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A comprehensive scoring system to measure healthy community design in land use plans and regulations

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ABSTRACT

Comprehensive land use plans and their corresponding regulations play a role in determining the nature of the built environment and community design, which are factors that influence population health and health disparities. To determine the level in which a plan addresses healthy living and active design, there is a need for a systematic, reliable and valid method of analyzing and scoring health-related content in plans and regulations. This paper describes the development and validation of a scoring tool designed to measure the strength and comprehensiveness of health-related content found in land use plans and the corresponding regulations. The measures are scored based on the presence of a specific item and the specificity and action-orientation of language. To establish reliability and validity, 42 land use plans and regulations from across the United States were scored January–April 2016. Results of the psychometric analysis indicate the scorecard is a reliable scoring tool for land use plans and regulations related to healthy living and active design. Intraclass correlation coefficients (ICC) scores showed strong inter-rater reliability for total strength and comprehensiveness. ICC scores for total implementation scores showed acceptable consistency among scorers. Cronbach's alpha values for all focus areas were acceptable. Strong content validity was measured through a committee vetting process. The development of this tool has far-reaching implications, bringing standardization of measurement to the field of land use plan assessment, and paving the way for systematic inclusion of health-related design principles, policies, and requirements in land use plans and their corresponding regulations.

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1. Introduction

Land use planning and implementation of the corresponding regulations geared toward healthy living is an important opportunity for addressing population health and health disparities (Dannenberg et al., 2003; Gordon-Larsen et al., 2006; Frumkin, 2002). Although a complex and nuanced multitude of interacting factors influence population health, addressing land use provides an opportunity for wide-spread and sustainable change (Rossen and P., 2012). Comprehensive land use plans, zoning codes, and subdivision codes all play an important role in determining the nature of the built environment and community design which can contribute to population health by helping or hindering opportunities for healthy living (Ricklin et al., 2012). The specific role that land use planning and community design plays in relation to population health includes increasing opportunities for active living

and physical activity (e.g. planning for communities that encourage walking, biking and active recreation) (Kelly et al., 2014; Saunders et al., 2013; Saelens and Handy, 2008) and encouraging healthy eating behaviors through access to healthy foods (Robinson et al., 2013) (e.g. planning for healthy food retailing and distribution by planned locating of farmers markets, supermarkets and community gardens). See Appendix A for a list of key terms and definitions (Government, T.I.F.L, 2010; Association, A.P., 2016; Foundation, 2015).

The need for a reliable, systematic coding system focused on measuring healthy community design standards in comprehensive land use plans and related regulations was identified during the formative research phase of a 3-year Delaware based community health partnership initiative funded through the Centers for Disease Control and Prevention - *Partnerships to Improve Community Health* (PICH) cooperative agreement, initiated in September 2014 (*Partnerships to Improve Community Health* (PICH), 2014–2017).

Rigorous and systematic review and scoring of land use plans using methods derived from content analysis is essential in providing data that illustrates the comprehensiveness and strength of healthy

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community design standards and principles articulated in plans. These provide a means of capturing the plan's overall strategy, intent and commitment to principles of healthy community design. Plan principles have been defined as “normative statements of intent” underlying the plan's overall strategy [Godschalk and Rouse, 2015](#). Analysis and scoring of implementation regulations (e.g. zoning and subdivision codes), provides data that measures if and how those principles will be implemented. Using a score-based analysis method that provides numeric scores enables researchers and practitioners to measure changes over time, facilitates comparison with other plans and regulations, and can be used to gauge how plan and regulations compare with a benchmark.

Content analysis and content analysis-based scoring methodologies can help planners produce more effective plans which could result in better outcomes ([Schilling, 2011](#)). In addition, content analysis enables planners to identify plan quality, strengths and weaknesses, and areas for improvement ([Berke and Godschalk, 2009](#)). While content analysis is a useful methodology, it is not a means of measuring plan effectiveness ([Hodgson, 2012](#)). [Norton \(2008\)](#) reviewed the use of content analysis for measuring plan policy focus, analytical quality and consistency in plans and zoning codes ([Norton, 2008](#)). He concluded that appropriate measures can be developed through content analysis, but it is important to distinguish among plan policy focus (e.g. management, urban landscape and rural landscape); plan analytical quality (e.g. plan presentation, public participation, fact base, infrastructure capacity analysis, land suitability analysis and implementation program); and plan consistency (e.g. vertical mandate and coordination, horizontal consistency, internal coherence and implementation) ([Norton, 2008](#)).

The planning literature provides a number of different methods for evaluating comprehensive land use plans. One example is analyzing specific domains covered in plans, such as smart growth principles, environmental quality, disaster resilience, sustainable development, and other policy domains ([Edwards and H., 2007](#); [Berke and Conroy, 2000](#)). Another method described in the planning literature uses a key factors comparison group methodology to compare groups of plans based on key factors, i.e. comparing plans that include a key factor to plans that do not include the key factor of interest ([Berke and Godschalk, 2009](#); [Berke and Conroy, 2000](#)). Finally, inventories can be a useful method for assessing the presence of specific domains, policies, principles, or goals in a plan ([Berke and Godschalk, 2009](#)).

