

# How Can Neighborhood Parks Be Used to Increase Physical Activity?

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## Key findings

Parks play an important role in providing venues for physical activity in urban areas but tend to be underutilized, especially for moderate to vigorous physical activity.

- Research underscores the need to target efforts to increase park-based physical activity to specific populations.
- There are numerous differences in how parks are used among different racial and ethnic groups, different genders, and different age groups.
- Park facilities by themselves are not sufficient to attract users; many sit unused or underused, even after recent renovations. On-site marketing and supervised activities are the top two park features that encourage greater use of parks for physical activity. Marketing efforts are likely to be especially important in low-income neighborhoods.
- The majority of park facilities are geared toward youths, while fewer facilities tend to target groups who are underrepresented among those using parks for moderate to vigorous physical activity—adults and especially seniors.
- Investments to encourage physical activity will not be made without the support of local park managers. Neighborhood parks are financed on the local level, and local park managers are best positioned to understand the needs of their local populations.

Regular physical activity is important for both physical and mental health (Troiano et al., 2008; Office of Disease Prevention and Health Promotion, 2018). U.S. federal guidelines recommend at least 60 minutes a day of moderate to vigorous physical activity (MVPA) for youths and 30 minutes five days a week for adults (Physical Activity Guidelines Advisory Committee, 2008). However, less than half of Americans currently meet these guidelines, and this lack of physical activity is contributing to a growing epidemic of chronic health problems, including obesity, heart disease, and diabetes.

Public neighborhood parks offer accessible infrastructure that can facilitate physical activity. The United States has more than 100,000 such parks, ranging from small “pocket parks” to community parks, large sports complexes, and natural resource areas. Most urban U.S. residents live within a mile of at least one park, which might include such facilities as tennis courts, playground equipment, walking loops, or skate parks.

However, the role that parks play in promoting physical activity depends on how they are used and, in particular, whether they are used for MVPA. MVPA is measured by increased heart rate, increased respiration or breathing rate, sweating, and muscle fatigue. Examples of moderate physical activity include brisk walking and casual bicycling, while vigorous physical activity includes running, swimming laps, and aerobic dancing (American Heart Association, 2015).

Many communities and organizations have tried to encourage park use and park-based physical activity by building new facilities or adding activity centers. However, until recently, there has been little research to understand whether these or other investments are increasing the use of

parks for physical activity. Whether residents visit their local parks and how they decide to use them can be related to a wide range of factors, including **individual characteristics**, such as potential park users' ages and genders; **neighborhood and environmental factors**, including the community poverty level and residents' perceptions of park safety; and **park factors**, including the numbers and types of facilities and the availability of organized activities.

In the past decade, RAND Corporation researchers have conducted multiple studies to examine park use and assess parks' role in promoting physical activity, including studies covering more than 80 parks in the Los Angeles area and the first national study of neighborhood parks, which involved visits to more than 170 parks across the United States (see side box). To support these studies, researchers developed an innovative tool, System of Observing Play and Recreation in Communities (SOPARC), to assess park use and physical activity. They also conducted in-depth surveys of park users and neighborhood residents. Their efforts provide insights into how parks are currently being used—and ways in which

they are underused—and suggest ways in which parks might be enhanced to encourage more physical activity, especially MVPA.

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## HOW DID THE RESEARCHERS STUDY PARK USE?

For many years, the only way to measure physical activity was to ask people to report on their own exercise habits. The introduction of accelerometers in 2004 provided an objective assessment of MVPA—and showed that American adults were engaging in much less physical activity than they had reported (Troiano et al., 2008; Centers for Disease Control and Prevention, 2017). But although accelerometers can provide more-accurate measures of individuals' physical activity than self-report can, equipping all park users—much less all potential park users—with these devices to measure park-based MVPA is infeasible.

