



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

impact obesity. The number of implementation measures was reliant on the correlation to land use plans. Since there is not a one-to-one correlation, the number is less than the implementations measures.

The land use plan measures are organized into three overarching focus areas: (1) Overall Plan, Vision and Strategy: 6 measures related to overarching principles of land use and public health and explicitly recognizes the relationship between public health and land use (2) healthy living: 29 measures related to areas such as: how we move around; how we eat and drink; how we play and get our exercise; and how we get and stay well (3) active design: 13 measures related to how we plan and build. The subcategories for each focus area were worded in a way that is intended to be understandable to the general public, in keeping with the Scorecard's utility as a tool to educate on the connections between the built environment and health. The 29 corresponding implementation measures relate to the plan of action, healthy living and active design as they relate to the land use measures. See Appendices B and C for a complete list of the land use plan and implementation measures used in the scorecard.

A total of six independent coders completed the scoring in three dual-coder groups, purposefully chosen with a variety of backgrounds that ranged in experience with land use planning. G1: two Scientists (PHD and Masters Levels) with backgrounds in scoring of school wellness policies and incorporating public health guiding principles into land use plans. G2: one PHD level Scientist and one Masters level Health Promotion Population Health Specialist both with experience in the promotion of healthy design principles. G3: one Masters level Scientist and one Population Health Specialist, both with no prior land use planning experience. Prior to the scoring of the plans discussed within, all coders scored at least two land use plans and the corresponding regulations as practice. Coders came together to sort out scoring discrepancies per item. An additional practice land use plan and corresponding regulation was then scored within dual coding groups and further discrepancies were discussed between partners. Discrepancies were mostly related to decisions between "1" and "2" scores for the land use plans and the particular attention paid to the exact wording of the measures (i.e., "and" vs. "or"). Coders provided feedback on the average time to complete scoring one land use plan and corresponding regulation (approximately 2–4 h depending on the length of the plan) and on the challenges they encountered trying to ensure scoring correctly and using the correct search terms. This information was used to create a Scoring and Training Guide that will accompany the scoring tool.

2.1. Coding

Each measure is scored using methodology based on the [Edwards and Haines framework](#) ([Edwards and H., 2007](#)) (revised in 2012 by the American Planning Association ([Ricklin et al., 2012](#))). Specifically, plans are scored for the presence of a specific item and the specificity and action-orientation of language. Each of the 50 land use plan measures is scored using a "0", "1", or "2" rating system ("0" if absent from the plan; "1" if present but limited in scope; "2" if present, comprehensive, actionable, and specific). The comprehensiveness score is calculated by counting all land use plan measures that score a "1" or "2" with a total possible comprehensiveness score of 50. Strength is calculated by summation of all scores with a total possible strength score of 100. The 29 implementation measures are scored using a "0" or "1" rating system ("0" if absent from the implementation action plan and/or code and regulations; "1" if present). Total implementation scores are calculated by summing all measures with a total possible implementation score of 29.

2.2. Psychometrics

The psychometrics analysis of the scoring tool was completed by collecting a sample of 42 land use plans and 42 corresponding development regulations across the United States. The methods used to

determine which plans were selected for review included: Geography (represent regions across the United States), Population size (represent a range of sizes, from small towns to large metropolitan areas), Accessibility (availability of online documents). These methods were used to ensure that coders scored a variety of land use plans and development regulations given they differ greatly based on content, style and format. Each dual-coder group scored 14 plans. Although comprehensive land use plans are fairly consistently formatted throughout the nation, the regulations are more variable. Many cities, counties and municipalities present their overall regulations in one combined document that includes both subdivision codes and zoning codes; this is called a Unified Development Code (UDC). Others present their regulations as two separate entities; Subdivision Code and Zoning Code. In addition, to the UDC and/or the Subdivision and Zoning Codes many comprehensive land use plans also include an implementation section within the general plan. Therefore, when scoring the implementation measures of our tool, the coders looked for evidence of the measures in both the implementation section (if provided) of the comprehensive land use plan and in the full regulations; i.e. UDC or Subdivision and Zoning Code. See [Appendix D](#) for a complete list of the 42 comprehensive land use plans and implementation documents chosen for review.

