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Evaluating Physical Activity Resources to Support Health Equity in Arizona

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Cover Page Footnote

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Evaluating Physical Activity Resources to Support Health Equity in Arizona

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Abstract. We evaluated physical activity (PA) resources in lower-income Arizona communities to support the Supplemental Nutrition Assistance Program–Education (SNAP-Ed) in pursuing equitable policy, systems, and environment (PSE) interventions. In 2017, 71 PA resources across 10 counties (65% parks) were rated using the Physical Activity Resource Assessment (PARA) tool. Accessibility was high, but condition scores and attractiveness varied across resources, with no rural/urban differences. Results suggest that Extension SNAP-Ed staff can be agents of change by assessing resource condition where physical activity health inequities may exist and then convening partners to begin to address needed changes.

INTRODUCTION

Health equity is a multi-faceted concept that embraces a fair and just opportunity for all people to be as healthy as possible. It is not tied to a single indicator, such as access to health care; instead, experts determine health equity based on multiple dimensions of the physical and social environment. It is increasingly important to address health equity as the wealth gap continues to widen in the United States (DePietro, 2020).

Cooperative Extension can play a key role in promoting health equity by leveraging key Family, Consumer, and Health Sciences programs such as the Expanded Food and Nutrition Education Program (EFNEP) and the Supplemental Nutrition Assistance Program–Education (SNAP-Ed). SNAP-Ed in particular plays a significant role in Extension's health education outreach model; as of 2014, 48 states run their SNAP-Ed program all or partly through Extension. In Arizona, Extension is the largest agency implementing SNAP-Ed locally. In recent years, Arizona SNAP-Ed intensified work at multiple levels of the socio-ecological model (Stokols, 1992) to address nutrition- and physical activity-related inequities in qualifying communities. Nearly 15% of Arizona's population are eligible for SNAP, meaning their gross income falls within 185% of the federal poverty level. Because these residents may be particularly susceptible to inequities in the built environment, Arizona SNAP-Ed prioritizes interventions to increase opportunities for physical activity (PA) in qualifying communities.

In order to prioritize appropriate environmental interventions, we explored the literature for factors shown to influence adult PA levels and found three: a) the accessibility of PA resources, b) opportunities for activity, and c) the attractiveness of PA resources (Humpel et al., 2002). *Accessibility* covers proximity to the resource as well as its hours of operation and required entry/use fees. The concept of *opportunity for activity* covers the condition and safety of PA resources. For example, Douglas and colleagues (2018) found that increased levels of physical disorder (e.g., litter, vandalism) predicted lower PA in 22 urban parks. A qualitative study of perceived park safety in lower-resourced/high-minority areas of Kansas City found that violence, concerning behavior, lack of maintenance and lighting, and traffic/busy roads dissuaded park use (Groshong et al., 2018). *Attractiveness* relates to the aesthetic of the resource. Knapp and colleagues (2019) found that attractive parks, rated by landscaping and overall visual appeal, were associated with 146% more African American female park users in Louisiana.

Bedimo-Rung and colleagues (2005) have added policy to the list of factors influencing PA behaviors. *Park policy* can incorporate diverse elements, including decision-making, funding and fund allocation, and park priorities (Engelberg et al., 2016; Joassart-Marcelli, 2010). For SNAP-Ed, policy becomes even more salient as program interventions increasingly incorporate policy, systems, and environmental change (United States Department of Agriculture, 2019).

In this study, we examine the above factors as they relate to PA resources—such as parks and other recreation sites—in Arizona’s lower-income census tracts. To focus on equity-related issues in Arizona’s built environment, we answered the following questions to inform future SNAP-Ed interventions facilitated by Extension staff.

- How *accessible* are local PA resources to individuals in qualifying communities?
- What is the *condition* of local PA resources, including safety indicators, that impact residents’ opportunities for activity?
- How *attractive* are local PA resources?

Although a direct question of policy was beyond the study’s scope, we also considered how park policy may influence resource condition.

METHODS

This quantitative study is a needs assessment of PA resources located in Arizona’s qualifying communities. All PA resources included in the study are located in census tracts where mean income fell below 185% of the federal poverty line; this specification increased the likelihood that resources were accessible to SNAP-eligible residents. We assessed PA resources in 10 of the state’s 15 counties between February and September of 2017.

The one-page Physical Activity Resource Assessment (PARA) developed by Lee and colleagues (2005) rates the presence and condition of 13 features (such as playground equipment), 12 amenities (such as bathrooms), and 12 incivilities (such as litter). The tool also records the type, size, operating hours, and cost of entry to each resource.

