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Amir Hajrasouliha, California Polytechnic State University, San Luis Obispo

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State of the Art in Planning for College and University Campuses: Site Planning and Beyond

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State of the Art in Planning for College and University Campuses

Linda C. Dalton, Amir H. Hajrasouliha, and William W. Riggs

The term campus plan evokes images of Thomas Jefferson’s design for the University of Virginia, Harvard’s interconnected quads, or Princeton’s neo-Gothic architecture. Campus planning continues to be important, particularly as older universities redevelop space to serve new disciplines, increase student success, incorporate technology, and meet sustainability goals (Taylor, 2016). We use the expressions planning for college and university campuses and campus planning to represent a broad, long-term, physical planning perspective that occurs within the context of the broader mission of higher education in the United States.¹

Most colleges and universities have developed policies and practices to address issues such as improving graduation rates, increasing diversity, protecting personal safety, improving students’ accountability for their behavior, and providing for cybersecurity. The physical environment is not likely the primary factor at play in addressing these social issues. Yet recent research in environmental design suggests that campus planning can ensure a supportive physical environment (Hajrasouliha, 2017a; Hajrasouliha & Ewing, 2016; Kenney, Dumont, & Kenney, 2005; Taylor, 2016).

Some pundits have predicted market segmentation and the demise of some place-based colleges and universities, particularly with the increasing presence of environmental sustainability and on community interface planning that supports economic development and reduces environmental impacts. City planners should expand campus district planning to address a broad array of issues and opportunities. Both university and city planners should facilitate collaboration between their institutions. Scholars should study a wide range of colleges and universities, including 2-year as well as 4-year institutions and those in nonurban settings.

Keywords: campus planning, master planning, town–gown relations

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¹ The term campus plan evokes images of Thomas Jefferson’s design for the University of Virginia, Harvard’s interconnected quads, or Princeton’s neo-Gothic architecture. Campus planning continues to be important, particularly as older universities redevelop space to serve new disciplines, increase student success, incorporate technology, and meet sustainability goals (Taylor, 2016). We use the expressions planning for college and university campuses and campus planning to represent a broad, long-term, physical planning perspective that occurs within the context of the broader mission of higher education in the United States. Most colleges and universities have developed policies and practices to address issues such as improving graduation rates, increasing diversity, protecting personal safety, improving students’ accountability for their behavior, and providing for cybersecurity. The physical environment is not likely the primary factor at play in addressing these social issues. Yet recent research in environmental design suggests that campus planning can ensure a supportive physical environment (Hajrasouliha, 2017a; Hajrasouliha & Ewing, 2016; Kenney, Dumont, & Kenney, 2005; Taylor, 2016).

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online learning (e.g., Harden, 2012). Higher education institutions and communities that value face-to-face education, however, need to plan their campuses effectively for the future (Haggans, 2016). Duderstadt (2000) comments, “With change will come unprecedented opportunities for those universities with the vision, the wisdom, and the courage to lead in the twenty-first century” (p. 10).

In this review we focus on how planning for college and university campuses in the United States involves human and institutional activity patterns with wide impacts. Nearby communities experience the benefits and impacts of a college or university whether it is in a metropolitan area or isolated location. Expansion plans have been particularly contentious when universities displace nearby residents and businesses; student behavior is typically the top issue in town–gown relations (Checker, 2011; Hubbard, 2008).

We begin with an assessment of the empirical literature on campus planning in the United States. Our framework focuses on three geographical scales: the campus (or campus park), the campus–community interface, and the larger campus district. We discuss how research at each scale covers several cross-cutting topics: land use, design, sustainability, economic development, and collaboration. We conclude that campus planning offers many opportunities for university and community planners to work together. Furthermore, scholars should broaden their studies of campus planning to cover a wider array of institutions and issues.

Campus Planning Literature: Review Framework

Richard P. Dober observed, in the 1996 edition of his treatise on campus planning, “Lacking an organized body of research or theory, campus planning is likely to be continued on a pragmatic basis” (p. 12). Twenty years later, a body of research has begun to emerge on campus master plans, the campus–community interface, and the larger campus district. We discuss how research at each scale covers several cross-cutting topics: land use, design, sustainability, economic development, and collaboration. We conclude that campus planning offers many opportunities for university and community planners to work together. Furthermore, scholars should broaden their studies of campus planning to cover a wider array of institutions and issues.

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1. **Campus master planning** focuses on site planning and the physical development of the visible campus, or *campus park*. A president or chancellor often initiates a master plan to prepare for a significant change such as an increase in enrollment. Master plan documents include background analysis, guiding principles, design framework, site plan, land use, transportation, infrastructure, utilities and other elements, and implementation and phasing (Dalton, 2016). The process typically culminates with the formal adoption of a heavily illustrated plan by the college or university’s governing board (trustees or regents).  

2. **Campus–community interface planning** addresses activity patterns that physically connect the college or university with the surrounding community, including infrastructure, circulation, housing, government services, cultural activities, athletic events, retail establishments, and other businesses. Either the university or a public agency may initiate the process, which involves negotiations over the responsibilities each entity will assume. The results are documented by agreements or memoranda of understanding signed by all parties rather than by formal plans.  

3. **Campus district planning** covers the larger area surrounding a college or university. Cities typically initiate planning at this scale and designate these districts formally, often in response to contentious town–gown issues. Planning for a campus district, like planning for other districts or neighborhoods within a city, involves members of the community and college or university as well as the city's planning staff. The city may develop land use plans, adopt development policies, enact regulations, and implement other programs in the plan.  

