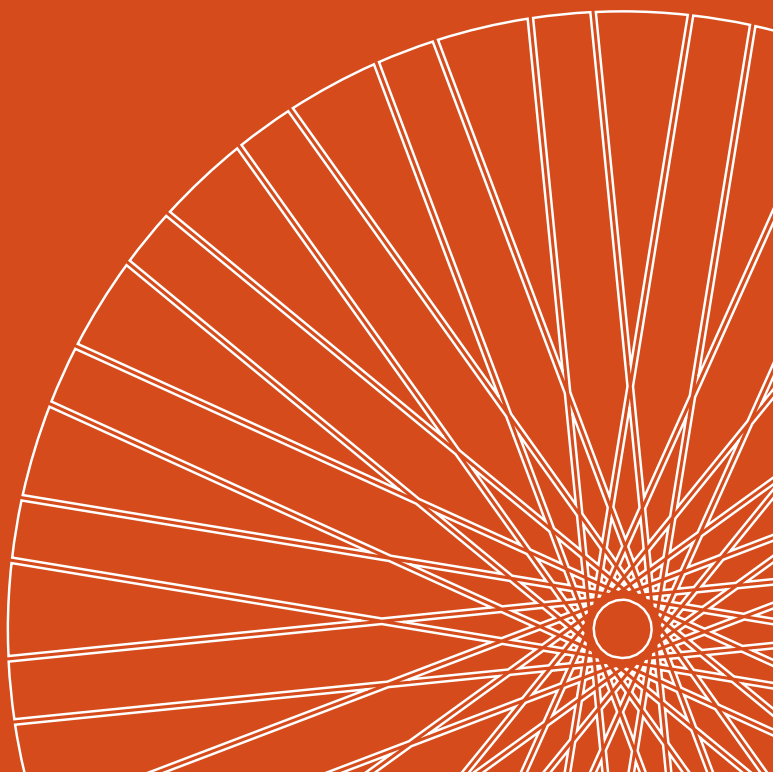


POLICY BRIEF

Do Kids Want to Play in the Queen City?

Buffalo's Built Environment and its Impact on Youth Physical Activity



Built Environment and Youth Physical Activity

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*Figure 1 - Right:
Privately maintained
playspace on vacant
lot with poor quality
sidewalks*



*Figure 2 - Left:
Playspace at a local
community center*



Presence and Quality of the Built Environment Influences Children's Ability to Play, Walk and Bicycle

Introduction

The built environment's form and quality greatly determine youth physical activity, significantly influencing kids' health and overall wellness. This report details the current strengths and weaknesses of Buffalo's built environment in relation to youth physical activity. First, we report on land use topics, such as housing density, land use mixture, and open space. Next, we look at Buffalo's physical infrastructure—the road and bicycle network; sidewalk quality and location; and tree canopy. Thirdly, we deliver the results of a youth neighborhood-audit, during which sixteen Buffalo youth examined two city neighborhoods to discover actual and perceived built environment elements that encourage and discourage youth physical activity. Lastly, we recommend that Buffalo policy makers implement seven built environment changes to enable and increase the attractiveness of physical activity for youth.

Open Space: Room for Youth to Play

Youth are likely to be physically active in areas of open space, such as parks, playgrounds, parkways, nature trails, athletic fields, and recreation areas. The city of Buffalo contains 3,585 acres of open space, amounting to 598 square feet of open space per resident, or 2,536 square feet per youth resident—slightly less than half of a standard basketball court per youth. To use play spaces, kids need to be able to safely and easily travel to them. The map below shows Buffalo's open space in dark green; areas within a half mile (considered a comfortable walking and biking distance for kids) of open space in light green; and, in white, the areas more than a half mile from open space. As is shown, most of the city is within a half mile of open space; however, a large swath of North Buffalo is more than a half-mile away from public open space. Thus, strategically situating open space in North Buffalo would place almost all city youth within a comfortable walking and biking distance of public open spaces [1, 2].

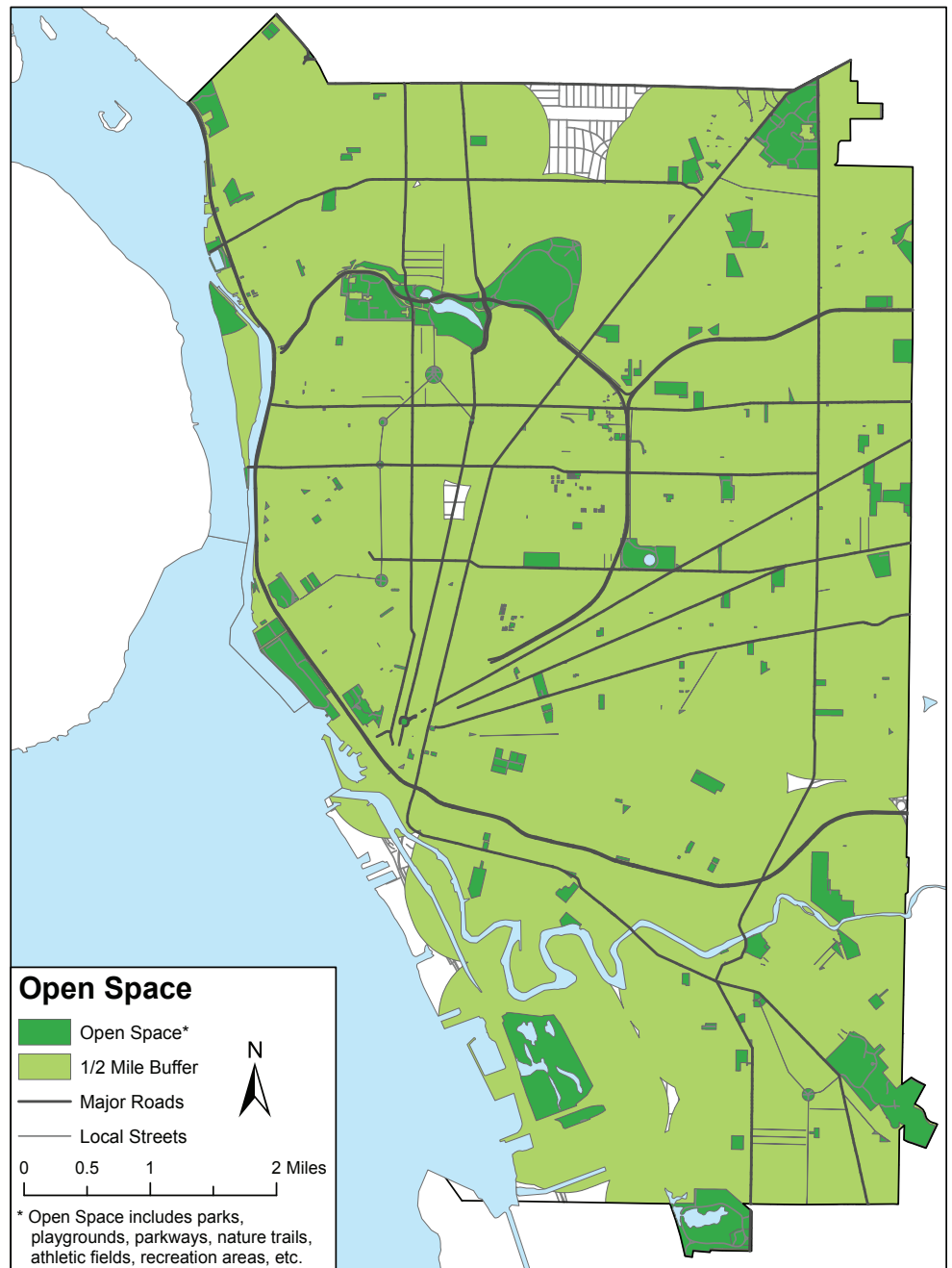


Figure 3: Proximity to Green Open Space, City of Buffalo

Dense Built Environments Promote Physical Activity

Kids are more likely to walk and bike in neighborhoods with dense built environments. Today, the average Buffalo neighborhood has 18.9 housing units per acre of residential land, while the city as a whole has a net residential density of 17.06 housing units per acre of residential land. In 2009, the net residential density of the city as a whole was 20.09, which means that there are fewer housing units per acre of residential land today than there were in 2009 [3, 4]. The impact of this change, which stems partly from the demolition of vacant residences, is that children are less likely to walk and bike.

