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Untapped Density:
Site Design and the Proliferation of Multifamily Housing

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Abstract

Suburban multifamily housing is an often overlooked housing typology that is the fasted growing housing market in the country and holds strong potential for achieving smart growth goals in suburbia. This paper focuses on understanding the roots of suburban multifamily site design and development. Through case studies of suburban multifamily development in Oregon and Arizona, this paper looks at the specific ways in which regulation, typical development practice, and design culture have shaped the current pattern of suburban multifamily development. It then proposes ways in which current planning, development, and design practices might shift in order to take advantage of this growing housing trend to create more livable, less congested, and multi-modal suburban communities.

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Suburbia is engrained in the minds of most individuals as a combination of single family homes, nuclear families, strip malls, and office parks. Strangely absent from this image is the ubiquitous and growing suburban multifamily housing development. Currently, one in four housing units in suburbia is an alternative to the single-family home and since 1970 suburban multifamily housing has been the largest growing housing market in the United States, far outpacing the growth of the suburban single family housing market (U.S. Census Bureau 1973 through 2005). Suburban multifamily housing is typically 20 to 30 units per acre, primarily rental property, and provides an existing and widespread model for bringing density into suburbia. It is ubiquitous throughout the country, comprises over 9 million units of suburban housing stock, and if current trends continue, 5 million additional units will be constructed in the next 20 years (Larco 2008-forthcoming).

This overlooked housing type holds tremendous promise for achieving smart growth goals in suburbia in that it is dense, typically located near commercial and retail centers, and houses a population that has shown a propensity for non-auto travel. While many authors have debated for and against the hypothetical acceptability of density in suburbia (Carliner 1999; Danielsen, Lang, and Fulton 1999; Easterbrook 1999; Ewing 1997; Gordon and Richardson 1997; Morrow-Jones, Irwin, and Roe 2004; Myers 2001), they have overlooked the fact that a large amount of dense housing development already exists in the suburbs and that the market for this housing type continues to grow. Given this reality, the question is therefore not if density would be acceptable or feasible in suburbia. Instead, it is important to focus on how we are implementing density and how the existing demographic and physical composition of multifamily suburbia might relate to smart growth goals.

Of central importance to how we implement density is the site design of suburban multifamily development. The current planning approach has been to locate this housing type near arterials (Peiser 1989) and to use it as a buffer between single family housing and commercial uses. While this approach has led to a potentially charged condition of density adjacent to commercial uses, the actual site design of a vast majority of these developments continues to adopt the detached and enclaved single family home development pattern. This negates the potential synergy of suburban multifamily housing developments and creates areas that are often uninviting, overwhelmingly auto-dominated, and with minimal connections to adjacent uses.

In this paper, I focus on understanding the roots of suburban multifamily site design and look specifically at the ways in which regulation, typical development practice, and design culture have shaped the current pattern of suburban multifamily development. I then analyze the barriers to creating more integrated and connected site approaches and propose ways in which current planning, development, and design practices might shift in order to take advantage of this growing housing trend to create more livable, less congested, and multi-modal suburban communities.

This paper is based on three case study sites of suburban multifamily housing in Oregon and Arizona. Each case study site was developed within the last 3 years, had more than fifty housing units, was located in a suburban setting, and was rental property. The case studies included a resident survey that asked demographic and transportation related questions, graphic analysis of the physical site designs, and interviews with planners, developers, and designers associated with the projects. While all of those

interviewed where connected to one of the three case study sites, the interviews also asked broad questions about each individual's experience with the range of suburban multifamily projects with which they had been involved. Taking this into account, the responses I received from those interviewed reflected the combined experiences of hundreds of suburban multifamily projects in over 25 different jurisdictions.

Suburban Multifamily Housing: What is it and Who Lives There?

Although ubiquitous throughout the country, suburban multifamily housing is an often overlooked development type. Due to codes, market demand, and economic realities, suburban multifamily housing typically follows one of three typological models: Garden Apartments/Condominiums, Elderly Housing, and Mixed Use Lifestyle Centers. By far the most prevalent model is the 'Garden Apartment/Condominium.' This housing type is typically two to three stories in height, usually without elevators, often has an exterior entry for each unit, and includes integral parking and open space (See Fig. 1 and 2). Due to the development of fairly consistent building codes across the country, especially in terms of fire safety and accessibility standards, the three story height is rarely exceeded in this model. Similarly, due to land cost, construction costs, and rental rates, these units are rarely less than two stories tall.

Based on housing density, these garden apartment/condominium developments are almost always in areas that have access to public sewer systems (U.S. Census Bureau 1973 through 2005). Reaching densities of up to 30 units per acre (similar to the average density of San Francisco), these housing developments are often multi-building and while primarily rentals, also exist as ownership communities.

Elderly housing has experienced significant growth in the last decade and differs from the garden apartment/condominium in that it almost universally has elevators, a reduced amount of parking, entry to units through a shared common interior space, and often includes group kitchen, dining, and recreational spaces. Because of the addition of the elevator and interior entry to units, this model of multifamily housing can often reach five or six stories in height.

Mixed-use lifestyle centers are a fairly recent development phenomenon which combines retail establishments, highly designed pedestrian environments, and multifamily housing in one, compact suburban location. This building type often includes elevators, has shared unit access through an enclosed lobby, and provides dedicated parking for residents separate from retail parking. Again, due to the addition of elevators and interior unit access, this model can reach five or six stories in height. Although this trend is in its infancy, the success of these developments coupled with the growth of the high-end apartment market (Goodman 2001; Obrinsky 2000) points to the potential for continued growth in this more affluent suburban multifamily housing market.