Figure 1 shows the three geographical scales of campus planning schematically to include 1) the traditionally defined campus park, 2) the physical interface between the campus and its immediate community, and 3) the larger surrounding district as may be defined by the city or town in which the college or university is located.

**Five Cross-Cutting Topics in Campus Planning**

Hajrasouliha (2017b) extensively reviews the literature and examines 50 randomly selected master plans in the United States to identify the most common goals, actions, and design strategies in campus master planning. He distills four big ideas representing trends in U.S. campus master planning: Green Campus, Complete Campus, Cohesive Campus, and Contextual Campus. In this essay we expand these four big ideas to five planning topics at the three geographical scales:

- **Land use** is a central component of the Complete Campus trend. This theme emphasizes a holistic campus: a convenient location to live, learn, work, and socialize. This topic also encompasses improving the sense of community, livability, safety, and walkability of the campus park, the campus–community interface, and the larger campus district.

<table>
<thead>
<tr>
<th>Scope</th>
<th>Campus master planning</th>
<th>Campus–community interface planning</th>
<th>Campus district planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical initiator</td>
<td>College or university</td>
<td>Either</td>
<td>City or community</td>
</tr>
<tr>
<td>Documentation</td>
<td>Adopted plan (by trustees or regents)</td>
<td>Formal or informal agreement</td>
<td>Adopted plan, development regulations (by city)</td>
</tr>
</tbody>
</table>

Table 1. The scope of campus planning at three geographical scales.
• *Design* and aesthetics are important to developing a Cohesive Campus, which entails looking at a campus as “a work of art” (Chapman, 2006, p. 4). Campus master plans traditionally focused on this idea by establishing design guidelines and codes. The main goals of this theme are to improve the legibility, imageability, and sense of identity of campuses, which can extend beyond the campus park to larger scales of planning and development.

• *Sustainability*, or the concept of a Green Campus, involves looking at the campus and its setting as an ecosystem. Changing travel behavior, reducing gas emissions, increasing natural resource conservation, and improving the visual quality of landscaping are common goals (Evans, Jones, Karvonen, Millard, & Wendler, 2015; Knuth, Nagle, Steuer, & Yarnal, 2007; Ng et al., 2010; Riggs, 2017).

• *Economic development* is one aspect of a Contextual Campus, integrated with the socioeconomic and built environment of the surrounding community. This sometimes involves capital investment and other forms of economic development in neighborhoods nearby.

• *Collaboration* is another aspect of the Contextual Campus, focusing on processes and improving relationships between universities and the surrounding neighborhood. This topic also includes partnerships between universities, public agencies, and private developers.

We searched the literature on these five topics for the three scales of campus planning. We find, however, that there is not much literature on some topics at certain scales, either because they are less applicable (e.g., economic development in campus master planning) or because scholars have not given them much attention.

Issues that have not received much attention have the potential for future investigation. Some universities, for example, are exploring public–private partnerships to fund student housing, but we find no empirical literature assessing this experience. Campus district planning could also address historic preservation, sustainability, and/or economic development, but the research to date has focused on land use and development controls. Therefore, we focus on the 10 cells in Table 2 that cover the topics emphasized in the scholarly literature.

### Scale 1: Campus Master Planning

Chapman (2006), Dober (1996), and Turner (1984) trace U.S. campus design back to its colonial origins. Coulson, Roberts, and Taylor (2010) describe the formal approach in campus planning prior to World War II as the quadrangle, Beaux Arts, pastoral/picturesque, or a hybrid of these types, all of which fit the notion of campus as park. Most historical campus plans reflect a landscape design or architectural theme for organizing open space and buildings. After World War II, “the traditional virtues of campus coherence, human scale, and place distinction” were overtaken by the unprecedented expansion of campuses and the growing dominance of automobiles (Chapman, 2006, p. 3).

The changing needs and means of delivering education during the 21st century have added to the complexity of campus planning. Hashimshony and Haina (2006) conceptualize the challenges and factors that define the future of the physical campus as financial, collaboration with industry, increasing student population and greater diversity, new patterns of teaching and learning (including online learning), growth of interdisciplinary fields of knowledge, and openness to the community.8

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### Table 2. Campus planning topics discussed at each geographical scale.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Campus master planning</th>
<th>Campus–community interface planning</th>
<th>Campus district planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land use</td>
<td>Site plan supportive of learning environment</td>
<td>University expansion; compatibility</td>
<td>Residential neighborhood quality; zoning, building, and housing code enforcement</td>
</tr>
<tr>
<td>Design</td>
<td>Landscape and building design guidelines</td>
<td>Historic preservation</td>
<td></td>
</tr>
<tr>
<td>Sustainability</td>
<td>Energy-efficient design and operations; resource conservation</td>
<td>Transportation demand management</td>
<td></td>
</tr>
<tr>
<td>Economic development</td>
<td>Local economic development; neighborhood improvement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collaboration</td>
<td>Joint projects</td>
<td>Preparation and implementation of district plan</td>
<td></td>
</tr>
</tbody>
</table>
Land Use at the Campus Scale

The main driver for campus land use planning is to support a university’s principal missions: teaching and—for some institutions—research and service. Both the academic and professional literatures emphasize the importance of the physical campus in teaching and learning, even in the internet era (Gorgati & Savid-Buteler, 2016; Haggans, 2016; Hajrasouliha, 2017a; Hajrasouliha & Ewing, 2016; Roberts & Taylor, 2016).