### Major RAND Park Studies

#### The First National Study of Neighborhood Parks

This national observational study involved 174 parks from 25 cities in the United States with populations of more than 100,000. The goals of the study were to determine how neighborhood park systems support population-level physical activity; to identify factors associated with park use and park activities, including facilities, management practices, and disparities between parks in high- and low-income neighborhoods; and to understand how park administrators currently measure park use and the potential usefulness of such measures.<sup>a</sup>

Researchers conducted the study between April and August 2014, producing a total of 2,088 hourly observations. This research was sponsored by the National Heart, Lung, and Blood Institute of the National Institutes of Health.

#### Los Angeles Neighborhood Parks Studies

From 2003 to 2015, RAND researchers conducted six independent studies of parks in the Los Angeles area, including hundreds of visits to 83 Los Angeles city parks, counting more than 400,000 park users and conducting 27,918 surveys with park users and local residents. Studies focused on such topics as the impact of park renovations, use of fitness zones and pocket parks, and community-based participation to improve park use. RAND researchers conducted these studies with support from the National Institutes of Health and the Robert Wood Johnson Foundation and working in partnership with the City of Los Angeles Department of Recreation and Parks, AltaMed Health Services, the City Parks Alliance, and the Trust for Public Land.

<sup>a</sup> Cohen, Han, et al., 2016.

**Figure 1. Example of a Neighborhood Park with Target Areas Identified**



SOURCE: Google Maps with authors' annotations.

RAND researchers developed SOPARC to provide a reliable, valid, and easy-to-use tool for quantifying park use and park-based physical activity. SOPARC offers a systematic way to estimate the number and characteristics of people using neighborhood parks (Han, Cohen, and McKenzie, 2013; Cohen, Setodji, et al., 2011). Researchers divide the park into “target areas” (see Figure 1) and observe park use in each area four times a day, seven days a week. By using SOPARC multiple times during a week on different days and at different times, researchers can build a generalizable picture of park use and the amount of MVPA that occurs within a park. SOPARC can also be used to measure changes in park use over time (such as before and after the installation of new facilities or equipment) (Han, Cohen, and McKenzie, 2013).

Initially, the counting device was able to categorize park users in a target area by the level of physical activity (sedentary, moderate, vigorous) but could not simultaneously track use by gender and age group. Subsequent enhancements to SOPARC implemented a 12-button counter on a tablet computer (Han, Cohen, Derosé, et al., 2016), which allows researchers to examine both physical activity levels and park use by gender and age group. This new counter helps

researchers evaluate the effects that programs, facilities, and other park enhancements have on different subpopulations of interest.

Interviews with park users and local residents provide additional subjective perspectives on such issues as park accessibility and perceptions of safety. RAND researchers developed a brief park-use questionnaire to assess past-week and usual park use at a specific park and addressed the frequency, duration, and type of physical activity in which users engaged in the park (Evenson et al., 2013).

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## COMMUNITY PARKS AND THEIR CONTRIBUTION TO PHYSICAL ACTIVITY

The average U.S. neighborhood park included in the national study covers 8.8 acres, although park size ranges from just over 2 acres to as many as 23 acres. A median of 12,400 people live within one mile of the typical park (Cohen, Han, Nagel, et al., 2016).

There is wide variation in park use, both among parks and within a park (Han, Cohen, Derose, et al., 2014). Within the same park, peak hours (4:00 p.m. to 8:00 p.m. during weekdays, late morning and early evening on weekends) can see 1.5 to four times more users than average, while nonbusy hours can attract only 5 to 10 percent of average use. Variations are even larger between parks. For example, some Los Angeles parks see ten times more MVPA than other parks across the nation with similar size and with similar facilities (Cohen, Derose, et al., 2016).

RAND researchers' analyses have found across many studies that parks are routinely underused, especially for MVPA. In the national study, researchers saw an average of about 20 people per hour in each park, although weekly park use varied greatly. Sedentary activity (sitting, resting) accounted for about 60 percent of all park use, and three out of four target areas for physical activity (e.g., tennis courts, sports fields) had no observed users (Cohen, Han, Nagel, et al., 2016). The Los Angeles park studies had similar results, with sedentary activity accounting for about 66 percent of all park use (Cohen, Derose, et al., 2016).

