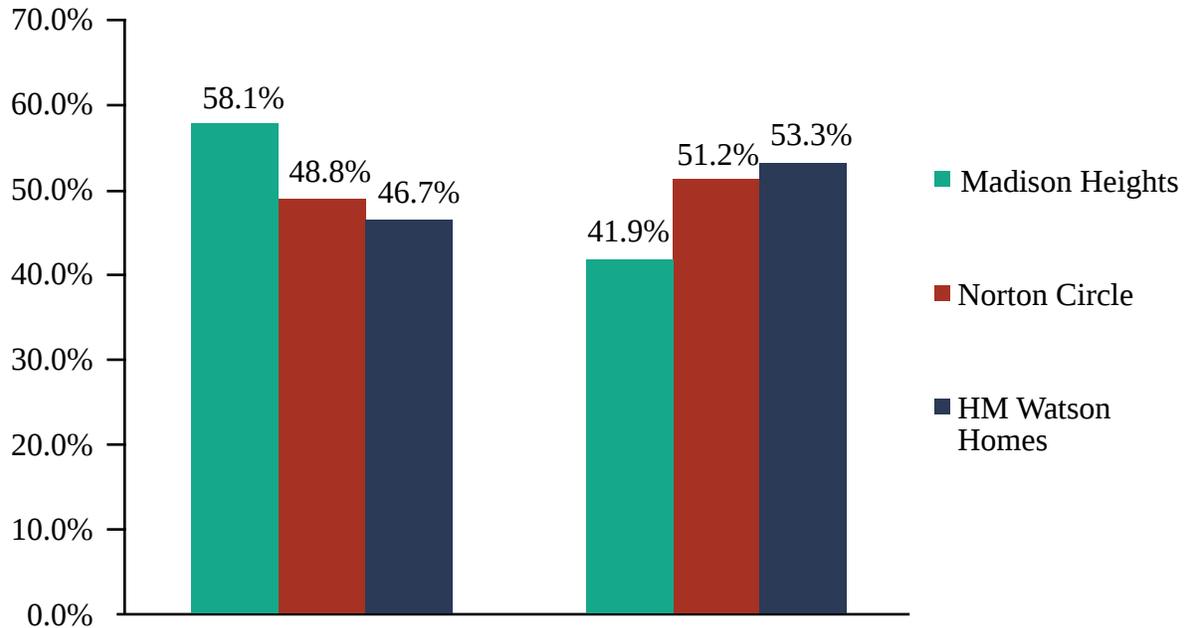
The Madison Heights development is located in the city of Avondale and was developed in 1973. It currently consists of 77 units, but if financing is approved will increase to 143 units when redeveloped. Aside from minor repairs, the property has not been renovated since its construction, and still relies on evaporative coolers rather than air conditioning for cooling. The property (see **Map 2**) extends west from Dysart Road along Madison Street, ending just east of 4th Street. Madison Heights lacks a west exit to 4th Street, instead butting up against a row of single-family homes. Agua Fria High School adjoins the property to the south, while various vacant lots lie along the north side of the property. Children from Madison Heights attend nearby Lattie Coor Elementary School and Avondale Middle School, both in the Avondale Elementary School District, and Agua Fria High School. Aside from these schools, the Madison Heights neighborhood is surrounded by residential and commercial areas (see **Map 3**) and has various resources and amenities within walking distance including Food City, Sam’s Club, a multitude of fast food restaurants, and Avondale Family Health Clinic (see **Maps 8, 9, and 10**).

Norton Circle was also developed in 1973, but is a much smaller complex with only 43 units. It is located in the historic Avondale district, approximately two miles southwest of the Madison Heights property. Norton Circle (see **Map 4**) connects to Western Avenue via 4th Avenue, which loops westward to become Norton Street. The complex is bound by 6th Avenue to the west and 4th Avenue to the east and is nestled immediately south of another apartment complex, Edgewater Apartments. Children living in Norton Circle attend Michael Anderson Elementary School, which lies to the northeast of the property extending south from Western Avenue. Aside from the school and other resources along Western Avenue, Norton Circle is surrounded by undeveloped vacant lots all along the south and east edges of the property, and a large parking lot to the west.

HM Watson Homes (see **Map 5**) is located in Buckeye approximately 20 miles southwest of Madison Heights. It was built in 1958 and consists of only 20 units, making it the oldest, smallest, and most remote of the three neighborhoods. Most units lie along Mahoney Avenue from 4th to 5th Street, with two additional units extending south on 4th Street. Two small playgrounds on the property are in complete disarray and have broken equipment. Most stores and resources are several miles north, and the schools a few miles east, as the surrounding Buckeye community is generally more spread out. Young families with small children make up the majority of households, and many have only recently moved in. Its smaller size and rural location give the neighborhood more of a small-town feel; most occupants report knowing and trusting their neighbors.

Figure 1
Ethnicity/race of households, separated by neighborhood

Data provided by HAMC



About the Population

The Madison Heights, Norton Circle, and HM Watson Homes affordable housing communities have a very diverse population, with a majority of residents identifying as Hispanic/Latino and over one in five whose principal language is Spanish (see **Figures 1** and **2**). Madison Heights in particular has a large number of African refugees, many of whom speak Swahili or Congolese, further adding to the language, cultural, and racial diversity of the population (see **Figure 3**). There is also considerable variation in household structure and age among residents. Almost 70 percent of households are families with children, adding up to a combined population of 229 children in all three neighborhoods. At the same time, over one in eight households identify themselves as “elderly,” with an average age of 71 among them. Significantly, many of the population—over one in four households—consider themselves “disabled,” defined by the HAMC as having a “physical or mental impairment which substantially limits one or more major life activities... that the average person can perform with little or no difficulty.”¹²

Figure 2
Principal language spoken in households, all three neighborhoods combined

Data provided by HAMC

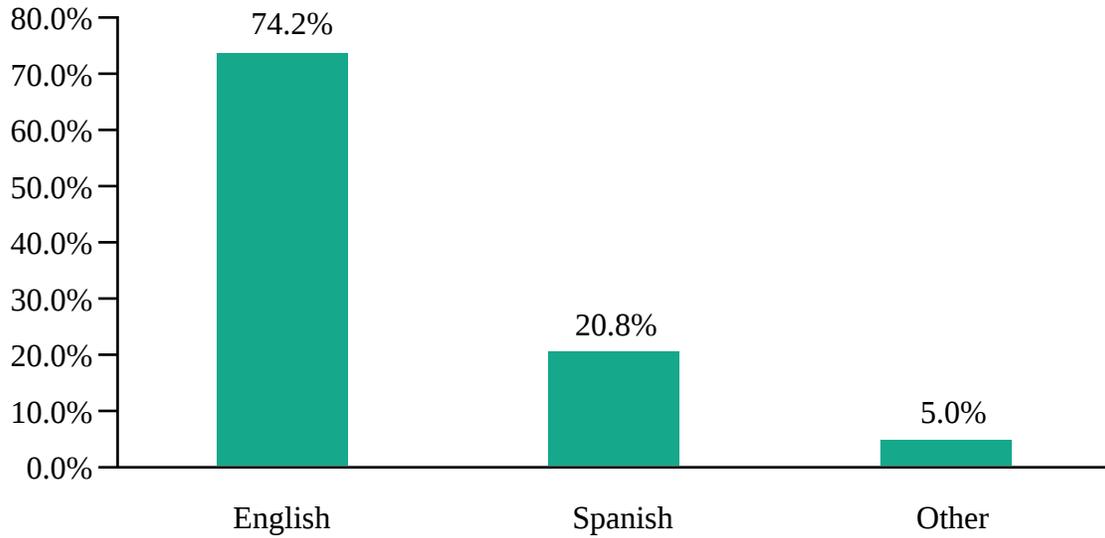
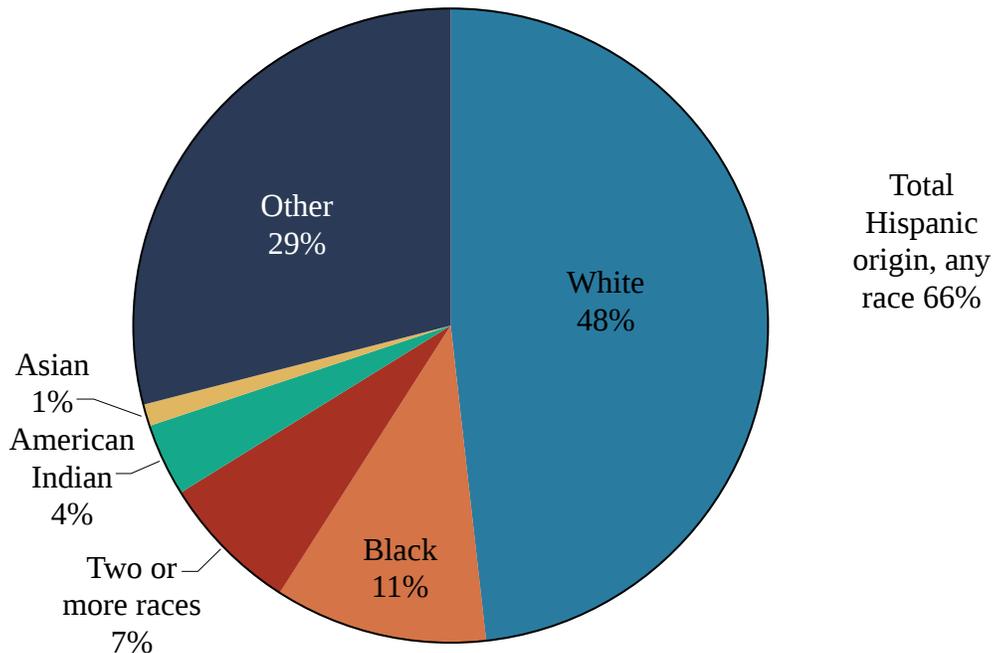


Figure 3
Race and ethnicity of Madison Heights residents*

Data provided by HAMC



*Those who identify as Hispanic may belong to any race

Assessment and Recommendations

This section outlines the data collected that describe existing health conditions and potential health impacts. In the Key Health Determinants section, background scoping information is presented together with the corresponding data, recommendations, and rationale in order to provide a more comprehensive understanding of each health concern. Methodology is described in further detail in **HIA Process and Methods**.

Baseline Community Health Status

In order to determine baseline community health status, data was collected from the greater Avondale community, helping to preserve anonymity of small-area data while avoiding fluctuations in numbers from year to year. In general, the demographics of Avondale are similar to those of Madison Heights, Norton Circle, and HM Watson Homes; the city has a majority minority population and is primarily composed of families with young children with a median age of 28.1 years old.¹³ There are clear limitations with this representation, however, as residents of the three communities have a disproportionately higher percentage of older and disabled adults and also have larger Hispanic/Latino and African-American populations. These differences limit the ability to draw substantive conclusions concerning the health of these communities, as the available data may not wholly represent the residents pertinent to this redevelopment.

Three measures were used to assess baseline community health in Avondale: natality data, which compiles information about births and prenatal care; mortality data, which organizes data by causes of deaths; and hospital discharge data, which categorizes hospital visits by primary diagnosis for hospitalization. Data for these three indicators were provided by epidemiologists from the Maricopa County Department of Public Health and supplemented with information from recent Health Status Reports for Maricopa County.^{14,15} Rates from the whole of Maricopa County are provided for comparison. This information provides a big-picture perspective of overall community health in the area; specific health determinants are discussed more in detail in the following section.

Natality

Data on birth rates, maternal characteristics, and birth outcomes can often help provide information on the status of a health system. Birth rates in particular are used to assess economic development and social change, as high birth rates can be associated with poor health outcomes and low socioeconomic status.

Infant mortality is frequently used to assess community health, as it can elucidate social and economic disparities in maternal health status as well as access to quality healthcare services both before and after birth. Infant mortality is defined as the death of an infant at any point between birth and the first year of life, and is calculated by dividing the number of infant deaths by the total number of live births within a given year.¹⁶ It is then multiplied by 1,000 to determine the mortality rate per 1,000 live births (see **Figure 4**). Due to the smaller population of Avondale and the relatively small number of births per year, infant mortality rates from the years 2009 to 2011 were averaged to avoid misleading and/or exaggerated variation from year to year.