Thomas Jefferson’s layout for the University of Virginia stands out as having a theoretical basis related to how students learn. This relationship is less clear today because of changing business models, evolving pedagogy, and declining public support for higher education. Haggans (2016) argues that the learning environment should be composed of a livable and sustainable physical environment, an active virtual environment, and a vibrant and safe social environment to address the evolving needs of higher education institutions. Kenney et al. (2005) propose a set of land use principles for creating a supportive learning environment, including using density and mixing campus uses (teaching, research, residence, and recreational facilities) to create vitality and interaction and at the same time integrating technology on campus. Many scholars suggest that an effective land use policy for student success and retention is to increase student housing on campus (Hajrasouliha & Ewing, 2016; Jacoby & Garland, 2004; Schudde, 2011).

An essential step in any campus land use plan is to assess space needs associated with these uses. Hajrasouliha (2017b) finds that the most immediate physical challenges that campus master plans cover are deficits in square footage and the diminished quality of facilities. Haggans (2016), however, recommends no net additional square feet for campuses to reduce their financial obligations. Haggans suggests instead rethinking capacity by better managing space and time, upgrading the best, getting rid of the rest, and right-sizing the whole campus.

Design at the Campus Scale

Chapman (2006) argues that universities are seeking to reclaim the sense of place lost in the decades after World War II. Kenney et al. (2005) recommend bringing meaning and beauty to special places on campus and creating a language of landscape elements that expresses the campus’s individuality and relationship to its region. The literature emphasizes the significance of macroscale design strategies rather than investment in \textit{starchitecture} and individual buildings (Coulson et al., 2014; Hajrasouliha, 2017b).

More than 30 years since Hall and Sandler (1984) coined the term \textit{chilly campus climate} for campus safety, female students still experience a culture of fear (Giovannelli & Jackson, 2013; Kelly & Torres, 2006). One of the few studies available makes a direct relationship between the likelihood of sexual assault and a safe built environment (Wiersma-Mosley, Jozkowski, & Martinez, 2017). Karjane, Fisher, and Cullen (2005) argue that campus master plans need to address crime on campus as a safety, financial, and marketing issue. Lighting, wayfinding systems, and increased visual connections are some common design strategies for addressing campus safety (Hajrasouliha, 2017b).

An emerging trend in campus design is promoting health through design. Hipp, Gulwadi, Alves, and Sequeira (2016) show that students associate campus greenness with greater quality of life. Lau, Guo, and Liu (2014) provide three prevailing perspectives for healthy design: healing gardens where greenery and plants produce restorative effects, flexible spaces that accommodate different activities, and green buildings that incorporate open space. They argue a healthy campus should encompass diverse open spaces to satisfy different purposes.

Design for dynamic contexts and different school-specific realities requires flexible planning processes. Gorgati and Savid-Buteler (2016) propose the following actions to increase the feasibility of design projects: virtualizing and visualizing outcomes and project scenarios, developing temporary space prototypes, making decisions based on prototyping and testing feedback, adjusting approaches, and calibrating investment as needed.

Campus design guidelines covering all of these aspects of design can be part of a campus master plan or an independent document. Campus design guidelines typically cover open space, circulation systems, landscaping regulations, site lighting, furnishing, the signage plan, building orientation, building massing, materials, and color palette.\footnote{Hajrasouliha & Ewing, 2016; Jacoby & Garland, 2004; Schudde, 2011.}

Sustainability at the Campus Scale

Defining a sustainable campus form is a multifaceted task. Thomashow (2014), former president of Unity College in Maine, identifies nine elements for a sustainability agenda: energy, food, and materials (aspects of infrastructure); governance, investment, and wellness (aspects of community); and curriculum, interpretation, and aesthetics (aspects of learning). Beringer and Adomßent (2008) describe multiple lenses campuses can use to promote sustainability, from facilities operations to teaching, research, and outreach. These perspectives involve more organizational layers and political cultures (and potentially complexities) than many cities. Leaders in higher education sustainability have called for more integrative approaches (Filho, Shiel, & Paço, 2015; Scott & Gough, 2007), the
most explicit being linking pedagogy with practice on the campus and using the campus as a living lab (Evans et al., 2015; Savanick, Strong, & Manning, 2008). Yet the bulk of sustainability research at the campus level to date deals with reducing energy and consumption (Clayton & Nesnidiol, 2017; Posey & Webster, 2013; Simpson, 2003).

The Association for the Advancement of Sustainability in Higher Education has developed a system to assess and rate sustainability for university campuses known as the Sustainability Tracking, Assessment & Rating System™ (STARS; White & Koester, 2012). STARS is “a transparent, self-reporting framework for colleges and universities to measure their sustainability performance” (Association for the Advancement of Sustainability in Higher Education, 2018). The rating criteria include five categories: academics (curriculum, research), campus and public engagement, operations (e.g., building systems, food and dining, transportation, and resource use), planning and administration, and innovation and leadership. Since STARS launched in 2010, 436 institutions have submitted STARS reports. Of the total participants, 6.5% of institutions choose not to participate in the rating; 16% earned Bronze, 49% Silver, 28% Gold, and 0.5% Platinum ratings.

Campus circulation, parking, and transportation are central aspects of sustainability (Roemmich, Balantekin, & Beeler, 2015; Zhou, 2012). We cover them in the campus–community interface section because they are interconnected with community and regional systems.

Scale II: Campus–Community Interface Planning

Scholars have framed the interface between a university and its community through real estate development and spatial growth until recently (Perry & Wiewel, 2005). In this section we begin with a review of that literature on university growth and development and then discuss more recent interface issues associated with investment in local economic development, environmental sustainability (focusing on transportation), and how they are addressed through university–community partnerships and collaboration.