We received a half-day in-person PARA training from the developer of the tool and obtained permission to adapt the tool as needed for use in Arizona. The Arizona PARA (see supplemental material) is similar to an updated version of the PARA used by Lee and colleagues in the United States and Mexico (©2010 UNDO Projects); however we made the following changes:

- Removed research-project specific headers,
- Updated the amenity term “fountains” to “decorative art,” more common in the region, and
- Updated incivilities related to grass (“no grass” became “no ground covering” and “overgrown grass” became “overgrown grass/weeds”) and noise (“auditory annoyance” became “noisy”).

We also received permission to slightly adapt the research protocol, providing concise steps for tool administration and definitions describing the difference between poor, mediocre, and good ratings for each item.

The PARA was administered by trained local agency staff whose 10 counties had chosen to promote use of area PA resources as part of their SNAP-Ed programming. Training included an hour-long webinar reviewing the PARA items, consistent scoring procedures, and example images of items with poor, mediocre, and good scores.

We classified PA resources into three types: parks, combination resources, and trails. Combination resources included both a park and another resource type identified on the PARA. We generated feature, amenity, and incivility scores for each resource by adding all sub-scores in that category. We calculated the total PARA score by summing the features and amenities scores and subtracting the incivilities score.

To address our study questions, we used cost, hours of operation, and the presence of bike racks to measure accessibility. We assessed condition—and by proxy, opportunities for PA—based on the presence and condition of features, amenities, and incivilities, including several PARA items related to physical and/or emotional safety such as lighting, sidewalks, and marked access points (Humpel et al., 2002) and incivilities such as vandalism, sex and substance use paraphernalia, and unattended dogs. Finally, we measured attractiveness based on the presence and quality of specific PARA amenities (e.g., landscaping, decorative art) and the relative absence of incivilities.

We entered our data into Qualtrics and analyzed them using descriptive statistics and Spearman’s correlations. The value of Spearman’s (ρ) is itself an effect size, similar to Pearson’s correlation; 1 is a perfect positive relationship, -1 is a perfect negative relationship, and 0 is no relationship between two variables (Spearman, 1904). The significance level was pre-determined at alpha (α) = 0.05.

RESULTS

SNAP-Ed staff assessed 71 PA resources in qualifying communities—42 urban communities where population >50,000 and 29 rural communities smaller than that population threshold. Table 1 provides descriptive information by resource size and type. Table 2 provides means, standard deviations, and minimum/maximum values for seven collected variables.

ACCESSIBILITY

Statewide, 83% of PA resources were free to use. One (2%), a rural pool, required payment at the door. Fifteen percent of the resources allowed free access to a primary attraction but required payment to use some parts or features; for example, a park was free to use, and a pool was available for a fee. Almost all resources (89%) were open from 7am-10pm. Exceptions included community centers in one county that were open only after school, a pool open in the

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Table 1. Characteristics of Physical Activity Resources in Lower-Resourced Areas of Arizona, by Type and Size

Size	Park (n=46)			Combination ^a (n=20)			Trail ^b (n=5)	
	Small	Medium	Large	Small	Medium	Large	Small	Large
	10	11	25	5	6	9	1	4
Urban	6	7	17	4	2	4	1	1
Rural	4	4	8	1	4	5	0	3
Total Mean Score	23.2	29.9	41.2	24.2	35.2	41.4	12.0	3.5
Features Mean	8.4	11.5	17.9	9.8	13.5	21.7	6.0	3.5
Amenities Mean	20.0	23.8	26.6	21.2	26.0	24.8	6.0	7.5
Incivilities Mean	-5.2	-5.5	-3.3	-6.8	-4.5	-5.0	0.0	-7.5
Avg. # Features	3.3	4.8	6.3	4.0	4.7	7.9	2.0	1.5
Avg. # Amenities	7.7	8.5	9.4	8.4	9.5	9.4	2.0	3.0
Avg. # Incivilities	3.9	3.7	2.6	4.8	2.5	3.4	0.0	3.8

Note. Small resources are < ½ a city block, medium resources are between ½ and 1 city block, and large resources are > 1 city block in size.

^a A combination resource was a park and one or more other resource type(s) identified on the PARA tool.

^b No trails were identified as medium-sized.