Figure 4
Infant mortality rates per 1,000 live births *Data provided by MCDPH*

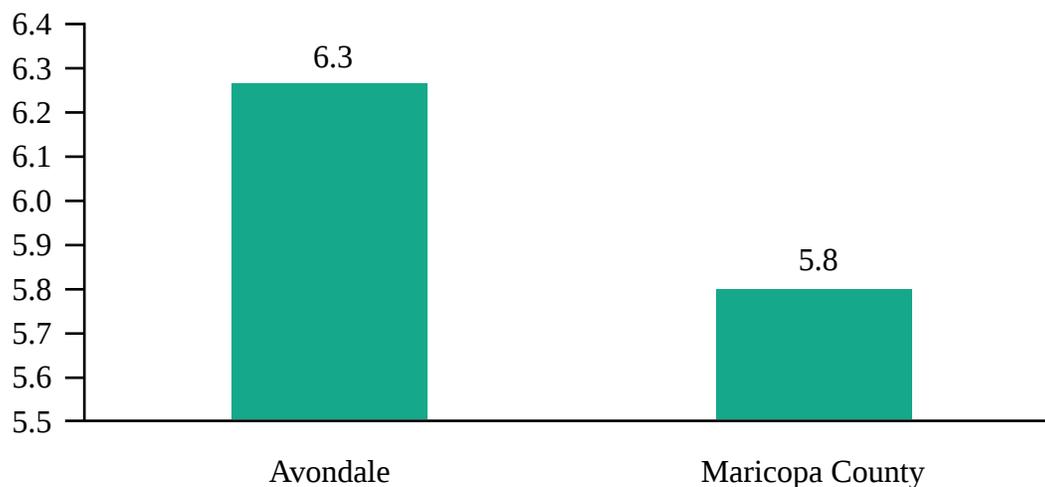
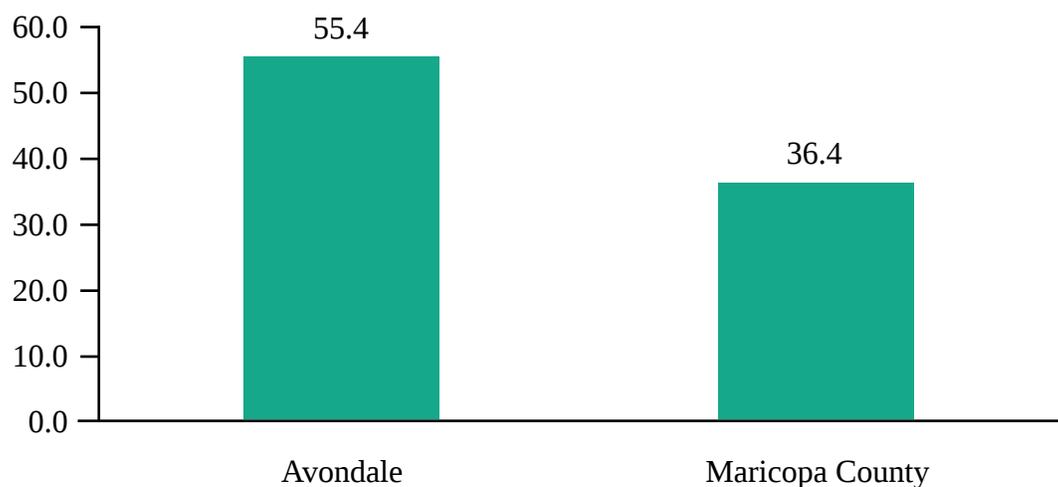


Figure 5
Teenage birth rates per 1,000 adolescent females in Avondale and Maricopa County *Data provided by MCDPH*



Teen birth rates are calculated by dividing the number of births to adolescent females in a given year by the total number of adolescent females in the population, defined as ages 15 to 19 years. It is then multiplied by one thousand to determine the rate per 1,000 adolescent females. The United States teenage birth rate has been steadily declining for the past two decades, and as of 2012 was 29.4 births for every 1,000 adolescent girls in the U.S.¹⁷ As shown in **Figure 5**, the rate in Maricopa County is significantly higher, and in Avondale higher still. This may be due to racial and ethnic disparities, as teen birth rates tend to be higher among Hispanic and black adolescents, whom are overrepresented in the Avondale community. Other risk factors for higher teen birth rates include lower median income and limited employment opportunities.

Mortality

Mortality rates, or death rates per 100,000 people, are commonly used as an indicator to track life expectancy, chart common causes of death, and compare mortality trends across different geographic areas. Like the rest of Maricopa County and consistent with nationwide vital statistics reports,¹⁸ the leading causes of deaths in Avondale were malignant neoplasms (cancer) of all types, heart disease, and chronic lower respiratory disease. Diabetes was also a significant cause of mortality, with rates similar to the rest of the county.

Figure 6
Death rates by underlying health condition, per 100,000 people *Data provided by MCDPH*

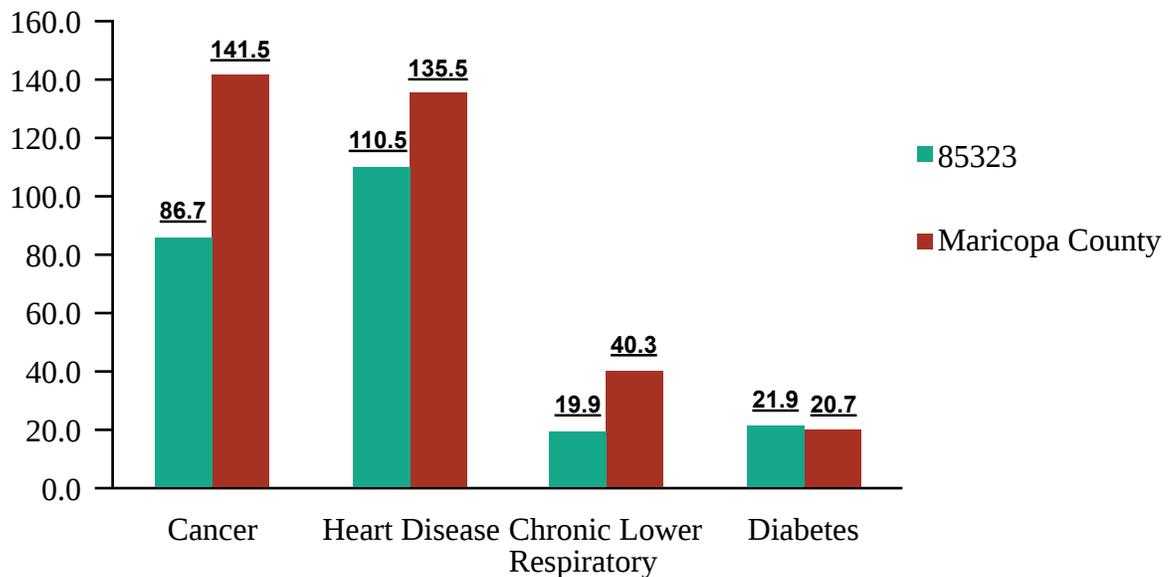


Figure 7
 Death rates due to external causes, per 100,000 people

Data provided by MCDPH

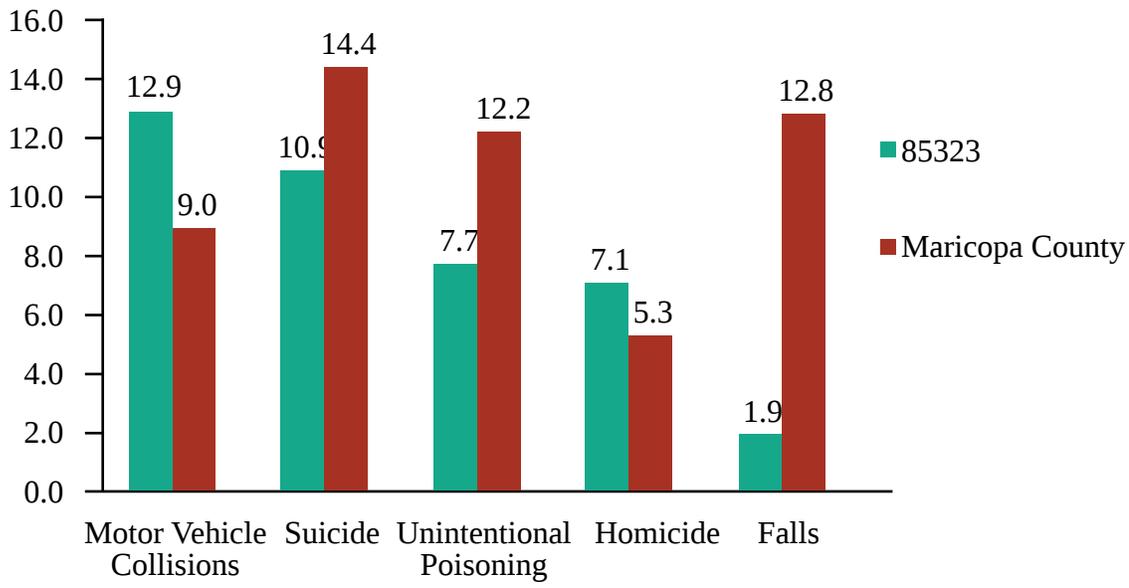


Figure 8
 Hospitalization rates by primary diagnosis, per 100,000 people

Data provided by MCDPH

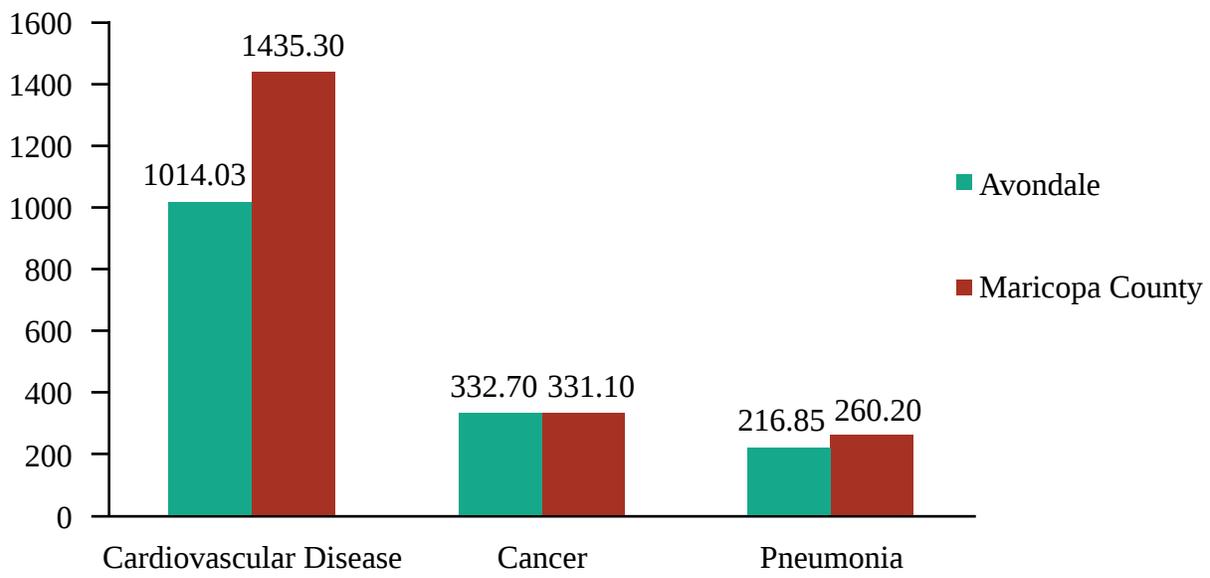
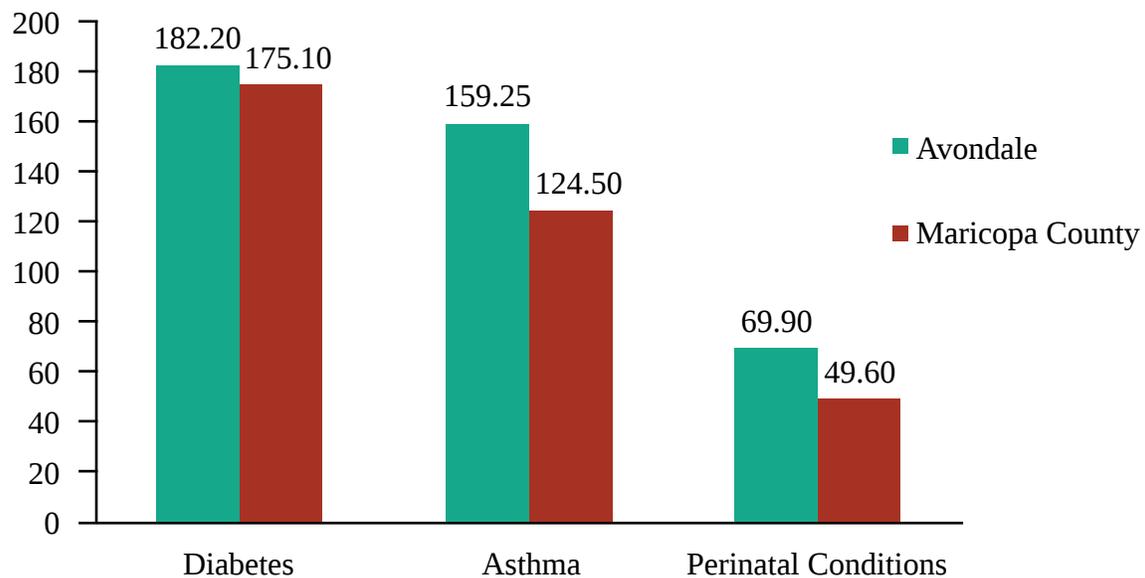


Figure 9
Hospitalization rates by primary diagnosis, per 100,000 people

Data provided by MCDPH



In the areas of cancer, heart disease, and chronic lower respiratory disease, rates of mortality are significantly lower in Avondale, perhaps due to the younger median age of the city relative to the rest of the county: 28.1 years in the city of Avondale as opposed to 34.6 years in Maricopa County.¹⁹ In contrast, the median age of residents living in the communities of Madison Heights, Norton Circle, and HM Watson Homes is 39, making it more likely that mortality rates within these communities are closer to the county rather than city rates.

In mortality caused by external causes, two key indicators were higher in Avondale than in Maricopa County: motor vehicle collisions and homicide. The high rate of deaths caused by motor vehicle collisions may indicate that streets within the city of Avondale are unsafe for multi-modal users, including automobile drivers, pedestrians, bicyclists, and public transportation users. The slightly elevated mortality rate due to homicide indicates a higher rate of violent crime in the area, which was corroborated by a few stakeholder interviews. However, most residents and stakeholders consider Avondale to be relatively safe and don't cite crime as an issue, particularly noting that the area's violent and gang-related crime activity has significantly declined in recent years.

Hospital Admissions

Hospitalization rates can often serve as indicators for access to and quality of primary care for chronic conditions, especially those that are controllable with outpatient care that can potentially prevent hospital stays. The hospitalization rates presented are categorized by principal diagnosis at time of discharge. As the population of Avondale is smaller than 100,000, averages of rates from the years 2009 to 2011 were used to adjust for yearly differences.

