Osteoarthritis Action Alliance (OAAA)
Walkability Audit Phase 1 and Phase 2:
Final Report – Executive Summary

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The goals of this project were to 1) establish whether existing walkability assessments were adequate for people with arthritis, and 2) identify features of the environment that should be included in walkability tools for people with arthritis. These goals were accomplished in two phases of this 'Walkability Project." In Phase 1, our objectives were to i) perform a literature search to identify evidence-based walkability features for community walking behaviors among people with arthritis, and ii) identify whether the arthritis focused evidence-based features are available on existing walkability assessments. In Phase 2, our objective was to develop consensus around walkability environmental features most important to people with arthritis for an 'arthritis assessment tool' that would be used with other public health walkability assessments.

Phase 1

June - September 2013 and in May 2016, four literature reviews were conducted in PubMed to identify the physical environmental features that are associated with physical activity or walking behavior of 1) older adults, 2) people with lower extremity osteoarthritis or lower extremity pain 3) people who use rolling assistive devices, and 4) people with mobility limitations. A detailed scoping review was conducted and identified articles critically reviewed for information on the environment-physical activity link. A qualitative summary approach was used due to the highly heterogeneous and often limited amount of research in this area. In addition, we did an environmental scan of "walkability" and "rollability" assessment tools or instruments through literature and google searches..

3,368 studies were identified in the literature search and hand searches. After reviewing titles and abstracts, 175 articles were included for full review. Based on full review, another 115 articles were eliminated because they did not meet eligibility criteria. 60 articles remained and were included in this review. The environment-physical activity link was examined most extensively in the older adult literature (40 studies: 31 quantitative studies and 9 qualitative studies). Eight articles addressed the environment-physical activity link among people with arthritis (one quantitative study; seven qualitative studies); six articles addressed the link between the environment and physical activity among adults with mobility limitations (four quantitative studies; two qualitative studies); and six addressed adults using wheeled mobility (three quantitative studies; three qualitative studies). The majority of the study samples were recruited from urban populations.

Overall, the literature was very heterogeneous in study methodology, including methods of measurement and definitions of environmental attributes. The environment-physical activity link was most widely studied among older adults, with the studies examining two dimensions: 1) leisure/fitness, and 2) walking for transportation. In contrast, the studies of people with arthritis, mobility limitations and those using rolling assistive devices, assessed the relationship of features of the environment with leisure/fitness physical activity. Overall, there were three

environmental features that were significantly associated with both physical activity and walking of older adults in the quantitative literature: i) walking paths/trails, ii) sidewalk conditions, and iii) places to sit and rest. Two environmental features were "mixed" for both physical activity and walking: i) traffic conditions, and (iii) presence of a senior center. Five environmental features were not associated with overall physical activity: i) parks/walking areas, ii) fitness/recreational centers, iii) safety, iv) walkability, and v) public transportation. Older adults participating in qualitative studies identified safety, walkability, mixed land-use, neighborhood aesthetics, sidewalk conditions, traffic conditions, public transportation, parks/green space, and places to sit or rest as being important for promoting physical activity in their neighborhoods. Little could be drawn from the literature of people with mobility limitations, rolling assistive device use, or arthritis due to the paucity of research in these areas.

In conclusion, the literature was quite limited in terms of identifying arthritis specific environmental features for walkability. The literature for general adult populations was more robust but it is not clear that the features among older adults fully address walkability for people with arthritis. Similarly, while there are numerous walkability assessments of community environments none of them specifically address the needs of people with arthritis or related rheumatologic conditions.

Phase 2

A modified Delphi study was conducted to identify important walkability features for people with arthritis. Eligibility criteria included community dwelling adults age 21 or older with self-reported physician diagnosed arthritis and access to the internet. Health professionals were eligible if they were age 21 or older and if they met one of the following: 1) a registered member of the Association of Rheumatology Health Professionals (ARHP), 2) a first or last author on an article examining the relationship between the environment and physical activity, or 3) a member of an organization serving older adults and adults with arthritis. Potential research participants were excluded if they were unable to speak and understand English.