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Contrary to the low-income, 'housing of last resort' stereotype related to this housing type, suburban multifamily housing is actually a choice selected by many individuals based on their lifestyle and stage in the lifecycle. Specific demographics such as young singles, couples without children, the elderly, and the divorced are attracted to this housing type as it provides affordability, reduced maintenance requirements, and increased ease in changing places of residence. In general, suburban multifamily householders are younger than suburban single family householders and although they typically earn less than single family householders, they represent a large range of income levels. While this housing type is typically more

affordable than adjacent single family housing, it is by no means strictly low-income housing. (For an analysis of suburban multifamily resident demographics, see Larco 2008-forthcoming).

Locating Suburban Multifamily Housing

The location of suburban multifamily housing, relative to other land uses, creates a strong potential for a smart growth alternative to the auto-centric model of suburbia. Research that has touched on suburban multifamily location has shown that it is typically situated along arterials, and near commercial development (Moudon and Hess 2000). While much of suburbia is an undifferentiated carpet of single family housing, multifamily housing is fairly consistently concentrated near commercial locations regardless of the jurisdiction in which they reside.

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As part of the case study research, an evaluation of the location of suburban multifamily housing in the greater Phoenix area confirmed the co-location of this housing type and commercial properties. In this study, we looked at all suburban multifamily developments containing more than 50 units that were completed between January 2004 and December 2006. This yielded 82 developments geographically scattered throughout the region and within 17 different municipalities. We mapped these developments and, using Maricopa county tax data, analyzed parcels that existed near these developments. Of the 82 developments in the study, 26 had commercial or retail uses within 1/8 mile of the multifamily parcel and the remaining 56 had these uses within 1/4 mile, both of which are walkable distances (See Fig. 3).

This pattern of locating suburban multifamily housing between commercial and single family housing uses is not only visible in Phoenix, as it is repeated in municipalities across the country (See Fig. 4). In interviews with planners in Arizona, Oregon, and California, they often noted that this location of multifamily housing was based two points. First, on a pragmatic level, locating suburban multifamily housing along arterials or other higher volume streets was based on a general concern that higher density housing will increase auto traffic. Although multifamily housing typically generates less auto trips per unit than single family housing (Institute of Transportation Engineers 2003), the concentration of units can add auto traffic to local streets. Second, planners in all three states indicated that they located and used suburban multifamily housing as a buffer between single family housing and commercial parcels. Although not stated, planners implied that multifamily housing was more acceptable to single family residents than would be an adjacent commercial parcel and that multifamily residents and/or developers were more willing than single family residents to accept commercial adjacencies. This sentiment and practice has been guided primarily by a history of unsympathetic planning policy which has marginalized suburban multifamily development and used it primarily at the service of single family development (see Hess 2005 for a description of the planning and policy bias against suburban multifamily housing).

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While historically the location of suburban multifamily housing has been derived for reasons that minimized the nuisances of commercial adjacency and increased traffic, this has also unwittingly created a potential mixed use, smart growth benefit with high

density housing located adjacent to commercial areas throughout the country. Although this suburban multifamily housing typology is rarely mentioned, this adjacency is exactly the idealized vision currently promoted by many smart growth and New Urbanism advocates.

A History of Separateness: The Enclaved Development

The development of suburban multifamily housing has largely followed the enclaved model of development generally found in suburbia. In this model, street networks have their own logic, strictly internal to a development, rarely connect to adjacent parcels, and provide only minimal linkages to arterials or collector streets (See Fig. 5). This form of development can be traced back to street standards first published by the Federal Housing Administration in the 1930's which promoted a nested hierarchy of streets, major thoroughfares outside of developments, and limited internal connectivity (see Southworth and Ben-Joseph 1997 for a discussion of these standards). While many have criticized this enclaved, disconnected form of development, it has largely persisted for reasons that are discussed below.

> **Lack of Comprehensive Planning**: Suburbs are generally defined by a lack of comprehensive planning with much of the direction and final form of specific developments currently dictated by private developers. These developers typically design neighborhood scale infrastructure improvements and street networks with only broad stroke guidance from zoning and planning codes. Public planning, in relation to street networks, has revolved around larger roadways such as freeways, arterials, and occasionally collector streets that typically affect more than any one single development. This lack of comprehensive network planning has benefits in that it reduces short term risk to municipalities and also allows developers flexibility to react to changing needs and market conditions.
>
> **Uncertainty of Leapfrog Development**: As suburban development typically occurs in a piecemeal, leapfrog fashion, with some parcels developed years before or after adjacent parcels, planners and developers face an uncertainty of what or when adjacent development will occur and therefore, an uncertainty of how to structure potential connections. The default to this uncertainty is to simply deal with all circulation issues on-site and limit connections to the existing collector and arterial roads outside of the specific development.
>
> **Nuisance Avoidance**: By definition, connections within and between developments in suburbia leads to potentially increased interaction and movement of individuals and vehicles. While some argue for the benefits of this connection, depending on the conditions, this interaction can also create negative externalities both between residential developments and between residential and commercial developments. These negative externalities include a potential increase in traffic, a potential increase in crime or the perception of crime, an overflow of cars into on street parking spots or commercial parking lots, and the potential for unwanted noise from commercial vehicles. In order to avoid these potential nuisances, most developments have adopted an enclaved model of development that minimized interaction with adjacent parcels.

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Risk Averse Development (and Financial) Culture: Real estate development is typically a high risk venture in which developers and those that finance development are extremely sensitive to untested ideas. Development patterns that have been vetted in suburbia, namely the enclaved development, are considered less risky due to the fact that they have a history of success. Changing this pattern of development, even in situations where the above barriers are overcome, might still face limitations due to the lack of willingness of developers and financial institutions to attempt new models.