## INDIVIDUAL FACTORS AFFECTING PARK USE

Although RAND work has found that park use for MVPA is low overall, researchers have also found that individual factors are associated with significant variation across populations, including differences by race, ethnicity, gender, and age.

### Racial and Ethnic Differences in Park Use

Surveys of Los Angeles city park users found that different racial groups visit their local parks with about the same frequency but often use parks differently, especially in terms of physical activity. For example, a Los Angeles–based study found that black and English-speaking Latino residents were significantly less likely than non-Latino white residents to use parks for exercise and to exercise outside the park or at all (Derose et al., 2015).

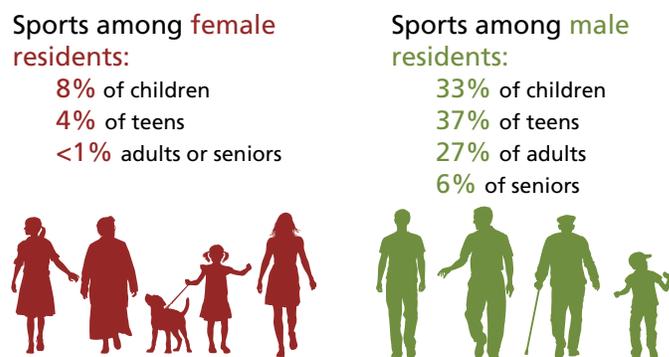
On the other hand, parks appear to offer an important venue for physical activity to Spanish-speaking Latino residents, who were equally likely as non-Latino white

residents to exercise in the park and significantly less likely to exercise outside the park. In addition, more than half of Spanish-speaking Latinos who visited the park reported walking to the park, compared with around one-third of other groups. Further, Spanish-speaking Latinos, Asians, and native Hawaiian and other Pacific Islanders were more likely than non-Latino whites to use parks for social interactions (e.g., seeing people they know in the park or going to the park with others) (Derose et al., 2015).

### Gender and Age Differences in Park Use

Researchers also found significant differences between male and female and between young and old park users. For example, as shown in Figure 2, across the 174 parks in the national study, males accounted for 57 percent of park users and more than 60 percent of park-based MVPA. The gender disparity was greatest among teens, with male teens accounting for 65 percent of teen park users and 68 percent of MVPA among teens.

**Figure 2. Gender and Age Disparities in Sports Participation Among Park Users**



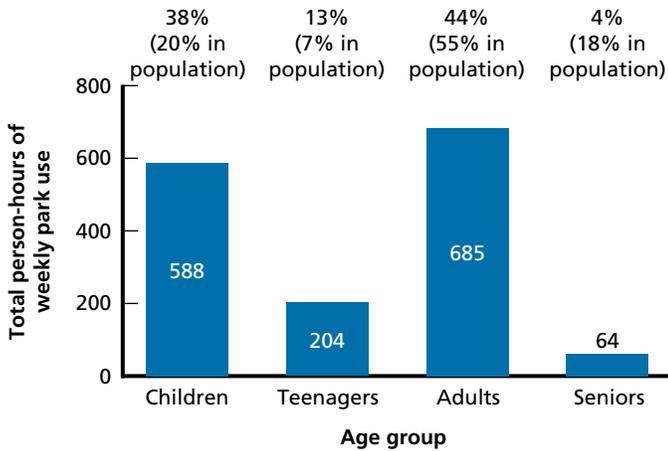
SOURCE: Cohen, Han, Nagel, et al., 2016.

Gender disparities were also apparent in the Los Angeles studies. For example, women living in low-income neighborhoods within one mile of a park reported fewer and shorter visits to the park and were less likely to exercise there than men in these same communities were (Derose et al., 2018).

