

# Site Design and Its Relation to Urban Form

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**F**rom the site planning and design perspective, the challenge is to heighten awareness of how different transportation solutions can be incorporated into physical plans for new residential, commercial, and industrial development. Local streets also need to be planned to be more than just automobile oriented. Provision for pedestrians, bus routes, and, where appropriate, rail transit needs to be made early in the planning process. This will require rethinking traditional subdivision design and layout of nonresidential areas.

## BASIC UNDERSTANDING AND RELATIONSHIPS

City planners have gained a basic understanding about location decisions and urban form that comes from Alonso's *Location and Land Use* (1) and the theories of Hoyt (2), Hoover (3), Ricardo (4), and others. However, this body of theoretical work says little about how actual site design and layout and the interface between the private realm and the public realm can influence travel decisions beyond the obvious. If it is easy to find the place, park, and get around, then the business or retail center is likely to be patronized. People want convenience, not congestion. From a residential perspective, people seek neighborhoods that are within commuting distance of their work places and also offer convenient access to shopping, recreational opportunities, and local schools.

Academic research using census data, origin-destination surveys, and similar empirical data has yielded useful information about travel behavior that has helped practitioners construct travel demand

and mode-choice models, but these models provide few insights into how to configure land use at the neighborhood and community scale, both in developing urban areas and in older urban areas where intensification and “recycling” is occurring, in order to reduce automobile dependence and thus overall vehicle miles of travel.

Many professional city planners believe that more study of trip data is needed to understand the potential to eliminate or shorten trips of each type. Ease of transfers between modes of travel also is important, and more practical guidance is needed to show how to fit park-and-ride facilities, paratransit, bicycles, and buses into project designs. Two good models are the 1989 *Guide to Land Use and Public Transportation*, published by the U.S. Department of Transportation (5) and *Designing Urban Corridors*, a 1989 publication of the American Planning Association (6); however, more work needs to be done to demonstrate that such integration not only can be effective but also can be accomplished in a cost-effective fashion.

Architects and site planners follow rules for physical layout of new development that are established in zoning and subdivision ordinances. Traditional standards govern the location of a house or office building on a lot; they rarely require physical planners to think about relationships to transit or pedestrian linkages beyond the project itself. Similarly, signage often is done last, and the functional and directional relationships within a project and between a project and adjacent development are not always worked out (e.g., walks to lunch spots, walks to transit, outdoor eating areas).

Urban planners do not know a lot about how to make mixed use work at less than the “mega-scale”—to strike the right balance in urban and suburban areas, particularly where neighborhoods and commercial districts are recycling, and to encourage sharing amenities between commercial and residential areas.

Both urban planners and transportation planners need to work within the framework of the built environment and identify different solutions for different types of urban and suburban areas. One example of a relatively successful program is in San Diego, California, where the Office of the City Architect, working with the Engineering and Development Department and the Metropolitan Transit Board, has initiated specific guidelines for transportation demand management (TDM) in the central business district, suburban employment centers, and transit-oriented corridors (7). The principal characteristics sought for each of these areas are illustrated in Figure 1. To complement this effort, citywide street design standards also have been established, including requirements for

- Sidewalks on both sides of all streets;
- Driveway limits (number and width);
- Sidewalks buffered from traffic;
- Pedestrian-oriented lighting;
- Minimal use of cul-de-sacs;
- Preference for loop roads, alleys, and cross streets; and
- Bicycle facilities, where appropriate.

Work being done currently shows specific options for site design, parking, transportation facilities and services, and support services that should be considered for typical projects (see Figure 2). These

### ***Central Business District***

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- Highest FARs; very-high residential density
- Mixed-use
- Pedestrian-oriented buildings
- Underground or enclosed parking
- Parking maximums

### ***Suburban Employment Centers***

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- High FARs; high residential density
- Mixed use
- On-site support services
- Pedestrian-oriented site plans
- Parking underground, or to rear or side
- Parking to vary according to transit proximity
- Parking maximums

### ***Transit-Oriented Corridors***

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- Moderate-high intensity use
- Pedestrian-oriented development
- Parking management required

FIGURE 1 San Diego: land guidance for TDM program (7).

