



CITY MANAGER'S WEEKLY REPORT

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CITY OF
Raleigh
MANAGER'S
OFFICE

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INFORMATION:

Crane Installation, 421 North Harrington Street (Smokey Hollow Project, Phase I)

Staff Resource: Lee Mai, Planning & Development Services, 996-5760, cuong.mai@raleighnc.gov

Construction activity continues on the significant redevelopment project occurring along North Harrington Street, referred to as the Smokey Hollow project. In order to setup the final stage of the construction crane, AllState Crane has been issued a permit to close 50 feet of North Harrington Street for one hour, Monday, January 27 and again on Wednesday, January 29, between the hours of 9:00 A.M. and 4:00 P.M.

Following installation and an HVAC equipment lift, the crane will then sit on the new Johnson Street alignment for the rest of the operation. Council member may hear from constituents caught unawares of the road closure. A map of the location appears below:



(No attachment)

Weekly Digest of Special Events

Staff Resource: Derrick Remer, Special Events Office, 996-2200, derrick.remer@raleighnc.gov

Included with the *Weekly Report* materials is the special events digest for the upcoming week.

(Attachment)

Council Member Follow Up Items

General Follow Up Item

Sunnybrook Road Elevated Reuse Water Tank – Information update

Staff Resource: TJ Lynch, Raleigh Water, 996-2316, tj.lynch@raleighnc.gov

Council will recall repetitive public comment from a resident of Sunnybrook Road; the purpose of this general update is to provide information and facts why the reuse water tank was sited at 618 Sunnybrook Road, the users of the reclaimed water stored in the tank, and benefits provided to the environment and the community because of the reuse water system, which relies on the water storage tank for operation.

Tank Siting

There are many factors involved in properly siting an elevated water storage tank in addition to the hydraulic modeling.

Major factors include the availability and cost of the land; the location of the site as it relates to the proximity of existing large diameter water transmission lines; the overall topography of the site, including its ability to drain properly and handle an inadvertent overflow; the adequacy of the site to accommodate the required construction activities for the specific tank size and configuration; the ease of access for the construction, operation and maintenance; and the relative ground elevation in relation to the proposed hydraulic grade line for the water distribution system.

Initial locations were evaluated based on the existing ground topography with the assumption that that the City's operating elevation for the reuse system will be Elevation 495, or 495 feet above sea level. Available sites with a finished ground elevation of 300 feet or more above sea level were identified for consideration in the vicinity of the reuse water transmission main, as these sites will provide the possibility of constructing a tank with a height less than 200 high to the tank overflow. Tank height is a major factor in the cost and constructability of elevated tanks. Tanks taller than 220 feet are considered out of the normal design range for elevated tanks, so siting a tank on high ground is very important.

In the case of the elevated water tank located in Southeast Raleigh, sixteen different locations were evaluated against the selected site at 618 Sunnybrook Road. The evaluation was conducted by comparing land features and ultimately the total construction cost of the project. The vetting reduced the field of potential sites to 5 in terms of acceptable land area and topography. The remaining vetting was a cost exercise to compare the total project cost at 618 Sunnybrook Rd. versus the alternate sites based on the land cost and cost associated with the distance from the pipeline. The actual bid amount for the tank construction was \$2,349,000.

Comparatively, the other tank sites would have cost ratepayers additional cost ranging from \$1.75 million to \$2.22 million.

Reason for the Tank and Reuse Water System

The elevated reuse tank on Sunnybrook Rd. is essential for system pressure and thus provides for the distribution of reuse water from Sunnybrook Rd. to NC State's Centennial Campus with users along the way. The reuse system was originally constructed as a method of water conservation for drought resiliency. By utilizing non-potable or reuse water for irrigation and chiller systems, there is more potable water available for human health related uses whether it be in the potable water system or stored in the lake. With the on-set of nutrient criteria and the Neuse Nutrient Reduction Strategy which resulted in a Total Maximum Daily Load or TMDL, nitrogen allocation challenges are within sight which makes the reuse system a valuable asset as it helps to serve as a beneficial method of nutrient disposal.

Current Users of Reuse Water

- North Carolina State University (Centennial Campus)
- City of Raleigh Parks, Rec. and Cultural Resources (softball complex, Walnut Creek Amphitheatre)
- WakeMed Hospital
- Raleigh Country Club
- YMCA on Rock Quarry Rd.
- City of Raleigh Solid Waste Services Facility (toilet flushing, truck wash)
- Raleigh Water (Walnut Creek Lift Station and Crabtree Lift Station odor control facilities)

(No attachment)

Follow Up from the January 21 Lunch Work Session

Neighborhood & Community Connections (Council Member Martin)

Staff Resource: TJ McCourt, Parks, 996-6079, thomas.mccourt@raleighnc.gov

During the work session Council requested additional information on the Neighborhood & Community Connections Program, which establishes quantitative metrics used to prioritize project funding based on community vulnerability and health equity.

A staff memorandum is included with the *Weekly Report* materials, along with a copy of the Neighborhood & Community Connections policy report.

(Attachments)

Special Events Weekly Digest

Friday, January 24 – Thursday, January 30

City of Raleigh Special Events Office
specialevnts@raleighnc.gov | (919) 996-2200 | www.raleighnc.gov/specialevnts

Permitted Special Events

Community Outreach

Heath Street

Saturday, January 25

Event Time: 10:00am - 4:00pm

Associated Road Closures: Heath Street between Poole Road and Cross Street and Cross Street between Heath Street and S. Carver Street will be closed from 10:00am until 4:00pm.