Inter-rater reliability was used to assess the ability of the scoring tool to produce consistent results across scores rather than absolute agreement. Intraclass correlation coefficients (ICC) were computed for each dual-coder group on the land use plan's total comprehensiveness and strength scores, focus area comprehensiveness and strength, and the total implementation score for the development regulations. Cronbach's alpha was used to measure the internal reliability between each focus area to ensure that similar measures received similar scores. Since dual-coder groups were used, one plan from each group was randomly selected for the alpha testing. ICC levels were based on the following criteria: 0.7 or above is strong; 0.6 is the minimal acceptable level ([Encyclopedia of Research Design and Salkind, 2010](#)). Acceptable alpha values were based on the following criteria; 0.8–0.9 (very good); 0.7–0.8 (respectable); 0.65–0.7 (minimally acceptable) ([DeVellis, 2003](#)).

3. Results

Total comprehensiveness scores ranged from 10 to 39; total strength scores ranged from 13 to 69; and total implementation scores ranged from 7 to 22. Coders were consistent in scoring plans in similar order (i.e., coders scored the same plans high, medium and low). The range for each score indicates there is no lower or upper limit that inhibits the tool from garnering appropriate scores.

Strong ICC scores were found for all three dual-coder groups (G1, G2, G3 respectively) for total comprehensiveness (ICC = 0.703, 0.943, 0.883) and total strength (ICC = 0.922, 0.968, 0.815). In addition, land use plan focus areas showed strong reliability among all groups: Overall Plan, Vision and Strategy comprehensiveness (ICC = 0.719, 0.696, 0.946) and strength (ICC = 0.723, 0.716, 0.969); Healthy Living comprehensiveness (ICC = 0.786, 0.938, 0.828) and strength (ICC = 0.954, 0.923, 0.813); and Active Design comprehensiveness (ICC = 0.715, 0.910, 0.886) and strength (0.805, 0.940, 0.796). ICC scores for total implementation also showed acceptable agreement for all groups (ICC = 0.604, 0.716, 0.771).

Cronbach's alpha values for the land use plan focus areas showed acceptable levels of internal consistency for Overall Plan, Vision and Strategy ($\alpha = 0.670$); and respectable levels for Healthy Living ($\alpha = 0.793$); and Active Design ($\alpha = 0.702$). Individual item analysis suggested the deletion of one item, based on the absence of variance among scores, pertaining to the presence of Health Impact Assessments in the land use plans. Health Impact Assessments were not present in 40 of the 42 plans.

The committee review process discussed in [Section 2](#) served to test content and face validity for the items used and the categorization of

items as land use versus implementation measures. Numerous committee members hold positions within state, county, and municipal government land use planning, transportation and housing agencies. Committee members participated in two conference calls to review and provide feedback first on the land use plan measures and then on the implementation measures. The committee's feedback was particularly beneficial in ensuring the tool would be more user-friendly, in addition to differentiation of those concepts best addressed in the land use plan measures versus the implementation measures. Since the committee has experts in the areas covered by the measures and is also comprised of those professionals most likely to use this tool in the future, receiving their feedback was critical to the review and content validation process.

4. Conclusions

Land use plan and implementation measures showed acceptable levels of reliability and consistency, as well as strong face and content validity across all three dual-coder groups. Reliability across all groups with differing backgrounds shows the usefulness and flexibility of this tool for a variety of end users. *The Healthy Living and Active Design: A Scorecard for Comprehensive Planning* was created to include measures that reflect the “gold standard” for strong and comprehensive land use measures pertaining to active living and healthy design. As a result, planners can use this tool to assess their current plans and identify areas for improvement for future land use plans. Identifying a consultant or group of professionals with knowledge of both health and planning provides an opportunity to integrate this tool as part of the process of updating the land use plan in a way that is not too overwhelming. This approach was recently tested by a planning consultant working on recommendations for a plan update as a part of a public health initiative in Kent County, Delaware, called Plan4Health (Plan4Health, 2015–2017). The consultant's results showcased the importance of timeframes and context in which plans were written, and as he states “the types of growth, growth pressures, and land use policies evaluated by a city and a county differ greatly”; therefore impacting the public health scores and interpretation. This is most apparent in the consultant's recommendation to address what the scores mean, as he states: scores can be used as indicators of how a plan is trending toward addressing health. For example, a score of 25 out of 100 would not be considered a “fail” but rather an indication that the plan addresses health, but has room to do so more comprehensively. This summary most accurately depicts the potential for the tool to be used as a way to gauge the progress of those cities and municipalities interested in connecting public health issues to the built environment.