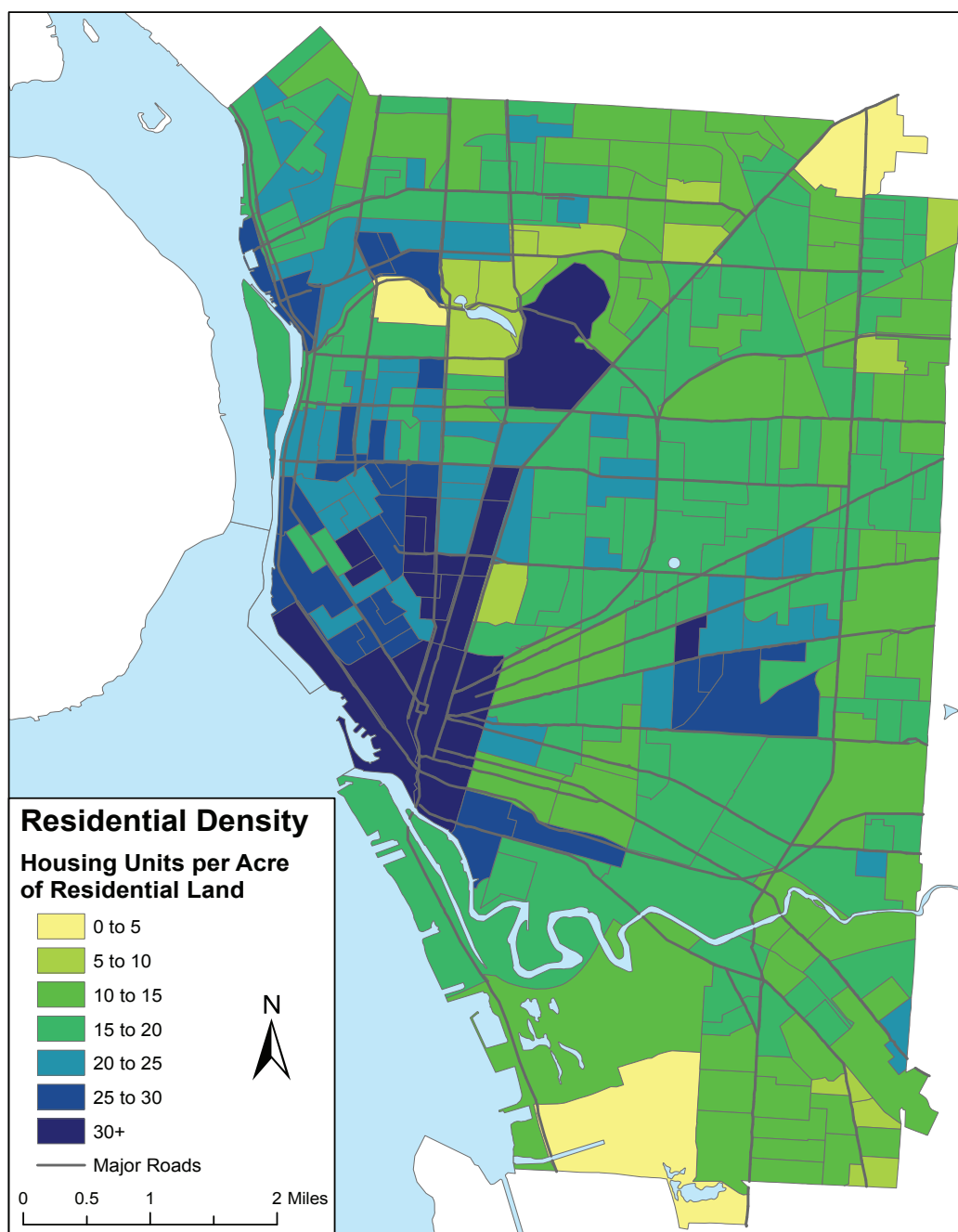
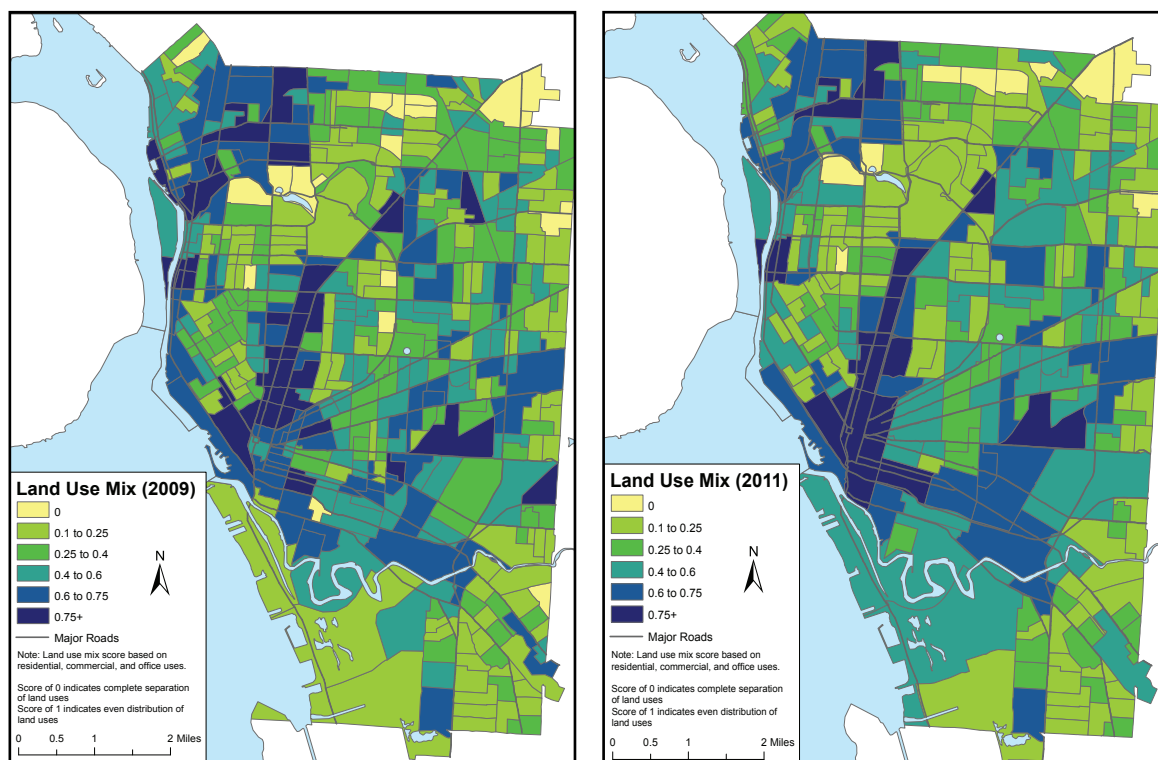


Figure 4: Housing Density, City of Buffalo

Mixed Land Uses Engender More Physical Activity

Youth are likely to walk and bicycle if they live in neighborhoods that offer a variety of destinations to visit. Neighborhoods with diverse land uses—such as those containing houses, retail stores, and youth-friendly spots like schools, playgrounds, basketball courts, parks, and community centers—are environments in which youth are more likely to be physically active than in neighborhoods with non-mixed land uses. Measured on a scale from 0 to 1 (respectively, no land use diversity to high land use diversity), the average Buffalo neighborhood currently scores 0.35. This illustrates that, despite being urban, most Buffalo neighborhoods tend toward homogenous land uses. Exceptions that offer a mix of amenities include downtown; the vicinity of Main St.; between William St. and Broadway west of Bailey; and northwest Buffalo [3].