Other Events This Weekend

A Nest of Singing Birds: Songs and Stories from the Appalachian Mountains

Friday, January 24

Fletcher Opera Theater

Brahms Piano Concerto No. 2 – North Carolina Symphony Classical Series

Friday, January 24 – Saturday, January 25

Meymandi Concert Hall

Downtown Raleigh Home Show

Friday, January 24 – Sunday, January 26

Raleigh Convention Center

Leoncavallo Pagliacci – North Carolina Opera

Friday, January 24 & Sunday, January 26

Memorial Auditorium

19th Annual African American Cultural Celebration

Saturday, January 25

North Carolina Museum of History

UFC Fight Night on ESPN+

Saturday, January 25

PNC Arena

Astronomy Days

Saturday, January 25 – Sunday, January 26

North Carolina Museum of Natural Sciences

Celebrate Chinese New Year

Sunday, January 26

Laurel Hills Community Center

Women's March on Raleigh

Sunday, January 26

Halifax Mall & Sidewalks

Public Resources

[Event Feedback Form](#): Tell us what you think about Raleigh events! We welcome citizen and participant feedback and encourage you to provide comments or concerns about any events regulated by the Special Events Office. We will use this helpful information in future planning.

[Road Closure and Road Race Map](#): A resource providing current information on street closures in Raleigh.

[Online Events Calendar](#): View all currently scheduled events that are regulated by the City of Raleigh Special Events Office.

Council Member Follow Up



Raleigh

MEMO

TO: Ruffin Hall, City Manager

FROM: TJ McCourt, Planning Supervisor

DEPARTMENT: Parks, Recreation and Cultural Resources

DATE: January 24, 2020

SUBJECT: Neighborhood & Community Connections Program

PROJECT BACKGROUND

The Neighborhood & Community Connections (N&CC) Program is a \$1 million effort funded by the 2014 Parks Bond to identify, prioritize, and build new walkable connections to parks and greenways.

The N&CC Program was designed to promote health equity throughout the City of Raleigh, using geo-spatial modeling and data analysis to guide investment to those communities which are most at risk of negative health outcomes and most in need of improved access to public parks and recreation opportunities. In 2017, the GIS model developed in support of the N&CC Program was awarded the G. Herbert Stout Award for Visionary Use of GIS by a Local Government in North Carolina.

Neighborhoods prioritized for investment through this program are identified using a Community Vulnerability Index originally developed by the Wake County Department of Human Services. This index is based on socioeconomic and demographic indicators that correlate with high vulnerability to negative mental and physical health outcomes such as heart disease, obesity, chronic stress, and depression—health outcomes which can be mitigated with improved access to parks and recreation opportunities.

EQUITY AND PARK ACCESS

The Community Vulnerability Index used in the N&CC Program can be applied in many different planning scenarios, in order to identify an equitable means of prioritizing funding in different areas throughout the City of Raleigh. Prioritizing investments in these communities helps ensure that Raleigh's Parks, Recreation, and Cultural Resources sites, facilities, and programs are accessible to the people who will benefit most from these public resources.

Raleigh has partnered with the National Recreation and Park Association (NRPA) on the [10-Minute Walk Campaign](#), an effort to develop measurable policies and strategies advancing the vision that every person, in every neighborhood, deserves to have safe, convenient access to a high-quality park or open space.

As a grant-funded partner of the 10-Minute Walk Campaign, the City of Raleigh has developed new methods of measuring park access across different areas of the city and prioritizing future projects to ensure the equitable distribution of resources. Two factors that can be considered when prioritizing new projects—equity and park access—are described in the attached information sheets.

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Raleigh, North Carolina 27601

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1 Exchange Plaza, Suite 1020
Raleigh, North Carolina 27601

City of Raleigh
Post Office Box 590 • Raleigh
North Carolina 27602-0590
(Mailing Address)



Raleigh

Equity Information Sheet

Equity Priority can be determined by analyzing five key indicators of community health and well-being, as defined by Wake County Human Services' *Community Vulnerability Index*:



1. Unemployment: Population age 16 and over who are unemployed in the civilian labor force;



2. Low Educational Attainment: Population over age 25 who have less than a high school diploma;



3. Age Dependency: Population under the age of 18 and over the age of 64 combined;



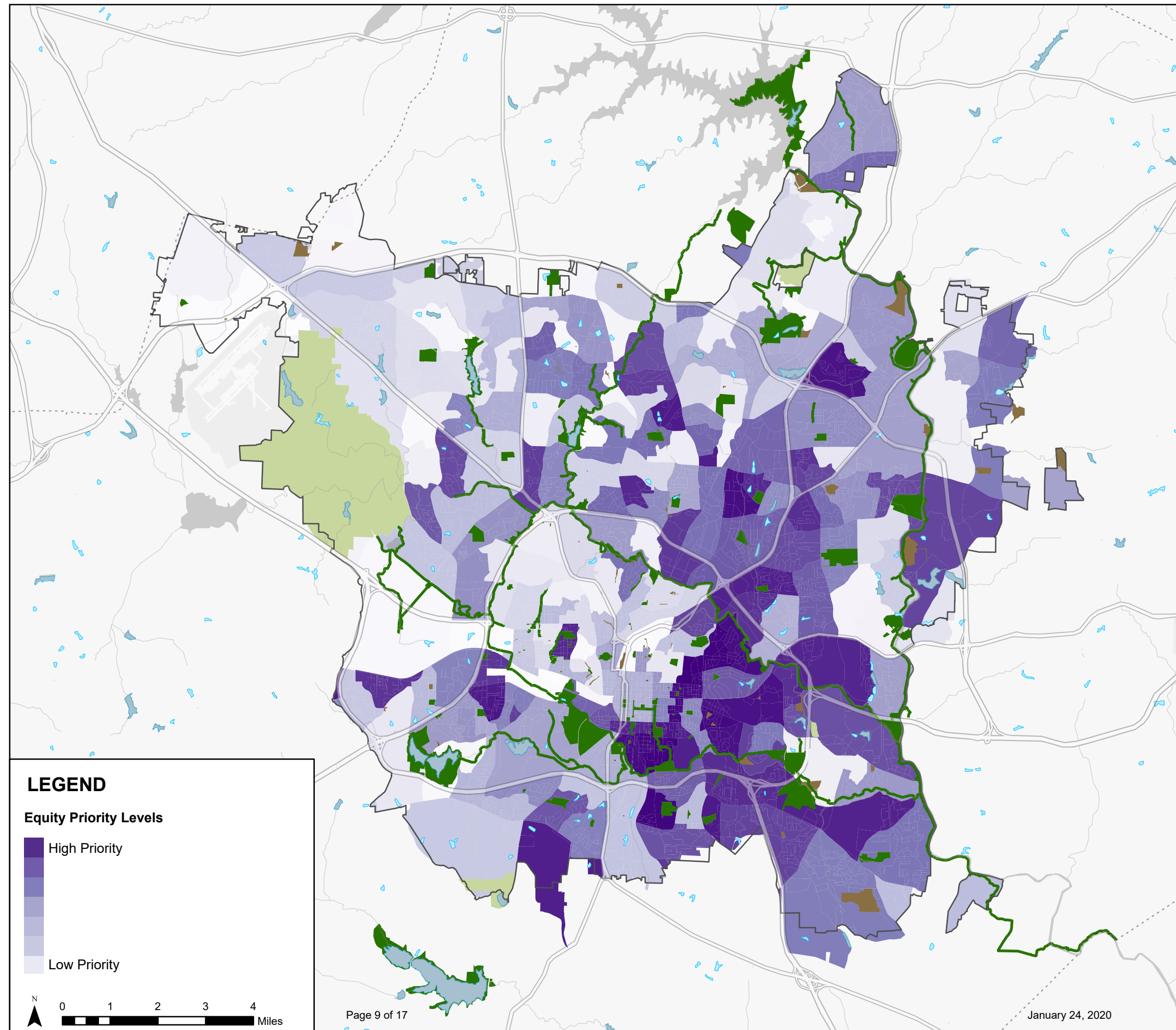
4. Housing Vacancy: The total number of vacant or unoccupied housing units in a block group.