Land Use and University Expansion at the Campus–Community Interface

Perry and Wiewel (2005) find that many universities become land-locked as communities grow around them. Universities struggle to find land to accommodate academic buildings, research activities, and housing for increasing enrollments and to initiate real estate development to satisfy those needs (Wiewel & Perry, 2005). Carriere (2011) and Winling (2011) illustrate the political sensitivity of university expansion through historical studies. The University of Chicago (IL) and Columbia University (NY) received national media coverage over the years when they sought to expand facilities beyond their traditional campuses (see also Alinsky, 1971). Both were initially excoriated for their treatment of nearby communities after World War II, using urban renewal tactics to fight decay and to acquire property, which ended up displacing low-income, African-American communities.

Recently these universities have adopted more sensitive approaches to working with their communities and have been able to add facilities important to their academic missions (Marcuse & Potter, 2005; Webber, 2005). The University of Pittsburgh’s (PA) experience has been similar to those of Chicago and Columbia; earlier it experienced tension with surrounding neighborhoods, and later it improved its relationship with the community through better communication (Austrian & Norton, 2005; Deitrick & Soska, 2005). Sungu-Eryilmaz (2009) describes how Smith College provided relocation assistance to tenants in college-owned commercial and residential buildings when it needed to build engineering facilities in Northampton (MA).

Norton et al. (2007) illustrate how competing land use priorities come to a head at the intersection of campus and noncampus property. In 2008 University of California, Berkeley, planners began work on a new intercollegiate aquatics facility and an art museum near the campus edge. They wanted to take advantage of site orientation and urban design/placemaking opportunities as well as improve circulation and transportation (Baker, 2008; King, 2008, 2011). The campus plan surprised the community at first because local land use plans did not envision the proposed uses (the museum and competitive athletic pool).

The university did not want to end up in a time-consuming lawsuit, so the lead campus planner engaged the local planning director in regular no-agenda, no notes meetings to strategize about process. The university was then able to complete the projects, adjusting them to meet concerns about height, bulk, traffic, and neighborhood protection. The results were more context-sensitive, publicly acceptable projects that faced little opposition.

Economic Development at the Campus–Community Interface

Perry and Wiewel’s (2005) cases cover universities as landowners and developers who have the potential to engage in local economic development. Both downtown and community economic development typically involve
some university facilities, yet they differ from the university expansion cases we discuss above. The motivation for economic development projects is broader, and such projects often involve complex partnerships between universities and their communities (Cummings, Rosentraub, Doherty, & Coffin, 2005).

Downtown campuses such as Georgia State in Atlanta have contributed to a resurgence in economic activity downtown (Kelley & Parson, 2005). Case Western Reserve much earlier helped to anchor the University Circle urban renewal project in Cleveland (OH; Souther, 2011). Johnson and Wales University (a private institution with about 10,000 students) assumed a visible role in supporting economic development in Providence (RI) in the first two decades of the 21st century (Cooper, Korval-K, Korval, & Mullin, 2014). The Massachusetts Institute of Technology has made a series of investments in Cambridge, recently adding a 2.5 million square foot mixed-use development known as University Park (Chapman, 2009).

Coffey and Dierwechter (2005) credit the new University of Washington campus in Tacoma with turning that city around and indicate the campus enjoys strong community support. The Tacoma case, however, also demonstrates the delicate balance between stimulating economic activity and meeting the needs of disadvantaged communities that might be displaced by economic growth.

Maurrasse (2001) compares the success and longevity of community and economic development partnerships in four very different universities: Hostos Community College (South Bronx, NY; public, 2-year college), San Francisco State (CA; public, master’s-granting university), the University of Pennsylvania (Philadelphia; private, research), and Xavier University (New Orleans, LA; private, historically Black). He finds that the institutional mission and leadership at San Francisco State and the University of Pennsylvania supported their commitments effectively (see also LeGates & Robinson, 1998). Hostos Community College and Xavier University, with more limited resources and less capacity in general, struggled with sustaining their partnership initiatives (Maurrasse, 2001, Chapter 6).

Several case studies emphasize the critical role of presidential leadership in supporting community economic development. The University of Pennsylvania received acclaim for supporting the revitalization of West Philadelphia under President Judith Rodin (Chapman, 2009; Ehlenz, 2015; Maurrasse, 2001; Rodin, 2005; Strom, 2005). Other doctoral universities have engaged similarly with their communities, notably the University of Wisconsin, Milwaukee, and the University of Cincinnati (OH) under the leadership of President Nancy Zimpher when she was president at each (Bromley & Kent, 2006; Klein et al., 2011; Zimpher, Percy, & Brukardt, 2002) and The Ohio State University under President Gordon Gee (Dixon & Roche, 2005).

Like the University of Pennsylvania, other universities recognized that their own continuing success depends on having a thriving local community. Some of these same universities have also explicitly adopted an urban-serving mission and/or identified themselves as engaged universities in supporting community development (Alperovitz, Dubb, & Howard, 2008). Other economic development approaches include Northeastern University’s (MA) Davenport Commons housing partnership (Calder, Grant, & Muson, 2005; Cooper et al., 2014) and partnerships between Clark University and Worcester Polytechnic with Worcester (MA) to build research and mixed-use projects in the Boston area (Cooper et al., 2014). The State University of New York–New Paltz carefully designed its regional economic development strategies to fit its liberal arts focus (Fairweather & Gifford, 2014). This university did not have the skills appropriate for technology transfer or the resources for real estate investment. Instead, it built on its strength in the arts to develop digital design programs for its students and businesses in the region.