	Regional	Community	Neighborhood	Mixed/Residential	Large Offices	Small Offices	Business Park	Industry
<b>Site Design</b>								
Pedestrian Orientation	●	●	●	●	●	●	●	●
Transit Access	●	●		●	●	●	●	●
Carpool/Vanpool Waiting Area	●			●	●		●	●
<b>Parking</b>								
Carpool/Vanpool Parking	●				●		●	●
Paid Parking	●				●		●	●
Limited Access to Parking	●				●		●	●
Shared Parking	●			●	●			
<b>Transportation Facilities</b>								
Bus Shelter	●	●		●	●		●	●
Transit/HOV Facilities	●				●		●	
Bike Racks/Lockers	●	●	●	●	●	●	●	●
Bike Lanes/Paths	●				●		●	
Electric/Alternative Fuel	●				●		●	
<b>Transportation Services</b>								
Information: Kiosk or Counter	●	●		●	●		●	
Information: Bulletin Board			●			●		●
<b>Support Services</b>								
Childcare	●						●	
Teleconferencing Facilities					●		●	●
Shower/Locker Facilities	●				●		●	●
Other Commercial Services	●	●		●	●		●	●
Size (in 000s sq. ft.)	1,000	200	25	200	500	25	1,000	200

FIGURE 2 San Diego: developer options for typical projects (7).

requirements are being fleshed out in more detail, for possible incorporation into the city's zoning ordinance.

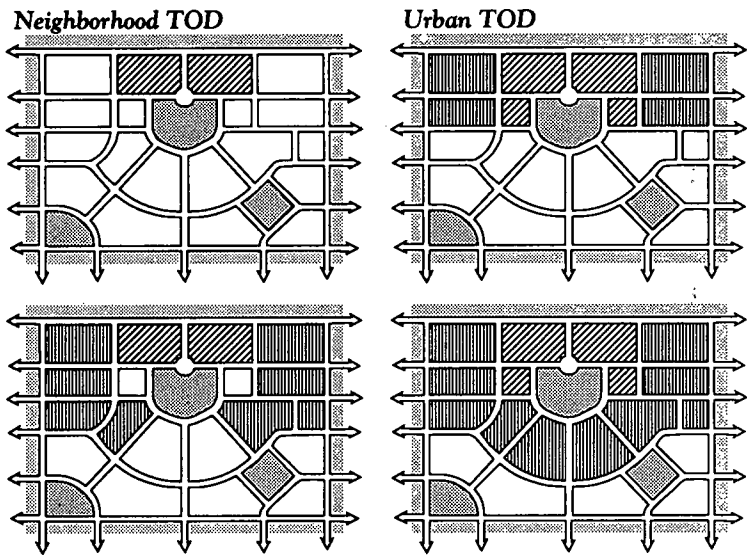
In northern California, Sacramento County has taken the concept of integrating transportation and land use planning a step further by defining a specific type of transit-oriented development (TOD) as part of a growth strategy required by the newly adopted General Plan (8). The objective of the TOD program is to concentrate moderate and high-density housing in mixed-use clusters centered around re-

gional transit station stops. Neighborhood TODs may be as small as 40 acres, whereas urban TODs could be as large as 160 acres (Figure 3). The county anticipates that TODs would be developed in infill locations as well as in new urban growth areas.

To promote transit access, local streets are to be designed to converge on transit stops and core commercial areas; there should be minimal need for cul-de-sacs, and multiple and parallel routes would serve automobiles, bicycles, and pedestrians (Figure 4). An arterial

Size: 40 - 160 Acres

Maximum Distance from Transit: 2000 Ft.



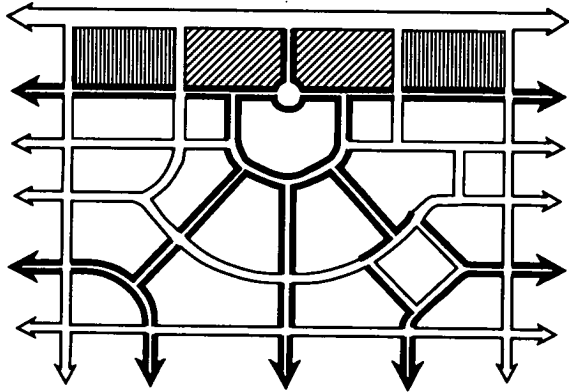
**Percent of Site Area**

Use	Neighborhood TOD	Urban TOD
Public	10% minimum	10% minimum
Core*	10-15%	10-30%
Housing	40-80%	20-60%
Office	0-40%	20-60%

\* Minimum retail space: 10,000 sq. ft.