5. Poverty Rate: The population living below the federal poverty threshold in Wake County;

Communities exhibiting a high concentration of these five demographic and socioeconomic indicators are more likely to experience negative health outcomes such as heart disease, obesity, chronic stress, and depression--outcomes which can be mitigated with better access to high-quality open spaces, outdoor recreation, and safe places to play and exercise.

Prioritizing investments in these communities helps ensure that PRCR sites, facilities, and programs are more accessible to the communities that will benefit most from these public resources.





Park Access Information Sheet

Park Access is a measure of how well different areas of the city are currently served by Raleigh's system of parks and greenway trails. Each census block in the city is assigned a Park Access grade based on four factors:



1. Distance to Nearest Park: How far residents need to travel to reach the nearest public park;



2. Distance to Nearest Greenway Trail: How far residents need to travel to reach the nearest greenway trail;



3. Acres of Open Space: How many acres of park land are accessible nearby;

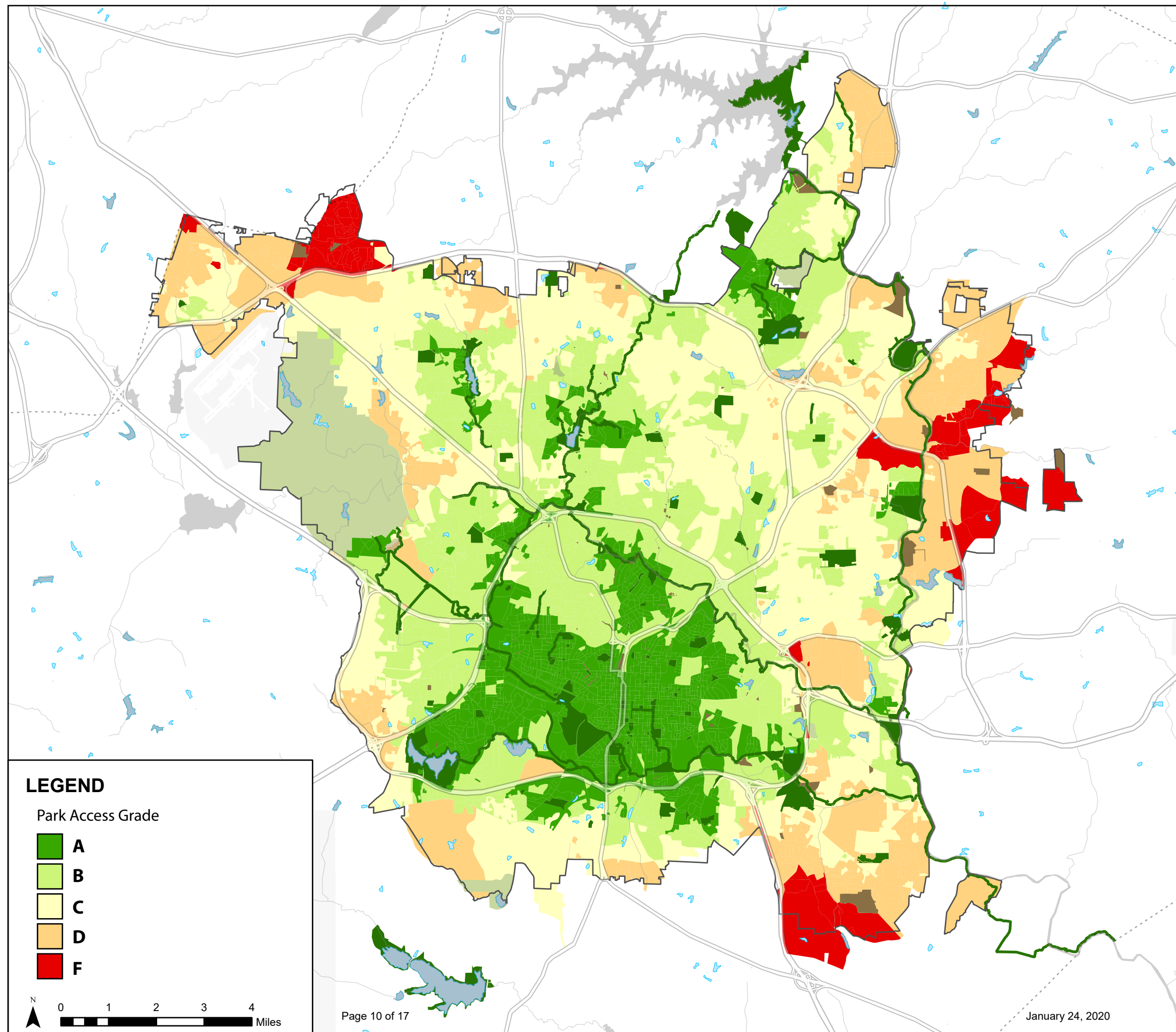


4. Park Experiences: The number and variety of park experiences available nearby.

Communities with an "A" letter grade have very good park access relative to other areas of the city. These neighborhoods are likely located within a 10-minute walk of a park, have access to many acres of open space, and can enjoy a wide variety of park experiences within a short distance of home.

Communities with a "D" or "F" letter grade have poor access to parks relative to other areas of the city. Residents in these areas may have to travel several miles to reach the nearest public park, and may only have access to a limited variety of park experiences.

Prioritizing investments in communities with low Park Access scores helps to promote Raleigh's goal of providing every citizen with safe, convenient access to a park or greenway trail.





Neighborhood & Community Connections Program

Policy Report
October, 2017



1. Executive Summary

The City of Raleigh Neighborhood and Community Connections Program (N&CC), spearheaded by the Raleigh Parks, Recreation and Cultural Resources Department (PRCR), serves to guide the City in developing priorities to better connect Raleigh neighborhoods to the city's expansive parks and greenway trail system.

Raleigh's system of public parks and greenway trails is a key contributor to the quality of life enjoyed by its citizens. With over 6,000 acres dedicated to public parkland and over 115 miles of greenway trails throughout the city, Raleigh's population is well served with access to open space and outdoor recreation. As the city continues to grow, however, it is becoming imperative to develop new and innovative methods of maintaining and improving the park system Level of Service (LOS).

The Neighborhood & Community Connections Program provides a cost-effective mechanism for improving the city's park system LOS. The goal of the N&CC Program is to improve safe, walkable access to parks and greenway trails for the communities in Raleigh that are most in need of improved access and which are most vulnerable to negative health outcomes associated with lack of access to open space and outdoor recreation opportunities. The N&CC Program will supplement a program of Land Acquisition, which together provide a comprehensive strategy for improving park system LOS that is inclusive, flexible, and context-appropriate.