Design and Historic Preservation at the Campus–Community Interface

Several universities have worked with their communities to avoid conflict over specific building projects. Chen (2015) documents how the University of Chicago restored and renovated the historic Chicago Theological Seminary building for a new research center while addressing community concerns about maintaining the integrity of the building and its relationship to the Hyde Park–Kenwood Historic District. Kahn (2011) recounts how Keene State College overcame similar concerns about how a new alumni center would fit in with historic Main Street buildings in the small town of Keene (NH).

Sustainability and Infrastructure at the Campus–Community Interface

Colleges and universities maintain their infrastructure within the physical campus, but they may share community facilities such as water and sewage treatment plants either as capital partners or as bulk consumers. They may also enter into mutual aid agreements for public safety, fire protection, and emergency services, depending on the size and nature of the institution.
Transport is the most visible system connecting universities and their communities, posing an environmental as well as operational challenge (Balsas, 2003; Barata, Cruz, & Ferreira, 2011). Many cities have experimented with pricing and transportation demand management (TDM; Manville, 2013; Millard-Ball, Weinberger, & Hampshire, 2014; Pierce, Willson, & Shoup, 2015). In comparison, university transportation programs grapple with a history of treating parking as an entitlement, a key factor that distinguishes them from their municipal counterparts (Shoup, 2008).

Universities experience a flow of travelers throughout the day, as students do not necessarily travel during the peak hours (Bond & Steiner, 2006). Campuses are large trip generators within the urban setting and place a large burden on their respective city neighbors (Daniels & Mulley, 2013; Johnson, Turochy, & LaMondia, 2017), even though students usually have much more compact travel footprints (Delmelle & Delmelle, 2012). Travel for faculty and staff also can be challenging because of a lack of affordable housing near campuses as well as the traditional expectation of parking as a perk (Shoup, 2005b). This has led to studies of how campus parking (and pricing) policies and TDM can encourage or deter driving behaviors (Guo, 2013; Shoup, 2005; Soria-Lara, Marquet, & Miralles-Guasch, 2017; Weinberger, Seaman, & Johnson, 2008; Willson & Shoup, 1990).

TDM refers to a set of policies that nudge travelers to consider alternatives to driving. Litman (2006, 2010) summarizes these measures as ranging from pricing efforts to financial incentives, social awareness initiatives, and educational campaigns; Rotaris and Daniels (2015) and Winters, Menton, and Freed (2008) compare approaches. Campus TDM programs can be implemented through both transportation and nontransportation policies. Transportation policies, for example, might include limits on student parking, employee parking pricing, or prices based on time of day or day of the week (Bianco, 2000; Proulx, Cavagnolo, & Torres-Montoya, 2014; Shoup, 2008). Incentives for carpooling and ridesharing can also be effective at reducing driving, particularly in more dense environments where trip matching can be efficient (Erdoğǎn, Cirillo, & Tremblay, 2015; McCoy, Andrew, & Lyons, 2016).

Nontransportation measures for reducing travel demands on campus include telework for faculty and staff, information and awareness campaigns, housing on or near campus, and/or infrastructure (e.g., providing showers, covered bike parking). Many education programs seek to increase active transportation via walking and biking by emphasizing their health or environmental benefits (Bassett, 2005; Bopp et al., 2016; Jariyasunant et al., 2015).

Effective TDM can equalize travel options and make them more coherent to the consumer, helping to reveal the social and environmental costs of driving (Deakin, 2001; Shoup, 1997, 2005; Willson & Shoup, 1990). Studies have shown that campus TDM can reduce job- or work-related trips where there are trusted social networks (Ferguson, 2000). Such programs involve a combination of coercive/price-based strategies alongside noncoercive, incentive-based strategies (Gärling & Schuitema, 2007), bundling individual efforts together into a comprehensive program. Campuses typically benchmark comprehensive TDM efforts to quantify progress toward trip reduction goals, recently tied to climate mitigation efforts (Cherry, Riggs, Appleyard, Dhakal, & Jeffers, 2018; Frank, 2011; C. K. Lord-Farmer, Riggs, & Greve, 2016).

Managing parking supply can contribute to TDM efforts. Providing less parking also addresses budget constraints (Bridgelall, 2014; Deakin, 2001; Rivadeneyra, Shirgaokar, Deakin, & Riggs, 2017). Empirical research shows that better supply management results in fewer vehicle miles traveled and reduced greenhouse gas emissions (Riggs, 2014; Riggs, Marthinsen, McDougall, & Siegman, 2011), particularly when campuses choose to invest in housing (Cherry et al., 2018; K. Lord-Farmer, Riggs, & Greve, 2017). Managing parking supply can address municipal concerns about traffic congestion (Deakin et al., 2004), most notably for compact, urban, and space-constrained campuses (Barata et al., 2011).

When campuses can be housing providers as well as trip generators, they reduce the need for some vehicular trips altogether (Johnson et al., 2017; Shannon et al., 2006). A study of James Madison University (Harrisonburg, VA) undergraduates reveals that students living on campus were more likely to engage in active transportation and have high levels of physical activity (Peachey & Baller, 2015). Bopp, Kaczynski, and Wittman (2011) conclude that walking and cycling reduced driving and increased physical activity for students, faculty, and staff at Kansas State University but that engaging in this kind of travel was framed by psychological and built environment barriers.