Limitations of this study include all scorers being from the same organization and not official land use planners, as well as the limited number of plans that were scored. A further limitation stems from the CDC cooperative agreement parameters in which this tool was created which required a focus on built environment strategies to reduce obesity. Strengths include geographic variability among plans, as well as the use of three dual-coder groups with differing educational and professional backgrounds, rather than a single-coder group. Future research is needed to establish further validity findings. Further refinements of the measures for clarity of language and scoring examples will be completed in future updates of the tool as well. Item deletion based on psychometrics will also be considered. In addition, coders found it difficult scoring implementation measures against separate zoning and subdivision ordinances versus singular Unified Development Codes. Future work will address best practices for these different regulations processes.

The need to prioritize and refine items so that the tool is user-friendly was an important lesson learned given the wide range of possible items and domains. In addition, the necessity of having a separate implementation scoring tool and subsequent scores became evident as the land use measures were being developed. It became

clear that strong and comprehensive land use plans are not effective without development regulations to ensure implementation (Grey, 2011; Extension, I.S.U., 2001). With the addition of the implementation measures, the scoring tool can answer questions such as: “How good is the plan?” and “How serious is the county/municipality in making it a reality?” However, it should be noted that the presence of an item within the implementation action plan is not a guarantee that it will be implemented. Counties and municipalities need to commit staff and resources for implementation; this is often a challenge in small municipalities with small planning departments and limited resources.

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 development regulations which will shape community designs of a variety of jurisdictions and impact the residents who live there.

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Conflicts of interest

None.

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Appendix A. Key terms.

Key term	Definition
Built environment	Buildings, roads, parks, and all other improvements constructed by people that form the physical character of a community.
Community	(1) A specific group of people, often living in a defined geographic area, who share a common culture, values, and norms and who are arranged in a social structure according to relationships the community has developed over a period of time. (2) More generally, a distinct local area such as a neighborhood, district, jurisdiction or municipality.
Comprehensive land use plan	Also known as a general plan, master plan or land-use plan, is a document designed to guide the future actions of a community. It presents a vision for the future, with long-range goals and objectives for all activities that affect the local government
County	A political subdivision of the state. A major function of counties is to assist the state in administering state programs. Counties provide a variety of important countywide health, welfare and social services that serve all residents within a county. For those areas that are not within a city (often referred to as the “unincorporated areas” of a county), counties exercise land use authority and may also provide such services as law enforcement, fire protection, parks, recreation, public works (including roads), water, waste water, solid waste, and libraries—services that are similar to those cities provide within their boundaries (known as the incorporated areas).

(continued)

Key term	Definition
Environment	Under the California Environmental Quality Act, “the physical conditions which exist within the area which will be affected by a proposed project, including land, air, water, minerals, flora, fauna, noise, objects of historic or aesthetic significance.”
General plan	The general plan is the foundation for local land use planning. The plan provides a vision for the foreseeable planning horizon – usually 10 to 20 years – and translates it into goals and policies for the physical development of the city or county. All other land use ordinances and policies flow from the general plan. The general plan covers all of the land within the jurisdiction and any additional land that, in the agency’s judgment, bears relation to its planning.
Health	A state of physical, mental, and social well-being and not merely the absence of disease and infirmity.
Land use	The occupation or use of land or water area for any human activity or any purpose defined in the general plan.
Land use regulation	A term encompassing the regulation of land in general and often used to mean those regulations incorporated in the general plan, as distinct from zoning regulations (which are more specific).
Planning area	The area directly addressed by the general plan. A city or county planning area typically encompasses the agency’s boundaries and potentially annexable land within its sphere of influence.
Regulation	A rule or order issued by a public agency having the force of law.
Subdivision	The division of a tract of land into defined lots, either improved or unimproved, which can be separately conveyed by sale or lease, and which can be altered or developed. The process often includes setting aside land for streets, sidewalks, parks, public areas, and other infrastructure needs, including the designation of the location of utilities.
Unified development code	Is a local policy instrument that combines traditional zoning and subdivision regulations, along with other desired city regulations, such as design guidelines, sign regulations, and floodplain and stormwater management, into one document.
Zoning	The division of a city or county by legislative regulations into areas, or zones, that specify allowable uses for real property and size restrictions for buildings within these areas; a program that implements policies of the general plan.