In addition, systematic plan-scoring methodologies and tools of varying scope exist in the planning literature. For example, [Berke and Conroy \(2000\)](#) developed a plan evaluation protocol designed to assess sustainable development principles in plans. [Hodgson \(2012\)](#) developed a robust and focused tool to evaluate food access and community food systems in comprehensive plans and sustainability plans. Hodgson's methods included an inventory of policies, goals and implementation; measures of the seven central principles of sustainable healthy food systems; and rigorous analysis of plan quality ([Hodgson, 2012](#)). More recently, the American Planning Association has made the methodology developed by [Godschalk and Rouse \(2015\)](#) for assessing sustainability standards in plans available. This lengthy and comprehensive methodology yields a numeric score that enables comparison of local plans with national standards. The standards include six *principles* (livable built environment, harmony with nature, resilient economy, interwoven equity, healthy community and responsible regionalism); two *processes* (authentic participation and accountable implementation); and two *attributes* (consistent content and coordinated characteristics). While this scoring methodology is indeed robust, systematic and comprehensive, and does include a healthy community component, there are only seven measurement standards for healthy community principles, which are somewhat general and very broadly stated (e.g. *5.4 Plan for physical activity and healthy lifestyles* ([Godschalk and Rouse, 2015](#))).

The focus of the scoring tool described in this paper is on healthy community design standards. It may be used by government officials and planners responsible for writing or updating plans within the context of public health, however it is intended as a robust scoring

methodology for researchers interested in measuring strength and comprehensiveness of specific elements in land use plans and regulations that facilitate and promote healthy living. It is important to bear in mind the distinction and the relationship between plans and their corresponding regulations. Land use plans generally describe principles, goals and policies for land use. These are translated into concrete, actionable implementation regulations in zoning and subdivision codes, development application review and approval processes and guidelines. Although implementation regulations have more “teeth” than land use plans, there is no guarantee that the regulations will be applied with fidelity on the ground. Differences in content, format and legal authority of local plans and regulations impact local governments' abilities to staff and/or commit planning department and planning commission resources to carry out many of the proposed land use elements.

2. Methods

The Healthy Living and Active Design Scorecard was developed by Cedar Creek Sustainable Planning Services, founded by a certified AICP planner and LEED Accredited professional with a specialty in Neighborhood Development. The tool was created based upon an extensive literature review, followed by key informant interviews with state and county land use planners, state and regional transportation planners, consultants, health promotion advocates, and population health specialists all of which are cited within the scoring tool. The result is a comprehensive set of measures; some are new, while others are modifications or enhancements of measures from existing national ([Architects, A.I.o., 2012](#); [Institute, T.U.L., 2015](#)) and local ([Unknown, 2010](#); [Institute for Public Administration, U.o.D., 2010](#)) studies. The creation of this tool provides a user-friendly, systematic method to identify elements of the built environment that can be directly influenced by land use planning and regulations.

The decision about which concepts to include in the land use plan measures versus the implementation measures was informed by a review process. A cross-disciplinary committee of the Delaware Coalition for Healthy Eating and Active Living (DE HEAL) was engaged in the review process for the scoring tool. This committee is comprised of approximately 20 individuals in the fields of planning, parks and recreation, and public health. Based on their knowledge of State of Delaware regulations governing county and municipal land use planning, committee members differentiated between measures that correspond to the vision and goals found in land use plans versus measures that pertain to the implementation requirements of the jurisdiction's government and its citizens. Committee member input aided in the further distinction between the Implementation Action Plan, which describes county or municipal government responsibilities, and the zoning code and regulations, which describe government requirements of citizens. For example, a land use plan could state the goal of “Promote sustainable land development patterns and practices” with an objective stating, “Create an accessible network of open spaces.” The implementation plan, however, would dictate the laws, regulations and requirements around the use of that open space; UDC regulation states, “A minimum of 50% of the total area for the development shall be set aside in Common Open Space and shall meet requirements of Section 7.6 of this UDC” ([Town of Marshall Comprehensive Land Use Plan, 2009](#); [Town of Marshall Unified Development Ordinance, 2011](#)). Therefore, it was essential for this tool to score both the land use and implementation measures in order to capture the strength and comprehensiveness of the land use plan goals/objectives while also measuring the likelihood those will be realized given the laws, regulations, and requirements supporting (or not supporting) them.

The tool includes 50 land use plan measures and 29 implementation measures. The decision to include 50 land use plan measures was based on the Scorecard developer's interest in having a round number of measures for ease of scoring, while also ensuring that the measures adequately addressed the range of community design topics that can

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