The 2014 Parks, Recreation and Cultural Resources System Plan sets out the vision of "bringing people to parks and parks to people" by ensuring equitable access to park experiences throughout the city. In order to build a more equitable park system, areas that have below-average access to parks and greenways will be identified and targeted as areas of focus for land acquisition, new park development, and connectivity improvement projects. The precise strategy for improving park access and LOS for any particular neighborhood must be sensitive to context as well as financially efficient.

In many areas of the city, neighborhoods may have parkland nearby in terms of absolute Euclidean distance ("as the crow flies"), but the path one must follow to actually walk or bike from her home to her nearest park is inefficient and in some cases prohibitively far due to a circuitous road network or poor park connectivity. In this situation, it may be unnecessary to acquire new parkland in order to improve park access LOS. The N&CC Program seeks to identify these scenarios, where improvements to pedestrian infrastructure can increase walkable access to nearby parks for areas of the city that currently have a below-average park LOS. The N&CC Program also provides a mechanism for prioritizing among many potential improvement projects, by quantitatively evaluating the impact that these projects will have on health equity and overall park system LOS.

Finally, the N&CC Program makes recommendations for future data collection methods to assess connectivity, use, and evaluation; potential funding opportunities from federal, state, and local governments, as well as private and public organizations; and promotional campaigns to increase awareness of existing facilities and encourage residents to use facilities and adopt healthy and active lifestyles. These recommendations are covered in detail in the appendices to this policy document.

2. Policy Development

The development of the N&CC Program began with a literature review of existing City of Raleigh documents and a nationwide exploration of connection-based policies. The literature review identified city goals and benchmark standards for establishing a comprehensive network. The N&CC Program seeks to address barriers to park and greenway walkability, but the policy does not replace the guidelines and priorities laid out in any previous plans established by the City of Raleigh.

2.1 City of Raleigh Policy Review

Existing city documents were reviewed throughout the development of the Neighborhood and Community Connections (N&CC) Program to ensure that PRCR priorities aligned with those of Raleigh's other stakeholders. The document review included the adopted City of Raleigh plans listed below:

- City of Raleigh Strategic Plan
- 2030 Comprehensive Plan
- 2014 PRCR System Plan
- 2015 Capital Area Greenway Planning & Design Guide
- 2009 Bicycle Transportation Plan
- 2015 BikeRaleigh Update
- 2012 Pedestrian Plan
- 2015-2019 Capital Improvement Plan
- Unified Development Ordinance (UDO)

PRCR consistently engaged other departments for feedback, contributions, and evaluation of the program to develop further criteria and priorities. Balancing accepted best practices with the specific needs of Raleigh's communities was a key priority during the drafting of this plan.

Common themes revealed through the document review included a shift toward pedestrian-oriented development and a need to provide access to the ever-growing Raleigh population. As the City continues to grow, projections indicate a population of more than 600,000 by 2035 (City of Raleigh Parks, Recreation and Cultural Resources Department, 2014). It is crucial that infrastructure be in place to accommodate this future growth as well as to serve residents today. The 2030 Comprehensive Plan specifically addresses the need for additional investments in the City's greenways and bicycle-pedestrian system to improve connectivity and provide convenient routes for active transportation options.