Risk Averse Planning Culture: Similarly, the planners' role in development typically does not allow or incentivize them to take on risks. Pushing for solutions that are outside of the typical code interpretation exposes planning offices to legal liability, attack from developers, confrontation and censure by City Councils or Mayors, and potential critique by citizens. While there are notable exceptions where planners pursue progressive implementation of codes and development, often times, in order to limit their personal risk "local officials do not like the responsibility that comes with a negotiated project, (and) prefer to find the answer in 'the book'" (Jan Krasnoweicki, one of the creators of PUD development practices, quoted in Southworth and Ben-Joseph 1997, pp. 142). Even in 'Planned Unit Developments' that are meant to allow negotiation between planners and developers in order to arrive at mutually beneficial solutions, planners often stay fairly close to what is described in zoning codes.

In addition to these reasons for the widespread practice of enclaved development in suburbia, there are zoning, planning, and development culture issues that have promoted enclaved development models in suburban multifamily housing specifically. In interviews with planners, developers, and designers, some of these were often described as the unintended consequences of zoning codes that rarely address suburban multifamily housing directly.

Lack of Multifamily Specific Zoning: In relation to zoning, multifamily projects often fall under a subset of single family regulations or a subset of commercial regulations, rarely regulated by multifamily specific codes. Neither the single family nor the commercial typologies share the specific needs of multifamily housing due to differences in typical parcel size, parking needs, common space needs, privacy needs, and exposure to public roads. This leads to a condition where regulations provide little guidance to multifamily development and projects are often developed without coordination with larger scale community needs.

Given the risk averse planning culture described above, the lack of multifamily specific regulation is a significant barrier to shaping development or creating more connected developments as there is often no applicable code in place to which planners can refer.

Code Dictated Buffers: Following a tradition of attempting to minimize nuisances between parcels, many zoning codes specifically require physical and/or visual buffers between dissimilar uses. These buffers apply to property lines dividing multifamily housing and single family housing or commercial uses. These types of regulations create a de facto separation which is occasionally

exacerbated when green buffers are used and smaller plants or trees grow unrestrained to create large barriers.

Lack of Street Network Regulation: While a range of regulations dealing with street widths, lengths, and connections typically exist for suburban development, these regulations are almost universally directed at single family development. The inherent nature of single family development dictates that a road network will exist as each single family parcels is required to directly access a right of way. In addition, each parcel has its own setbacks, off-street parking requirements, and un-built area requirements (open space), leading to repetitive parcels with fairly evenly distributed on-site characteristics.

Multifamily development parcel are typically much larger than a single family home parcel, have a number of units and buildings on them, and have no requirement for each unit or each building to directly access a right of way. This creates a situation where the existence of streets as the organizing structure of a development is not necessarily guaranteed. In multifamily development, parking and open space can be shifted as needed within a specific parcel, often leading to a condition where there is virtually no street network and where site plans resemble large parking lots or have a series of continuous parking drives in lieu of streets. This site organization creates a more disconnected condition as it limits consistent or continuous structure between suburban multifamily developments and adjacent parcels (See Fig. 6).

Perceived 'Buffer' Role of Suburban Multifamily Housing: As described above, planners have typically thought of suburban multifamily housing as a buffer between single family developments and commercial parcels. This role has negated any inclination to connect suburban multifamily developments with adjacent properties as it would inherently reduce the separation sought. This does not necessarily imply that planners are specifically against connections, it is simply that they are often not considering connections as an integral component of these developments.

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Often Un-Welcome Development: Suburban multifamily housing has often been stigmatized as low-income housing that burdens local schools and lowers adjacent property values (Downs 1992; Fischel 2004). Although this is largely unfounded (Haughey 2003, 2005; Larco 2008-forthcoming; Nguyen 2005) this stigma has persisted and has created an environment often hostile to suburban multifamily housing. With this as a starting point for development, the idea of connections between uses has often been a non-starter, especially regarding connections between multifamily developments and adjacent single family developments. Fear of negative externalities has led residents and, by extension, planners to accept and promote enclaved suburban multifamily development.

In the Heron Meadows case study in Oregon, a single family neighborhood refused to allow connections to the proposed multifamily development even though the single family residents had regularly travelled through the previously vacant parcel to reach nearby commercial development. The stigma of multifamily development clouded their proven desire for direct pedestrian travel.

Under the Radar: In interviews with planners, developers, and designers, they often stated that they had simply not considered the possibility of connections between suburban multifamily development and adjacent parcels. This was especially the case regarding connections to adjacent commercial properties. In case study sites where no connections were made, all individuals related to those projects stated that they would have been open to considering connections to commercial areas had they been proposed. While this is not a guarantee that they would have agreed to connections, not considering them as part of the development dialog was a critical barrier to the connections ever existing.

Why Connect?

Given that development, regulatory, and design culture point towards enclaved development, it is important to ask, what is to be gained by creating more connected developments? Street connectivity has become an area of interest in the last two decades as progressive planners, developers, and architects have promoted highly connected neo-traditional models of development as more walkable, livable, and healthy (Congress for the New Urbanism 1996; Katz 1993). Street connectivity is defined as the degree of directness and availability of alternative routes within a street network, and is measured by the number of intersections in a given area, the ratio between straight line paths and street network paths, and average block length (Handy et al. 2002). Most of the research on street connectivity has focused on single family developments and has shown significant benefits to increased connectivity. Areas with more connected street networks correlate with increased physical activity (Frank et al. 2005; McGinn et al. 2007; Saelens et al. 2003), lower obesity rates (Booth, Pinkston, and Poston 2005), and increased walking and biking (Frank et al. 2006).