Table 2. Mean Features, Amenities and Incivilities Scores for all Physical Activity Resources in Qualifying Areas of Arizona (n=71)

	Mean	SD	Min / Max
Features score	14.1	7.9	1.0 / 34.0
Amenities score	23.2	7.0	1.0 / 35.0
Incivilities score	-4.7	4.2	-20.0 / 0.0
Total score	32.7	15.0	-18.0 / 67.0
No. features	5.2	2.7	1.0 / 12.0
No. amenities	8.5	2.3	1.0 / 12.0
No. incivilities	3.2	2.2	0.0 / 9.0

Note. A maximum of 13 features, 12 amenities and 12 incivilities can be assessed using PARA, but no more than 12 features, nor more than nine incivilities were recorded at any resource. Means in the table reflect a diversity of resource types assessed, from parks with many features and amenities, to trails with very few of either.

afternoons and evenings, and three resources that closed at dusk. When community centers were closed, their design influenced access to other parts of the resource—in one case, an adjoining park could be used regardless, but in the other, play equipment and a basketball court were inaccessible when the center was closed. Although this study focused on PA resource condition, not safe routes to the resources, it is worth noting that only 26% of resources had bike racks.

CONDITION

Figures 1, 2, and 3 present a visual summary of the features, amenities, and incivilities assessed at all resources. Sidewalks, play equipment, and basketball courts were the most common features, while volleyball courts, sidewalks, and play equipment needed the most improvement. Access points, lighting, and trash containers were the most prevalent amenities; landscaping, bathrooms, and drinking fountains needed the most improvement. Litter, noise, and a lack of ground covering were the most-reported incivilities, with litter and ground covering issues (both lack of and overgrowth) rated as most severe.

Over 85% of the assessed resources included indicators of safety such as lighting, sidewalks, and marked access points; we observed that over 80% of these indicators were in good condition. Safety-related incivilities were comparatively rare—more than 97% of sites were free of unattended dogs or sex paraphernalia, and 92% were free of substance use paraphernalia. Vandalism was more common—present at 11% of sites.

ATTRACTIVENESS

We noticed landscaping at 90% of PA resources and decorative art at 15%. However, almost one-third of resources received ratings indicating a need to improve landscaping. Litter was the most pervasive incivility, reported at 72% of sites; 51% of all instances were moderate (5+ pieces visible) or severe (11+ pieces visible). For incivilities related to ground cover, 41% of resources lacked covering and 34% were overgrown. We rated about one-third of these as moderate (a moderate

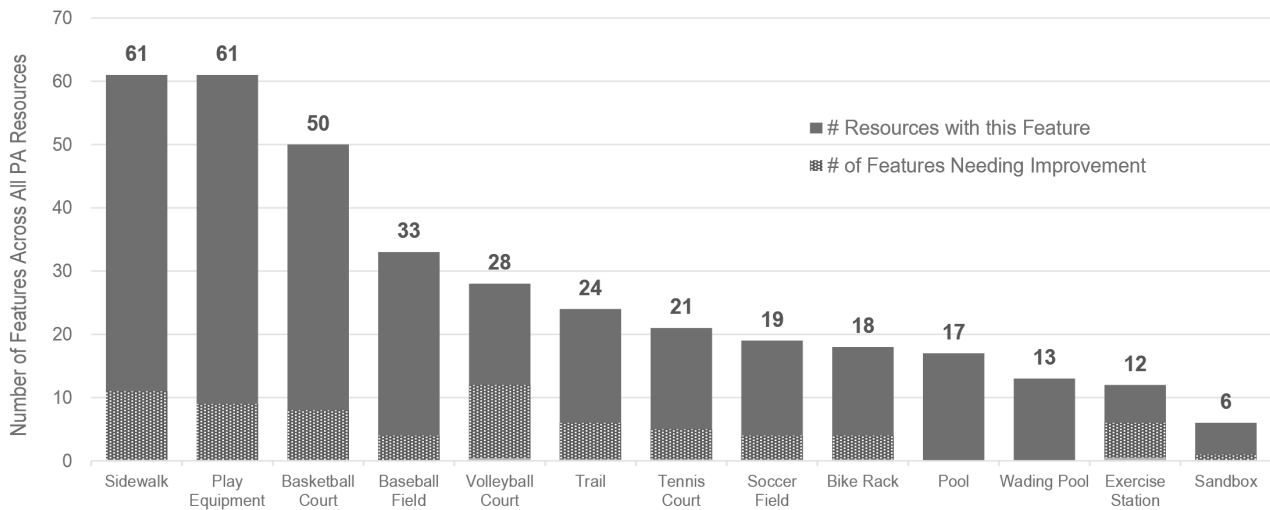


Figure 1. Features of PA resources in Arizona (n=71).