Despite the presence of these mixed use neighborhoods, Buffalo's land use today is less diverse than it was two years ago. In 2009, the average Buffalo neighborhood scored higher (0.39) on the land use diversity scale than it does today (0.35) [3, 4]. To encourage youth to be physically active in their neighborhoods, the city must enable neighborhoods to diversify their land uses. The Buffalo Green Code—the city's proposed land use plan and zoning code—offers this opportunity. Simultaneously, the Buffalo Green Code can ensure that any reduction in land use diversity is offset by an increase in healthier land uses like open spaces and playgrounds.



*Left - Figure 5:
Land Use Mix, 2009*

*Right - Figure 6:
Land Use Mix, 2011*

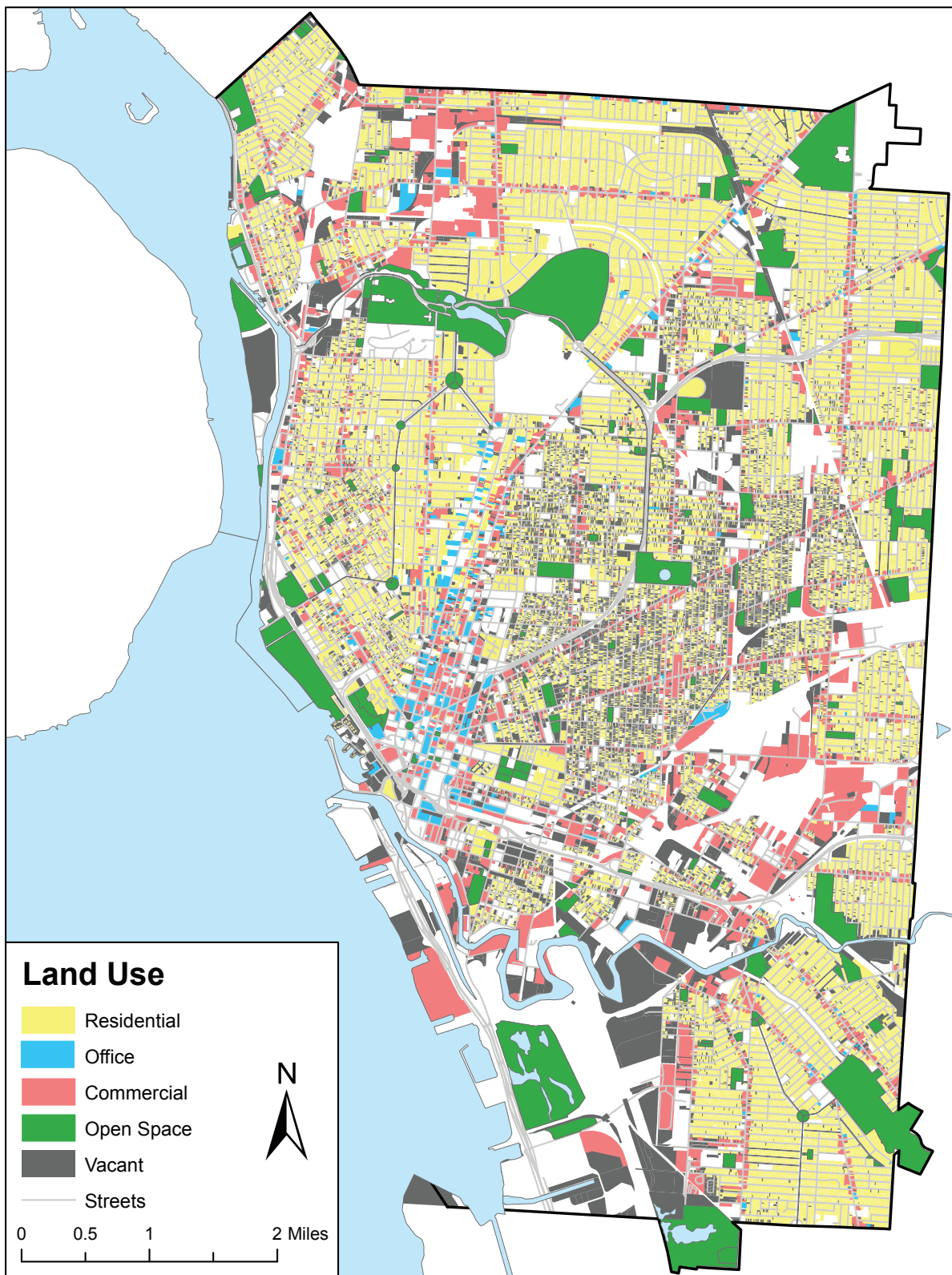
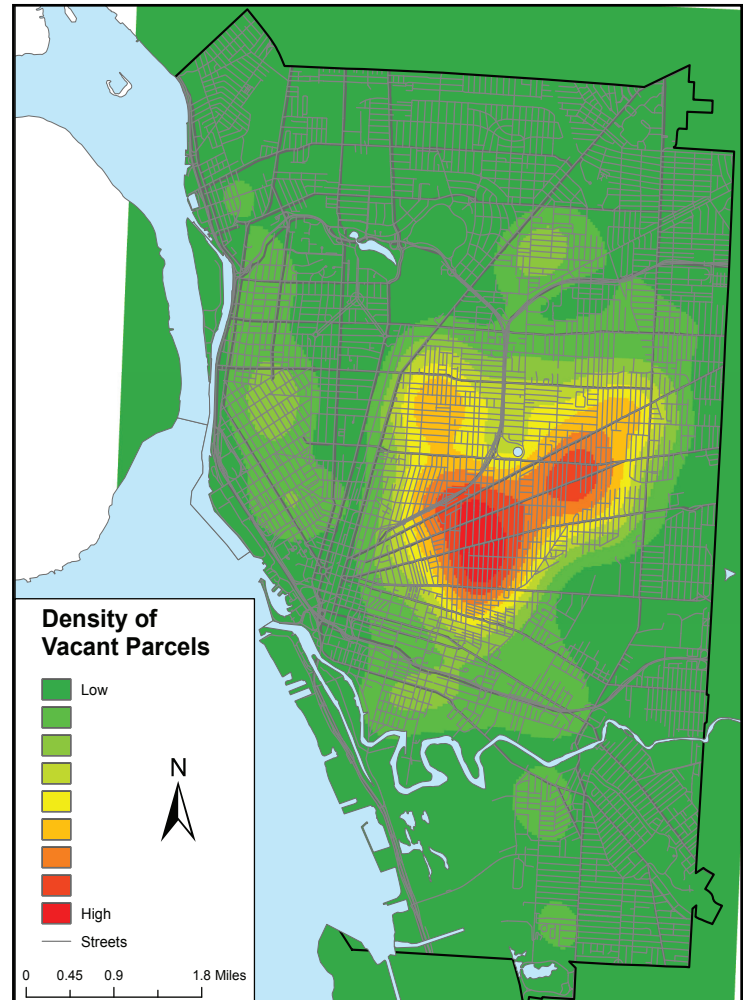


Figure 7:
Types of Land
Uses

Vacant Properties: Opportunities Disguised as Eyesores

Youth are not likely to be physically active in areas with unkempt or vacant properties. Vacant and unkempt properties discourage youth from being physically active in their neighborhoods in several ways: the buildings and unkempt lots are eye sores; structurally unsound buildings are dangerous; and vacant buildings attract crime. Children are not likely to want to play outside in these conditions, and, moreover, their parents often discourage it.