In addition to these benefits, well connected multifamily developments, in specific, could provide additional benefits due to their typical parcel size as well as their location relative to commercial development. The smaller size of multifamily parcels (as compared to single family neighborhoods), often creates a challenge for accommodating service vehicles when only one or two access points to the development are possible. In interviews, multifamily designers stated that fire truck access and turnarounds were the largest limiting factor in site design and limited the flexibility and density of development. If access points were provided in multiple locations across a parcel (as is typical in more connected developments), there would be no need to bring service vehicles throughout the parcel and then out again to the same connection point, potentially minimizing the amount of streets and paving, and providing greater flexibility to site design.

Additionally, connections between suburban multifamily housing and neighboring commercial areas could increase the vibrancy of these commercial areas. Many cities have attempted to revitalize typical suburban strip mall development by creating more pedestrian friendly areas and increasing livability. The proximity and density of suburban multifamily housing provide a client base to these commercial areas and could assist in attaining livability goals.

If You Connect, Will They Come? (By Foot or Bicycle)

While suburbia is rarely considered an environment where any non school-aged person walks or bikes, the travel behavior of suburban multifamily residents challenges that assumption. Using data from the National American Housing Survey, suburban

multifamily residents are more than three times more likely than single family residents to walk or bike to work (3.5% vs. 1.1%), four times more likely to use transit to work (6.6% vs.1.5%), and twice as likely to carpool to work (15.2% vs. 7.3%) (U.S. Census Bureau 1973 through 2005). This travel behavior by suburban multifamily residents approaches the mode choices seen in urban areas and shows that, contrary to popular belief, these residents are inclined to use non-auto modes of transit. In some research, the proximity of subjects' residences to commercial areas or other destinations has limited the degree in which street connectivity has affected travel behavior (Handy 1996; Handy and Clifton 2001). Suburban multifamily housing potentially bypasses this issue as it is typically located directly adjacent or near to commercial areas.

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As part of the case study research, we sent surveys to residents that asked them about demographic information and their travel behavior. In the survey, residents were asked to mark local stores, restaurants, or services they visited and to then draw a line that showed their path of travel to these places if they walked or biked to them (See Fig. 7). In total, 554 surveys were received by residents and 57 were returned (an additional 93 were returned due to vacancy and were therefore not included in the analysis).

In general, the survey results countered the exclusively auto centric stereotype of suburbia (See Table 1). Overall, 61% of respondents walked and/or biked to local stores, restaurants, or services and 74% said they would be amenable to walking and/or biking if local stores, restaurants, or services were easier to get to. The largest barrier to walking and/or biking across all case study sites was the ease and safety of trips, with 31% reporting this. Additionally, 19% of respondents said they either walked, biked, or used transit as their primary or secondary means of transport to work and 44% reported using these means of transport as their primary or secondary means for non-work trips. These preliminary results reinforce the analysis we conducted with the American Housing Survey and positions suburban multifamily housing as a distinct multi-modal development type within suburbia and a potential means of furthering smart growth goals.

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While the case studies were focused on barriers in general and not on comparing more and less connected suburban multifamily developments, the results suggests that the connectivity of developments may play a critical role in the transportation mode choice of residents. We ranked the connectivity of case study sites by number of intersections per acre, number of vehicular or pedestrian connections to areas outside of the developments, and extent of pedestrian network within the developments (See Fig. 8-10 for graphic analysis). When comparing the more connected case study (Heron Meadows in Eugene, Oregon) and two less connected case studies (Trillium at Union Hills and MonteVerde in Phoenix, Arizona), we found distinct similarities and differences. Respondents in the more connected and one less connected development reported a strong inclination to walk and/or bike if local amenities where easier to get to with 87% of Heron Meadows residents reporting so and 93% of Trillium residents reporting so. (MonteVerde respondents reported a substantially lower percentage, but many respondents specifically noted that this was due to a high crime rate in the area).

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Even though respondents across all three developments had a similar number of cars per household, respondents in the more connected development were more than twice as likely to walk and/or bike to local amenities with 87% reporting that they did so. In addition, respondents from the less connected developments reported the ease and/or safety of a potential walking and/or biking trip as the largest barrier to their walking and/or biking. The more connected development reported the weather as the largest barrier and 'no large barriers' as the most common response to that question. Respondents in the more connected development also visited more local stores, restaurants, or services in general and the median number of establishments walked to was three compared to a median of zero establishments walked to in the less connected developments. In addition, a few respondents from the more connected development reported strolling through the neighborhood (i.e. walking without a specific destination).

I should emphasize that these differences between more connected and less connected developments are speculative at this point as the study design did not control for demographics, geographic location, or density. While suggestive, these results point to the need for more research. If further research supports these initial findings, this would point to low cost and fairly easily implementable changes in regulations that could lead to increased non-auto transport by suburban multifamily residents.

Overcoming Obstacles to Connection

While there are currently a number of barriers to creating connections between multifamily developments and adjacent parcels, developing specific multifamily regulation as well as educating planners, developers, designers, and residents about multifamily housing can be effective in promoting more connected developments. This is especially true of fostering connections between multifamily developments and adjacent commercial parcels.

First and foremost, planners and developers must change their understanding of suburban multifamily development. Instead of thinking of these areas as isolated buffers they should be considered critical pieces of larger semi-urban nodes that include commercial development as well as surrounding single family housing. This change includes re-conceptualizing typical commercial strip mall development as not being solely auto-centric but instead also accommodating pedestrian and bicycle connections. We must also re-conceptualize suburban multifamily residents as not being detriments to a community, but instead potentially increasing the vibrancy of suburban areas. By correcting misdirected stereotypes and publicizing the shifting suburban multifamily residential demographics we can mitigate efforts that marginalizing this development type and have historically contributed to its isolation.