Appendix B. 50 comprehensive plan measures.

The following table illustrates the 50 measures used to score a comprehensive plan as related to incorporation of health concepts. Each measure provides a score of 1 or 2 based on the verbiage in the plan related to the concept. These scores are used to calculate the strength and comprehensiveness.

A. Overall plan, vision and strategy	
P-1	The plan explicitly recognizes the relationship of the built environment to obesity, chronic disease and public health in general.
P-2	The plan demonstrates collaboration with public health officials, public health advocates, relevant institutions and stakeholder groups.
P-3	The plan addresses health inequities among populations within its jurisdiction.
P-4	The plan contains a stand-alone health chapter or element.
P-5	The plan refers to Health Impact Assessments (HIAs).
P-6	The plan establishes a relationship between land use decisions and social cohesion/mental health.
B. Healthy living	
<i>How we move around</i>	
P-7	The plan mentions reducing car dependency as a means of improving public health.
P-8	The plan includes a goal or objective to increase the number of citizens who walk or bike to work and other daily activities.
P-9	Complete Streets: The plan references “Complete Streets” principles.
P-10	Complete Streets: The plan includes a bicycle/pedestrian plan.
P-11	Complete Streets: The plan includes traffic calming goals and measures.
P-12	Complete Streets: The plan includes references to measures that improve pedestrian mobility and safety.
P-13	Complete Streets: The plan requires developers to provide bicycle, pedestrian

and wheelchair access in new communities.

- P-14 The plan seeks the development or extension of off-road greenways and trails for biking and walking.
- P-15 The plan recommends reduced parking requirements for developments located near transit stops and/or with bicycle, pedestrian and wheelchair access.
- P-16 The plan identifies access to health care and mobility as issues of special concern to aging populations.
- P-17 The plan identifies access to health care and mobility as issues of special concern to disadvantaged populations.
- P-18 The plan supports “Safe Routes to School” for children or other mechanisms that support children walking or riding bikes to schools, including locating schools closer to residential areas.
- P-19 The plan supports the co-location of community services in school buildings.
- How we eat and drink*
- P-20 The plan supports the preservation of existing working farms.
- P-21 The plan supports the preservation or development of “urban” or specialty farms, which grow products such as vegetables, herbs, honey, eggs, flowers and plants for local distribution and sale (in addition to or instead of commodity crops such as corn and soybeans).
- P-22 The plan cites the need to increase access to healthy food, especially in low-income communities where “food deserts” may exist.
- P-23 The plan supports the creation and sustainability of community gardens.
- P-24 The plan addresses the creation and sustainability of farmer’s markets.
- P-25 The plan includes an objective to increase the number of full-service grocery stores in underserved areas.
- P-26 The plan supports businesses that provide healthier food and drink options, especially in documented underserved areas.
- P-27 The plan addresses access to drinking water and/or promotes installation of water fountains.
- How we play and get our exercise*
- P-28 The plan sets goals for access to open space, parks and recreational facilities.
- P-29 The plan refers to the latest Statewide Comprehensive Outdoor Recreation Plan (SCORP).
- P-30 The plan establishes a high level of service for parks – for factors such as lighting, cleanliness, safety.
- P-31 The plan establishes standards for developer-provided open space within developments.
- P-32 The plan identifies geographic areas with the greatest need for more physical activity.
- How we get and stay well*
- P-33 The plan includes data on the number of health and human service outlets available to populations in need in the jurisdiction.
- P-34 The plan includes policies to work with relevant state agencies to improve access of all citizens to health care and wellness services.
- P-35 The plan supports policies that enable aging in place.