Today, Buffalo is home to 3,291 acres of vacant land—more than nine times the acreage of Delaware Park [3]. Buffalo will not repopulate to mid-20th century levels in the near future, so there is little market demand to rebuild on many of the vacant properties. To ignore them, however, is to overlook their potential to detract from or benefit children's health. The City can play a major role in strategizing how to reuse these lands in ways that stimulate physical activity, such as by enabling community gardens, open space, and athletic fields.



*Top - Figure 8:
Vacant Parcel Density*

*Bottom - Figure 9:
Vacant home on the West Side*



Physical Infrastructure

The City's Road Network: A Motorist's Playground

Buffalo has an extensive road network, including major highways which move people efficiently throughout the region. Many of these thoroughfares, however, create barriers against physical activity. Our highway system severely limits access to the waterfront and splits the original Olmsted Park System, as well as many old neighborhoods. Route 198 and Interstate 190 hamper youth from walking or biking to two of the likeliest places for physical activity—the waterfront and the city's largest park. A NYDOT project to redesign approximately three-miles of Route 198 into a landscaped boulevard is currently in development [5]. Additional effort should be made to convert portions of Interstate 190 to pedestrian and bicycle friendly boulevards.

Many other major roads pose traffic safety threats to pedestrians and bicyclists. Motorists travel faster than the posted speed limits because many of Buffalo's major roads are underutilized and excessively wide. A "road diet"—which targets roads that carry 12,000 to 18,000 vehicles per day, eliminating excess lanes and reducing the width of remaining lanes—may make these roads safer for pedestrians and bicyclists [6]. Fewer, narrower lanes slow vehicles down and lessen the distance pedestrians and bicyclists must travel to cross the road. Moreover, the space left from narrowing and eliminating lanes can be used to create or improve existing pedestrian and bicycle infrastructure [6, 7].

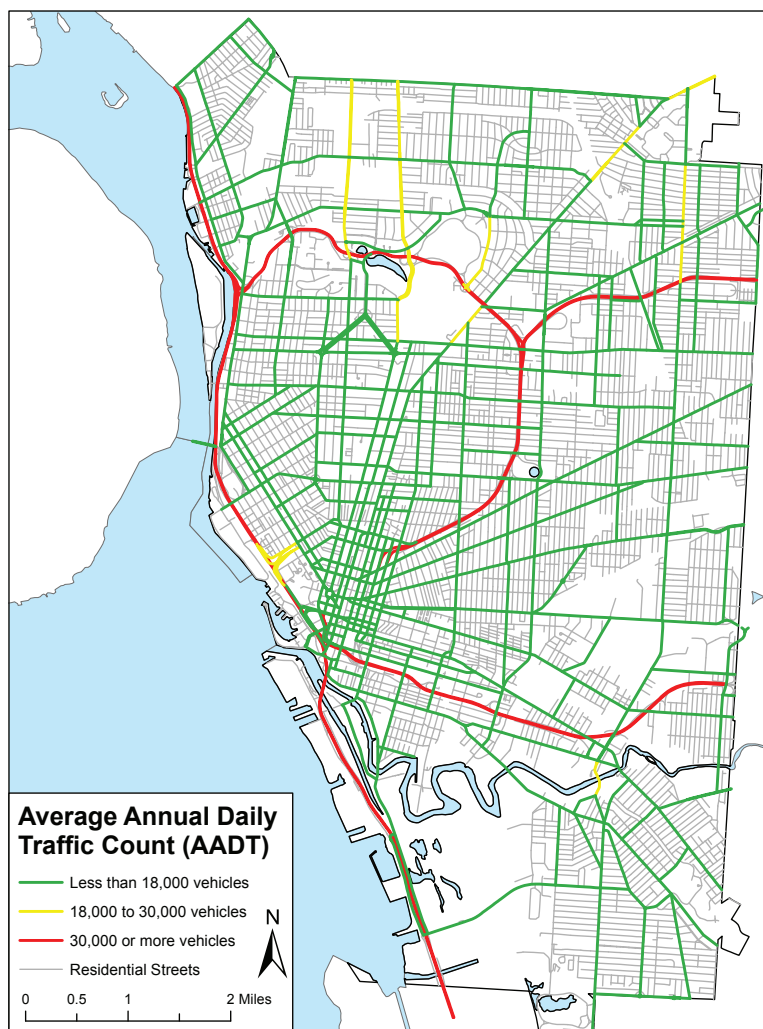


Figure 10:
Traffic Volume on Buffalo's Roadways

The City's Pedestrian Network: An Extensive System in Need of Improvements

Sidewalks and crosswalks are important infrastructure because they encourage walking. Many city sidewalks, however, need to be repaired or replaced because they have shifted from their original position, have large cracks, or are overgrown with vegetation. Additionally, snow removal is a major issue for pedestrians because residents—not the City—are responsible for clearing sidewalks. High-renter and high-vacancy areas are less likely than owner-occupied areas to have snow cleared from sidewalks, and dangerous sidewalk conditions result. Furthermore, many painted crosswalks are faded or non-existent, and pedestrian crossing aids¹ are available only at major intersections. Data documenting local streets' sidewalk location and condition needs to be collected in order for the City to prioritize areas for pedestrian infrastructure investment.