Seniors are also greatly underrepresented among park users. Figure 3 shows that, although seniors make up 18 percent of the population, they account for only 4 percent of park use in the national study.<sup>1</sup> In contrast, children

<sup>1</sup> That is, seniors do not make up 4 percent of users (the researchers did not count individual people) but account for 4 percent of observed activities and other park uses.

**Figure 3. Weekly Park Use, by Age Group, 2014**



SOURCE: Cohen, Han, Nagel, et al., 2016.

represent 20 percent of the population but 38 percent of park use.

The differences in park use shown across RAND studies suggest that there is no one-size-fits-all approach to encourage park use for MVPA. Park-level design solutions and programming will be needed to help realize parks' potential for promoting physical activity across the full range of local residents.

## NEIGHBORHOOD AND ENVIRONMENTAL FACTORS AFFECTING PARK USE

Within the RAND body of park research, RAND researchers have conducted numerous analyses to explore the neighborhood and environmental factors associated with park use and physical activity. These include neighborhood socioeconomic status, crime, and perceptions of safety.

### Socioeconomic Status

Researchers found neighborhood poverty to be associated with differences in both park size and park use. The national study found that, within the same city, parks in lower-income neighborhoods tend to be smaller than those in higher-income neighborhoods, even if parks in higher- and lower-income areas have the same number of accessible facilities (Cohen, Han, Nagel, et al., 2016). Residents in lower-income neighborhoods use local parks less than residents in higher-income neighborhoods. Lower-income-area parks also have

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less than half as many supervised areas (Cohen, Han, Nagel, et al., 2016). In one study, parks in Pittsburgh food-desert neighborhoods (i.e., mostly urban areas that lack easy access to food outlets) were found to be accessible and generally considered safe but sat mostly empty (Cohen, Hunter, et al., 2016).

The Los Angeles park study produced similar findings, with parks found to be used less by residents in low-income areas than in medium- and high-income areas, even after accounting for differences in park size, staffing, and programming (Cohen, Han, Derose, Williamson, Marsh, Rudick, et al., 2012).

### Perceptions of Safety and Crime

In urban areas where parks are available, safety issues are frequently cited as barriers to park use and physical activity (Lapham et al., 2016). Park safety concerns are often related to residents' perceptions of the safety of the neighborhood as a whole, including concerns about crime, homelessness, and drug and alcohol use.

RAND research found, unsurprisingly, that park users care about safety. However, these studies also suggest that park safety in itself is not sufficient to attract people to parks. For example, a study of neighborhood parks in Albuquerque, New Mexico; Chapel Hill and Durham, North Carolina; Columbus, Ohio; and Philadelphia, Pennsylvania, found that local residents who perceived a nearby park as safe were four times more likely to report having visited the park than those who did not (Lapham et al., 2016). However, the vast majority of local residents (88 percent) in the study already perceived

their neighborhood parks to be safe, so concerns about a lack of park safety affected only a small number of residents.

A study of park use in low-income neighborhoods in Los Angeles had similar results, with the majority of residents surveyed perceiving their neighborhood parks to be safe or very safe (Cohen, Han, Derose, Williamson, Marsh, Raaen, et al., 2016). Interestingly, the presence of homeless people in the park did not have a negative relationship with park use, and, in fact, the presence of homeless people was associated with *higher* numbers of park users (the presence of intoxicated persons, however, was associated with lower numbers of users).

## PARK FACTORS AFFECTING PARK USE

Researchers also examined the associations between park factors—including accessibility, numbers and types of facilities, renovations, supervised activities, and marketing—and park use.

### Park Accessibility

Accessibility is an important consideration in encouraging park use. RAND research has found that living closer to the park—even among residents who all live within one mile of a park—was consistently associated with more-frequent park use, exercising in the park, and having social interactions in the park (Derose et al., 2015).