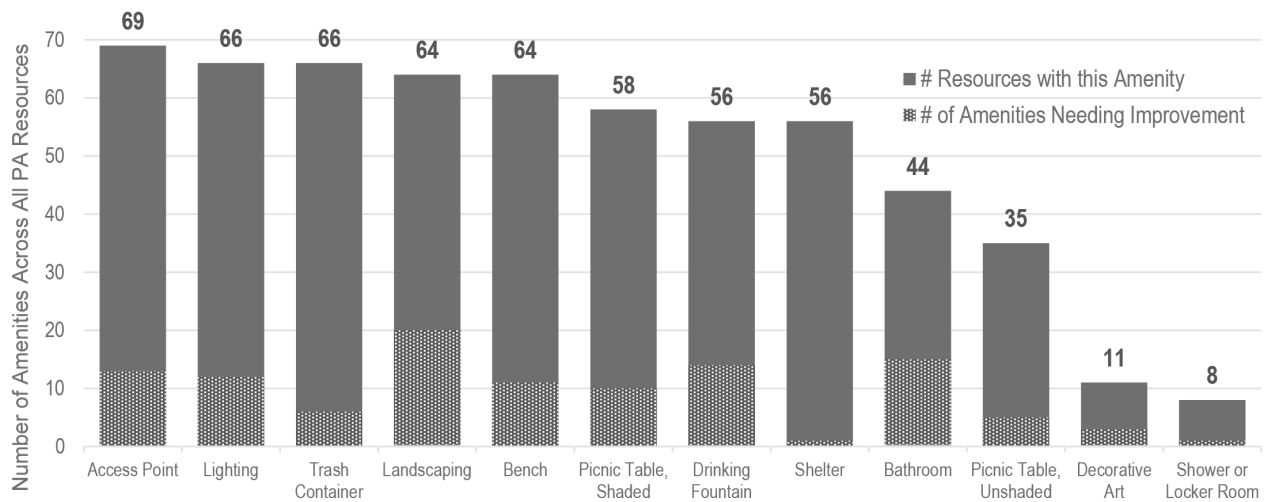


Figure 2. Amenities present at PA resources in Arizona (n=71).

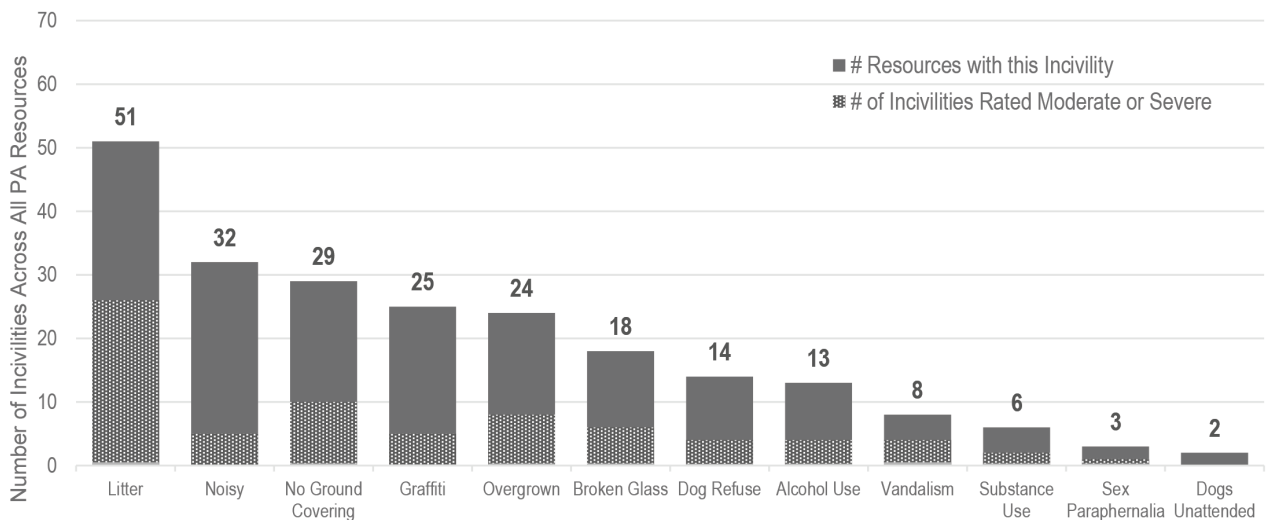


Figure 3. Incivilities present at PA resources in Arizona (n=71).