Consumers were recruited through the following approaches: 1) advertisements in the Arthritis Foundation's online newsletter with a link to the study; and 2) emails obtained through opt-in research participant registries established through Boston University's Center for Enhancing Activity and Participation among People with Arthritis (ENACT) research center and studies. ENACT's opt-in registries include participants who have agreed to be contacted for research projects related to exercise and work disability who were not engaged in physical activity-related research studies, consumer members of ENACT's mailing list, and members of ENACT's outreach educational initiatives to the African-American community.

Health professionals were recruited using the following sources: 1) Association of Rheumatology Health Professions membership, 2) literature review identifying authors of prominent papers in the field of the environment and physical activity among people with arthritis, 3) list-serves and email distributions of professional organizations affiliated with people with arthritis, and 4) a contact person from members of the Osteoarthritis Action Alliance, a community coalition of organizations supporting people with arthritis.

Data Collection and Data Analysis

Data for the Delphi study were collected using an online survey data system. In Part 1, we asked open-ended questions to identify important features of the environment that promote walking activity and general physical activity. Both walking activity and general physical activity were ascertained because both were identified in the literature review. Participants were

then asked to list three additional items that are not on the list provided for both walking activity and general physical activity. The purpose of this follow-up question was to attempt to identify items that were important for people with arthritis above and beyond factors commonly reported from older adult populations in the context of general physical activity and environment. We also collected demographic factors including age, sex, education level, type of arthritis, comorbidity, and activity level. The data were analyzed using a modified, qualitative grounded theory approach. The domains identified in Phase 1 were used as a guiding frameworks to code the qualitative data. This approach allows a grouping of words to be classified into similar environmental categories. Data for each group (consumers and health professionals) were analyzed separately. For Part 2 of the Delphi study, participants in Delphi Part 1 (both consumers and health professionals) were emailed a follow-up survey with the top environmental features identified (in Part 1) for walking and general physical activity. The goal with this phase of the research was to obtain consensus on the most important environmental features for physical activity for people with arthritis and related conditions. Consensus was identified by determining if at least 80% of respondents agreed or strongly agreed that the feature was important. In addition, the mean of the rank order of the items was calculated and items distributed from most to least important in numerical order. Items were deemed the highest priority for inclusion on an instrument if 80% of people agreed or strongly agreed that the feature was important and the items were listed as most important in the rank order of the items.

In part 1 of the Delphi study, 149 consumers and 26 health professionals completed the online surveys to identify environmental features important for people with arthritis and rheumatic conditions. One hundred and five consumers (70% retention) and 19 health professionals (73%) completed Part 2 of the Delphi study. The results from the two parts of the Delphi study found that the top 8 environmental features for both walking and physical activity were consistent, with over 85% of people reporting agree or strongly agree for the following features:

- Safety from crime
- Safety from injury
- Walkways free of objects blocking the path
- Smooth and level walkways
- Street lighting (adequate lighting)
- Places to sit and rest
- Ramps and railings at stairs.

Similar results were obtained from the rheumatology health professionals. These items are recommended as a focused walkability assessment for people with arthritis, probably with the inclusion of a general environmental walkability assessment. (See Appendix A)

Appendix A
Arthritis Walkability Assessment

This arthritis walkability assessment should be used in conjunction with other walkability assessment tools that assess the environment for activity for general adult populations. **The items on this tool are recommended as important for adults with arthritis and related rheumatologic conditions.** (Note some of these items are included on other walkability assessments and can be omitted from this assessment.) Please consider these factors in the environment, in particular, for people with arthritis and rheumatic conditions.

1. Is the environment safe from crime?
   Yes_____ No_____

2. Is the environment safe from injury?

   a. Are walkways free of objects blocking the path?
      Yes_____ No _____

   b. Are walking areas separate from roads (e.g., sidewalks)?
      Yes_____ No _____

   c. Are walking areas smooth and level?
      Yes_____ No _____

   d. Is the area well lit?
      Yes_____ No _____

3. Are benches or places to sit and rest present?
   Yes_____ No _____

4. Are ramps and railings present at stairs?
   Yes_____ No _____