The study of Los Angeles parks found that those who lived within a quarter-mile of the park tended to visit more often, and only 13 percent of park users lived more than one mile from the park (Cohen, McKenzie, et al., 2007). Surprisingly, the researchers found that frequent park users visit multiple parks and do not necessarily visit the parks closest to their homes (Evenson et al., 2013). They also found that parks in wealthier neighborhoods attract more users from longer distances than parks in lower-income neighborhoods do.

### Numbers and Types of Facilities

Efforts to increase park use often focus on renovating or adding facilities. RAND studies found that neighborhood parks offer a variety of facilities, most of which tend to be in good condition. In the national study, researchers counted a

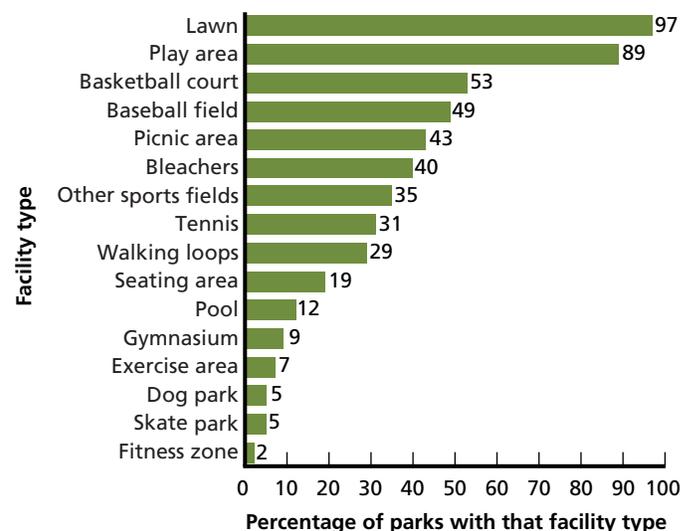
median number of five facility types (e.g., play equipment, basketball court, lawn) per park, although the numbers of facilities ranged from as many as 11 to only one. Figure 4 shows a ranking of park facilities and other amenities from most to least common (Cohen, Han, Nagel, et al., 2016).

As indicated in Figure 4, park facilities tend to be geared more toward youths than toward adults and seniors. For example, children’s playgrounds are found in 89 percent of parks, while walking loops—which constitute the greatest source of MVPA for adults and seniors—are found in only 29 percent of parks (Cohen, Han, Nagel, et al., 2016). Supervised activities, such as classes or sports leagues, were lacking in more than half of the parks.

The number of facilities per park had a small but significant impact on park use. Across the parks observed in the national study, parks with more facilities—independent of size—had slightly more users and more physical activity overall than the average park did: Each additional facility was associated, on average, with a 2-percent increase in park users and a 2-percent increase in physical activity (Cohen, Han, Nagel, et al., 2016).

Researchers found variation in terms of facilities’ contribution to MVPA. The national study found that the facility generating the most MVPA time for adults and seniors was the walking loop, which is designed to facilitate continuous movement along a pathway (as opposed to sidewalks, which are typically shorter and designed to connect different sections of a park) (Cohen, Han, Nagel, et

**Figure 4. Park Features in Order of Frequency Observed**



SOURCE: Cohen, Han, Nagel, et al., 2016.

## The park features found to make the greatest difference in park use for MVPA were the existence of organized park programming and marketing.

al., 2016). Researchers found that parks with walking loops had 80 percent more users than parks without, and levels of physical activity were 90 percent higher (Cohen, Han, Evenson, et al., 2017). There was also a “spillover” effect in that parks without walking loops had higher rates of overall use throughout the park than other loops did. Seniors tended to use parks with walking loops more than other parks, although overall use by seniors was still low (8 percent in parks with loops, compared with 4 percent in those without).

Other park facilities associated with greater levels of physical activity among adults and seniors were gyms, fitness zones, and exercise areas. Among children and teens, walking loops, skate parks, and swimming pools were the top park facilities contributing to MVPA. In another Los Angeles study, the use of “pocket parks”—small parks, typically less than one acre—compared favorably in promoting MVPA among children and teens with that of existing playground space in nearby parks.