Cardiovascular disease accounts for the vast majority of hospital visits in Avondale, followed by cancer and pneumonia, as shown above. This is consistent with rates in Maricopa County, as well as nationwide.²⁰ The lower incidence of hospital stays due to cardiovascular disease may indicate a more active, younger population in the city of Avondale.

Interestingly, however, in the areas of diabetes, asthma, and perinatal conditions, rates of hospitalization were actually higher in Avondale than in the rest of Maricopa County. This could suggest poorer control of chronic conditions or decreased access to primary care and/or preventive services. The large Hispanic/Latino population in Avondale may account for the slightly higher hospitalization rate due to diabetes, as rates among this group are almost double those of non-Latino whites.²¹ The higher incidence of asthma-related hospitalizations may reflect Avondale’s proximity to nearby farming communities as well as the abundance of vacant, undeveloped land in the area, which may result in increased dust and poor air quality. Finally, the combination of increased hospitalizations due to perinatal conditions and the elevated infant mortality rate (see **Figure 4**) could be related to a higher overall birth rate, or suggest that other factors may be playing a larger role, for instance inadequate preconception care, young age at time of pregnancy (see **Figure 5**), inadequate birth spacing, gestational diabetes, or other maternal and/or neonatal conditions.

In summary, infant mortality rates, teenage birth rates, and hospitalization rates due to chronic disease are higher in Avondale in comparison with Maricopa County. With the exception of deaths caused by motor vehicle accidents and homicide, mortality rates are paradoxically lower—more likely a reflection of the younger Avondale population. While these data points provide an overall picture of health status in the relevant zip code and surrounding Avondale area, they do not wholly represent the small population of Madison Heights, Norton Circle, and HM Watson Homes residents, due to the differences cited above. Unfortunately, the small size of the study area precludes a more precise and accurate assessment of this population’s health status.

Key Health Determinants

Based on both qualitative and quantitative research methods (see **HIA Process and Methods**), a few key themes were identified: safe housing, particularly for older adults and people with disabilities; safe, active neighborhoods; access to services; and thriving, resilient communities. These issues were divided among the three primary links between housing and health mentioned earlier: physical housing conditions, neighborhood conditions, and social and community traits. As shown in the pathway diagram (**Figure ES1**), these key health determinants are related to a myriad of intermediate impacts and health outcomes, and often impact each other. Due to the interrelated nature of these issues, many recommendations will overlap, which only emphasizes and reinforces the importance of thinking holistically in regards to health.

Safe Housing

Safe, quality, accessible housing is an important determinant of health, as poor housing conditions are linked to a variety of poor health outcomes. Ineffective waste disposal, intrusion of disease vectors such as rats and insects, and overcrowding are associated with increased rates of infectious diseases including respiratory

infections and tuberculosis.²² Pest infestations can also lead to an increased risk of asthma and allergies, as do damp, moldy housing, old carpeting, and inadequate ventilation.²³ Design of safe, healthy housing is important for injury prevention, as building design and materials can influence the risks of both burns and falls. Each year, over 11 thousand people are estimated to die due to preventable unintentional injuries within the home, including falls, burns, poisoning, and drowning.²⁴ Particularly for older adults, slippery surfaces and poorly lit areas—especially stairs—can greatly increase the risk of falls and other unintentional injuries.

Healthy aging is the development and maintenance of optimal physical, mental, and social well-being and function in older adults. By 2030, nearly one in five Americans will be age 65 or older, doubling the current number of older adults to about 71 million.²⁵ The rapidly increasing number of older Americans has far-reaching implications, with one study projecting that in 2050 over one-fifth of U.S. households will have at least one resident with physical limitations.²⁶ Mobility is one particular concern central to the health of older adults, especially those who have or are at risk of developing physical disabilities and/or cognitive impairments.²⁷ Changes in balance and vision increase susceptibility to falls,²⁸ the leading cause of fatal and nonfatal injuries alike among older adults.²⁹ Even without subsequent injury, falls may contribute to a fear of falling.³⁰ This causes many older adults to limit their physical activity, harming their overall health and increasing their actual risk of falling. Since most adults wish to age in place and stay in their current homes for as long as possible,³¹ special attention must be paid to physical environments to ensure safe, accessible, and comfortable housing for all residents.

Existing Conditions and Potential Impacts

Of all three properties, approximately one in eight heads of households are 65 or older, many of whom live alone and are therefore even more vulnerable to the dangers of falls and unintentional injuries. In addition, over one in four residents identify as “disabled,” defined by the Rehabilitation Act and the Fair Housing Amendments Act as an individual with “a physical or mental impairment which substantially limits one or more of a person’s major life activities...basic activities that the average person can perform with little or no difficulty.”^{32,33}

Current housing conditions in Madison Heights are generally poor, with minimal improvements since its construction in 1973. The complex is composed of 48 single-story duplexes with bland exteriors, few windows, and no peepholes in the doors. There is very little landscaping or shade in the complex, and the extent to which units are decorated and personalized varies greatly; some front entrances are adorned with plants and welcome signs, while others are left bare and empty.

Inside, units lack air conditioning, and residents must rely on old evaporative coolers during hot Arizona summers. Units range from one to five bedrooms, but all configurations have only one bathroom, a great inconvenience for larger families. In addition, residents comment that there is very little space within units; the kitchen can only accommodate one person at a time, and some bathroom doors open into the toilet. This makes movement considerably more cumbersome, especially for older adults and those with disabilities.

Figure 10
Housing unit in Madison Heights *Courtesy of resident conducted walking audit*



Given the large percentage of older adults and people with disabilities, it is important to consider ways in which the physical housing conditions can be improved to ensure maximum safety and comfort for all residents, regardless of age or level of ability. The redevelopment is an opportunity to include features that enhance mobility and independence for older and disabled residents who live alone, potentially reducing the number of unintentional injuries so that Madison Heights achieves the same low mortality rate due to falls evident in the surrounding zip code of 85323 (see **Figure 7**). The consolidation of three communities and doubled capacity of the redevelopment also has the potential for increased noise disturbances among neighbors, which can be mitigated with intentional design and use of materials.

Recommendations

Three recommendations were developed to address safe housing conditions for older adults and people with disabilities:

- 1. Include key universal design features to make the new Madison Heights safer for older and disabled residents, particularly first floor and single-bedroom units.**

The disproportionately large number of older and disabled adults currently living in Madison Heights, Norton Circle, and HM Watson Homes increases the need for forethought and consideration when building the new

Madison Heights units. Housing can be made safer for all residents by making all first-floor and single-bedroom units more “visitable.”^{34,35} One way to achieve this is through “universal design”—the design of safe and attractive physical environments and communities to accommodate everyone, regardless of age, size, or ability.³⁶ Certain features can greatly increase access and mobility, for instance zero-step entry, wider doors and hallways, ample lighting, and easy-to-reach light switches, doorknobs, and thermostats.³⁷ Walls should also be reinforced to accommodate the installation of grab bars, should they be needed. With these features in mind, designers and developers can not only save money on future renovations and installations, but also reduce the risk of falls and other unintentional injuries resulting from preventable hazards in the home. This will improve mobility, safety, and health for all residents while supporting maximum independence and competency for older adults and people with disabilities.

2. Improve noise insulation to prevent loud disturbances from neighboring units and outside.

Many residents who currently live in Madison Heights, Norton Circle, and HM Watson Homes have long been accustomed to single-story housing units with larger yards and increased distance between units. The higher density of the new Madison Heights and the addition of a second story will require residents to live in much closer proximity to their neighbors. It is important to consider the potential for increased noise above, next to, and outside units, particularly with the mix of single and family units and the addition of two community play areas. Therefore, developers and builders should consider improved sound insulation in walls and ceilings to prevent noise disturbances and avoidable environmental stress.

3. Use safe materials during construction to prevent outgassing of harmful toxins and chemicals.

The new development is an opportunity to ensure that the new housing units are mechanically and structurally safer than the old Madison Heights. Sound construction should reduce the need for constant repairs and improvements. It is recommended that developers and builders use only safe materials to prevent release of hazardous chemicals and toxins, for instance nitrogen dioxide from substandard combustion appliances, volatile organic compounds, carbon monoxide, lead, asbestos, and polyvinyl chloride, all of which can result in chronic health problems for both adults and children.²²

Safe, Active Neighborhoods

Regular physical activity is crucial to physical and mental health. Currently, nearly two-thirds of American adults and over one-third of children and adolescents are overweight or obese,³⁸ increasing their risk of multiple chronic conditions including obesity, type 2 diabetes mellitus, cardiovascular disease, stroke, and some types of cancer.^{39,40} Additionally, in the past 30 years obesity has more than doubled in children and more than quadrupled in adolescents,⁴¹ a dire trend given the established risk that childhood overweight and obesity persist into adolescence and adulthood.⁴²

Making communities more walkable and bikable is one step towards increasing physical activity and decreasing rates of overweight and obesity among both children and adults. One study demonstrated that for

each additional hour spent in the car per day, there was an associated six percent increase in obesity risk.⁴³ Safe, walkable, and bikable streets provide increased opportunities for recreation and physical activity while improving access to services and resources. Neighborhoods that lack sidewalks and are host to traffic hazards limit access to safe places where people can walk, bike, and play, and they discourage children from walking or biking to school.⁴⁴

Older adults and people with disabilities in particular tend to rely on walking and public transportation options. One in five Americans age 65 and older does not drive, making the case for a community that is less automobile-reliant and more pedestrian-friendly.⁴⁵ As it stands, older adults are overrepresented in pedestrian fatalities nationwide despite comprising a smaller portion of the general population.⁴⁶ In addition, low-income communities generally lack access to cars and are therefore more dependent on walking as a primary mode of transportation. As these populations are more likely to experience isolation from the general population,⁴⁷ safe, “complete” streets—designed for all users of various modes of transportation and varying levels of ability—that connect residential and commercial areas for all users can remove barriers to independent travel and improve general livability.⁴⁸

Existing Conditions and Potential Impacts

Safe, Walkable/Bikable Streets

While many residents use cars for most activities, surveys indicate that 46 percent of residents walk for their primary mode of transportation and 14 percent bike, suggesting a need for safe, multimodal access on streets in and surrounding the Madison Heights neighborhood. In addition, a large number of school-age children walk to the nearby Lattie Coor Elementary, Avondale Middle, and Agua Fria High Schools. The high percentage of schoolchildren, older adults, and disabled residents compounds the need for safe, complete streets.

Exposure to excessive natural heat is a significant concern in the area, further exacerbated by the finding that there is very little shade in Avondale. Given the extremely high temperatures of Arizona, reaching over 100 degrees Fahrenheit from as early as March and to as late as October,⁴⁹ it is even more important to consider landscaping and shade cover for people living in and traveling around the neighborhood.

The existing Madison Heights property is neither safe nor complete for its users. Madison Street is the sole entrance road into the complex. The westward slope of the street results in flooding during rainstorms (see **Figure 11**). Over time, the flooding and drainage problems have caused deterioration, which has contributed to various potholes and cracks in the road that make the road even harder to navigate for cars, bikes, and pedestrians alike. In addition, there are no sidewalks along Madison Street, forcing pedestrians to walk either in residents’ front yards, or on the broken street.

Figure 11
Madison Heights direction of drainage *Courtesy of Google Earth*



As part of the assessment phase, residents were recruited to help conduct walking audits to Lattie Coor Elementary and Agua Fria High Schools (see **Appendix E**). The audit of the route to Lattie Coor indicated limited sidewalk connectivity, little or no shade, no lighting, and very few crosswalks despite heavy pedestrian traffic by children. Of particular concern is the unsafe crossing across 4th Street; Madison Heights currently lacks a legal west exit out of the complex, so children often cut through the adjacent vacant lot and jaywalk across 4th Street to access the sidewalk that leads north to La Canada Boulevard. Studies show that pedestrian crashes are more than twice as likely to occur in areas without sidewalks, and the lack of crosswalks contributes to over 40 percent of pedestrian fatalities.⁵⁰ The blind spot created for southbound drivers as 4th Street curves near the Madison Heights neighborhood makes this crossing extremely unsafe. In addition, residents report that 4th Street is often a site for racing, and has resulted in many severe crashes and rollovers. Considering high foot traffic by children and adults living in and around Madison Heights, these problems mark the area surrounding 4th Street and La Canada Boulevard as one in clear need of improvement.

Dysart Road, the route to Agua Fria High School, is host to a different set of problems. The busy arterial sits adjacent to the Madison Heights property and sees an average of about 19,000 cars per day.⁵¹ The road spans four lanes but lacks bike paths, compelling bicyclists to ride on the sidewalk to avoid heavy, speeding traffic. This endangers pedestrians and bicyclists alike who are often going in opposing directions. In addition, Dysart is only lit on the east side and offers very limited sidewalk connectivity, posing a clear danger to people with disabilities who may be forced onto the road. Finally, there is almost no shade along the way, making excessive heat exposure a danger to pedestrians, bicyclists, and public transportation users.

The redeveloped Madison Heights is proposed to increase from 77 to 143 housing units, potentially doubling the number of people living in the same area. Significantly, a large percentage of these are school-age children who will presumably walk and/or bike to nearby schools. Safe streets improve connectivity to vital services (see “Access to Healthy Food and Healthcare Services” section), and can potentially reduce the number of motor vehicle accidents and pedestrian/bicyclist injuries experienced by Madison Heights tenants and Avondale residents (see **Figure 7**).