The 2030 Comprehensive Plan presents six vision themes that serve as the overarching goals of Raleigh's strategy. The N&CC Program components address all six of these themes from a connectivity perspective (see next page). Raleigh's six vision themes coincide with PRCR's desire to provide equitable opportunities for park access to Raleigh residents (City of Raleigh Parks, Recreation and Cultural Resources Department, 2014).

1



Economic Prosperity and Equity
As one of the main tenets of the Neighborhood and Community Connections Program, ensuring equitable access to Raleigh's extensive parks system is essential to effecting positive health outcomes and promoting a high quality of life for all residents.



Expanding Housing Choices
As the city increases affordable housing options and works to reduce homelessness, the Neighborhood and Community Connections Program hopes to provide accessible park amenities that influence neighborhood quality and the health and livability of residents.



Managing Our Growth
As the city continues to grow it looks to foster quality land uses and alternative transportation modes, like pedestrian and bicycle friendly routes. Providing desirable places to live, work, and play includes offering a complete network of sidewalks, greenways, trails, and paths to create an integrated system.



Coordinating Land Use and Transportation
Additional bicycle and pedestrian facilities to better serve the growing community and optimize land use patterns will aid in effective planning for future development. Linking pedestrian friendly routes to public transportation can increase park visitation and encourage multi-



Sustainable Development
Providing safe routes for alternative means of transportation, like biking and walking, is a wise use of resources as it provides greener options and offers enhancements to the natural and built environments throughout the city. Similarly, non-motorized transportation options protect the environment and foster environmental stewardship as residents contribute to the city's overall sustainability and resilience.



Growing Successful Neighborhoods and Communities
Raleigh's goal to create new, diverse, walkable neighborhoods with convenient access to open spaces and community services are closely aligned with the mission of the Neighborhood and Community Connections Program. Maintaining those same goals in older, established neighborhoods is more difficult, but a main component of completing a walkable network of parks and greenways.

2

2.2. National Best Practices Review

A major portion of the N&CC Program involved exploring other pedestrian-friendly city plans. The precedent city plans that were examined were chosen based on shared characteristics with the City of Raleigh such as size, culture, and geographic location. Reviewed cities include:

- Charlotte, NC
- Portland, OR
- Seattle, WA
- Los Angeles, CA
- New York City, NY
- Kirkland, WA
- Durham, NC
- San Francisco, CA
- Denver, CO
- Miami-Dade County, FL

Reviewing the pedestrian plans designed by the above cities revealed the following common criteria as important considerations when planning connectivity facilities:

- Proximity to or density of schools
- Proximity to or density of transit, rail stations, bus stops, rail or bus routes
- Motorist-pedestrian/bicyclist collision rates
- Neighborhood-serving land uses (grocery stores, retail, libraries, post office, etc.)
- Proximity to or density of parks
- Street types
- Population of surrounding area
- Roadway related safety needs
- Proximity to or density of land uses serving elderly or differently-abled populations
- Proximity to or density of hospitals, major landmarks, multifamily residential areas, or other major pedestrian generators

The above criteria address broader issues of equity, health and safety, land use, street planning, and transit. These are all important considerations when developing a connectivity- plan and give greater context to the complexity of improving the walkability of communities. A truly comprehensive plan requires the cooperation of multiple agencies and a collaborative effort to address the many concerns facing our residents today.

3. Program Benefits

There are many benefits to prioritizing walkable infrastructure including economic, environmental, and health benefits. The National Recreation and Park Association describe these benefits nationally in their Safe Routes to Parks campaign, which stresses the importance of connecting all people to parks. Locally, the City of Raleigh's goal is to connect residents to a park within one-mile of their home or work. Providing safe access to parks promotes physical activity leading to better health outcomes for residents and visitors. As described in the 2030 Comprehensive Plan, land use patterns in Raleigh lack adequate street

connectivity to facilitate walking, leading to increased traffic congestion, worsening air quality, and a lower quality lifestyle than that desired by so many Raleigh residents. Remedies outlined in the 2030 Comprehensive Plan include investments in a multi-modal transportation system, the greenway system, and pedestrian and bicycle infrastructure.

With these recommendations in mind, PRCR developed the N&CC Program with the specific goal of connecting neighborhoods to the city's extensive parks and greenway system. Increasing active and personal transportation options is essential to maintaining desired levels of park services and will be an important infrastructure investment to meet growing demands. Projected growth rates for Raleigh suggest a strong need for increased focus on sustainable transportation and living options, and PRCR believes actively pursuing pedestrian- and bicycle-focused infrastructure will help address that concern. This policy document provides suggestions on how to connect residents to existing resources.

PRCR developed this document in collaboration with the City of Raleigh Office of Transportation Planning; Wake County Health and Human Services; the Parks, Recreation and Greenway Advisory Board; as well as many health- and equity-focused community organizations. It aims to articulate a policy that addresses priorities of multiple departments while furthering the overall goals of the City of Raleigh and its citizens. The N&CC Program appendices contain recommendations for pre- and post-implementation evaluation methods, a multi-tiered prioritization matrix, and funding strategies. The document outlines a plan to begin the important work of proving safe and accessible routes to our award-winning parks and to advance towards connecting *all* Raleigh residents to convenient, attractive, and inviting parks and greenways.

3.1 Citizen Demand in the 2014 PRCR System Plan

As evidenced by community input, Raleigh residents desire parks and greenways close to their homes, with safe, accessible walk- and bikeways (City of Raleigh Parks, Recreation and Cultural Resources Department, 2014). A 2013 Community Interest and Opinion Survey revealed 30% of surveyed households said the highest priority should be placed on providing greenways and connections closer to their homes. Twenty-seven percent of households identified the need for more "walk-to" parks and 60% of households support developing new greenways and connecting existing trails. Situating these sites near other pedestrian generating locations like schools, business districts, and public spaces also encourages citizens to use them more actively. Nearly 50 percent of all household trips, nationally, are three miles or less (Partnership for Active Transportation, 2016), inviting opportunity for decreasing vehicular traffic and increasing active transportation methods by providing adequate facilities. These responses indicate a legitimate need and desire by Raleigh residents to be connected to the park and greenway systems. By identifying and filling in gaps, we hope to eliminate the access barrier and provide park experiences to all Raleigh residents.