### Park Renovations

RAND studies have found that even the addition of new or renovated facilities does not necessarily generate an increase in physical activity within parks. From 2003 to 2008, researchers measured park use before and after renovations in five Los Angeles–area parks, comparing them with five similar parks that did not undergo renovations (Cohen, Sehgal, et al., 2009). These renovations included new gym facilities, a senior center, and a skate park.

The results were mixed. After renovations, a skate park was successful in generating more physical activity, with a 510-percent increase in use of the expanded skate park; this was more than six times the increase in activity seen over the same three-year period in a comparison state park that was not renovated (77-percent increase). In another case, park renovations were associated with lower park use: a remodeled senior center that received new exercise

equipment, a courtyard garden, and modern architectural features had substantially fewer users after renovations than before. It is possible that this decrease in park use occurred because the center offered fewer hours of exercise classes and other programmed activities after the renovations. In this case, social factors, such as individuals’ connection to a site and availability of programming, appear to be more important in attracting seniors than facility renovations.

A study of parks in San Francisco found that, after park renovations, usage more than doubled for two parks over four other parks that either had no renovations or were in the midst of renovations. However, increased use was seen among adults and children but not among teens and seniors (Cohen, Han, Isacoff, et al., 2015).

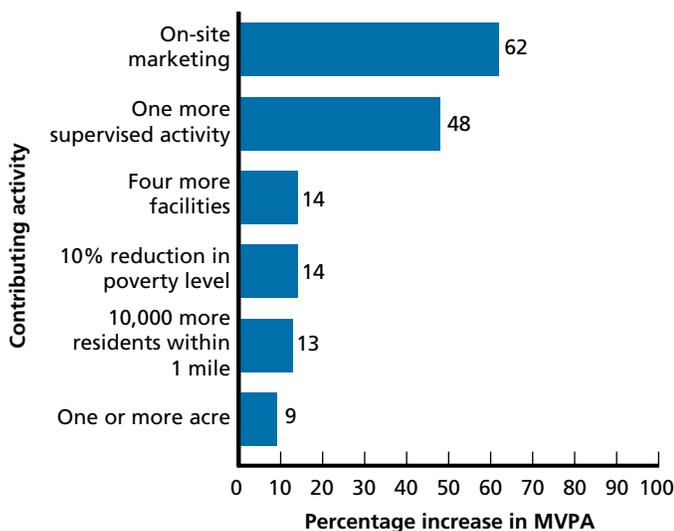
### Supervised Activities and Marketing of Programs

The park features found to make the greatest difference in park use for MVPA were the existence of organized park programming and marketing. In the national study, every additional supervised activity was associated with 48 percent more park users and 37 percent more MVPA time (Cohen, Han, Nagel, et al., 2016). A study of Southern California parks found that each activity in addition to the number of activities at the average park accounted for 58 more users, with the greatest effect on youths and teens (Cohen, Marsh, Williamson, Derose, et al., 2010). A study of park use in predominantly low-income neighborhoods in Los Angeles found that a decrease in the number of users after park renovations was related to a parallel decrease in the number of organized activities (Cohen, Golinelli, et al., 2009). Researchers attributed 39 percent of the total decline in the average number of park users to the decline in the number of organized activities.

Marketing of park activities was also found to have a positive impact on park use and MVPA. The national study

found that the presence of marketing materials (e.g., banners, posters, signs) in the park and at its edges was associated with 62-percent more park users and 63-percent more hours of MVPA time, respectively, compared to parks without such marketing (Cohen, Han, Nagel, et al., 2016). A study of Los Angeles parks found that park investments in marketing and outreach—especially increased signage—were responsible for 37 percent of the increase in the number of park users and 39 percent of the increase in park-related MVPA over a 2-year time period (Cohen, Han, Derose, Williamson, Marsh, and McKenzie, 2013).