Figure 12
La Canada Boulevard: No shade or lighting along route to school *Courtesy of resident conducted walking audit*



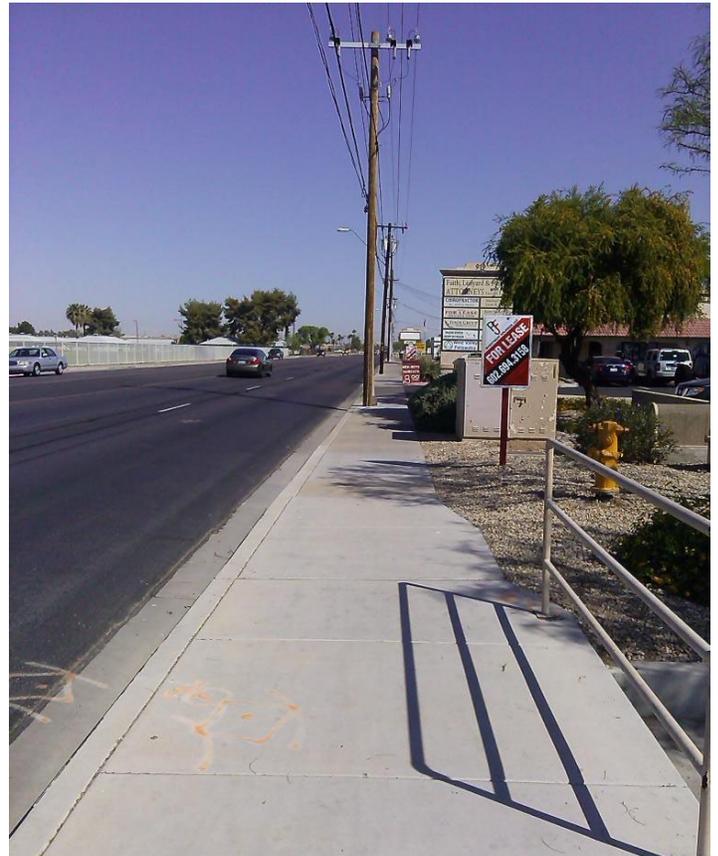
Figure 13
Central Avenue: No bike lanes, shade, and very limited lighting *Courtesy of resident conducted walking audit*



Figure 14
Dysart Road: Lack of sidewalk, lighting, or shade on east side



Figure 15
Dysart Road: Minimal lighting, signs of graffiti, and telephone poles obstructing path



Photos courtesy of resident conducted walking audit

Opportunities for Recreation and Physical Activity

In a health survey of Madison Heights and Norton Circle residents, 49 percent of residents reported exercising regularly at least once or twice a week. Of those, a majority of residents walk for exercise, followed by 23 percent who run. Although 76 percent of respondents live within walking distance of a park, only 43 percent had actually visited one in the past month. Thirty-two percent of residents reported that cost was a barrier to physical exercise, presumably preventing residents from accessing or utilizing local recreation centers and/or equipment.

Figure 16
On-site playground at Madison Heights



Courtesy of resident conducted walking audit

Unfortunately, the on-site playground at Madison Heights is poorly maintained and is limited in recreational amenities. Additionally, there are few opportunities for physical activity in nearby parks, with limited active recreational elements for children and adults. In order to gather more information during the assessment phase, two residents were recruited to conduct a mini park audit (see **Appendix E**) of the playgrounds owned by the First Southern Baptist Church of Avondale, located on La Canada Boulevard just east of Central Avenue. The park audit showed that the two playgrounds were relatively “safe” and “well-maintained,” but lacked more active recreational components and shade (see **Figure 17**). They also lack recreational opportunities for older children and children with disabilities.

Figure 17
Playground at First Southern Baptist Church



Courtesy of resident conducted walking audit

Besides the two playgrounds, the First Southern Baptist Church hosts a basketball league open to all local teenage boys, including those who live at Madison Heights but may not necessarily attend the church. Also in the surrounding area, the Tri-City West Thornwood Branch of the Boys and Girls Club offers affordable after-school programs that provide ample opportunities for physical activity among school-age children. Unfortunately, its location on Western Avenue makes it too far for residents of Madison Heights to walk. Although local school buses

provide transportation from schools to the Club, there is no similar transportation in the evening, making the Boys and Girls Club difficult to access for families without cars.

According to the proposed site plan (see **Appendix A**), the new Madison Heights will include more connected and navigable sidewalks, increasing the potential within the complex for walking as exercise. A larger and more connected/engaged Madison Heights affordable housing community may also result in stronger ties and partnerships with nearby recreational centers and organizations in Avondale. Expanded opportunities for recreation could increase levels of physical activity among residents, thereby limiting the risk of chronic conditions such as cardiovascular disease and diabetes and enhancing overall physical and mental health.

Recommendations

Safe, Walkable/Bikable Streets

1. Make interior sidewalks in the new Madison Heights complex curved and at wider angles.

Given the larger population of older adults and people with disabilities, ensuring that sidewalks are safe and easy to navigate can greatly reduce the risk of preventable falls and other unintentional injuries. It will also facilitate easier movement for parents with young children in strollers or those with wheeled luggage. Aside from general travel through the complex, improved connectivity and accessibility of sidewalks can also promote increased physical activity, as more than one in five surveyed residents report using the streets for exercise (see **Appendix F**). Particularly for those who have limited access to outside recreational facilities, improved safety and walkability of sidewalks within the Madison Heights neighborhood can ensure that all residents have access to physical activity.

2. Make Dysart Road a “complete street” to make it more bicyclist- and pedestrian-friendly.

Results from the mapping workshop (see **Appendix F**) and walking audits (see **Appendix E**) indicate heavy, speeding traffic along Dysart Road that makes the area dangerous for walking and biking. Safe, “complete” streets can improve mobility and livability by connecting residents of Madison Heights and the surrounding neighborhood to the community while reducing their dependence on more expensive private transportation options. “Complete streets” are those designed with everyone in mind, regardless of age, ability, or mode of travel. Features that make a street complete include wide, connected sidewalks with buffers and shade; crosswalks that allow ample time for pedestrians to cross; slower and reduced traffic; bicycle lanes; shaded bus stops; and ramp access for wheelchair users.⁵² Making Dysart a “complete street” would greatly improve safety and walkability/bikability for all users, regardless of mode of transportation or ability. Fortunately, the City of Avondale has already identified this as a priority in its most recent transportation plan update⁴⁸; improvements planned for the next fiscal year include bike lanes, reduced traffic lanes, a buffer between street and sidewalk, and ample lighting and shade.

3. Create a safe, accessible west exit to 4th Street to promote safe routes to schools and resources.

The Madison Heights complex is in a prime location with its close proximity to schools, grocery stores, and restaurants. Currently, residents must squeeze through a back exit and cut through the adjacent lot on the north side in order to access 4th Street/Palo Verde Drive. Because the area is not being maintained, it currently serves as a repository for litter and trash thrown by anyone cutting through the vacant lot (see **Figure 18**). This includes residents, but also others who frequent Food City and fast food restaurants to the north and the Department of Economic Security and schools to the west. The garbage build-up encourages pest infestation and other environmental health problems, with clear, negative health impacts. Designated as part of a “Safe Route to School” (see **Map 6**), it is important to ensure that this exit is safe, accessible, and healthy for all users, particularly children—including those who may be disabled and/or use wheelchairs. A controlled-access gate that connects Madison Heights to a sidewalk and/or crosswalk at 4th Street/Palo Verde Drive would greatly improve pedestrian access and safety, thereby promoting safer, more walkable and bikable routes to schools and services.

Figure 18
Litter and trash at the west exit of Madison Heights *Courtesy of resident conducted walking audit*

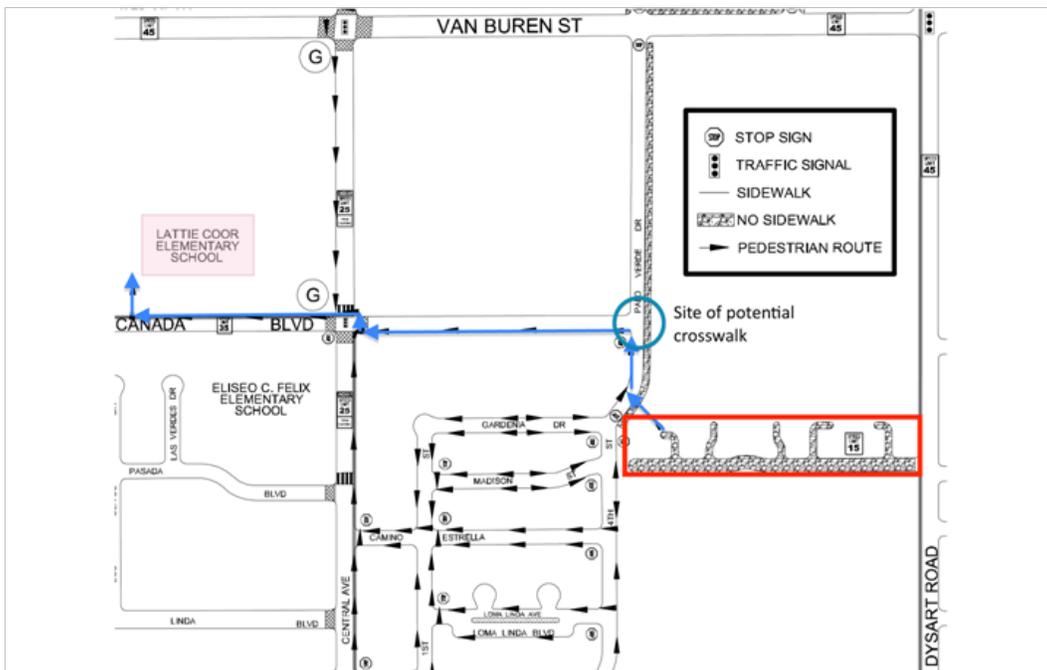


4. Add sidewalks and perform a crosswalk warrant study for the intersection of Palo Verde Drive and La Canada Boulevard.

During recommendations meetings, several residents shared that cars often race down 4th Street, and the curve near Madison Heights is a dangerous site of many rollovers and crashes. The addition of sidewalks along the east side of Palo Verde Drive and a crosswalk at La Canada Boulevard (see **Map 6**) would encourage pedestrians to cross there rather than at 4th Street, making the popular pedestrian route safer, especially as it serves many children on their way to Lattie Coor Elementary and Avondale Middle Schools. Currently there are 146 children living in Madison Heights, but that number is expected to increase to 229 when residents of Norton Circle and HM Watson Homes move into the complex. Many of these children will presumably walk and/or bike to school, making it even more important that this route to school is as safe as possible. Additional foot traffic across 4th Street is generated by adults who often use this same route to get to the Department of Economic Security. Given its heavy use, potential for accidents, and its inclusion as part of the designated “Safe Route to School,” a crosswalk warrant study at the intersection of 4th Street and La Canada Boulevard would be greatly beneficial, serving Madison Heights residents as well as everyone in the surrounding area.

Map 6
Safe routes to school: Madison Heights to Lattie Coor Elementary/Avondale Middle School

Courtesy of City of Avondale



5. Make Central Avenue a “complete street” to make it more bicyclist- and pedestrian-friendly.

Considering the high bicyclist/pedestrian traffic and especially its importance as a route to several schools in the area, Central Avenue would greatly benefit from “complete streets” policies that limit automobile traffic, increase shade and lighting, add bike lanes, and include a buffer separating the sidewalk from the street. While the City of Avondale has included such provisions in the form of a “road diet” in its transportation plan update,⁵⁰ we recommend a higher priority for Central Avenue given the high numbers of schoolchildren who bike and walk along this road. Safe routes to school are a great way to ensure and promote physical activity among children, as studies show that children in elementary and middle school who walk or bike to and from school are more physically active—both at a higher intensity and for longer periods of time.⁵³

6. Install bike lockers in the Madison Heights complex.

Through conversations with Advisory Committee members, it was discovered that the City of Avondale currently has a grant for bicycle lockers but has not yet chosen a location to install them. Given the street improvements and bike lane additions planned for Dysart Road in the next fiscal year, the Madison Heights neighborhood is a perfect place to pilot this program. Not only would this free up room within housing units of current bicyclists and bike owners, but the subsequently reduced risk of bike theft may incentivize other residents to invest in bicycles. More people may be encouraged to use bikes to commute to work and school, increasing physical activity among residents while also improving access to local resources and services..

Opportunities for Recreation and Physical Activity

1. Install an on-site fitness room in the Madison Heights community center.

Seventy-seven percent of surveyed residents indicated they would use an exercise room within their housing complex to increase their physical activity (see **Appendix F**). Especially for older and disabled residents who may otherwise have limited access to other recreational centers, an on-site fitness room would increase opportunities for physical activity, which has been shown to decrease the risk of falls and other unintentional injuries.³⁰ Equipment should be safe, easy to maintain, and accessible to people of wide range of ability levels. The fitness room should also incorporate universal design principles to promote activities for all ability levels, for instance weight training with free weights and medicine balls, movement activities such as stationary cycling and yoga, and stretching.⁵⁴

2. Design multigenerational community areas that are safe and amenable for everyone, regardless of age or ability.

With the great diversity in age, household structure, and ability of residents from Madison Heights, Norton Circle, and HM Watson Homes, community areas that are multigenerational can help facilitate social cohesion among residents while encouraging recreational and physical activity that is safe for both children and older

adults. One possibility is to develop a small, on-site community garden in one of the designated play areas in order to provide a convenient source of fresh fruits and vegetables, promote increased physical activity and social cohesion, and ultimately improve both individual and community health.⁵⁵ Residents exhibited significant interest and support for this idea, as several in Norton Circle currently cultivate gardens in their own yards. Possible design ideas are included in **Appendix G**.