Recent gaming experiments have shown how employees respond when employers offer financial incentives not to come to a campus during certain times (Mandayam & Prabhakar, 2014; Zhu et al., 2015). Behavioral economics has applied social awareness of one’s commute or risk of public embarrassment as a means of influencing campus travel behavior (Jariyasunant et al., 2015; Riggs, 2017). Recent studies show that increasing marketing and education about travel options through mobile tools, print media, or direct outreach continues to be an excellent way...
to encourage cycling and walking (Bopp et al., 2016; Riggs, 2015, 2016; Riggs & Kuo, 2015). These efforts might be bundled with many emerging smart mobility tools and ridesharing options (McCoy et al., 2016).

Campuses and communities can collaborate to encourage a robust community discussion about transportation impacts and alternatives. Bond and Steiner (2006) discuss how the University of Florida partnered with regional transit agencies to increase service along with the availability of transit passes for students, faculty, and staff. The University of Washington and other institutions have offered subsidized or free public transport passes (often called a U-Pass) along with policies to price parking at the market rate and to promote on-campus housing to decrease community and environmental impacts and increase commuting via transit, biking, and walking (Senft & Calgary, 2005; Shannon et al., 2006; Williams & Petrait, 1993). Shoup (2003) echoes the benefits in his evaluation of the BruinGo program at the University of California, Los Angeles, as do Hess, Ray, and Attard (2014) in their assessment of a universal transit pilot at the two University of Buffalo (NY) campuses.

These partnerships face some challenges. At The Ohio State University, many women were reticent to engage in active travel without investment in streetscape infrastructure, such as improved bike lanes and sidewalks, which requires a campus–community partnership to plan, design, and construct (Akar, Fischer, & Namgung, 2013).

Some work has suggested that campus TDM efforts need more targeted initiatives (Riggs & Ross, 2016; Riggs, Rugh, Cheung, & Schwartz, 2016). Some fare programs fall flat and face financial sustainability challenges. The University of Connecticut’s prepaid fare program, for example, was not successful (Zolnik, 2007). Furthermore, the Buffalo program was not renewed because of financial limitations, the fate of many pricing and/or TDM pilot programs. Community-based travel programs such as bike share and bike voucher programs (Allen, Lipton, & Brooke, 1999) may face the same financial sustainability issues.

Loukaitou-Sideris et al. (2014) review campus travel safety, finding that collisions are generally underreported. They frame three different danger zones where collisions are likely to occur near campus—activity hubs, access hubs, and traffic hubs—and focus on the campus periphery as the highest risk location for vehicular collisions with injuries. This again justifies the need for built environment intervention alongside campus TDM efforts.

**Collaboration at the Campus–Community Interface**

A few researchers focus on how universities and their communities can work together on increasing environmentally sustainable, reducing greenhouse gases, and adapting to climate change, focusing on issues other than transportation. Matthews and Smith (2015) describe an initiative called Town + Gown between the City of New York and the City College of New York to support research on sustainability. McComas, Stedman, and Hart (2011) find community support for energy reduction measures by Cornell University (NY). Gruber and colleagues (2017) discover that university research and risk analysis contributed positively to local climate change adaptation efforts.

Gumprecht (2003, 2007) stresses how open space, performance halls, museums, sports events, and other activities at the University of Oklahoma create a social and cultural center for the broader Norman (OK) community: “When it snows, for example, a hill in Brandt Park [on campus] provides the best sledding in town” (Gumprecht, 2007, p. 86). Making university facilities open to the community is only the first step in collaboration.

Universities and communities have discovered that they can develop positive community relations when they collaborate on a project of mutual benefit. Examples include libraries and library operations at Keene State College (Halverson & Plotas, 2006), Front Range Community College (Westminster, CO; Smith, 2006), and San Jose State University (CA; Berry, 2004), where the universities and cities jointly fund and operate these facilities for both community and university constituents. The performing arts center at California Polytechnic State University, San Luis Obispo, is a three-way partnership involving funding from the city, the university, and a nonprofit foundation.

**Scale III: Campus District Planning**

Campus district reports differ from campus–community interface studies in that the context is larger in scope and more comprehensive than the projects or systems typically addressed by campus–community interface planning. Campus or university districts encompass the neighborhood or neighborhoods near the campus and often include residential and commercial land uses. A campus district is often self-designated by residents and/or businesses, just as other urban neighborhoods assume an identity over time with a major land use, geographical feature, or activity such as a park.

A city’s creation of a formal campus district is often triggered by a specific conflict or negative experience between a college or university and the community, particularly student behavior off campus. The city can assert stronger leadership and direction as the initiator of a campus district than it can in campus–community interface situations. Rohnert Park (CA), Cleveland, Columbus
(OH), Portland (OR), Fort Worth (TX), Seattle (WA), Spokane (WA), and Milwaukee have established districts for the areas that surround major universities in these cities. Cincinnati and Minneapolis (MN) have also been studying university impacts within the surrounding area (City of Cincinnati, 2016; City of Columbus, 2015; City of Fort Worth, n.d.; City of Milwaukee, n.d.; City of Minneapolis, 2009; City of Portland, 2016; City of Seattle, 2013).

The limited literature on campus districts shows that the presence of a college or university can have a significant impact on the surrounding community. Sungu-Eryilmaz (2009) finds that communities are becoming more demanding and local governments more assertive, asking colleges and universities to pay their share and assume responsibility for their impacts, just as they expect other large public and private institutions to be responsible for theirs. This has led some cities to initiate planning for university neighborhoods or campus districts.