Figure 5 shows the relative contributions that various **Figure 5. Relative Contributions That Park Facilities, Programs, and Features Make to Moderate to Vigorous Physical Activity**



SOURCE: Cohen, Han, Nagel, et al., 2016.

park facilities, programs, and features make to MVPA.

## CONCLUSION AND RECOMMENDATIONS

RAND research has found that, although parks play an important role in providing venues for physical activity in urban areas, they tend to be underutilized, especially for MVPA. What can be done to encourage people to make better use of this resource?

First, the research underscores the need to target efforts to increase park-based physical activity to specific populations. RAND research identified numerous differences in how parks are used among different racial and ethnic groups, different genders, and different age groups—information that can be useful in developing ways to encourage people to use parks for physical activity. For example, Spanish-speaking Latinos, Asians, and native Hawaiian and other Pacific Islanders were more likely than non-Latino whites to use parks for social interactions. Thus, one option for increasing park use among these populations might be to offer group exercise activities, such as walking clubs and adult sports leagues, that promote both exercise and social interaction simultaneously. Supporting the role of parks as a dual venue for both social interaction and exercise might also be especially important for seniors.

Second, parks need to offer more supervised activities and engage in marketing efforts to reach potential users. RAND research has found that park facilities by themselves are not sufficient to attract users; many sit unused or underused, even after recent renovations. In comparison, on-site marketing and supervised activities are the top two park features that encourage greater use of parks for physical activity. Marketing efforts are likely to be especially important

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in low-income neighborhoods, where parks might not be meeting the needs of local residents. Flyers and banners in the park or on fencing or other external boundaries can raise awareness of park programming directly among park users, and may also increase local awareness and facilitate word-of-mouth communication about park activities more broadly.

Third, new facilities might also have an important benefit in increasing park use for physical activities if investments are carefully targeted. RAND research found that the majority of park facilities are geared toward youths, while fewer facilities tend to target groups who are underrepresented among those using parks for MVPA—adults and especially seniors. For these populations, such features as walking loops might be the most-beneficial investments. Because living closer to a park was consistently shown to be associated with park use, exercise, and social interactions in the park, another promising option would be to increase the number of parks so

that most people would reside within a half-mile journey or ten-minute walk to a park as a common national standard.

Relatively modest investments, such as these, might help encourage neighborhood park use for physical activity among all populations, regardless of race, ethnicity, income, gender, or age. This goal cannot be achieved without the support of local park managers. Neighborhood parks are financed on the local level, and local park managers are best positioned to understand the needs of their local populations. The most important future direction for park managers to consider is to define benchmarks for optimal use of their local parks. Managers can begin to establish such benchmarks by identifying how many people are currently using the parks for MVPA, which groups are underrepresented among park users, how much physical activity the parks can support, and how the parks can best attract that level of users on a routine basis.

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## About This Report

In this report, we use data from 15 years of studies on parks and physical activity that rely on systematic direct observation. We provide insights on the role of park management strategies and park design in promoting park use and park-based physical activity. This work was largely supported by multiple grants from The National Heart, Lung and Blood Institute of the National Institutes of Health and also by the Robert Wood Johnson Foundation's Active Living Research program.

We would like to acknowledge the contribution of many team members who have worked with us over many of these years, including Bing Han, Kathryn Pitkin DeRose, Thomas L. McKenzie, Catherine Nagel and the City Parks Alliance, The Trust for Public Land, Peter Harnik, Stephanie Williamson, Terry Marsh, Laura Raaen, Amber Sehgal, Kelly Evenson, Sandra Lapham, Philip Ward, Amy Hillier, Jennifer Isacoff, Bianca Shulaker, Altamed Health and their promotora program.

The research was conducted in RAND Health, a division of the RAND Corporation. A profile of RAND Health, abstracts of its publications, and ordering information can be found at [www.rand.org/health](http://www.rand.org/health).

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