3. Develop a joint-use agreement between First Southern Baptist Church and the City of Avondale to maintain and expand recreational spaces for children.

The First Southern Baptist Church owns the land along La Canada Boulevard between Central Avenue and 4th Street/Palo Verde Drive, which currently includes two small playgrounds and a vacant lot just northwest of Madison Heights (see **Map 7**). Although the two playgrounds are open and available for public use, they are limited in recreational amenities, largely due to limited resources. Furthermore, restrooms are locked after-hours because of security and maintenance concerns. A joint-use agreement, a legal contract that sets the terms for the shared use of properties and/or facilities, between the City of Avondale and the First Southern Baptist Church would greatly expand the resources at the Church’s disposal for the maintenance and expansion of existing playgrounds, while also facilitating development of the vacant lot into a grass field or courts in which children could run and play. Since residential proximity is strongly associated with the level of park use,⁵⁶ a nearby park or field could greatly increase the level of physical activity among Madison Heights residents. As a direct result of recommendations meetings with the Advisory Committee, the City of Avondale parks director and the pastor of First Southern Baptist Church are currently in preliminary discussions and negotiations over such a shared-use agreement.

Map 7
Vacant lot that could be developed into a sports field as a result of a joint-use agreement between the First Southern Baptist Church and City of Avondale *Courtesy of Google Earth*



Access to Healthy Food and Healthcare Services

Healthy Food

Healthy diet and nutrition are central to health and well-being. Population studies have shown that about one-third of cancers could be avoided with healthy diet, regular exercise, and maintenance of normal weight.⁵⁷ Merely living in an area where markets selling fresh produce outnumber other types of stores is associated with lower risks of obesity, cardiovascular disease, and other diet-related chronic conditions. The addition of a new supermarket in a census tract was associated with increases in produce consumption by 10 to 30 percent, with particularly significant increases among low-income and communities of color.⁵⁸ Especially considering the marked increases in childhood and adolescent obesity,⁵⁹ this argues for a higher priority to be placed on access to fresh fruits and vegetables to ensure healthy, nutritious diets.

Healthcare Services

Access to healthcare services refers to the timely and appropriate use of healthcare services to promote and protect health in order to achieve the best health outcomes and enhance overall quality of life. It has the potential to greatly improve physical and mental health through detection, treatment, and prevention of disease and disability, increasing life expectancy for healthcare users.⁶⁰ In 2013, over one-third of adults in the United States went without recommended care or failed to fill prescriptions due to costs.⁶¹ Women are even more likely than men to forgo needed healthcare due to cost-related access barriers, despite having more healthcare needs.⁶²

Existing Conditions and Potential Impacts

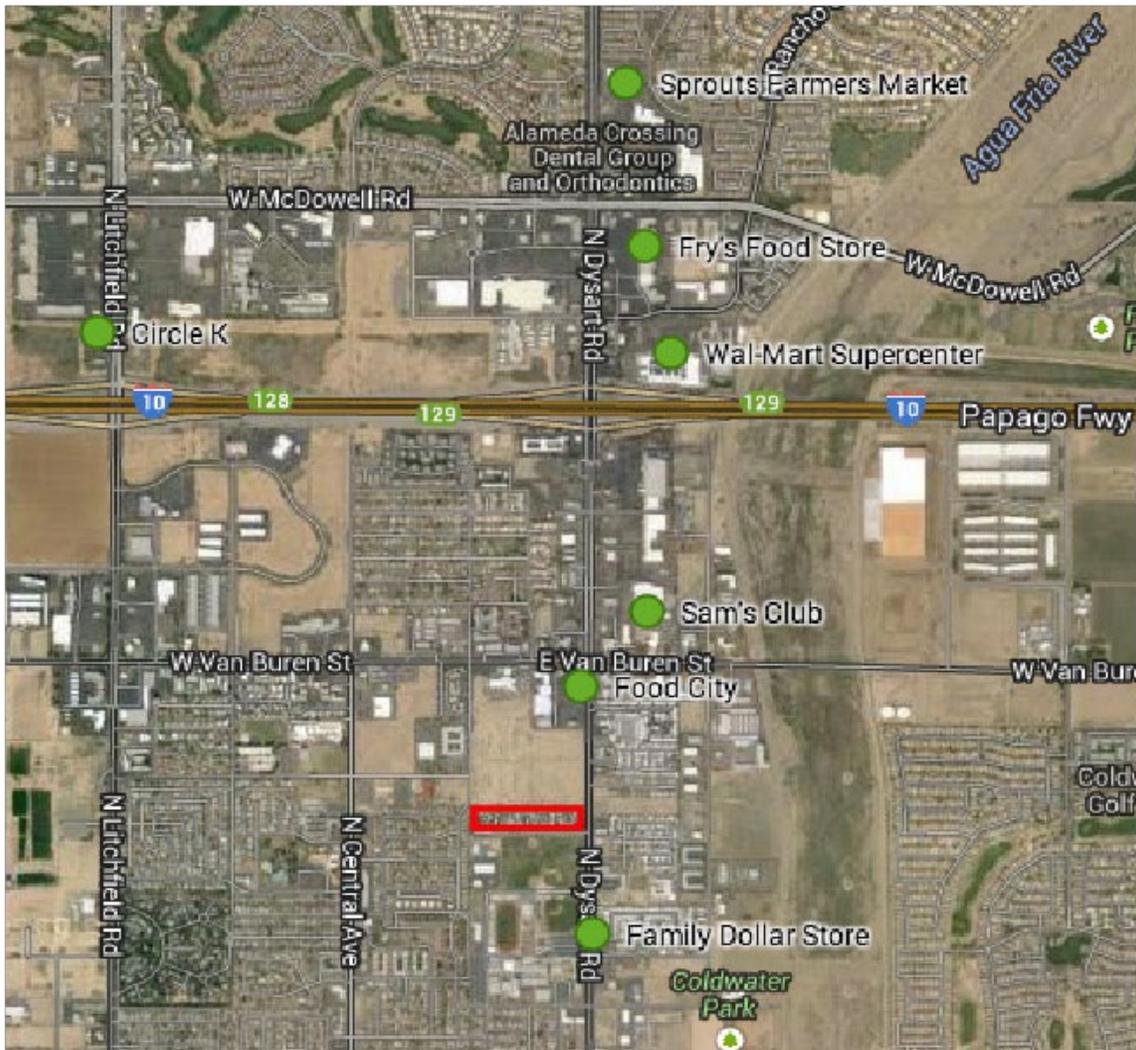
Healthy Food

Madison Heights is in an optimal location, with good access to healthy foods (see **Map 8**). Food City, Sam’s Club, and Walmart are all within walking distance—particularly relevant since 20 percent of surveyed residents report walking to grocery stores. In addition, Fry’s and Sprouts are only a few miles away, north of the Interstate-10 and north of McDowell Road, respectively. However, there is also a multitude of unhealthy, fast food options within close proximity that line Dysart Road, including but not limited to: KFC, Del Taco, McDonald’s, Jack in the Box, Chick-Fil-A, and Panda Express (see **Map 9**). For many residents, these may often be the most convenient options, given the close proximity and relatively quick, affordable meals.

The combination of options for fresh produce as well as fast food may explain the simultaneously high consumption of fast food and relatively high intake of fresh fruits and vegetables; almost 70 percent of surveyed residents eat two or more servings of fruits and vegetables per day, but an alarming one-third of residents also reported consuming fast food at least once a week. Over 25 percent of surveyed residents cited the lack of variety and transportation as primary barriers to increased fresh fruit and vegetable consumption, while approximately one-fifth report lack of time to cook fresh meals (see **Appendix F**.)