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Table 3. Spearman's Correlations Demonstrating Associations among PARA Feature, Amenity, Incivility, and Total Scores (n=65)

	1. Features score	2. Amenities score	3. Incivilities score	4. Total score	5. No. Features	6. No. Amenities	7. No. Incivilities
1. Features score	1.0						
2. Amenities score	.67**	1.0					
3. Incivilities score	.18	.37**	1.0				
4. Total score	.84**	.86**	.56**	1.0			
5. No. features	.95**	.53**	.05	.73**	1.0		
6. No. amenities	.58**	.78**	.22	.68**	.56**	1.0	
7. No. incivilities	-.06	-.25*	-.94**	-.43**	.03	-.15	1.0

* p<.05, ** p<.01

amount, noticeable) or severe (a very large area without ground cover, or overgrown grass that may be obstructing some equipment).

RELATIONSHIPS AMONG PARA SUB-SCALES

Table 3 presents the nonparametric Spearman's correlations among PARA sub-scales. The total PARA score was significantly correlated with all other scores. As the number of reported incivilities increased, feature and amenity scores decreased.

RURAL AND URBAN RESOURCES

There were no quantitative differences in total PARA scores for rural versus urban PA resources stratified by resource size. However, we did note differences in the condition of individual features and amenities, including soccer fields (40% rated poor/mediocre in rural areas vs. 14% in urban) and drinking fountains (52% rated poor/mediocre in rural areas vs. 9% in urban). Incivilities showed the opposite pattern: for urban resources, 50% of broken glass and dog refuse ratings were moderate/severe, but this was only true for 13% of ratings for rural resources.

DISCUSSION

From a health equity perspective, it is important to understand the PA resources situated in SNAP-eligible census tracts. We focused on the accessibility, condition, and attractiveness of local PA resources to better understand the factors that can support equitable access to PA opportunities.

ACCESSIBILITY

Access to PA resources is an important first step toward greater health equity in the built environment (Bedimo-Rung

et al., 2005). Our results revealed that most Arizona resources across urban and rural areas were free to access and had extended hours of operation. This finding aligns with other studies that have found PA resource accessibility, specifically parks, to be relatively equitable regardless of demographics such as income level (Hughey et al., 2016). While a Denver-based study detected no disadvantage for lower-resourced residents in terms of park presence or availability, the author did report that parks available to these residents were of lower quality (Rigolon, 2017).

CONDITION, RURALITY, AND SAFETY

Our findings showed that, despite restricting the sample to lower-income census tracts, the PA resource condition across Arizona varied widely. Suminski and colleagues (2012) found strong relationships between park quality and racial/ethnic makeup of an area, even when controlling for median income. This correlation suggests that more work may be necessary to better understand patterns in Arizona's condition ratings; for example, an examination of community demographics beyond income and differences between urban and rural locations may present useful insight.

Our inclusion of rural PA resources adds to the sparse literature in this area and makes it more relevant to Extension personnel who are acutely aware of rural health inequities (Andress & Fitch, 2016). Many studies focus on urban parks (Douglas et al., 2018; Knapp et al., 2019; Rigolon, 2017), and Feng and colleague's (2010) meta-analysis of the built environment and obesity found that only seven of 63 studies considered rural settings at all. However, our sample included 29 (41%) rural PA resources and explored differences between them and urban resources. Our results showed that the variation in PA resource condition was not generally associated with a rural versus urban setting, with

the exception of soccer fields and drinking fountains—both of which received higher ratings in urban areas. In contrast, incivilities at urban resources were rated as more severe than at rural resources. One potential explanation is that rural resources experience less traffic and are therefore less likely to accrue incivilities—but that features and amenities in urban resources are more frequently serviced.

When considering conditions that influence the likelihood of using a PA resource, safety is critical. Humpel and colleagues (2002) discuss safety indicators like lighting and sidewalks, both of which we found to be prevalent and in relatively good condition in the resources in our study. However, their meta-analysis pointed more toward *perceptions* of safety versus the objective presence of safety-promoting items as key influencers of PA resource use.

ATTRACTIVENESS

The literature suggests that attention to aesthetic qualities can promote health equity (Knapp et al., 2019; McCormack et al., 2010). Our findings show a range of PA resource attractiveness across qualifying communities, with no clear variation by rural or urban setting. Most resources (90%) included landscaping, with one-third of those needing improvement but two-thirds given the highest rating. Decorative art was less common. Incivilities, which lessen attractiveness, also varied by item: half of the reported litter and vandalism were rated moderate to severe, but litter was much more common than vandalism (72% vs. 11%). Together, these findings suggest a tailored approach to improve resource aesthetics rather than a one-size-fits-all panacea for incivilities.