Creating multifamily zoning regulation addresses the needs of this specific development type and gives planners a guide that allows them to promote more connected developments without exposing themselves to increased liability and professional risk. There are a few central points that can be addressed by zoning that would mitigate many of the barriers discussed earlier. This preliminary list of best-practices is compiled from multifamily city ordinances (City of Eugene - Oregon 2001; City of San Jose - California 1997; Town of Huntersville - North Carolina 1996) professional reports (Handy, Paterson, and Butler 2003) as well as numerous comments recorded during the case study interviews.

Streets and Street Connectivity Standards: The move towards streets and away from parking drives can contribute substantially to street connectivity by providing a site structure that can integrate with and extend to adjacent site structures. The streets themselves, not parking drives, should be the primary circulation routes through a development. Block sizes should be minimized with typical blocks no longer than 600' in length and block areas no larger than four acres. Streets themselves should remain narrow, preferably with curb-to-curb dimensions no wider than 28'. Buildings should front streets where possible in order to help define the public realm and emphasize the site structure.

Standards should encourage interconnectivity both within a single development as well as to adjacent parcels by maximizing intersections and 'straight line' paths where possible (See Fig. 11). Where existing connection points do not exist, due to adjacent vacant land or enclaved development, connection points should be suggested and made ready. Gated communities, which inherently limit connectivity, should be discouraged.

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Parking Design: Parking drives, where continuous perpendicular parking occurs on both sides of a drive aisle, should be discouraged. Instead, streets should lead to a series of 'Parking Courts' of lengths no larger than 200' and separated occasionally by planting islands (See Fig. 12). Parallel parking should be encouraged on streets themselves. Where the density of development does not allow limited length Parking Courts, larger parking lots should be accommodated but these should still connect to a street network within the development.

Pedestrian Network: The pedestrian network should be considered for uses beyond getting residents from their cars to their front doors. This network should provide connectivity both within the site and to adjacent sites. The extent of the network should be maximized, both in terms of total length and number of intersections provided. Pedestrian paths should have a low, planted buffer between them and streets wherever possible.

Pedestrian connections to adjacent parcels should be encouraged even when vehicular connections are not possible. This includes pedestrian connections to neighboring cul-de-sacs. Pedestrian connections to adjacent commercial parcels should be made at the sidewalk directly in front of buildings where possible and not only along the arterial or collector fronting commercial developments.

Conclusion

While suburbia is typically considered antithetical to smart growth, suburban multifamily housing has the potential to contribute to five of the ten Smart Growth Principles promoted by the Smart Growth Network (Smart Growth Network 2008). It adds to a mix of land uses, addresses compact building design, assists in providing a range of housing choices in suburbia, can support more walkable neighborhoods, and houses a demographic that has been shown to use a wide range of transportation modes.

Although this housing type has been largely overlooked, its location and density are in line with many of the mixed use development models that are promoted by progressive planners, developers, and designers today. From a land use perspective,

suburban multifamily developments contribute to a charged mix, but site design has historically been a barrier to actual interaction between these uses. While planning and development regulation and culture have largely continued a legacy of enclaved suburban multifamily development, we have much to gain by breaking this tradition and pursuing more connected development.

Suburban multifamily residents use non-motorized form of travel much more frequently than single family residents and our case studies suggest that more connected developments may further promote walking and biking. Increasing connectivity has been correlated with increased physical activity, decreased obesity, and increased non-motorized travel; all aspects that contribute to a positive quality of life.

We must change the national conversation regarding suburban multifamily development. In order to maximize the potential role of suburban multifamily housing, we must re-conceptualize this housing type and its residents, consider this development as part of larger semi-urban nodes, and promote connections through revised zoning regulations. To assist this process, it will be critical to document and disseminate successful, well connected models of suburban multifamily development. As developers and planners are risk averse, disseminating successful models will broaden the range of design options and will help to dispel unsubstantiated biases against suburban multifamily housing.

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Figure 1: Typical suburban multifamily developments from around the country. (Clockwise from top left: Eugene, Oregon; Phoenix, Arizona; Pleasanton, California; and Sun Prairie, Wisconsin)

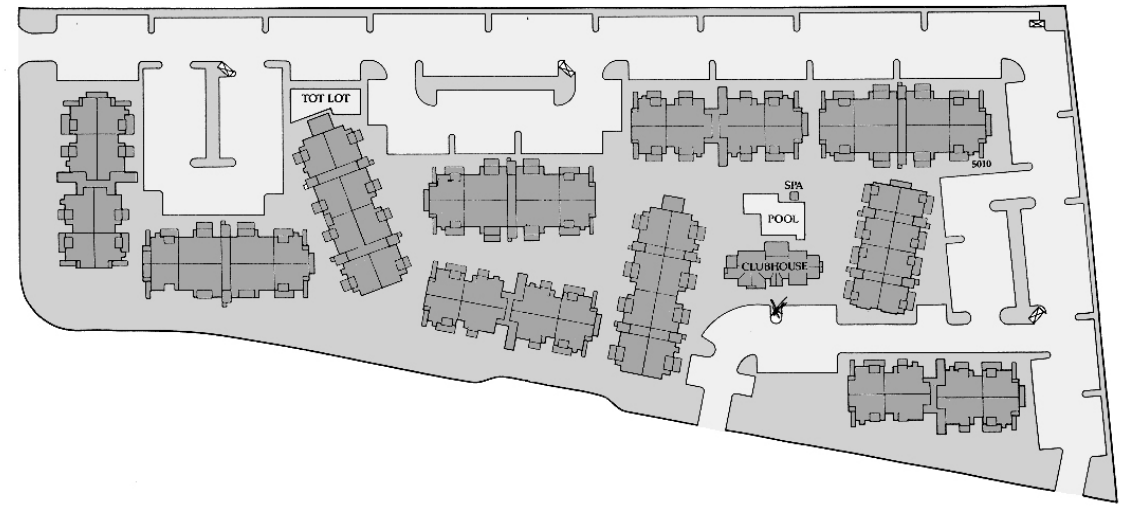

Figure 2: Typical suburban multifamily site plan with continuous parking drives, clustered buildings, and limited connections to adjacent parcels. (Pleasanton, California)