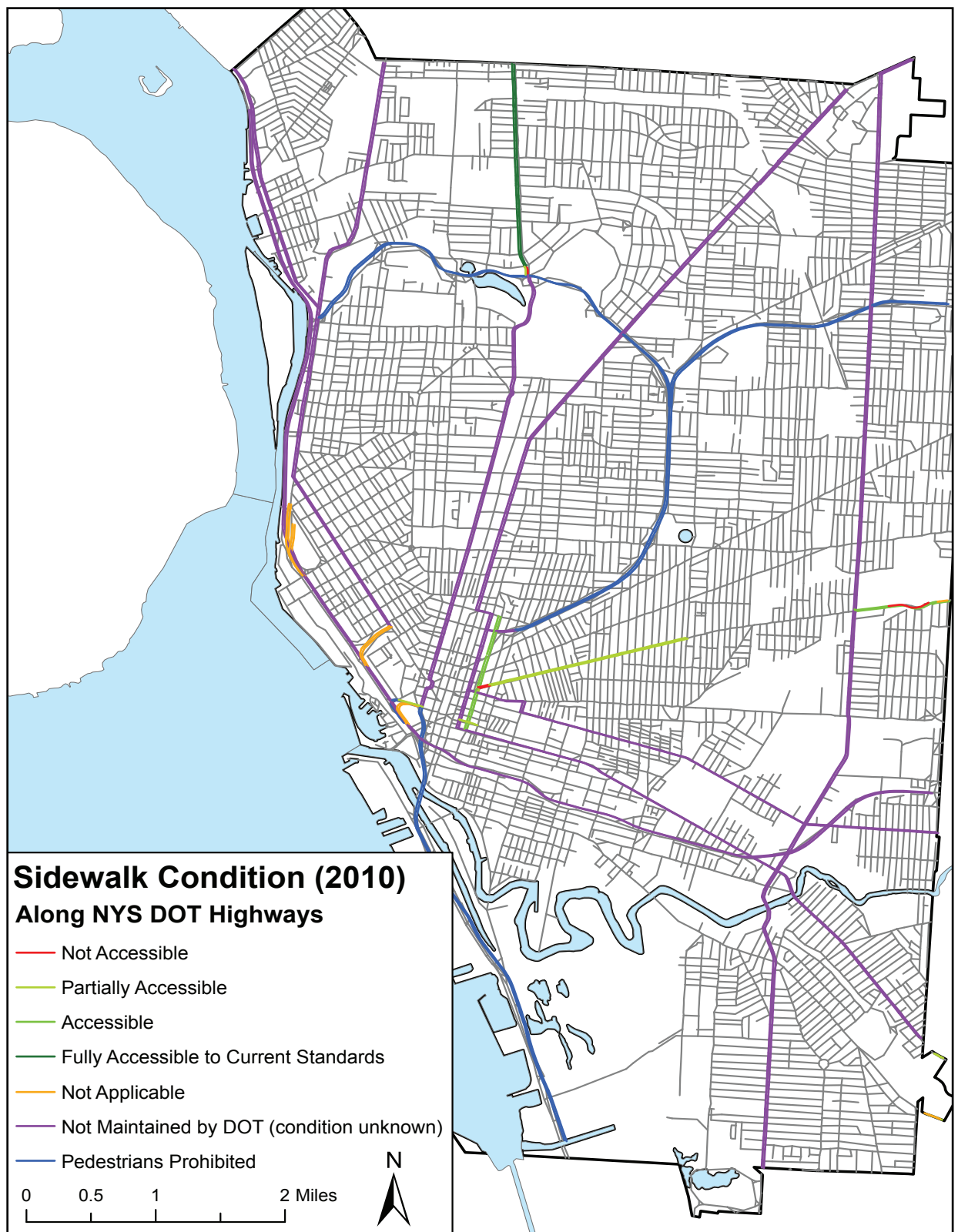
Data on the exact location and condition of Buffalo's sidewalks are limited to a small percentage of sidewalks along New York State Department of Transportation (NYSDOT) highways². NYSDOT has an inventory of 5.6 miles of sidewalk in Buffalo, but only 1.9 miles (34%) are classified as fully accessible by the 2004 Americans with Disabilities Act (ADA) Accessibility Guidelines. 1.3 miles (23%) are classified as having minor maintenance problems; 2.0 miles (36%) are classified as partially accessible; and 0.4 miles (7%) require full replacement because they are classified as inaccessible [8].

Additionally, NYSDOT has an inventory of 595 curb ramps. Of these curb ramps, 106 (18%) are classified as ADA compliant. To make the remaining 82% ADA compliant, 147 (25%) require Detectable Warning fields—walking surfaces with tactile cues for the visually impaired—and 342 (57%) need to be completely replaced. Condition ratings are not available for marked crosswalks along NYSDOT highways. NYSDOT typically replaces most pavement markings on a three-year cycle unless conditions warrant otherwise [8, 9].

1: A crossing aid is a pedestrian crossing timer or a flashing warning sign.

2: Many sidewalks along these routes, however, are not owned by NYSDOT and their conditions were not determined.

*Figure 11:
Next Page - Sidewalk Condition Map*



The City's Bicycle Network: Create More Signed Bike Lanes

Bicycling is a very common way youth play and travel. The city of Buffalo has a limited bicycle network comprised of multi-use trails, signed lanes, sharrows, and non-signed streets. Within the city, there are twenty-two miles of multi-use trails, 14 miles of on-street signed bicycle lanes, and approximately 1.5 miles of sharrows. Sharrows—or shared roadway bicycle markings—are painted markings on the street depicting a bicycle and two arrows. They are used to alert motorists to expect bicycles to occupy the travel lane. The bicycle network, however, is composed predominantly of non-signed streets (126 miles) which have been safety rated by the Greater Buffalo-Niagara Regional Transportation Council (GBNRTC). Only 8% (10 miles) are rated “suitable” for biking, while 114 miles are rated “caution advised” and 2 miles are rated “extreme caution advised” [10, 11]. New York State law allows bicyclists under thirteen years old to ride on the sidewalk; however, Buffalo law prohibits all people from bicycling on the sidewalk. Consequently, youth are forced to ride on the many “caution advised” streets, or to ride illegally on the sidewalk [12, 13]. Extending the signed bike lane network would make bicycling much safer and more attractive for youth.