FIGURE 3 Sacramento County transit-oriented development (TOD) (8).

*Preferred*



Interconnected streets converging to transit stop and core commercial. Minimal need for cul-de-sacs.

*Prohibited*

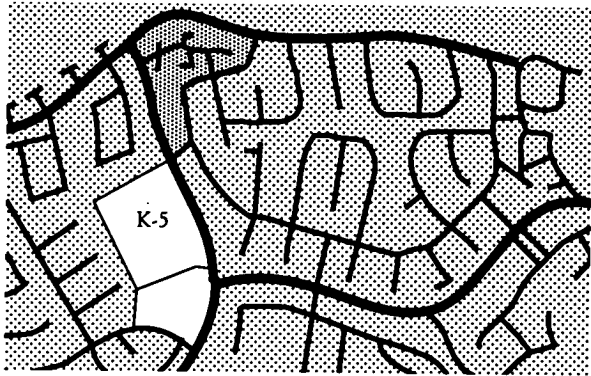


FIGURE 4 Sacramento County transit-oriented development street patterns (8).

street should not be the sole route between neighborhoods, as is typically the case in traditional subdivisions.

To reduce automobile use for most shopping trips, it may be productive to encourage construction of more, smaller shopping centers instead of fewer, larger centers, which is the current trend. If such centers are well served by transit or located near park-and-ride facilities, the chance of success may be higher than if they are only served by highways and arterials. California cities such as Davis and Oceanside

have set limits on the size of neighborhood and community-oriented commercial centers to encourage this type of development pattern.

Last, urban planners and site designers could be well rewarded with a better understanding of the importance of project identity for neighborhood cohesion and spatial orientation, that is, what organizing elements at the project scale can help reinforce larger elements of urban form and support a balanced transportation system. Current practice is to focus solely on the developers' market and immediate land use relationships, with less attention given to regional access and ease of transit service. The TOD program in Sacramento County and San Diego's Developer Handbook (7) are intended to spur awareness of these linkages.

## METHODOLOGY

To help in plan-making, urban planners need better guidance (rules of thumb) to make decisions on land use mix and minimum density versus intensity that will support different types of transit use. This information also will prove useful in project review by providing a clearer frame of reference for developers and their architects about what constitutes acceptable, transit-oriented developments.

With the growing importance of traffic congestion as a community issue, urban planners need more information about the strengths and weaknesses of level-of-service (LOS) standards as a growth management tool and criterion for project review. Although LOS can establish specific measures against which to judge a project's impact on road operations and measure effectiveness, these standards often are mandated without regard to whether they can be attained; they are unable to control demand or, in many cases, capacity; finally, they do not permit trade-offs that accept congestion at some locations. This is important because congestion is "needed" in order to increase use of alternative modes. In the San Francisco Bay Area, alternative approaches to using LOS standards for regional routes have been devised as part of Contra Costa County's growth management and transportation improvement program (9). These may prove to be useful guides for other jurisdictions seeking flexibility in fitting transportation solutions to land use patterns.

To improve administration of transit-oriented development policies, planners need more practical guidance on how to structure surveys of specific types of projects to gauge parking demand, correlate

TDM measures and parking use, and ensure effective monitoring of conditions of project approval. Such programs also are required to ensure compliance with environmental laws calling for mitigation monitoring and reporting following certification of environmental documents such as an environmental impact review or an environmental impact statement.

Finally, information on effective ways to provide for collective use of parking facilities and also encourage transit use also would help. Here, the methodological issue can help address a policy question—whether local incentives or regulations can bring park-and-ride opportunities into underused commercial centers, both to increase transit ridership and to help local merchants. Normally, zoning ordinances do not allow a parking standard, the number of spaces required per 1,000 square feet of commercial space, to be reduced because transit service is available or to recognize joint use of parking areas for commuter parking as well as shopping.