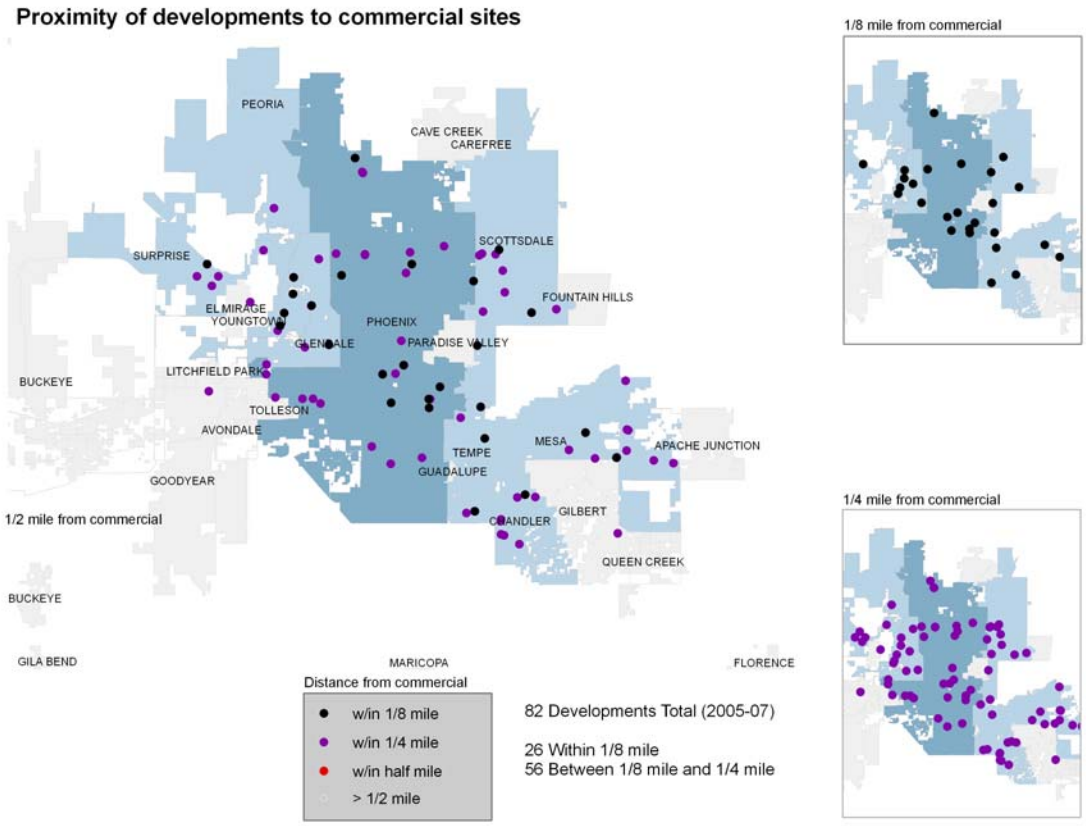

Figure 3: Proximity of suburban multifamily developments to commercial parcels

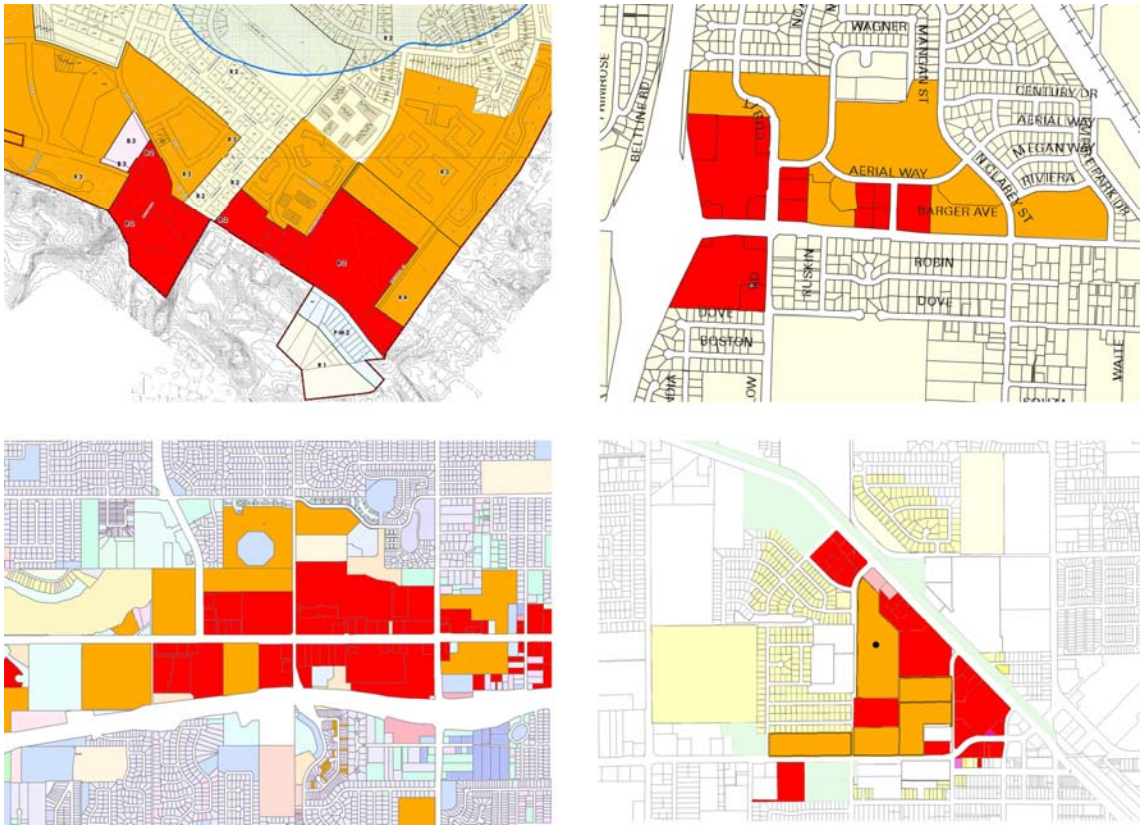

Figure 4: Examples of typical land use patterns with suburban multifamily housing developments (light grey) buffering commercial parcels (dark grey) and single family developments (white). (Clockwise from upper left: Annapolis, Maryland; Eugene, Oregon; Phoenix, Arizona; and Orlando, Florida)

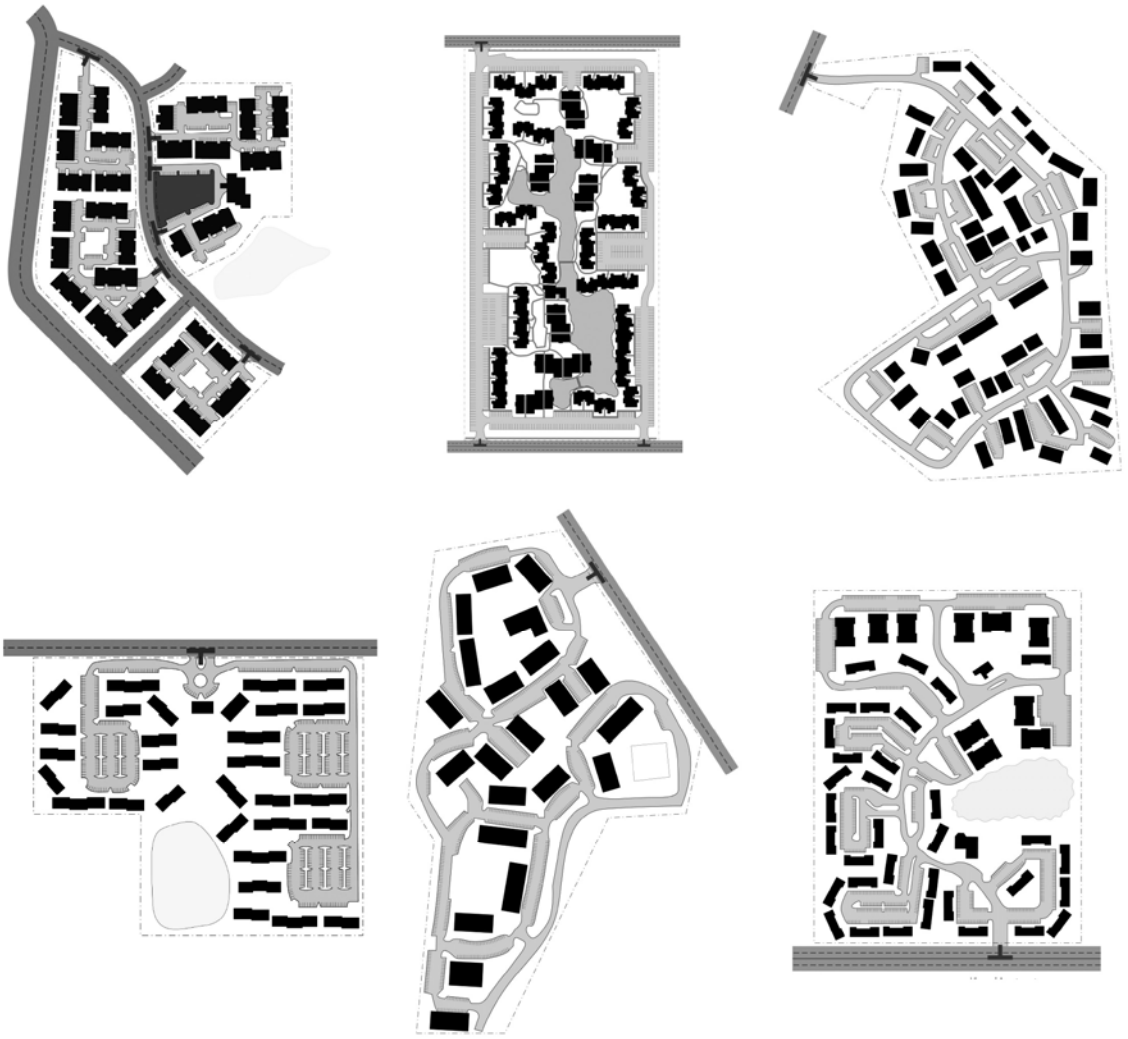

Figure 5: Typical suburban multifamily development typologies with no connection to adjacent parcels and limited connection to arterials. (Clockwise from upper left: Pikesville, Maryland; Orlando, Florida; Wilmington, North Carolina; Kissimmee, Florida; Columbus, Ohio; and Orlando, Florida)

Figure 6: Suburban multifamily developments disconnected from each other and the adjacent commercial properties. Notice the distinct 'street' network in each development. (Eugene, Oregon; © Google Earth).