Map 8
Grocery stores near the Madison Heights neighborhood

Courtesy of Google Earth

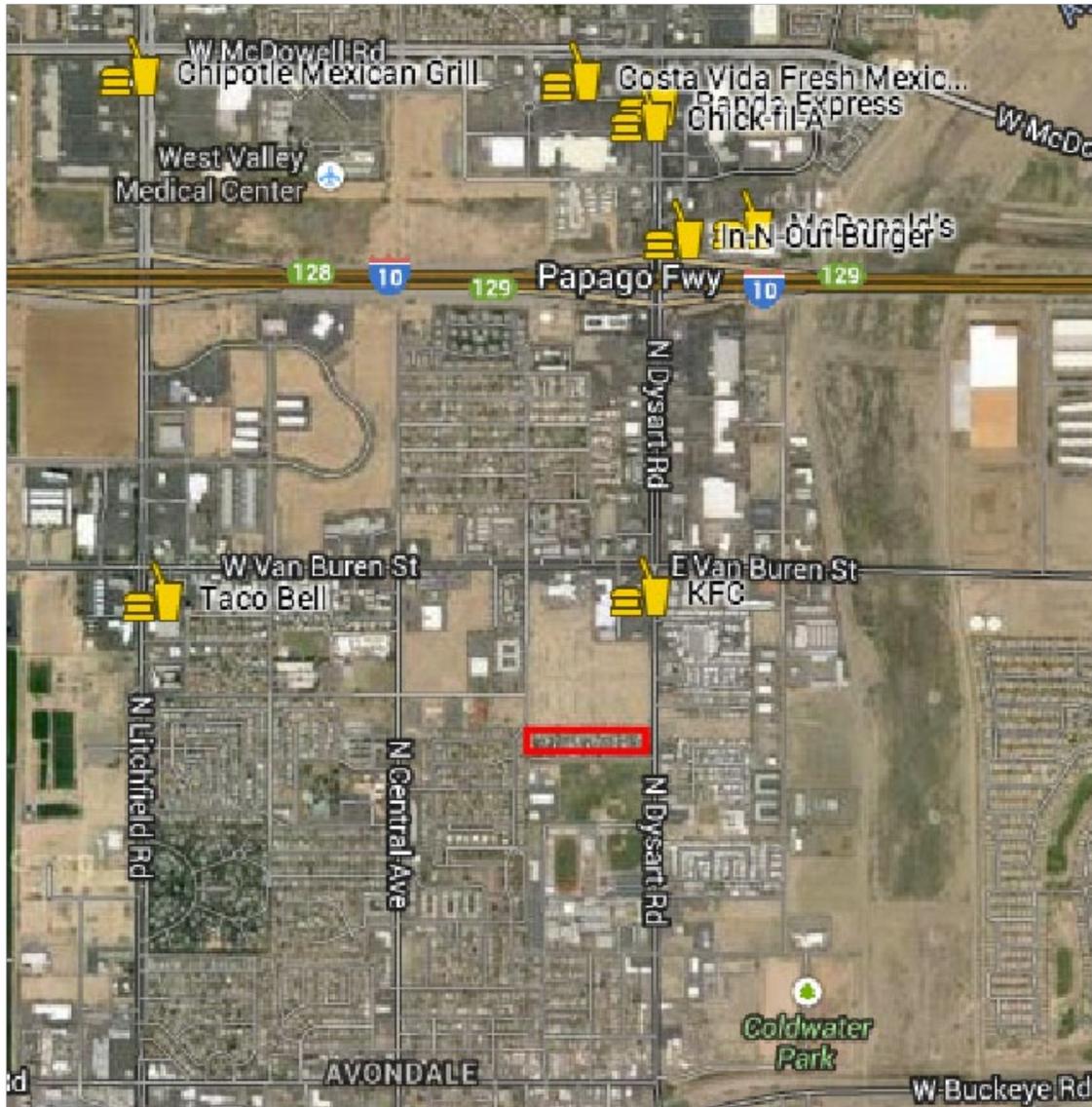


LEGEND

-  Madison Heights neighborhood
-  Grocery stores

Map 9
Fast food restaurants near the Madison Heights neighborhood

Courtesy of Google Earth

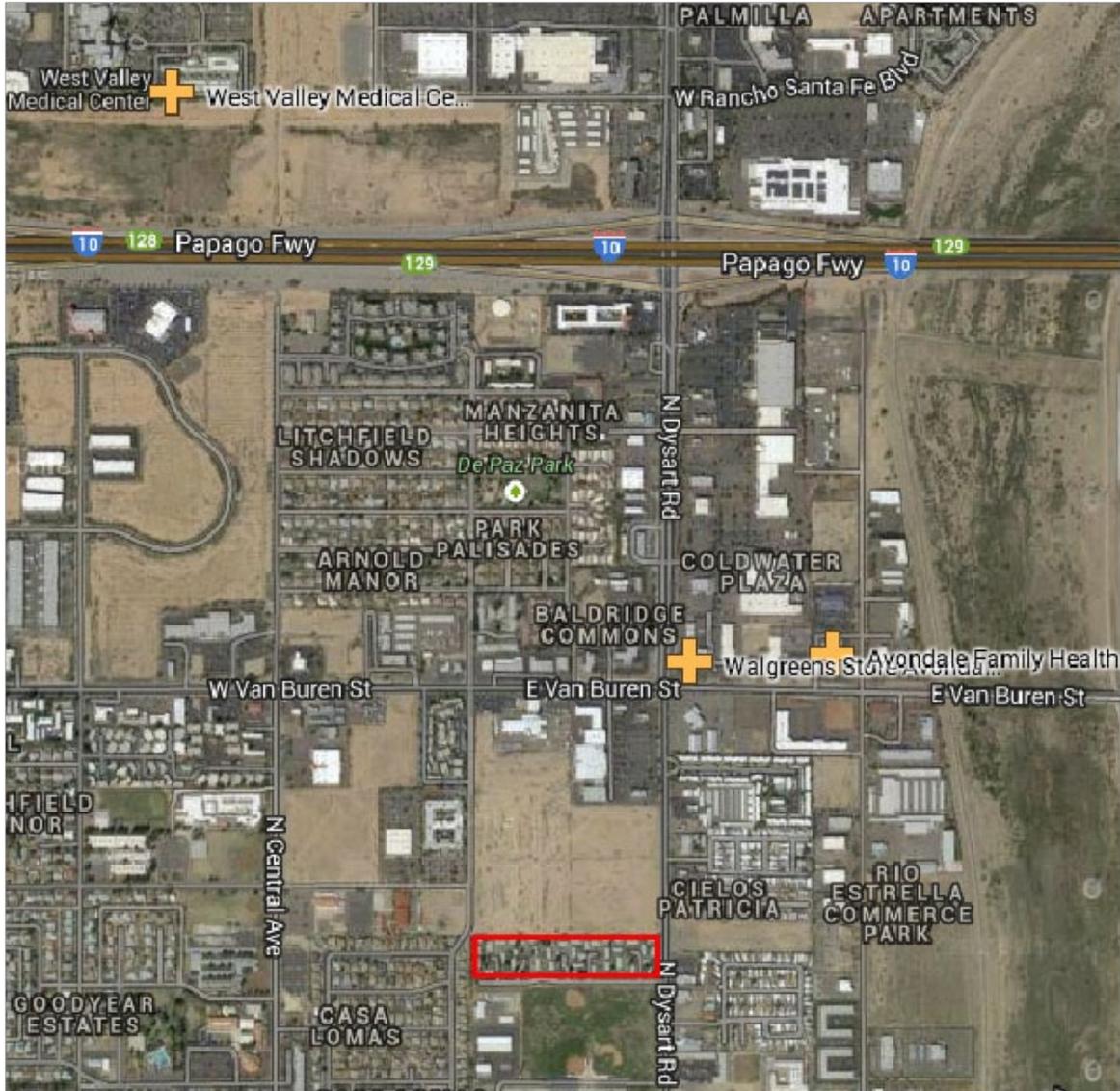


LEGEND

-  Madison Heights neighborhood
-  Fast food restaurants

Map 10
Healthcare providers near the Madison Heights neighborhood

Courtesy of Google Earth



LEGEND

-  Madison Heights neighborhood
-  Healthcare providers

As mentioned earlier in “Safe, Active Neighborhoods,” safer, more connected streets and sidewalks could improve access to healthy food options surrounding the Madison Heights redevelopment. Partnerships with local resources and agencies to promote use of community gardens and farmers’ markets can also enhance healthy eating among residents, potentially decreasing the risk of various diet-related health conditions.

Healthcare Services

Similar to fresh fruits and vegetables, access to healthcare services was not reported to be a problem by residents, despite the relative paucity of local clinics. Avondale Family Health Center and Walgreen’s Pharmacy are both located on Van Buren Street and offer general primary care services (see **Map 10**). Multiple public transportation options exist for residents who lack access to cars. The Mission of Mercy mobile medical clinic also serves Avondale residents, stopping at the First Southern Baptist Church every Monday evening. The nearest full-service hospital is West Valley Hospital, located about two miles northwest on McDowell Road.

While the redevelopment of Madison Heights is unlikely to directly affect access to healthcare services, “complete streets” policies for Dysart Road and Central Avenue as outlined in the “Safe, Active Neighborhoods” section would promote connectivity and potentially increase utilization of existing services. A more engaged, socially cohesive affordable housing community (described below in “Thriving, Resilient Communities”) may also result in mutual education and reinforcement of beneficial behaviors and norms, for instance watching out for one another, seeking care when necessary, and regularly going to primary care and/or preventive medicine appointments.

Recommendations

Healthy Food

1. Encourage participation in community garden and nutrition education classes at Care 1st Resource Center.

Twenty percent of surveyed residents indicated a desire and need to educate families on the importance and taste of healthy foods (see **Appendix F**). A community garden is scheduled to open at the Care 1st Resource Center, located at 328 West Western Avenue, Avondale approximately two miles southwest of Madison Heights. This is a great opportunity to provide valuable nutrition education to Madison Heights residents while engaging them in the production and preparation of fresh produce. The community garden would also improve residents’ access to affordable healthy foods, which has been linked to increased consumption of fresh fruits and vegetables.⁶³ Moreover, community gardens encourage physical activity and foster social cohesion among community members.

2. Develop a community garden, either on-site or in the vacant lot owned by First Southern Baptist Church just northwest of Madison Heights.

Community gardens are proven to increase fresh fruit and vegetable intake while cultivating a greater sense of community. Although the new community garden at the Care 1st Resource Center offers new opportunities for access to fresh produce, physical activity, and nutrition education, it is relatively far from the Madison Heights neighborhood. Considering that 27 percent of surveyed residents cited transportation as a primary barrier to purchasing and eating healthy foods, a community garden that is on-site or within walking distance would go a long way toward improving access. A smaller community garden that caters to the needs and tastes of Madison Heights residents would also boost participation, providing all residents a unique way to engage in healthier eating with their neighbors. Local agencies and resources such as United HealthCare, Care 1st Resource Center, or the Maricopa County Department of Public Health SNACK program could be invited as partners to provide nutrition education and training to residents.

3. Explore other options such as farmer’s markets and the mobile grocery stores.

During recommendations meetings, residents of Madison Heights and Norton Circle revealed that there are multiple fresh produce options available to the Norton Circle community, including a weekly farmer’s market and a biweekly mobile grocery store/truck called “Market on the Move,” run by The 3000 Club.⁶⁴ Given the close proximity of Norton Circle to Madison Heights, it is therefore feasible and worth investigating inviting these services to the new Madison Heights in order to provide more convenient and affordable options for fresh produce.

Healthcare Services

1. Publicize programs and resources that provide free and/or subsidized transportation to and from healthcare appointments.

There are a myriad of services that offer free or more affordable transportation to eligible resident, including Benevilla, Dial-A-Ride, Arizona Department of Economic Services, Maricopa Integrated Health System, and more.⁶⁵ These transportation options and other services could be organized and publicized in a one-page reference sheet so that residents of Madison Heights and the surrounding communities can be connected to local resources and agencies. Another great resource that should be included is the “Find Help Phoenix” website, a searchable database that provides maps and links to various free and/or affordable health and social services throughout Maricopa County.⁶⁶

2. Create and manage a resident directory or rideshare list.

Given the limited access to transportation among Madison Heights residents, another solution is the creation of a rideshare list, in which a directory of willing Madison Heights residents could be established such that fellow neighbors and community members could carpool or drive each other to appointments, with compensation and/or gas to be arranged among residents themselves. This would also promote social cohesion and a sense of community within the Madison Heights community.

Thriving, Resilient Communities

A resilient community describes both the resilience of the individuals making up the community and the resilience of the community as a whole. Individual resilience is composed of three components: biological adaptability to stress; attachment, or capacity to form meaningful, caring relationships; and sense of control, or ability to make sense of and/or manipulate one’s environment.⁶⁷ A community is defined by a sense of place, shared common perspectives or interests, diversity in relationships and roles, sense of togetherness, and joint action and engagement.

Central to resilience and community is social cohesion—the “glue” that bonds people together in a society. Particularly under conditions of change or adversity, social cohesion can provide incentives for collective action,⁶⁸ while also supporting physical and mental health.^{69,70} Collective social capital, or the combined sense of social support within a community, has been found to contribute more to self-rated health status than individual social networks alone.⁷¹ In a study of over 3,000 Maricopa County residents, researchers found that neighborhood social cohesion was significantly associated with better self-reported physical and mental health,⁷² while a prospective national study demonstrated that improved neighborhood social cohesion actually helped to protect against stroke.⁷³ Communities that experience high levels of mutual trust and strong social connections are also linked to reduced crime rates and less fear of crime.⁷⁴ Conversely, perceptions of danger can serve as a barrier to neighborhood social cohesion.⁷⁵

Although stress is often understood as synonymous with “distress,” not all stress is negative.⁷⁶ Controllable stress, which can be managed by active coping strategies, can actually be physically, psychologically, and emotionally beneficial. In contrast, in situations where people lack control over negative stimuli, “uncontrollable” stress can result in long-term consequences such as heightened perceptions of stress, increased tension, anxiety, and depression, and “learned helplessness.”⁷⁷ This phenomenon refers to neurobiological as well as behavioral changes including increased levels of the stress hormone, cortisol, and decreased social activity.⁷⁸ Over time, chronic uncontrollable stress can take a great physical and psychological toll, resulting in increased anxiety, depression, a lowered immune system, and increased blood pressure.⁷⁹

Adults age 65 and older are a population especially vulnerable to stress and social isolation; many transitions in later life are both physically and emotionally taxing, particularly the loss of loved ones that can lead to loneliness and subsequent depression.⁸⁰ As this group grows and comprises a larger percentage of the United States population,⁸¹ measures should be taken to promote social cohesion and avoid loneliness, predictive for depressive symptoms.⁸² Fortunately, the living environment provides an opportunity to support community members, including older adults, and help them overcome stress, pain, discomfort, and disability.⁸³ The optimal communities are therefore those in which uncontrollable stress is minimized, while the ability to respond and adapt to stress in a healthy manner, or resilience, is cultivated. An active, resilient community is one that is diverse, connected, inclusive, and can adapt to changing conditions.⁸⁴ By increasing physical activity, active engagement, and social connectedness, intentional design of a more active, resilient community can improve the health and well-being of all residents.

Existing Conditions and Potential Impacts

Uncontrollable stress and decreased social cohesion are significant problems facing the current residents of Madison Heights, Norton Circle, and HM Watson Homes. One predominating reason is their perceived lack of autonomy and control over their housing situation. In general, residents did not seem to know whom to contact or which resources to use in the event of a problem in the building, whether maintenance- or crime-related. In interviews, a specific concern articulated was the inadequate and sometimes contradictory communication related to the redevelopment and moving process. Despite flyers and meetings conducted by the HAMC and Gorman and Company to discuss the proposed redevelopment, many residents were still unaware of the proposal and were understandably anxious about the timeline and associated costs, as well as details of the new design. Older and disabled residents, many of whom have lived in their current homes for several years, exhibited even greater anxiety, as they typically need more time and preparation to move and adapt to a new environment and community.

Among families with small children, parents expressed considerable concern related to their children switching schools. Because current residents of Madison Heights will have to be temporarily relocated, there's a possibility that children would have to move twice during two different school years. Residential and school instability can be extremely stressful to children, impeding social development and academic performance.⁸⁵ Especially as the effects of school mobility can be amplified during the early elementary years, it will be important to consider the impact of school transfers on younger children in the Madison Heights community.

Regarding actual displacement, Norton Circle and HM Watson Homes residents had mixed reactions. Although a few residents from Norton Circle expressed some opposition to the move, most were excited at the prospect of new facilities and improved infrastructure. Significantly, residents of HM Watson Homes were surprisingly untroubled, despite facing the largest change from their small, rural Buckeye neighborhood to the more urban and densely populated Madison Heights in Avondale. On the whole, once assured of improved design features and presented with the proposed site plan and elevations (see **Appendices A and B**), most residents of all three communities were eager to see changes and enthusiastic about the proposal.

Part 1 crimes are serious violent and property crimes that are more likely to be reported to the police, and were used in this HIA to assess actual and perceived crime in the area. According to Uniform Crime Reporting statistics, part 1 crimes include eight offenses: homicide, rape, robbery, aggravated assault, burglary, motor vehicle theft, larceny-theft, and arson.⁸⁶ Some community stakeholders cited violent crime in historic Avondale as a concern, prompting its inclusion in this HIA. However, citywide rates of violent crime have purportedly decreased in recent years (see **Figure 19**). Meanwhile, the rate of property crime has stayed relatively steady (see **Figure 20**).

Figure 19
Part 1 person crimes reported in the City of Avondale

Data provided by the Avondale Police Dept.