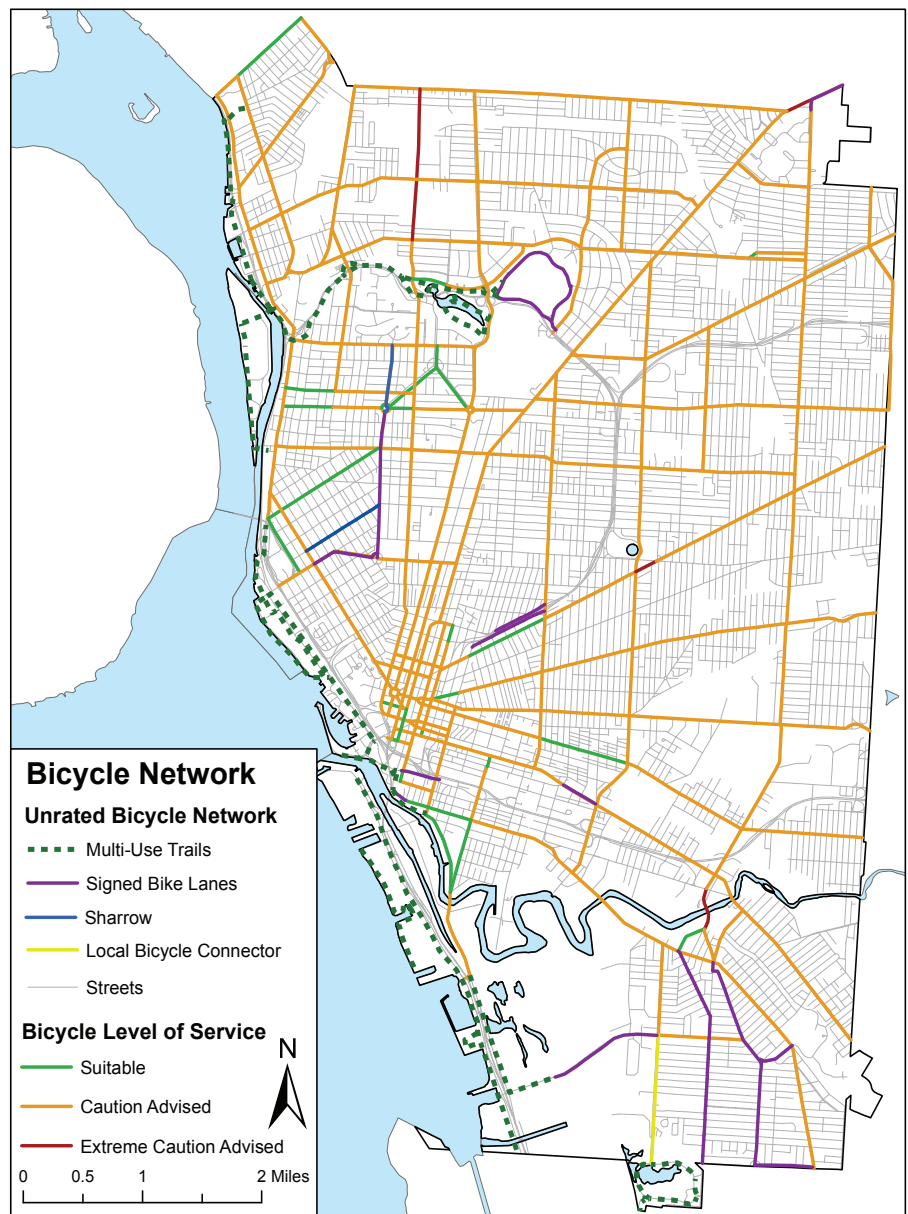


Figure 12:
Bicycle Network

The City's Street Trees: Disparities in our Canopy

The benefits of street trees for promoting physical activity are numerous. Tree-lined streets are aesthetically pleasing and invite pedestrian activity. Trees provide shade during hot days, and they protect passersby and waiting transit-riders during rain and snow storms. Youth exercise by climbing trees during their play. Lastly, tree-lined streets calm traffic, increasing the safety of pedestrians and bike riders.

South Buffalo's McKinley Parkway and the majority of West Side and North Buffalo streets are tree-lined, but the East Side, Black Rock/Riverside, and much of South Buffalo have the opportunity to re-tree their streets. In fact, throughout the city, and especially in these neighborhoods, there are nearly 47,000 vacant street-tree locations. Today, approximately 55% of street-tree locations are planted—far from the City's 2014 goal of 85% [14, 15].

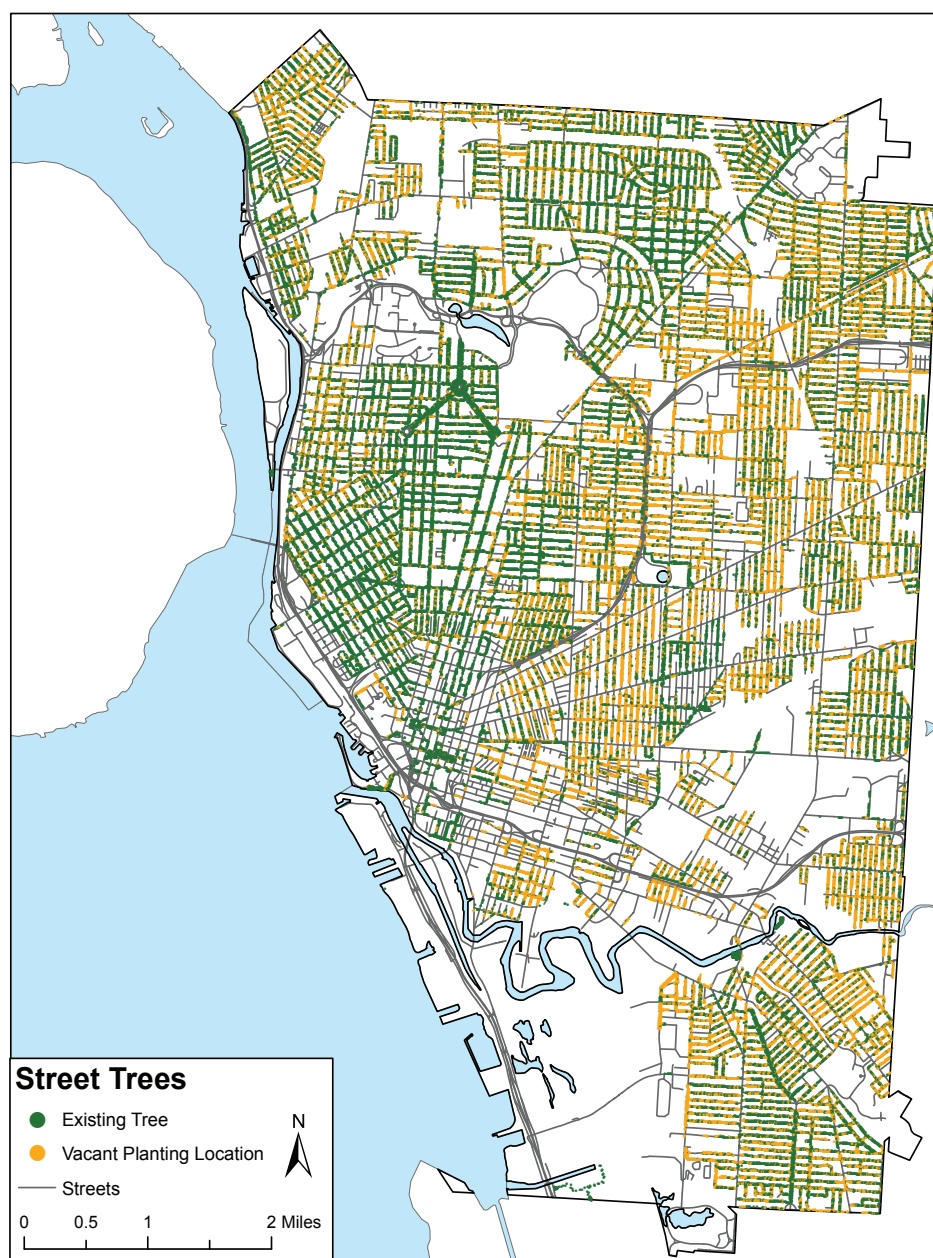


Figure 13:
Tree Coverage

Youths Investigation and Report:
What Elements Make Neighborhoods Attractive for Physical Activity?

Youth perceive the built environment differently than adults. To create environments youth will use, decision makers must understand children’s perspectives. To better understand what kids view as opportunities and barriers to physical activity in the built environment, 16 youth leaders³ from the HKHC-Buffalo partnership audited the built environment of two comparable Buffalo neighborhoods. During the neighborhood audit, youth documented walking and biking infrastructure; safety from crime and vehicular traffic; human activity; aesthetics; and attractive destinations.

The two neighborhoods - one on the East Side and one on the West Side (see figure 14) - were chosen based on the following commonalities: compared to the average Buffalo neighborhood, both neighborhoods had a higher youth density; a higher percentage of families with children living below the poverty level; and a higher percentage of households without access to a vehicle. The factor differentiating the two neighborhoods was the rate of youth pedestrian and bicycle accidents with motor vehicles.