POLICY CONSIDERATIONS

Our findings revealed a negative correlation between incivilities and features/amenities. One potential contributor may be the interplay of park maintenance policies with community treatment of the resource: poorly maintained PA resources could attract more public incivilities, or an increased number of incivilities could dissuade maintenance of features and amenities. This correlation may also be linked to Parks and Recreation department budgets, with the combination of higher quality features and amenities and fewer incivilities reflecting higher budgets (Joassart-Marcelli, 2010). More broadly, the overall variation found in the condition of the assessed PA resources could reflect policy-related elements such as “local policy, citizen involvement in park decision-making, park funding and allocation, [and/or] sources of funding and park priorities” (Engelberg et al., 2016, p. 395).

STRENGTHS AND LIMITATIONS

Key strengths of this study include its broad reach throughout two-thirds of the counties in a large and geographically diverse state; additionally, the inclusion of PA resources

located in rural areas enabled rural-urban comparisons. Data collection accuracy, feasibility, and utility were enhanced by the short tool length, the breadth of items assessed, the Arizona-specific adaptations to the tool, concise PARA protocol guidance, and the careful training of SNAP-Ed staff.

The study also had limitations. Because this work was funded to assess the needs of SNAP-Ed eligible communities, we were unable to assess resources in higher-income census tracts for comparison against those in lower-income tracts. These additional analyses would enable a deeper exploration of patterns in the accessibility, condition, and attractiveness of PA resources. Moreover, we restricted data collection to only items captured by the PARA, while research suggests that needs assessments would benefit from asking community members directly about the perceived safety (Groshong et al., 2018; Humpel et al., 2002) and attractiveness (Knapp et al., 2019; McCormack et al., 2010) of local resources.

CONCLUSION AND IMPLICATIONS

Among the Arizona resources assessed, accessibility was relatively high; however, condition, safety, and attractiveness of resources varied considerably, which may deter use. Incivilities were negatively correlated with feature and amenity scores, which suggests that removing incivilities and increasing the maintenance of features and amenities may be mutually reinforcing, resulting in a more appealing environment in which to be physically active in qualifying communities. Anecdotes describing Extension SNAP-Ed staff’s use of PARA data in Arizona suggest that strong relationships with local Parks and Recreation agencies, as well as links between neighborhood residents and these agencies, may lead to improved park environments.

As educators and agents of change in their communities, Extension personnel have an opportunity to address PA resources in a variety of ways.

To address access, they might:

- Engage with community residents to learn which PA resources they use most and what barriers to access they experience.
- Explore how to address accessibility issues reported by community residents, such as barriers related to public transportation or walkability access to the resource.

To address how PA resource condition impacts opportunities for physical activity, they might:

- Assess resource condition using the PARA or other tools, preferably with community input on which PA resources should be assessed and insight from community members on their day-to-day experience of the PA resource.

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- Incorporate information on residents' perceptions of safety, perhaps by engaging residents through neighborhood associations, and compare these perceptions to PARA scores to consider areas of discrepancy.
- Develop relationships with Parks and Recreation departments to explore together any issues identified by assessments.

To address attractiveness, they might:

- Consider, in partnership with neighborhood associations and Parks and Recreation department staff, what interventions could be effective to improve PA resource appeal.
- Convene a group to explore how low or no-cost improvement activities at PA resources, such as regular litter cleanups or the repainting of some structures, might be accomplished locally.

Extension personnel may wish to employ an equity lens in their built environment SNAP-Ed work by using PARA; they may also wish to consider how characteristics of the area immediately surrounding the resource may affect access and use. For example, are there sidewalks or bike lanes leading to the resource? Is the resource near a bus stop or housing complex? Are there other community resources nearby, such as libraries, schools, or churches? Looking beyond the resource itself, Extension staff may gather a more complete picture of the local physical activity setting in which residents may be making decisions about their likelihood to participate in physical activity at the resource. Mullenbach (2019) identifies the importance of community engagement in fostering a sense of park ownership, and Extension personnel are well-placed to engage with communities and elevate community voices in discussions of PA resource accessibility, improvement, and maintenance. *As PA resource advocates, Extension staff* can encourage more equitable access to PA resources by bringing together community partners like planners, parks and recreation staff and management, and community residents to actively address the accessibility, condition, and attractiveness of PA resources.

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