Figure 7: An example of a survey map with a respondent's markings. Residents were asked to circle local areas they visit and then asked, if they walked or biked to any of these areas, to draw the path of travel they used. (Image shown is a typical map from Heron Meadows in Eugene, Oregon)

Table 1: Survey Responses for Heron Meadows, Trillium at Union Hills, and MonteVerde
(03/08)

Survey Question	Overall	More Connected	Less Connected	
		Heron Meadows	Trillium	MonteVerde
Would you walk and/or bike to local stores/restaurants if they were easier to get to?	74%	87%	93%	50%
What do you see as the largest barriers to walking and/or biking to nearby stores/restaurants/offices? (* signifies most frequent answer given)				
There is no easy and/or safe way to get to nearby stores/restaurants/offices	***31%**	9%	***53%**	***38%**
The weather is a significant barrier to my walking and/or biking	24%	30%	13%	19%
There are no large barriers to walking and/or biking	26%	***48%**	13%	6%
Percentage of Respondents that Walked and/or Biked to Local Stores, Restaurants, or Services	61%	87%	36%	38%
Median Number of Local Stores, Restaurants, and Services Visited	3	4	3	2
Median Number of Local Stores, Restaurants, and Services Walked or Biked to	2	3	0	0
Average Number of Cars per Household	1.31	1.48	1.20	1.19

Heron Meadows
Eugene, Oregon

Trillium at Union Hills
Phoenix, Arizona

MonteVerde
Phoenix, Arizona

Figure 8: Basic Organization, Proximity to Commercial, and Eighth Mile Radius

Figure 9: Existing Vehicular and Pedestrian Connections to Adjacent Parcels

Figure 10: Pedestrian Networks Within and Beyond Development

Figure 11: Huntersville, North Carolina addresses street connectivity in their zoning code and Laurel at Huntersville is an example of this code requirement applied to suburban multifamily housing. Notice the number of connections provided and how many of these connections directly link the multifamily development to existing adjacent commercial developments.

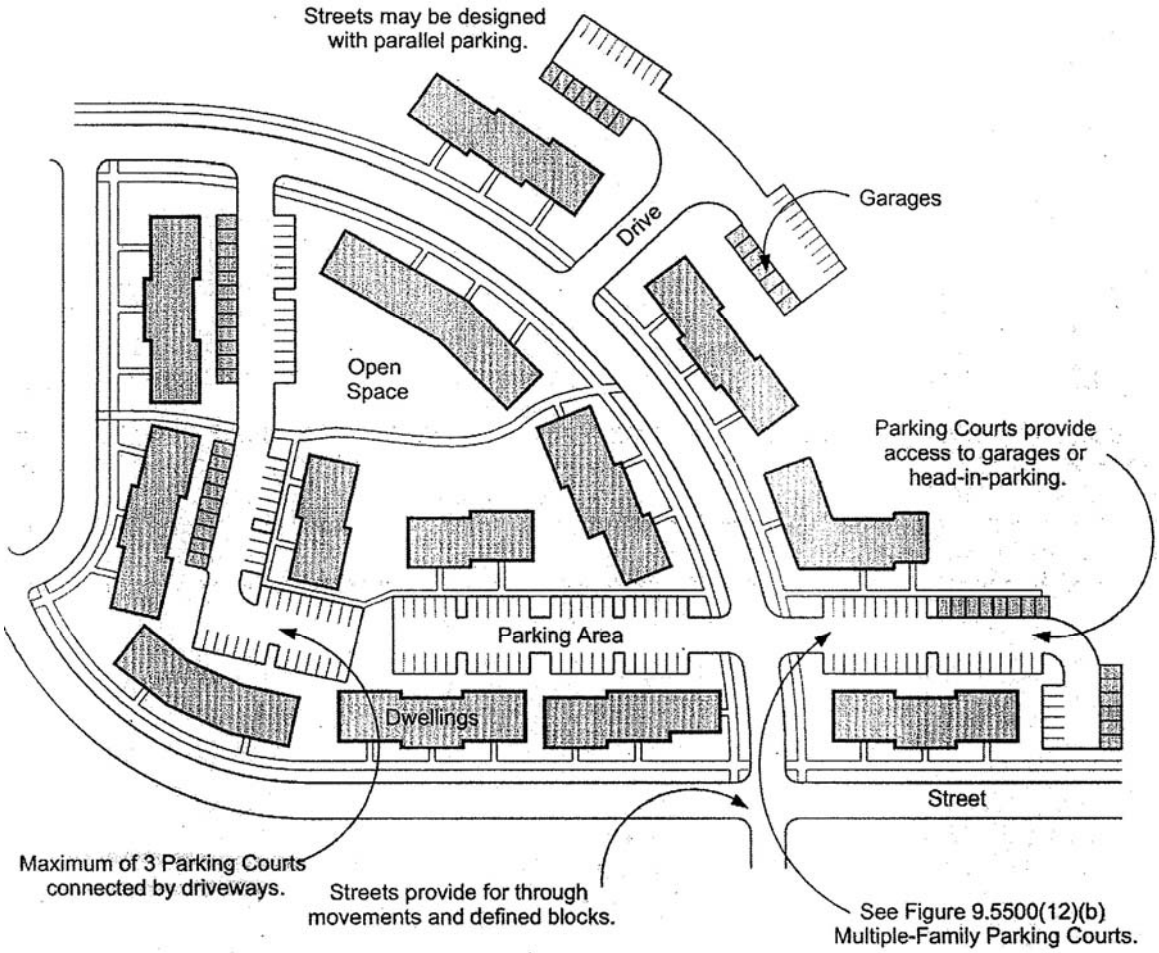

Figure 12: City of Eugene, Oregon Multifamily Parking Diagram. Notice the primary circulation is via streets with parking occurring in Parking Courts off of these streets. (City of Eugene - Oregon 2001, 9.5500(12))