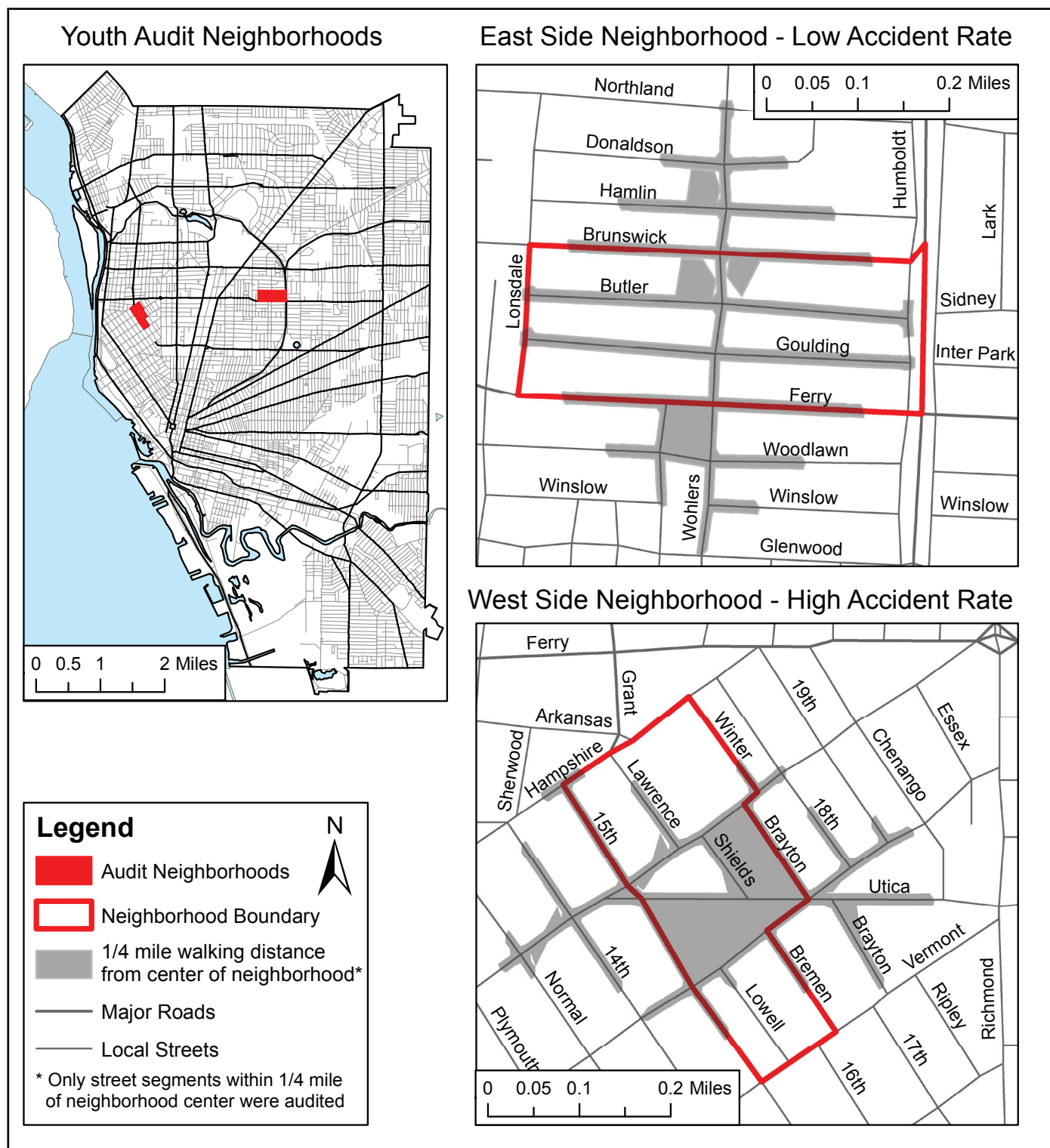
The East Side neighborhood experienced 18.7 accidents per 10,000 youth, while the West Side neighborhood reported 47.3 accidents per 10,000 youth—two and a half times more accidents than the East Side neighborhood.

3: All youth leaders were high school-aged.
4: Audits were conducted along all street segments within ¼ mile walking distance from the center of the neighborhood.

Figure 14:
Neighborhood Comparison

	East Side Neighborhood	West Side Neighborhood
Youth Density per Acre	11.6	12.0
Families with Kids Below Poverty	36.5%	26.3%
Housing Units without a Vehicle	42.5%	59.9%
Youth Accident Rate per 10,000 Youth	18.7	47.3

Figure 15:
Audited Neighborhoods and Routes



Sidewalks, Human Activity, and Aesthetics Determine the Attractiveness of Walking

In the low-accident rate East Side neighborhood, most youth responded positively when asked if the neighborhood was an attractive place to walk (i.e. if they enjoyed and felt comfortable walking there). When classifying 94% of street segments as attractive for walking, youth noted their feelings of safety, the neighborhood's calm atmosphere, and the good sidewalk conditions. In fact, the neighborhood had continuous sidewalks on both sides of the streets. Over 60% of these sidewalks were in excellent or good condition. Sidewalks in fair or poor condition (40%) were uneven, contained major cracks, or had overgrowing vegetation. Youth deemed only one street segment in the East Side neighborhood as an unattractive place to walk because of its bumpy sidewalks.

Compared to the East Side neighborhood, youth found the high-accident rate West Side neighborhood's street segments less attractive for walking. Youth leaders deemed 61% of street segments attractive for walking because of the neighborhood's aesthetics and bustling human activity. Nine segments were reported as unattractive for walking. Sidewalks were present on both sides of the streets; however, one street segment lacked continuous sidewalks. None of the sidewalks were rated "excellent," and only 35% were in good condition. Sidewalks rated fair or poor were uneven, contained major cracks, or were overgrowing with vegetation.

From Top to Bottom:

Figure 16: East Side well-maintained sidewalk

Figure 17: East Side poorly-maintained sidewalk

Figure 18: West Side well-maintained sidewalk

Figure 19: West Side poorly-maintained sidewalk



Bike Lanes, Traffic Speed, and Sidewalks Matter for Bicycling in a Neighborhood

Youth expressed mixed opinions about the East Side neighborhood's attractiveness for biking. There were no marked bike lanes in the neighborhood; for this reason, the youth considered 60% of the street segments as unattractive for biking. Youth who found the neighborhood attractive for biking ignored the absence of bike lanes, and commented instead on the good sidewalk conditions. Although Buffalo law prohibits bicycling on sidewalks, many youth have adapted to the lack of bicycle infrastructure by using sidewalks for bike travel.

Compared to the East Side neighborhood, youth found the West Side neighborhood's street segments slightly more attractive for biking. Like the East Side neighborhood, the West Side neighborhood lacked marked bike lanes. Youth reported approximately 57% of the segments to be unattractive for bicycling because of the absence of bike lanes and the presence of heavy traffic. Street segments with light traffic, however, were considered attractive for bicycling.

Traffic Speed Determines Youth's Perceptions of Intersection Safety

Youth considered 96% of the East Side neighborhood's intersections extremely or somewhat safe to cross. Streets had a mixture of light and medium traffic—none of the streets were heavily trafficked. Few intersections had painted crosswalks and only one intersection had a pedestrian crossing aid. Youth reported only one intersection somewhat unsafe to cross because they felt vehicles were traveling too fast.

Youth reported 93% of intersections within the West Side neighborhood extremely or somewhat safe to cross. None of the streets had heavy traffic and youth did not report any vehicles as traveling too fast. One intersection had painted crosswalks and two intersections had pedestrian crossing aids. Youth considered two intersections unsafe to cross.



*Figure 20:
East Side Neighborhood – ADA
compliant ramps but faded crosswalk*

Human Activity in Neighborhoods Helps Kids Feel Safe From Crime

The youth auditors reported most East Side neighborhood street segments as extremely or somewhat safe from crime. Adults or youth were present on most of the neighborhood's street segments. All youth and approximately 50% of adults were engaged in physical activity, while the other 50% of adults were sitting and talking. Four street segments had no adults or youth present, but only two segments were reported as extremely or somewhat unsafe due to the dearth of human activity.