C. Active design: how we plan and build

- P-36 The plan supports walkable, mixed-use development.
- P-37 The plan identifies the need to plan and build connected street networks in mixed-use areas that are pedestrian-friendly.
- P-38 Compact development: The plan promotes compact development to promote livability, walkability and transportation efficiency.
- P-39 Compact development: The plan addresses transit-oriented design.
- P-40 Compact development: The plan supports Traditional Neighborhood Development, or village-style development.
- P-41 Compact development: The plan supports infill and redevelopment of greyfields in areas already served by public infrastructure.
- P-42 Compact development: The plan supports repurposing, adaptation and reuse of older buildings rather than demolition and new construction on greenfields.
- P-43 Compact development: The plan supports connectivity between developments.
- P-44 Compact development: The plan supports accessory dwelling units in appropriate locations to create affordable options in existing communities and foster social cohesion for older citizens, young people just starting out, and others who can’t afford or don’t want to live in a single-family dwelling.
- P-45 The plan promotes “third places” and public spaces.
- P-46 The plan addresses the use of street trees for shade and to enhance walkability.
- P-47 The plan supports the orientation of buildings to face the street or include windows that face the street (promoting “natural surveillance” and making walking safer).
- P-48 The plan supports recognized third-party standards for healthy building design and operations, such as Leadership in Energy and Environmental Design (LEED).
- P-49 The plan supports recognized third-party standards for sustainable, healthy mixed-use communities such as STAR Communities or LEED for Neighborhood Development.
- P-50 The plan supports intergovernmental coordination that ensures mobility and seamless access to services between jurisdictions.

Appendix C. Implementation measures.

The following table lists the measures indicating the level in which a plan identifies action items that support implementation of the comprehensive plan. A measure is scored with a 0 for no mention at all, or a 1 for a given action item being present to support the measure.

D. Implementing a plan of action

- I-1 An action plan is present that includes, at least in part, implementation of the healthy living and active design goals of the comprehensive plan and addresses the Scorecard's measures relating to overall plan, vision and strategy.
- I-2 The implementation action plan specifically demonstrates intergovernmental coordination and collaboration with public health officials, public health advocates, relevant institutions and stakeholder groups.
- I-3 The implementation action plan includes specific measures for addressing health inequities among specific populations, such as those in high poverty areas, the elderly or the disabled.
- I-4 The implementation action plan directs the development of a health impact assessment (HIA) process or protocol and specifies the type of developments or projects that would benefit from an HIA.

E. Healthy living

How we move around

- I-5 The implementation action plan details a policy for decreasing car dependency in partnership with the local Metropolitan Planning Organization (MPO), transportation agency and other potential stakeholders such as ride-share, bicycle and health advocacy organizations.
- I-6 The implementation action plan details a policy for achieving a "complete streets" approach to mobility and zoning.
- I-7 The land use and development regulations require traffic calming measures that slow traffic and enable safer non-motorized transportation.
- I-8 Bicycle, pedestrian and wheelchair mobility are required in new mixed-use and commercial developments.
- I-9 Implementation action plan details policies, resources and partnerships that will lead to the addition or extension of off-road greenways and trails for biking and walking.
- I-10 The land use and development regulations allow for reduced parking requirements.
- I-11 The implementation action plan identifies specific objectives, resources, partners and tracking measures for increasing safe routes to schools.
- I-12 The implementation action plan identifies potential projects where co-location of community services could be achieved.

How we eat and drink

- I-13 Existing working farms are valued and preserved through specific implementation mechanisms.
- I-14 Urban or specialty farms are allowed and encouraged through specific implementation mechanisms. These mechanisms are the same as in the working farms measure, in addition to access to technical assistance and business and financial incentives.
- I-15 The implementation action plan includes objectives for reducing the occurrence of "food deserts," along with metrics to track progress.
- I-16 The land use and development regulations enable community gardens.
- I-17 The land use and development regulations enable farmer's markets.
- I-18 The land use and development regulations require access to public drinking water where appropriate.

How we play and get our exercise

- I-19 The implementation action plan includes specific objectives for improving and/or expanding open space, parks and recreational facilities where needed and providing resources for a high level of services
- I-20 The land use and development regulations set standards and requirements for developer-provided open space within developments.