## **POLICY AND INSTITUTIONS**

Local decision-makers can learn from more detailed guidance on site planning, parking management, and project design and its relation to circulation systems and transit. Case studies and comparative surveys could show the merit of parking maximums as well as parking minimums in zoning ordinances. Such information also would help local officials determine whether, as a matter of local development policy, there should be a “lid” on downtown parking or parking around transit nodes in order to encourage transit use. In Portland, Oregon, for example, the number of parking spaces has been limited for more than a decade. By contrast, parking limits for commercial development around stations on San Francisco’s Bay Area Rapid Transit (BART) system have rarely been set. In fact, commuter parking spillover has prompted complaints for more local parking.

As a general rule, it may make sense to encourage urban planners and traffic engineers to make streets narrower in newly developing neighborhoods. They also should ensure that in shopping centers and business parks internal roads can accommodate a 40-ft bus. If such standards are not imposed, then efforts to encourage transit service in suburban employment centers will be less successful, because convenient door-to-door service cannot be provided.

Narrower streets slow traffic, make walking more pleasant, and improve the scale of residential, commercial, and industrial areas.



These objectives are clearly being sought in the San Diego and Sacramento County programs.

To emphasize a pedestrian scale, not just in pockets but throughout the community, urban planners should require sidewalks in all new subdivisions and in commercial and industrial development. A corollary should be no more "gated communities." To further create a streetscape for walking, zoning ordinances should require that parking in neighborhood commercial areas be placed in back of buildings. Making buildings address the street improves the appearance of cities and encourages walking.

Finally, local planners and officials need more information about new types of transit-oriented zoning and development regulations, including incentives or bonuses to improve the quality of higher-density housing and office complexes near transit nodes to make them desirable. It is not sufficient to provide just a certain amount of housing near jobs; it also is necessary to provide the right kind and mix. This issue was central to the debate at this conference over appropriate land use in the business park corridor adjacent to John Wayne Airport (10).

## RESEARCH NEEDS

To guide preparation of a research agenda for FHWA, the following questions are suggested as promising avenues of inquiry:

- What are appropriate site development standards to address pedestrian, bicycle, and transit availability?
- How effective are density "floors" that set a minimum land use intensity and parking "lids" in encouraging transit use?
- How should commercial and industrial parking requirements vary based on transit availability?
- What are the minimum requirements for support services and eating and drinking establishments at major employment centers to affect work-based vehicle trips?
- What street design standards encourage pedestrian use and bicycling?
- How should conflicts between the goals of reducing peak-hour congestion and improving air quality be reconciled?

Air quality-related transportation measures are intended to reduce vehicle trips, whereas congestion-reduction measures focus on in-

creasing capacity or spreading trips throughout the day, or both. Either one of these approaches could have the unintended effect of a net increase in vehicle trips. Specific guidance is needed for site planning and project review, so priorities and trade-offs are understood. This is particularly important for local officials and for developers who are attempting to reconcile competing considerations in an uncertain economic environment.

## REFERENCES

1. W. Alonso. *Location and Land Use: Toward a General Theory of Land Rent*. Harvard University Press, Cambridge, 1964.
2. H. Hoyt. *The Structure and Growth of Residential Neighborhoods in American Cities*. Government Printing Office, Washington, D.C., 1939.
3. E. M. Hoover. *The Location of Economic Activity*. McGraw-Hill, New York, N.Y., 1948.
4. D. Ricardo. *On the Principles of Political Economy and Taxation*. London, 1817.
5. Snohomish County Transportation Authority. *A Guide to Land Use and Public Transportation*. Report DOT-T-90-13. U. S. Department of Transportation, December 1989.
6. K. R. Bishop. *Designing Urban Corridors*. Planning Advisory Service Report 418. American Planning Association, Chicago, Ill., 1989.
7. *Transportation Demand Management Developer Handbook*. Office of the City Architect, City of San Diego, September 1990.
8. Calthorpe and Associates. *Transit-Oriented Development Design Guidelines*. Final Review Draft, Sacramento County Planning and Community Development Department, September 1990.
9. *Growth Management Program Implementation Documents: LOS Guide, Model Growth Management Element, Guide to Local Planning and Growth Management*. Contra Costa Transportation Authority, Walnut Creek, California, August 1990; October 1990.
10. *Irvine Business Complex Urban Village Project*. Review Draft, City of Irvine Community Development Department, September 1989.