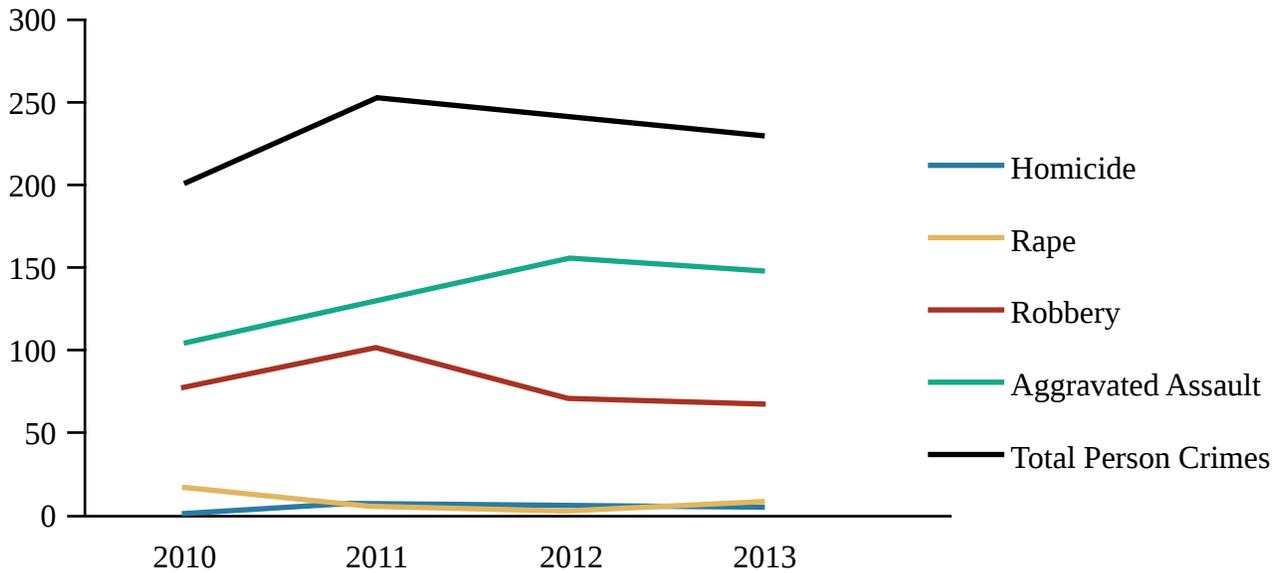
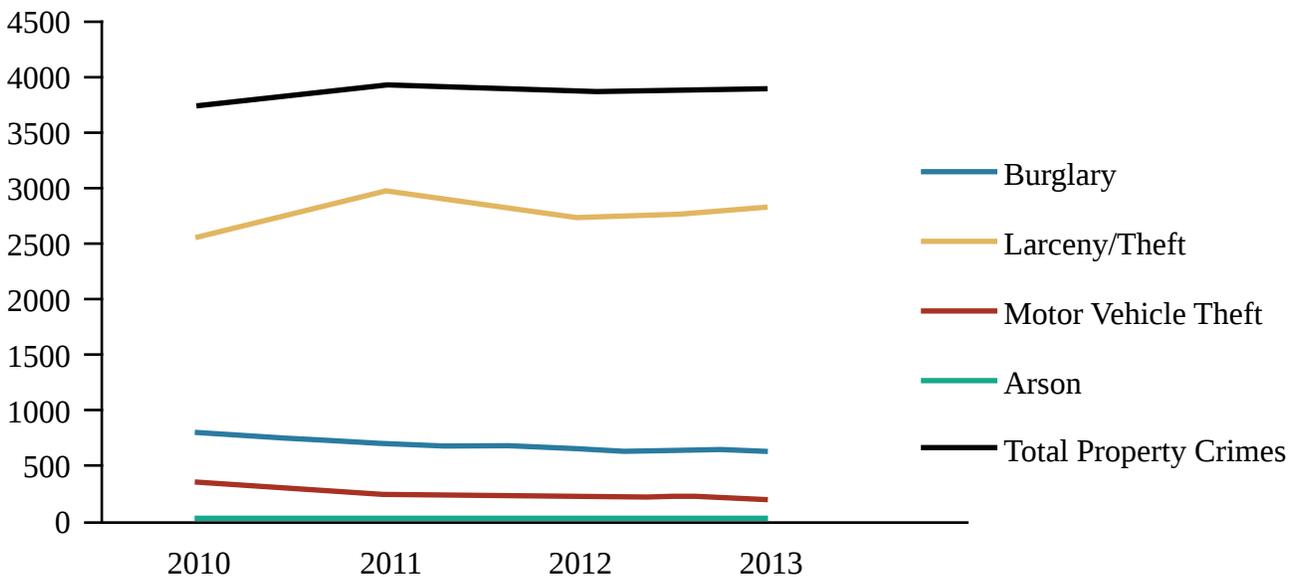


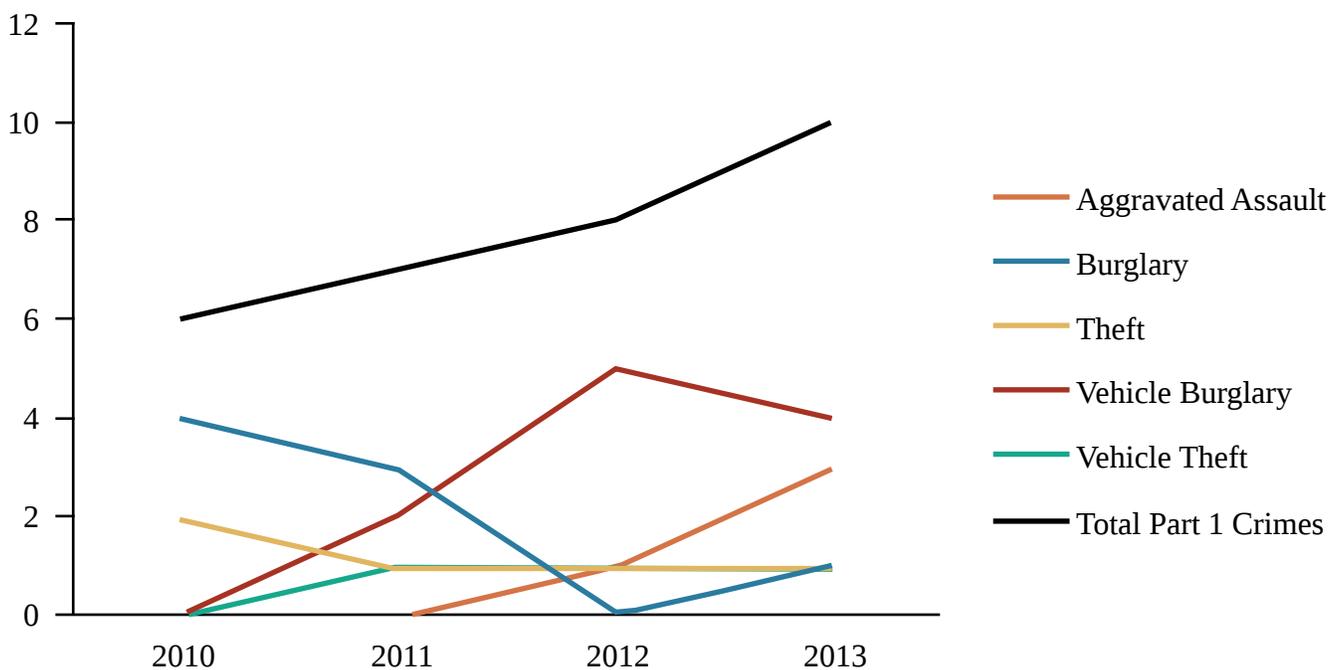
Figure 20
Part 1 property crimes reported in the City of Avondale

Data provided by the Avondale Police Dept.



Interestingly, crime does not appear to be a significant concern among residents living in Madison Heights; many children are seen playing outside, suggesting that parents generally feel the area is safe, and residents do not mention crime as a major problem. A quick review of reported part 1 crimes in the Madison Heights neighborhood seems to show a slight increase from the year 2010 to 2013 (see **Figure 21**). However, due to the small size of the area and subsequently, small number of cases, it is difficult to determine the significance of this trend.

Figure 21
Part 1 crimes reported in Madison Heights neighborhood *Data provided by the Avondale Police Dept.*



Homicide, robbery, rape, and arson were reported to be zero for all three years and were therefore omitted from this graph.

There are various challenges that might hinder community resilience in the new Madison Heights development. First, the resident population is very diverse, with people of varying ages, household structures, languages and cultures, and levels of ability. In addition, the consolidation of three disparate housing communities may disrupt existing social ties among residents as they move into a different, larger housing complex. This may make it more challenging at first to reach out and forge new connections among residents. However, minimization of uncontrollable stressors, increased opportunities for diverse connections among residents of varying ages, levels of ability, and communities, and improved communication channels can greatly improve community resiliency in the new Madison Heights. This has the potential to strengthen individual resiliency and neighborhood social cohesion, both of which are integral to positive physical and mental health outcomes.

Recommendations

- 1. Work together with the Avondale Police Department’s Crime Prevention Through Environmental Design (CPTED) program to include preventive design features in order to maximize safety in the built environment.**

The Avondale Police Department’s Crime Prevention Through Environmental Design (CPTED) program aims to reduce fear and crime incidence through the use of intentional design and built environment.⁸⁷ By partnering with this program, the HAMC and developer Gorman and Company can obtain further guidance in how best to incorporate window screens, security doors, lighting, and landscaping features in order to maximize visibility, control access by intruders, and create a sense of ownership for residents of the new Madison Heights. Beyond reductions in actual crime, improved perceived safety may help improve social cohesion in the community. Finally, since some residents indicate that an unsafe environment was a barrier to exercise (see **Appendix F**), successful use of CPTED features may also increase levels of physical activity.

- 2. Regularly inform residents of Madison Heights, Norton Circle, and HM Watson Homes of updates to the redevelopment plan and timeline.**

The inadequate and sometimes contradictory information conveyed to residents of Madison Heights, Norton Circle, and HM Watson Homes has caused undue anxiety and uncontrollable stress related to the redevelopment process. Periodic updates from the HAMC and/or Gorman and Company regarding financing, estimated dates for groundbreaking and relocation, and implementation of HIA recommendations would ameliorate some of these concerns while reestablishing trust and communication with residents. The designation of a specific liaison or representative of HAMC could further streamline communication, whether this takes the form of monthly notifications by mail, flyers, or resident meetings.

- 3. Manage temporary relocation process to minimize school transfers and limit possible academic disruption.**

In speaking with residents, the biggest concern among parents was the movement of children from their current schools, as this has a great potential to impact academic, social, and psychological development. Particularly as multiple school transfers lead to worse effects, it will be critical to maintain as much continuity as possible during the relocation process. The relocation consultants should work closely with school officials from Lattie Coor Elementary and Avondale Middle Schools to consider timing and school boundaries during the relocation process. One possibility is to preferentially move families with younger children into the Rose Terrace apartments, which fall within the boundaries of Lattie Coor Elementary. Families without children or who are otherwise unconcerned with school transfers can be placed in temporary housing that lies outside of Lattie Coor boundaries. Another possibility would be to delay moving Madison Heights families until the summer, which would minimize disruptions during the school year.

4. Continue meeting with Madison Heights HIA Advisory Committee in order to solicit insight and feedback, identify potential resources, and strengthen existing partnerships.

The HIA Advisory Committee for this health impact assessment represents a diverse variety of community stakeholders including residents, agencies, and private organizations that have been critical to the process by lending their unique insights and ideas. In moving forward with the redevelopment, the HAMC and the developer, Gorman and Company, would benefit greatly by reconvening meetings with this group in order to follow up with the implementation of recommendations while strengthening ties with the local community. All members of the Advisory Committee have demonstrated interest in continued involvement with the Madison Heights redevelopment and are keen to continue working together to build a healthier, more resilient community.

5. Organize and host a welcome event or “grand opening” for residents of the new Madison Heights.

The residents moving from Norton Circle and HM Watson Homes may be unfamiliar with the neighborhood surrounding Madison Heights. A welcoming event organized with local vendors and agencies (e.g. Care 1st Resource Center, Department of Economic Security, Women Infants and Children, City of Avondale, Avondale Family Health Center, etc.) could introduce new residents to the available resources and contacts while giving residents a chance to mingle and get to know each other. This would also be a great opportunity for the HAMC and property manager to actively engage with residents to reestablish trust and communication. In addition, a “walking school bus” of parents and children walking together to Lattie Coor and Avondale Middle Schools could also be beneficial, as parents and children would have another opportunity to bond while becoming familiar with the safest routes to school.

6. Encourage and foster the creation of a resident council for the new Madison Heights.

Resident engagement has been recognized as an important key to improve property management, foster a sense of community, protect and empower residents, create a social support system, and build skills and capacities among residents who participate.⁸⁸ A resident council in which residents can identify community issues, participate in education programs and capacity-building workshops, and work together to address concerns can greatly empower residents to advocate for change within their community. The responsibility to create and facilitate a robust resident council should be included in any contracts for property management. In light of the history of poor communication with previous property managers, this would not only foster greater social cohesion among residents, but would also provide residents with a more effective and regular mode of communication with the HAMC, increasing trust and creating a safer, healthier, and more cohesive Madison Heights.

7. Promote and foster creation of neighborhood circles among Madison Heights residents.

Intergenerational neighborhood circles, in which each resident of Madison Heights belongs to a small group of neighbors that checks in and keeps tabs on each other, could create smaller communities within the greater Madison Heights community. This would simultaneously foster a stronger sense of community and increase individual and neighborhood safety. Examples of such smaller communities include the Coalition for a Better Acre’s “NeighborCircles,” in which groups of 8 to 10 neighbors get together for a facilitated meal every week or two and discuss various neighborhood issues and concerns,⁸⁹ and the Resilience Circle Network’s “resilience circles” that focus on personal security and shared action.⁹⁰ The neighborhood circles in Madison Heights could be smaller and less formal, but would be a great way to help residents get to know and help look out for one another. Especially for older and disabled adults, this could serve not only as a social support system, but also as an extra precaution for preventing accidents and loneliness.

8. Intentionally design and build the community center and play areas to promote intergenerational interaction and exchange.

Intergenerational communities consist of individuals of all ages, whose age diversity is reflected in community membership as well as in the facilities and services that serve them. Physical environments designed to promote intergenerational interaction, for instance between young families and older adults or for grandparents raising grandchildren, have been proven to increase social cohesion and civic and community engagement.⁹¹ As Madison Heights has a high population of both young families and older adults, a community center and green spaces designed to engage members of different generations can help make the new Madison Heights a more resilient and cohesive community. Some possible design sketches are included below. Additional ideas and drawings for development of such spaces are included in **Appendix G**.

Figure 22
Sketch for amphitheater style community area *Courtesy Catalyze Research and Consulting LLC*



Figure 23
Sketch for on-site community garden

Courtesy Catalyze Research and Consulting LLC



The flower garden can include taller plants like sunflowers that can provide additional shade and a natural barrier from the walking path around the garden.



A water feature can manifest as a water pump, a fountain, or any other interesting water installation that can be used both for play and irrigating gardens.



The inexpensive shade structure above the picnic tables and barbecue stations provides ample shade and protection from the harsh sun of Arizona's summers.