Similarly, youth reported most areas within the West Side neighborhood as extremely or somewhat safe from crime. Two street segments were reported as somewhat unsafe because of their reputation for having drug houses. While auditing the neighborhood, the youth observed an on-duty police officer. They found his presence comforting from a security standpoint, but were distressed that it was necessary for police to patrol the neighborhood. Most of the neighborhood's street segments were populated with adults or youth outside. The youth audit team recorded that most adults were engaged in physical activity (only a few adults were sitting) and all youth were engaged in physical activity. The difference between the East and West Side neighborhoods was that youth were observed two and a half times less often on the West Side than on the East Side—nearly 45% of the East Side neighborhood's segments had youth, but youth were observed on only 17% of the West Side neighborhood's street segments.



Top to Bottom:

Figure 21: Police Presence, West Side Neighborhood

Figure 22: Signs of Kids' Physical Activity, East Side Neighborhood

Destinations and Aesthetics are Important to Kids

Youth place great importance on neighborhoods' destinations and aesthetics. The East Side neighborhood was predominantly residential with a few mixed-use street segments. The neighborhood's school, community garden, basketball courts, "high-security" church, and food market were destinations to which youth said they would go if they lived in the neighborhood. Youth liked that nearly 85% of street segments were lined with trees and that 40% had attractively-landscaped properties. Kids did not like street segments with graffiti (approximately 20%); substantial trash and litter (50%); or poorly maintained, abandoned, and vacant buildings or properties. The audit group particularly appreciated block club and other community organization signs posted throughout the neighborhood, as well as the many different national flags flown at individuals' homes.

The West Side neighborhood was primarily residential with a few mixed-use and commercial street segments. The neighborhood contained many destinations to which the youth would go, including: a school, a community center, corner stores, a garden, a playground, a car parts store, a daycare, and a laundromat. More than 80% of street segments were lined with trees and 35% had attractively-landscaped properties. Youth perceived fenced yards and playgrounds positively because they felt that fences protect children from traffic and crime. Approximately 35% of street segments were strewn with substantial trash and litter, and 35% of street segments had graffiti. The youth audit team considered gang-related and "pointless" graffiti negatively; however, they liked artistic graffiti—especially murals. The neighborhood's many poorly maintained, abandoned, and vacant buildings and properties were also considered unattractive. Additionally, youth viewed amenities that adults typically welcome—such as a community message board—negatively because they did not appear to be in use.

*Figure 23:
West Side
Neighborhood
– Visually
appealing
mural*



Built Environment and Youth Physical Activity

Elements of the Built Environment	East Side	West Side
Destinations	School, community garden, basketball courts, church, food market.	School, community center, corner store, garden, playground, car parts store, daycare, Laundromat.
Positive Aesthetics	Block club, community organizations, and national flags.	Fenced yards and playgrounds, murals.
Negative Aesthetics	Poorly maintained, abandoned, vacant buildings/properties.	Poorly maintained, abandoned, vacant buildings/properties. Unused community message board and bench.

Figure 24: East and West Side Neighborhoods: Destinations and Aesthetics Identified by Youth

Qualities in the Built Environment	East Side	West Side
Attractive for walking	94%	61%
Lined with trees	85%	80%
Attractive landscaping	40%	35%
Continuous sidewalks	100%	96%
Sidewalks in excellent or good condition	60%	35%
Sidewalks in fair or poor condition	40%	65%
Intersections safe to cross	96%	93%
Marked crosswalks	39%	4%
Crossing aids	6%	8%
Attractive for biking	39%	43%
Marked bike lanes	0%	0%
Perceived as safe from crime	89%	91%
Absence of graffiti (not all graffiti was viewed negatively)	80%	65%
Human activity	78%	78%
Youth activity	45%	17%
Absence of substantial trash and litter	50%	65%

Figure 25: East and West Side Neighborhoods: Percentage of Street Segments Exhibiting Qualities in the Built Environment



Top to Bottom

Figure 26: East Side Neighborhood – Well-maintained properties and landscaping

Figure 27: East Side Neighborhood – Highly visible school garden sign

Figure 28: West Side Neighborhood – Aesthetically pleasing landscape

Figure 29: West Side Neighborhood – Highly visible and active community organization

Youth's Suggestions for Improving the Neighborhoods

The youth audit team had many suggestions for ways to encourage youth physical activity in the East Side and West Side neighborhoods. First, youth wanted parks, sports fields, courts, and playgrounds to be added to both neighborhoods. They adamantly voiced the need for healthy food retail destinations, and felt the neighborhoods needed more color and vibrancy, perhaps through murals. Youth wanted sidewalks in both neighborhoods to be repaired and maintained, and for additional bike lanes and crosswalks to be available. They also felt strongly that crime in both neighborhoods needed to be reduced. Lastly, in the West Side neighborhood only, youth felt safety would greatly improve if the City installed traffic circles at several multi-street intersections.

Youth's Perceptions of Neighborhoods Matter

People's behaviors are heavily influenced by their perceptions, which are created by a complex intermingling of experience and knowledge. Youths, like adults, have perceptions that influence their understanding of people and places. The youth auditors demonstrated the power of perception when they accorded a less-than-perfect safety assessment (90% safe from crime) to the audit neighborhoods, despite not witnessing or recording any criminal activity in either neighborhood during the audit. They also proposed strongly, as noted earlier, that crime in both neighborhoods ought to be reduced. It is plausible that rather than relying on their own observations in the field, the youth drew on historic and learned notions of each neighborhood as having high levels of criminal activity. These notions may be introduced and reinforced by parents, other respected adults, peers, the news, and other popular media. Irrespective of whether or not the neighborhoods are actually safe, the youth's perceptions – and possible past experiences – decrease their likelihood of being physically active in these neighborhoods. Consequently, policy makers need to approach youth physical activity from two angles: improving the built environment and addressing children's and parents perceptions of these environments.

Conclusion

Youth obesity and physical inactivity is a growing problem. Policy makers can vastly improve the health of Buffalo's youth by making our physical environment more conducive to and attractive for physical activity. This analysis of the connection between Buffalo's built environment and youth physical activity reveals many of our city's strengths, as well as its opportunities for improvement.

To change the physical environment in ways that promote youth physical activity, policy makers must understand how youth perceive the built environment.

Kids want...

- * to be connected to safe places to play sports and obtain healthy food.
- * neighborhoods that are lively, colorful, and well-maintained.
- * expanded and better maintained pedestrian and bicycle infrastructure.
- * to feel safe from both vehicle traffic and crime, even if it requires fencing around desirable destinations.

To address youth's aforementioned broad concerns and ideas, we recommend implementing the following seven changes to Buffalo's physical environment:

- * **Modify Buffalo's new land use plan and zoning code to increase density and diversify land use in our neighborhoods.**
- * **Support conversion of vacant land into spaces that promote physical activity, such as community gardens, athletic fields/courts, and multi-use pathways.**
- * **Make our waterfront and parks accessible to pedestrians and bicyclists by downgrading segments of Routes 198, 33, and Interstate 190 to pedestrian and bicycle-friendly boulevards. Implement road diets on four-lane roads that carry fewer than 12,000–18,000 vehicles per day.**
- * **Develop a pedestrian priority matrix that identifies and prioritizes infrastructure needs including sidewalks, crossing aids, crosswalks, and repairs.**
- * **Connect and extend the marked bike lane network.**
- * **Re-tree neighborhoods with limited green cover—the East Side, Black Rock/Riverside, and South Buffalo—to reach the city's goal of an 85% tree canopy.**
- * **Create open spaces in North Buffalo so all city youth will be within walking distance of an outdoor, public place to play and be physically active.**

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