F. Active design

How we plan and build

- I-21 Site design standards promote walkability and connectivity.
- I-22 Zones, overlays or floating zones that promote compact development, mixed use and multi-modal transportation are present in the implementing code.
- I-23 Such zones, overlays or floating zones that promote compact development, mixed-use and multi-modal transportation include incentives to encourage their use.
- I-24 The land use and development regulations require connectivity between developments.
- I-25 The land use and development regulations permit accessory dwelling units in appropriate locations to create affordable housing options within existing communities.
- I-26 The land use and development regulations set requirements for "third places" or other civic spaces.
- I-27 Street trees are required in new developments.
- I-28 The land use and development regulations provide approval and/or financial

incentives for use of third-party standards for sustainable, healthy mixed-use communities such as leadership for energy and environmental design (LEED for building design and construction, LEED for neighborhood development), National Green Building Standard, or STAR communities (sustainability tools for assessing and rating communities).

- I-29 The local government pursues intergovernmental agreements that ensure mobility and seamless access to services between jurisdictions.

Appendix D. Comprehensive land use plans and development regulations reviewed.

Region	Location	Population size	Plan type	Plan year	Implementation document(s)
Midwest	Greenville, IL	6860	City	2005	Unified development code
Midwest	Dubuque, IA	58,068	City	2012	Unified development code
Midwest	Blue Springs, MO	53,053	City	2014	Unified development code
Midwest	Olathe, KS	129,913	City	2010	Unified development code
Midwest	Linn County, IA	214,927	County	2013	Unified development code
Midwest	Waseca County, MN	19,127	County	2005	Unified development code
Midwest	Duluth, MN	86,239	City	2006	Unified development code
Midwest	Lanexa, KS	49,573	City	2015	Unified development code
Northeast	Radnor, PA	31,474	Township	2003	Zoning and subdivision codes
Northeast	Baltimore County, MD	817,720	County	2010	Zoning and subdivision codes
Northeast	Caroline County, MD	32,759	County	2010	Zoning and subdivision codes
Northeast	Dover, DE	36,826	City	2008	Zoning and subdivision codes
Northeast	Denton, MD	4361	Town	2010	Zoning and subdivision codes
Northeast	Kent County, DE	167,477	County	2007	Zoning and subdivision codes
Southwest	Georgetown, TX	53,007	City	2009	Unified development code
Southeast	Forsyth County, GA	189,314	County	2012	Unified development code
Southeast	Hammond, LA	20,207	City	2011	Unified development code
Southeast	Marshall, NC	897	Town	2009	Unified development code
Southeast	Wheeling, WV	28,129	City	2014	Unified development code
Southeast	Lafayette, LA	123,528	City	2014	Unified development code
Southeast	Fredericksburg, VA	26,632	City	2015	Unified development code
Southeast	Palm Beach County, FL	1,359,074	County	2015	Unified development code
Southeast	Suffolk, VA	85,477	City	2006	Zoning and subdivision codes
Southeast	Douglas County, GA	135,037	County	2013	Unified development code
Southeast	Raleigh, NC	423,287	City	2015	Unified development code
Southeast	Canton, GA	23,841	City	2008	Unified development code
Southwest	Buda, TX	9443	City	2011	Unified development code
Southwest	Schertz, TX	35,093	City	2002	Unified development code
Southwest	Seguin, TX	26,237	City	2008	Unified development code
Southwest	Temple, TX	68,877	City	2008	Unified development code
Southwest	Altus, OK	19,716	City	2004	Unified development code

(continued)

Region	Location	Population size	Plan type	Plan year	Implementation document(s)
Southwest	Rockwall, TX	39,948	City	2012	Unified development code
Southwest	Dona Ana County, NM	212,942	County	2015	Unified development code
West	Santa Clarita, CA	179,030	City	2011	Unified development code
West	Salem, OR	157,967	City	2015	Unified development code
West	Olympia, WA	47,847	City	2014	Unified development code
West	Grant County, WA	91,458	County	2006	Unified development code
West	Skagit County, WA	118,364	County	2007	Unified development code
West	Denver, CO	633,777	City	2000	Zoning and subdivision codes
West	Laramie, WY	31,601	City	2003	Unified development code
West	Englewood, CO	31,298	City	2003	Zoning and subdivision codes
West	Richland, WA	51,116	City	2008	Zoning and subdivision codes

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