Additional Concerns

In addition to these primary themes, a few other concerns were raised by community stakeholders including gang violence, lack of youth engagement, broken families, and limited employment opportunities. Upon deeper investigation, the fear of gang violence was based on outdated information and unsubstantiated by further evidence. The other issues were not corroborated by other stakeholders and/or were outside the scope of this HIA in terms of developing recommendations specific to these concerns for the HAMC and Gorman and Company. Instead, some elements were absorbed into the overarching themes in “Key Health Determinants” and more indirectly addressed through the lenses mentioned above.

HIA Process and Methods

There is no prescribed method of conducting an HIA, as each is specifically tailored to its unique scope, proposal, and affected populations. However, in general an HIA is an iterative process that can roughly be divided into six key phases: screening, scoping, assessment, recommendations, reporting, and monitoring/evaluation. The *Minimum Elements and Practice Standards for Health Impact Assessment, Version Two*⁹² was used to guide the process and ensure best practices were incorporated.

Screening

In the screening stage, the timing, feasibility, and potential health impacts of the health impact assessment (HIA) are evaluated in order to determine whether or not the HIA should be conducted. There should be sufficient time to conduct an analysis before the final decision is made to move forward with the proposal. In addition, HIAs are most useful when the proposed program or policy change is not directly related to health, and health is not already being considered in the decision making process, but has the potential to impact health outcomes and health inequities.

Feasibility and Potential Impact of HIA

Although the decision to redevelop Madison Heights, Norton Circle, and HM Watson affordable housing projects had already been made, financing was not yet approved at the time of the HIA. As such, details of the final design were yet to be finalized and could be informed by the findings of an HIA. It was determined that an HIA could help inform community design and the relocation process while increasing resident engagement throughout the process. There was also an opportunity to examine the broader neighborhood health-related issues. Bringing interested stakeholders together created the potential to identify and mobilize different resources, potentially forging new partnerships.

A project team was assembled, composed of individuals from the Maricopa County Department of Public Health (MCDPH), Health in Policy and Practice (HIP²), Local Initiatives Support Corporation of Phoenix (LISC), and Dignity Health St. Joseph’s Hospital and Medical Center. Funding was provided by LISC and the Human Impact Project, a collaboration of the Robert Wood Johnson Foundation and The Pew Charitable Trusts, allowing for adequate financial resources to conduct the project.

In addition, the Housing Authority of Maricopa County (HAMC), the key decision maker identified in the Madison Heights HIA, had recently participated in and witnessed the success of the Coffelt-Lamoreaux Public Housing Redevelopment HIA (Coffelt HIA), which not only provided a model, process, and best practices for the Madison Heights HIA, but also increased the HAMC’s receptivity and support of the HIA process. Given the decision to begin relocation and development in June, the project team felt that a rapid HIA was best suited for this decision, with an estimated project timeline of three months and projected completion date of June 1st, 2014. By mobilizing various partners and data sources, the project team determined there were sufficient resources and time to conduct a rapid HIA to ascertain the potential health impacts of this proposed redevelopment.

Potential Health Impacts

Due to the varied locations and demographics of the three affordable housing communities and the unique proposal to consolidate them, this project had the potential to affect various social and environmental determinants, including but not limited to: social cohesion, youth engagement, crime and safety, access to transportation, access to physical activity, access to healthy foods and access to services. In addition, the relatively high percentage of vulnerable populations such as children, elderly, refugees and people with disabilities within the affected community presented an opportunity to investigate and potentially ameliorate certain health inequities.

Stakeholder Involvement

During the screening phase, the project team conducted in-person and phone interviews with stakeholders representing populations, agencies, or organizations that might be affected by this proposal, including but not limited to residents of all three communities, local schools, churches, hospitals, resource centers, the police department, and elected officials at both the city and county levels. From this list, individuals were invited either to 1) sit on the HIA Advisory Committee to inform and guide the development of recommendations; or 2) participate in mapping workshops, walking and park audits, and/or key informant interviews (see **Appendices E and F**). In this way, stakeholders were involved throughout the decision-making process and were able to communicate relevant concerns and/or provide input via recommendations for decision makers.

Scoping

In the scoping stage, plans for stakeholder engagement and communication and a timeline are developed to determine priority issues to be studied, as well as participant roles for assessing key health determinants. The stakeholder engagement and communication plans are included in **Appendices C and D**. A health determinant pathway diagram is a logic model often used to conceptualize links between key issues and health outcomes in order to develop research questions.

Key Health Issues

Based on conversations with stakeholders and the preliminary mapping workshop with residents, a few key health issues were identified: safe housing, particularly for older adults and people with disabilities; safe and complete streets; access to physical activity and recreation; access to healthy food and healthcare services; crime and safety; and resilient communities. These issues were explored according to the research questions in **Screening and Scoping**.

Health Determinant Pathway Diagram

The pathway diagram (see **Figure ES1**) is a logic model used to predict how the proposal may affect key health determinants and impact health outcomes. The pathway diagram demonstrates the direct and immediate health impacts of the proposed redevelopment, as well as downstream health outcomes.

Assessment

In the assessment phase, both qualitative and quantitative research methods are used to collect information on baseline health conditions and evaluate potential health impacts on the affected populations.

Epidemiology

Data for community health status was collected by epidemiologists at the Maricopa County Department of Public Health. Due to some inconsistencies in numbers for hospitalization rates, citywide data from published Maricopa County Health Status Reports⁹³ were used instead, which were limited to the years 2009 to 2011. For mortality data, information was pulled from the zip code 85323 in order to get the most relevant and accurate representation of Madison Heights area data, using four-year averages from years 2009 to 2012 to account for fluctuations in small area numbers. Official population numbers for the zip code were limited to the 2010 census, so estimates from City-data.com, Usa.com, and the Health Status Reports were used for the other years. The Avondale Police Department supplied crime report data and analysis to help determine part 1 crime rates in the area.

Mapping Workshop

During the scoping and assessment phases, a participatory mapping workshop was held at the Mosaic Arts Center in historic Avondale with a total of 107 Madison Heights and Norton Circle residents. The workshop was conducted in English and Spanish to ensure that all residents were actively included and engaged in the conversation. Participants were divided into small groups, each with a large aerial map of the historic Avondale district and a planning and design kit. Using color-coded stickers that represented neighborhood amenities, services, positive and negative attributes, and desired community elements, workshop participants identified various strengths and weaknesses within their community. They were asked to focus on access to healthy foods and public transportation, opportunities for active living, housing needs, and other health-related concerns. In addition to workshop facilitators, the director of the Housing Authority of Maricopa County and a representative of developer Gorman and Company were present, primarily to answer residents' questions related to the redevelopment and relocation process. The workshop was an opportunity for participants to raise specific issues, concerns, challenges, and desires for the new Madison Heights development and surrounding neighborhood. The full report summarizing the insights gained from the community engagement workshop is included in **Appendix F**.

Health Surveys

At the mapping workshop, participants were asked to fill out health assessment surveys that asked questions pertaining to access to healthy food, physical activity, and access to transportation. Out of 107 total participants, 44 residents completed the survey. Survey results and data are included in **Appendix F**.

Walking and Park Audits

Audit tools are a qualitative way to assess street safety and accessibility by examining sidewalk connectivity, shade, speed limits, and other walkability features. Six residents, three each from the Madison Heights and Norton Circle communities, were recruited to conduct walking and park audits. Each Madison Heights resident was paired with a Norton Circle resident to walk from the Madison Heights complex to Lattie Coor Elementary, Agua Fria High School, and the First Southern Baptist Church in order to determine walkability and safety. Furthermore, two residents assessed the amenities of the Church playgrounds in order to determine opportunities for physical activity and recreation. Both audit tools were provided by St. Luke's Health Initiatives (see **Appendix E**).

Resident Interviews

One-on-one interviews were conducted both in person and by phone for several residents who were unable to come to the participatory mapping workshop, including those with disabilities and residents living in the more remote HM Watson Homes. These residents were asked a series of questions regarding their prior knowledge of the proposed redevelopment and relocation, the strengths and weaknesses of their current neighborhood and housing unit, perceived strengths and weaknesses of the current Madison Heights, and desires for their new neighborhood and housing unit.

Recommendations

The recommendations phase of the HIA calls upon the project team, HIA Advisory Committee members, and other community stakeholders to analyze and interpret findings from the assessment phase in order to develop appropriate recommendations for decision-makers. For this HIA, preliminary recommendations were crafted based on existing data, literature, and public health principles, then presented together with assessment findings to the Advisory Committee. Two recommendations meetings with Advisory Committee members were conducted to ensure thorough discussion of the issues and subsequent evaluation of recommendations and alternatives. These two meetings also provided opportunities for residents and other stakeholders to identify gaps and/or discrepancies in data collected, thereby triangulating the more general quantitative and qualitative information with firsthand accounts and experiences.

Based upon the knowledge and judgment of members of the Advisory Committee, recommendations were written and polished for a public community meeting, where input was solicited from residents of Madison Heights and Norton Circle, as well as other community stakeholders. Because of the HIA's accelerated timeline, the assessment and recommendations phases were conducted concurrently. As a result, some recommendations were developed before all data were collected and analyzed.

Recommendations Advisory Committee

The following people and agencies participated on the HIA Advisory Committee to guide and inform the development of recommendations for the Housing Authority of Maricopa County:

- Stephanie Pope and Safi Catherine; residents of Madison Heights
- Thomas Johnson, Katherine Murray, and Celinda Myslinski; residents of Norton Circle
- David Dube, Vincent Lopez, Kenneth Steel, Jacqueline Ward, Ahmed Mohamed, and Hovi Nguyen; Maricopa County Department of Public Health
- Michele Scanze and Cynthia Melde; Arizona Department of Health Services
- Mia Stier and Ian Dowdy; Sonoran Institute
- Dr. Matt Bentz; Agua Fria High School
- Dr. Betsy Hargrove and Ceyda Murillo; Avondale Elementary School District
- Dr. Pam Goslar; Dignity Health St. Joseph’s Hospital and Medical Center
- Christine Fanchi, Daniel Culotta, and Chris Reams; City of Avondale
- Pastor Jack Marslender; First Southern Baptist Church of Avondale
- Jolie Keys and Anna Rico; United HealthCare

Reporting

The reporting phase involves the communication of findings and recommendations to decision makers, affected populations, and the general public. The findings and recommendations of this HIA were shared with the decision makers Housing Authority of Maricopa County and developer Gorman and Company in a detailed presentation including methodology and data to allow for further explanation and clarification. A similar presentation was also conducted for the members of Health in Policy and Practice (HIP²) to ask for feedback, share lessons learned, and contribute to existing knowledge and support for health impact assessments in Arizona. Printed copies were then distributed to project partners, decision makers, all members of the HIA Advisory Committee, and the Maricopa County Board of Commissioners. The Local Initiatives Support Corporation of Phoenix (LISC) also plans to cite this report as an example of how affordable housing and HIAs may be used to assist and integrate future community development efforts.

Finally, the completed report will be publicly available on the HIP² (www.azhip2.org), Health Impact Project (www.healthimpactproject.org), and LISC Phoenix (www.lisc.org/phoenix/) websites, to be viewed and downloaded as needed by interested community members.

Monitoring and Evaluation

The final monitoring and evaluation phase of the HIA is characterized by tracking various indicators to evaluate the implementation of the proposal and HIA recommendations, as well as the impact of the HIA on the decision-making process. This entails the evaluation of both the HIA process and the downstream health impacts and outcomes, as outlined below.

Process Evaluation

The following measures were used to evaluate the quality and effectiveness of the HIA process:

- Practice Standards Checklist (see **Appendix H**)
- HIA Advisory Committee Survey (see **Appendix I**)

In addition, the number of stakeholders who actively participated in the HIA recommendations process serves as an indicator of stakeholder engagement. The two recommendations meetings held with Advisory Committee members involved a total of 21 different residents and community stakeholders, most of whom were present at both meetings. The recommendation meeting with residents of Madison Heights and Norton Circle had a total of 35 residents and 10 Advisory Committee members.

Impact and Outcome Evaluation

Following the completion of this health impact assessment and redevelopment, it is recommended that an external evaluator measure the health impacts and outcomes affected by this proposal. The Monitoring and Evaluation Plan (see **Appendix J**) proposes a few indicators, as well as possible responsible parties and timelines.

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Appendix A
Proposed Site Plan

Appendix B
Preliminary Elevations

Appendix C
Stakeholder Engagement Plan

Appendix D
Communication Plan

Appendix E
Audit Tools

Appendix F
Mapping Workshop Report

Appendix G
Design Ideas for Multigenerational Community Spaces

Appendix H
Practice Standards Evaluation Checklist

Appendix I
Advisory Committee Survey and Responses

Appendix J
Monitoring and Evaluation Plan

Access all appendices at www.tinyurl.com/madisonheightsappendices.

About Health in Policy & Practice

Health in Policy & Practice (HIP²) is a catalyst for healthy communities throughout Arizona. Through education, collaboration, information sharing, and partnership development, HIP² empowers organizations and communities to integrate healthy community design into decision making.

HIP² engages in the following activities:

- Health Impact Assessment promotion and facilitation - agencies and organizations wishing to execute an HIA can call on us and our network of HIA practitioners to complete any and all of the six steps of an HIA.
- HIA training - we offer free training throughout Arizona to introduce the concept of HIAs to those unfamiliar with them and to show the value of HIAs within the community.
- Advocacy efforts - HIP² has offered comments and guidance on including health in the General Plans of municipalities in the state.

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Health in Policy & Practice

About Local Initiatives Support Corporation

The Local Initiatives Support Corporation (LISC) is dedicated to helping community residents transform distressed neighborhoods into healthy and sustainable communities of choice and opportunity — good places to work, do business and raise children. LISC mobilizes corporate, government and philanthropic support to provide local community development organizations with: loans, grants and equity investments; local, statewide and national policy support; and technical and management assistance.

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