In this section we trace the major issues in campus districts that emerge from the limited literature—primarily land use planning and development regulation—with a strong emphasis on housing and opportunities for collaboration between communities and universities.

Land Use and Development Regulation at the Campus District Scale

Local governments use common planning tools to manage the land uses and development intensities in areas surrounding universities. Campus district plans sometimes include overlay zones to address specific issues, such as historic buildings, parking, noise, or the number of unrelated individuals who may occupy a housing unit. District plans may also enable memoranda of understanding between local governments and universities addressing campus development beyond traditional boundaries when university buildings are interspersed with other property in the community (Sungu-Eryilmaz, 2009).

District plans focus on the surrounding area because regulation of university properties per se has additional challenges; campus development patterns, and the size and scale of college and university buildings, differ visibly from most other land uses. The applicability of local development regulations to universities varies across states and institutions (Austrian & Norton, 2005). In some states (e.g., California), public universities are exempt from local development regulations, although they are subject to state law and may be required to comply with policies and procedures established by a university system or state coordinating board. Where they have jurisdiction, some cities create institutional use zones that cover all aspects of physical development. Other cities use conditional use permits to regulate individual university projects, although Bunnell and Lawson (2006) criticize this approach as piecemeal.

Housing and neighborhood quality concerns in university districts often arise from student behavior off campus. Age and lifestyle differences between permanent residents and students are a major source of friction. Powell (2014) finds that when students began to dominate neighborhoods (dubbed studentification, a special form of gentrification), tensions increased as permanent residents felt their own influence and control over their community decrease.

Aggestam and Keenan (2007) document how the town of Fairfield (CT) imposed regulations on students renting beachfront properties after a large and disruptive student-sponsored party. Only seniors from Fairfield University (a small college with a total enrollment of 5,000 students) were allowed to live off campus, yet emotions ran high in the aftermath of the party. Aggestam and Keenan conclude that the antagonistic dialogue among local residents, business owners, town officials, university representatives, and students reflected deeper, long-standing friction in the community.

Communities surrounding growing universities that do not house most of their undergraduates on campus often see an increase in rental housing. Vandegrift, Lockshiss, and Lahr (2012) find that housing prices were higher in New Jersey communities with 4-year colleges but not in those with 2-year institutions (which enroll commuter students). Cortes (2004) finds “that the demographic and housing characteristics of university neighborhoods...are unlike other neighborhoods” (p. 368) when studying housing markets in communities near public and private universities in Chicago, Cleveland, Detroit (MI), Milwaukee, and Philadelphia. He finds that enrollment growth was less likely to increase nearby housing costs when a university built student housing to accommodate that increase. Other factors included timing (opening the new housing at the time enrollment grew) and whether university housing increased the total housing supply or displaced existing neighborhood housing.

Collaboration at the Campus District Scale

Campus district planning involves local government, community residents, and sometimes local businesses, as well as university representatives. Misunderstandings and distrust are common among these stakeholders. Such situations sometimes end in regulatory action, as we discuss above. Improving communications is the first step toward collaboration between universities and surrounding districts. The International Town & Gown Association was established in 2008 to address the kinds of university–community relations issues that commonly arise between colleges and universities and their communities (Internati-
Lawson (2006) describe how Portland State University followed. Austrian and Norton (2005) and Bunnell and rather than the city initiated the process and collaboration provides another example, one in which the university tensions between the city, neighborhood, and the university. findings that these efforts had a significant impact on improving neighborhood quality and also improved communica-
tions. At that point The Ohio State University planning faculty and students became involved, helping to document tensions. At that point The Ohio State University planning faculty and students became involved, helping to document code violations and other issues. The Code Enforcement Task Force persuaded the city to adopt new ordinances and to target enforcement to the university area. Evans-Cowley finds that these efforts had a significant impact on improving neighborhood quality and also improved communications between the city, neighborhood, and the university.

Planning in downtown Portland during the 1990s provides another example, one in which the university rather than the city initiated the process and collaboration followed. Austrian and Norton (2005) and Bunnell and Lawson (2006) describe how Portland State University (PSU) successfully integrated campus planning with planning for downtown Portland. Then-President Judith Ramalay saw the need for PSU to expand to accommodate growing enrollment and a larger mission. Bunnell and Lawson find that “developing an official plan for land use and development in the University District…was…important to the University because the PSU campus lay on the cusp between residentially and commercially zoned areas” (p. 31). They conclude that “PSU was motivated to take a leading role in orchestrating the preparation of a plan for the University District so that it could…shape the policies that were included in the plan, and accelerate the process of plan adoption” (p. 40). As in Ohio, planning faculty and students were heavily involved. Some of the ultimate outcomes included a rapid transit stop on campus and an urban center with a public plaza and transit hub.

Evans-Cowley (2006) traces the work of the University Area Commission in Columbus, which represents the neighborhoods surrounding The Ohio State University. The residential neighborhoods had experienced a transition from home ownership to rentals, accompanied by illegal conversions of single-family homes to rooming houses and “garages, attics, and basements” to residential units (p. 113). The University District Code Enforcement Task Force oversaw inspections and replaced complaint-based code enforcement with systematic enforcement. The community was also concerned about issues such as noise, trash, and illegal parking that were not addressed by code enforcement, and a riot after a football game in 2003 exacerbated tensions. The Ohio State University planning faculty and students became involved, helping to document code violations and other issues. The Code Enforcement Task Force persuaded the city to adopt new ordinances and to target enforcement to the university area. Evans-Cowley finds that these efforts had a significant impact on improving neighborhood quality and also improved communications between the city, neighborhood, and the university.