3.2 Health Benefits

The City of Raleigh has expressed a strong desire to advance equitable health outcomes among its residents (City of Raleigh, 2015) and the N&CC program is a direct result of that pursuit. The Centers for Disease Control (CDC) states having access, via walking or bicycling, to health-promoting destinations, such as parks, greenway trails, and schools is important for overall health (Centers for Disease Control

and Prevention, 2012). Having improved access leads to physical activity, which is association with health benefits like improved cardiovascular health, weight loss or maintenance, decreased risk of becoming obese or developing type II diabetes, high blood pressure, osteoporosis, and other chronic diseases (Centers for Disease Control and Prevention, 2012). Finally, recent research also suggests that access to the outdoors and contact with nature may promote mental health by relieving stress and encouraging social interactions among friends (Centers for Disease Control and Prevention, 2012).

Research shows that the distance from a person's home to a park is a strong predictor of frequency of use (Cohen, McKenzie, Sehgal, Williamson, Golinelli, & Lurie, 2007). In fact, a 2007 survey by the State Center for Health Statistics shows that 60% of North Carolinians reported they would increase their level of physical activity if they had more accessible sidewalks and trails (Cook, O'Brien, Jackson, Searcy, & Findley, 2014).

The 2011 CDC Community Guide reviewed 10 studies, which revealed that creating or enhancing access to places for physical activity substantially increased physical activity among the population studied (Centers for Disease Control, 2011). Eliminating barriers or providing walkable access to parks or greenways could have a positive effect on the percentage of Raleigh residents who participate in physical activity. Individuals are more likely to go to a recreation site and to be physically active if they are able to walk or bike to that site, which results in an increase in physical activity and better public health outcomes (Blanck, et al., 2012). Access is about more than the presence of a facility, a factor in which Raleigh excels; rather it is about ease and attractiveness of the destination.

3.3 Access and Equity

In a city with many parks and greenway facilities, like Raleigh, it may be difficult to understand that park access is a problem. Considering how many parks or miles of greenways exist is important, especially as the population grows, but thinking about how residents are able to access these facilities paints a better picture of access and equity. Barriers to park use range from a lack of awareness about existing resources to more complicated factors like culturally inappropriate facilities (Blanck, et al., 2012). Placing parks in locations that support walking access provides opportunities for two types of physical activity, walking to the site and using the site upon arrival. Entrance locations are critical because someone may live next to a park, but due to street patterns, access points, or physical barriers like fencing, they still have to walk long distances to gain access (Blanck, et al., 2012). Additionally, even with proper placement, entrances may be within a reasonable walking distance, but if they lack signs or are located on a busy road that is difficult to cross, visitation may be deterred (Blanck, et al., 2012).

Parks, greenways, and recreational facilities are found throughout communities, but their accessibility, features, and conditions vary across different groups and populations. In many urban areas across the U.S., low-income populations and people from racial minority backgrounds often exhibit poorer health behaviors and outcomes (Egede, 2006). Data find certain racial and ethnic groups have significantly poorer access to green spaces (Dai, 2011). Disparities in park access limit opportunities for these populations to meet their recommended levels of physical activity, leading to higher body weight and poorer health outcomes. Focusing Raleigh's efforts on providing equitable park and greenway access will have long-term effects on the health outcomes of the population. Regularly assessing access will aid the

city and planners in targeting specific areas for green space development in order to eliminate disparities and ensure equal access for all (Dai, 2011).

3.4 Safety

According to America Walks, as of 2010, every 12 minutes someone dies in a car crash and every 10 seconds someone is injured and taken to an emergency room in the US (America Walks and Sam Schwartz Engineering). America Walks' studies also show that encouraging walking decreases the frequency with which people drive, reducing the risk of getting into a traffic accident because that risk increases with the average amount of travel time that each person spends in a car. Similarly, the more people who are walking or bicycling, the less likely drivers are to collide with them. Policies that increase the numbers of pedestrians and cyclists are effective in improving the safety of those on foot and bike (Jacobsen, 2003). Additionally, safety can mean prevention of injury in road collisions, but it can also encompass safety from violence and crime. Research suggests perceptions of road safety and safety from violence and crime have been independently connected with activity levels and health outcomes, so to truly assess connectivity, walkability audits may be useful in evaluating indicators for both traffic and crime safety (Galardi, 2016).

3.5 Economic Incentives

Investing in pedestrian- and bicycle-friendly infrastructure has economic benefits to governments that prioritize its development. Many studies suggest improving pedestrian networks has a positive impact on businesses and leads to increases in real estate values (Partnership for Active Transportation, 2016) (Lindsey, Man, Payton, & Dickson, 2004) (Alliance for Biking and Walking, 2016). Homes near bicycle and pedestrian paths yield higher sales prices and sustain higher rents, revenues, and resale values (Lindsey, Man, Payton, & Dickson, 2004). Even apartment buildings with greater percentages of green space and proximity to recreational areas had statistically significant positive effects on property values (Lindsey, Man, Payton, & Dickson, 2004). Trails also attract businesses and tourists, and improved trail access near businesses can increase sales while reducing the need for expensive parking (Alta Planning + Design, with Stewart, 2016). When planned with a focus on water quality protection through vegetated buffers along streams, greenways can also reduce costs associated with water treatment and flood damages (Alta Planning + Design, with Stewart, 2016). Even better support for Raleigh's goal of connecting residents to a park or greenway within one mile of their homes, is the research showing that parks exerted a significant, positive effect on property values, but that the effect declined with distance and was not significant outside of one mile (Lindsey, Man, Payton, & Dickson, 2004). Not to mention, trails are far less expensive to construct than roadways.