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Conclusion: Implications for Scholarship and Practice

In this review of the published literature we show that significant scholarship on campus planning has begun to develop. The research is thin, however, represented by a few comparative studies and a number of case studies, mostly of large universities in metropolitan locations. Thus, the most important conclusion from our analysis is that we need more scholarly study of campus planning in all its guises, and scholars need to study a full range of colleges and universities.

Maurrasse (2001) finds that university mission and resources make a big difference in how institutions work with their communities. The leadership at State University of New York–New Paltz chose an approach to regional economic development they felt was compatible with the university’s mission and resources (Fairweather & Gifford, 2014). More research can tell us, for example, whether and how the alternative transportation strategies of urban universities might be adapted to suburban or rural situations. We need to know how campus planning can support student learning at commuter institutions as well as those with large residential populations. Scholars who tend to study the experience of their own institutions now need to conduct more longitudinal, comparative, and evaluative research.

The blank cells in Table 2 suggest other important topics that scholars need to address. How might public−private partnerships affect the kind of student housing facilities and programs that universities can provide? Could a district approach to sustainability entail more comprehensive programs and practices than efforts more focused on transportation or energy consumption?

The case studies consistently emphasize the importance of partnership and collaboration in campus planning at the community interface and district scales. University and community planners can apply this finding in future work, working together to improve communication and find common ground regardless of the specific issue or opportunity: a shared facility, university expansion, travel demand management, or student behavior in residential neighborhoods.

College and university planners can focus master planning on two key themes: site planning and design that support student learning. At both the master plan and community interface scales, university planners can use the research findings to enhance sustainable development and operations.

Finally, both university and community planners can collaborate with their campus, community, and interested
scholars to further our understanding of what makes for successful campus planning at all scales. In sum, the literature provides a lot of depth regarding a few situations, which leads to useful inferences about circumstances and factors that explain short-term successes and failures in campus planning. We need more comparative studies and longer term analysis, however, to reach more generalizable conclusions about the results and effectiveness of campus planning (Rubin, 2000).

Notes
1. The Society for College and University Planning (http://www.scup.org/page/resources) and the American Council on Education (http://www.acenet.edu/higher-education/Pages/default.aspx) provide extensive resources and publications on strategic planning in higher education, which we do not address given our focus on physical planning for campuses (Society for College and University Planning, 2017).
2. The comparative data in this section draw from the Carnegie data and typologies (Center for Postsecondary Research, 2015). About half of the institutions of higher education in the United States are in cities, one-fourth are in suburbs, and the other fourth are in small towns and rural areas.
3. Only a few of the case studies were conducted by authors not affiliated with any of the colleges or universities covered (Bromley & Kent, 2006; Cooper, Korval, & Mullin, 2014; Hajrasouliha, 2017b). We used authors’ biographical summaries to determine their affiliations. We were not always able to discern whether an author was directly involved in the planning or implementation of the initiative or relationship. Furthermore, some authors had moved to other institutions by the time the article was published.
4. We focus on physical planning yet recognize that universities may also engage in other kinds of activities that affect student learning and community development, such as applied research, service-learning, and community empowerment. See, for example, Britton and Aires (2014), Corburn, Curf, Arredondo, and Malagon (2015), Dewar and Isaacs (1998), Heaney (2013), Lambert-Pennington, Reardon, and Robinson (2011), Lowe (2008), McClintock, Cooper, and Khandeshi (2013), Nyden, Figert, Shibley, and Burrows (1997), Raja, Ball, Booth, Haberstro, and Veith (2009), Reardon (1998, 2000), and Rubin (1998). A number of these activities have been funded by federal grants or private foundations.
5. To see a typical campus master plan, see http://www.masterplan.wisc.edu/2005report.htm.
6. Campus master plans sometimes cover some interface topics, such as traffic, as off-site impacts, particularly if the plan is subject to environmental review. We consider traffic extensively at the campus–community interface planning level. To learn more about a typical partnership agreement, see the City of Berkeley’s Downtown Area Plan (http://goo.gl/AbDAN7), agreed to as part of negotiations over the campus master plan (http://www.berkeley.edu/administration/ldp/pdf/settlement.pdf).
7. To see a typical campus district plan, see http://www.seattle.gov/dpd/cs/groups/pam/@pan/documents/web_informational/p2535413.pdf.
8. Several authors suggest the topic of technology and smart campuses should be addressed by campus planners (Hipwell, 2014; McGee & Díaz, 2005; Ng et al., 2010; Yu, Liang, Xu, Yang, & Guo, 2011). However, this topic is yet to be fully discussed in the literature.
10. Unlike the regular Carnegie classification, which includes all higher education institutions in the United States, universities must apply for the engaged university status. This process is now managed by the New England Resource Center for Higher Education (n.d.), housed at the University of Massachusetts, Boston. Urban-serving universities are also self-identified and are a smaller group because they only include public research institutions (Coalition of Urban Serving Universities, 2018). This review includes engaged university studies that focus on the campus–community interface or campus district. For a sampling of broader activities, see, for example, Feld (1998) and Mayfield (2001).
11. The literature rarely addresses the municipal or community perspective on universities and colleges and how they specifically approach campus district planning. We find references to campus and university districts on city websites and by attending conference sessions of the American Planning Association and its chapters, but these postings or sessions do not provide a scholarly perspective on campus district planning.
12. This trend appears in the form of litigation by the local government or community organizations rather than in scholarly articles (e.g., Pinsker, 1996).

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