3.6 Walkability

Lack of existing infrastructure is another barrier to walkability. In addition to needing safe, nearby facilities, cities must make the effort to provide complete, connected walking and biking routes to reach those facilities. Pedestrian crossings, bridges, paved shoulders, signals, medians, lighting, signs, and other features often referenced in Complete Street guides create built environments that invite active transportation activity. One study has shown that people are at least four times more likely to walk when roads have safe sidewalks (Jacobsen, Safety in numbers: more walkers and bicyclists, safer walking and bicycling, 2003).

4. Methodology

4.1 Park Project Identification

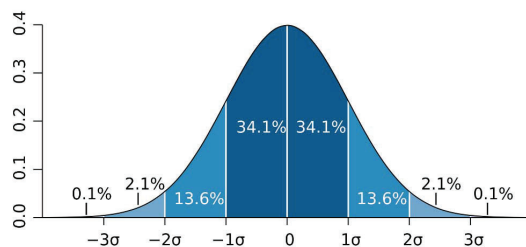
To be most effective to the PRCR Department and to the City of Raleigh, it is important that the methods and goals of the N&CC Program align with those of existing programs and plans. Not only does this alignment ensure the City is working toward the same goals, but it aids in the implementation of a usable model. By drawing on the Priority Next Steps outlined in the PRCR System Plan, N&CC Program identified the Experience-Based Park Access GIS model as the first step in evaluating park and greenway trail access (City of Raleigh Parks, Recreation and Cultural Resources Department, 2014).

Experience-Based Park Access Model Analysis Methods

The Experience-Based Park Access model was developed to guide future land acquisition and service delivery in order to build a more equitable and more accessible park system in Raleigh. It first identifies all parks offering a core park experience. Core park experiences include opportunities for socializing, going to a playground, open play, and walking or riding a bike.

The model calls for the use of census block centroids, park access points, and the Wake County street network in order to measure access distance from every populated census block within the city's extraterritorial jurisdiction (ETJ) to its closest core park experience. The set of census block access distance values are then used to determine the citywide mean access distance of a census block to a core experience.

The Experience-Based Park Access GIS Model establishes its baseline statistics with data collected in the Parks, Recreation and Cultural Resources system in 2013. In 2013, the average distance to closest park among all census blocks in the City of Raleigh was 0.93 miles. In the 2013 statistics, 1.29 miles represents 1-sigma, or the upper bound of one standard deviation around the mean. This is illustrated in the graph below, where the mean (0) corresponds with a distance to closest park of 0.93 miles, and 1-sigma (1 σ) corresponds with a distance to closest park of 1.29 miles.



In this iteration of the Experience-Based Park Access Model, the 1.29-mile threshold was chosen as the distance threshold for analysis because the Neighborhood & Community Connections Program seeks to

address access issues specifically for the portion of the population whose park access is significantly worse than average (or in other words, referring to the chart above, the 15.8% of the population whose distance to closest park falls within the light-blue areas above the 1 σ threshold of 1.29 miles). In future iterations of the model, a distance of 1 mile can be used as a suitable proxy for "average" park accessibility in Raleigh. Adopting a 1-mile threshold in the future has the significant advantage of being more conceptually straightforward than the 1.29-mile threshold currently employed. Other communities may substitute a different threshold for acceptable levels of park access, to suit their needs. For example, the National Recreation & Parks Association recommends a 0.5-mile threshold, roughly equivalent to a 10-minute walk, when evaluating walkable access to park facilities.

The Experienced-Based Park Access model uses the following measures to evaluate park access:

- Distance to the closest park measures the distance between park access points and Census Block centroids using the Wake County road network; this does not take into account sidewalks, trails, walking paths, greenways, or any other connection type.
- Number of accessible parks per person measures the number of parks within the 1.29-mile accessible range, as determined by the 2013 system analysis, by dividing each park by the total population of all of the surrounding Census Blocks within the 1.29-mile range. Each Census Block receives the sum of the calculated number of parks/person for all parks within the 1.29-mile distance.
- Number of accessible park acres per person measures the total number of acres of accessible parks available to each Raleigh resident within the 1.29-mile range. The value is calculated by dividing the accessible park acreage by the population of all of the surrounding Census Blocks within the 1.29-mile range. Each Census Block receives the sum of the acres/person values of all parks within the 1.29-mile distance.

The model identified areas of the City where connections from residential areas to existing parks are above the 1.29 mile standard, based on these results, the N&CC Program identified 119 parks as candidates for potential access improvement. This list of parks was then scored and sorted based on a set of criteria that identified which parks were highest priority candidates for N&CC improvement projects.

4.2 Greenway Project Identification

The process of developing potential greenway projects differs slightly from the process used to identify park projects. Greenway acquisition practices vary from land acquisition because of the historical development of greenway systems. Rather than the typical approach of purchasing the title to a parcel used by parkland acquisition, Raleigh acquires greenway easements within corridors. Greenway easements are in perpetuity and attached to a deed, therefore the easement transfers with each new landowner (The City of Raleigh Parks, Recreation and Cultural Resources Department, 2015). This policy allows landowners to transfer development rights while maintaining City access to the easements. Greenway trails, which are developed public access facilities that fall within the greenway corridor, provide access to the open space areas and connectivity throughout the community. Some portions of the greenway trails may fall outside a riparian easement but have been developed to improve network

accessibility, meet citizen demand, or connect the trail to other city resources, like parks, community centers, or other pedestrian generators.

To continue Raleigh's current process of greenway development, the N&CC Program examined potential access points along the existing greenway trail system that fell within the greenway corridor and along public utility rights-of-way or other fabricated corridors. Using the department's GIS platform, additional parcel information identified existing access points, City of Raleigh parks, and private open space, homeowner's association-owned, vacant, and exempt properties. This allowed the N&CC Program to identify potential access points on city-owned property or on properties that may have owners willing to collaborate with the city to develop new greenway access. From there, the Experience-Based Park Access Model can evaluate the potential population served by opening an additional access point or creating a new trail, and creating a list of potential projects. Like the park project identification method, the N&CC Program will develop a similar prioritization matrix to identify case studies and prioritize projects.

4.3 Prioritization

With input from the Parks Planning Committee of the Parks, Recreation and Greenway Advisory Board, the N&CC program created a tiered prioritization matrix to prioritize which parks should be further studied as potential sites for N&CC connectivity improvement projects. The table on the following page identifies the criteria used to identify and prioritize potential N&CC projects.

The Primary Evaluation Criteria address the quantitative criteria that are measured through the N&CC Toolset of the Experience-Based Park Access GIS model. These three quantitative criteria (circuitry, community vulnerability, and pedestrian safety) are used to rank each of the city's parks in order of which parks are the best candidates for a N&CC project.

Based on this prioritized list of parks, PRCR staff will identify new potential access points and routes at the highest-priority parks. The Secondary Evaluation Criteria in the table are to be used to evaluate, in greater detail, the relative costs and benefits associated with each proposed connectivity project.

4.4 Prioritization Matrix

	Tier	Criteria	Notes	Data Source
Primary Evaluation Criteria (Quantitative)	1	Circuitry	Ratio of network distance to absolute (Euclidean) distance from census block centroid to park access point	Internal
	2	Community Vulnerability	Wake Co HS data (includes % pop under 18 and over 65, % pop below poverty, %pop no HS diploma, % housing vacancy, % pop unemployed)	Wake Co HS/CS http://arcg.is/1XEYwaw
	3	Street Classification	See <i>Pedestrian plan model 2015 Needs scoring</i>	Planning Department
		Speed Limit	See <i>Pedestrian plan model 2015 Needs scoring</i>	Transportation Planning
		Sidewalk Presence	Street segment safety scores modified based on presence of sidewalk on one side (x0.5 modifier) or both sides (x0.0 modifier) of the street	Street Maintenance, Engineering Services
Secondary Evaluation Criteria (Qualitative & Qualitative)		Impact on Population Served	Additional population added to Network Service Area (NSA); improvement in NSA scores for circuitry and safety	
		Constructability	Existing city-owned ROW, easements, slopes, structures required, etc.	GIS/visual confirmation
		Supported Land Use	Consider future zoning and growth potential to determine if projects will support greater populations in the future	Future land use map/urban form map
		Partnership Opportunities	In conjunction with other projects/ Grant opportunities	Transportation projects, small area plans, SRTS, CAMPO, etc.

4.4 Primary Evaluation Criteria

Circuitry: This measure is used to identify areas of the city where street network topology is inefficient, and thus areas that could benefit from the addition of new links and nodes. Circuitry scores are derived from the ratio of *[Network Distance] / [Euclidean Distance]* between an origin (census block) and a destination (park access point). A high circuitry score indicates that nearby residents have to travel a disproportionately long distance to reach their nearest park.

Community Vulnerability¹: This measure is used to promote the N&CC Program’s goal of health equity, by targeting investment in pedestrian infrastructure in those neighborhoods that would benefit most from increased walkability. Vulnerability scores are derived from socioeconomic and demographic indicators that correlate with high vulnerability to negative health outcomes such as heart disease and childhood obesity. The indicators used in this analysis are: Unemployment, Age Dependency, Educational Attainment, Housing Vacancy, and Poverty Rates.

Pedestrian Safety: This measure is used to identify park service areas that are particularly unsafe for pedestrians, and thus parks that could benefit from N&CC connectivity improvements. Pedestrian Safety scores are derived from an analysis of street typology, speed limits, and the presence or absence of sidewalks within the park service area.

4.5 Case Studies

Application of the prioritization matrices allows the N&CC Program to identify several case studies to include as a supplement to this document, as models demonstrating the potential impacts of improved connectivity projects. Appendix A provides a list of prioritized projects and a selection of case studies.

Conclusion

The Neighborhood & Community Connections Program is representative of a broader effort by the City of Raleigh and the Parks, Recreation and Cultural Resources Department to employ quantitative analyses toward achieving the goals of the 2014 PRCR System Plan. A prioritization methodology focused on health equity and the equitable distribution of park and greenway access throughout the city will ensure that the \$1 million identified in the 2014 Parks Bond for the N&CC Program will be invested in the communities of Raleigh that will benefit most from improved connectivity to open space and increased access to outdoor recreation opportunities.

The N&CC Program will continue to benefit City of Raleigh park system planning activities beyond the scope of the projects that will be funded through the 2014 bond. The N&CC methodology will be used to supplement the overall parks and greenways Level of Service model, and will continue to inform the City’s approach to improving system-wide LOS through future investments in infrastructure and land acquisition. Additionally, this analysis will identify needs and opportunities for improving connectivity, which will improve our ability to address these issues during future park master plan and greenway construction projects. Finally, this exercise has provided a firm basis for collaboration with the Office of Transportation and other City of Raleigh departments, which will continue to improve the availability, reliability, and consistency of data used across the city for many initiatives in the future.

¹ See: Wake County 2014 Vulnerability Assessment Index. Interactive map available online at: <http://wake.maps.arcgis.com/apps/Viewer/index.html?appid=0a819c62578e41ccbab77003dd3b0a43>. This series contains the five indicators from the ACS 2010-2014 five year average. The indicators used are: (1) % of persons living below the federal poverty rate; (2) % of unemployed civilians age 16 and over in the labor force; (3) % of youth under age 18 + % of adults age 65 and over; (4) % of vacant housing units; (5) % of adults ages 25-64 who did not earn a high school diploma or equivalent (GED). Each characteristic is displayed separately along with the total Vulnerability Index Ranking.