PARKING STRATEGIES FOR SMART GROWTH

PLANNING TOOLS FOR THE SAN DIEGO REGION

June 2010

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BACKGROUND

Smart growth development sites feature relatively dense development, mixes of compatible land use with pedestrian amenities, bicycle facilities, and optimal access to public transportation. These features favor access by transit, walking, and bicycling. The diversity of uses within close proximity encourages visitors to make journeys within the site by foot, even if they arrive by car. Furthermore, research has shown that vehicle ownership for smart growth residents is lower than for residents of suburban development. All of these factors suggest that parking demand in smart growth areas is lower than elsewhere in the region and that parking supplies should reflect this fact.

The United States EPA has published key guidance on parking provisions for smart growth. Recognizing connections between mixed-use development, driving, and parking, the EPA, in a publication on parking in smart growth developments, has stated:

> *[T]ypical parking regulations and codes simply require a set amount of parking for a given square footage or number of units, assuming all trips will be by private automobile and ignoring the neighborhood's particular mix of uses, access to transit and walking, and context within the metropolitan region. Such inflexible parking requirements can force businesses to provide unneeded parking that wastes space and money.... [I]nflexible minimum parking requirements are the norm – but they represent a barrier to better development (EPA, 2006).*

It is important to note that lower parking rates can reinforce lower vehicle trip generation rates, a fundamental goal of smart growth. Donald Shoup, Professor of Urban Planning at the University of California, Los Angeles, and an articulate critic of minimum parking requirements, contends that by making parking more scarce and costly, people will become more likely to travel by transit, by bike, or on foot. As the cost to park increases (in terms of out-of-pocket cost or the time-cost associated with searching for scarce parking), drivers will re-evaluate their mode choice and some will change travel behavior to and from destinations. Thus, cities that reduce parking requirements for smart growth also can expect reduced levels of driving.

STUDY CONTENTS

The study includes a review of current literature and best practices regarding parking in smart growth environments. The findings were compared to an assessment of parking standards utilized by local agencies in the region. This review seeks to establish the reasonableness of lower parking rates for smart growth developments. The study also delineates auxiliary parking management strategies that can and should complement lower parking rates. The study did not include collection of empirical parking demand data in the San Diego region, and it does not address parking requirements for public transit stations and downtown San Diego.

STUDY FINDINGS

The study found that a number of cities in the region provide accommodations for smart growth development in their parking requirements, but that typical parking requirements in the region may provide an excess supply of parking relative to demand documented in nationwide studies. Additional measures to provide parking appropriate to smart growth developments could potentially be implemented.

The study did not include collection of empirical parking demand data in the San Diego region. Therefore, further study in the region, at a neighborhood level, is warranted to examine if parking demand in San Diego smart growth areas deviates significantly from demand observed in nationwide studies, and to determine appropriate strategies for particular locations. Additionally, the study does not address parking requirements for public transit stations and downtown San Diego.

Demand documented in studies conducted in other regions provides a starting point for analyzing potential parking strategies that may be appropriate in smart growth environments, based on the experiences at existing smart growth developments that have employed these strategies. Further research of parking demand at smart growth sites in the region is called for at the neighborhood level, in order to capture each area's unique characteristics with respect to parking demand.

This study is available as a resource for local jurisdictions if they choose to use it. Local jurisdictions are under no obligation to use this study in their development approval processes. The study does not make regionwide recommendations, and recognizes that parking management should be analyzed and implemented on a community basis.

PARKING STRATEGIES FOR SMART GROWTH

INTRODUCTION

This study reviews current parking requirements and policies in the San Diego region and highlights relevant smart growth parking demand and policy studies. This review is to establish the reasonableness of lower parking rates for smart growth developments. The study also delineates auxiliary parking management strategies that can and should complement lower parking rates. The study did not include collection of empirical parking demand data in the San Diego region, and it does not address parking requirements for public transit stations and downtown San Diego.

EXISTING LOCAL JURISDICTION PARKING REQUIREMENTS IN THE SAN DIEGO REGION

Ultimately, the amount of parking supplied for new development is controlled by a jurisdiction's parking code requirements. A review of SANDAG member jurisdictions' parking codes revealed a few special parking requirements and parking strategies for smart growth developments. Implementation of such special provisions may continue to increase. SANDAG recently released a set of smart growth design guidelines titled *Designing for Smart Growth: Creating Great Places in the San Diego Region* (June 2009). This document proposes parking policies and design guidelines specifically for smart growth developments.

Current parking standards (as of September 2009) were collected for each of the jurisdictions that comprise SANDAG and are presented in Table 2 on the next page. These standards represent the baseline parking requirements for each jurisdiction.

Exceptions to Standard Parking Requirements: Accommodations for Smart Growth

The jurisdictions listed in Table 2 were contacted to confirm their standard parking requirements and to notify this study of any exceptions to their standards. Several of the jurisdictions commented that they have parking requirement variations for downtown core areas, areas well served by transit, mixed-use areas, and affordable-housing projects. This section details the comments received.

- The City of Carlsbad offers density bonus incentives to affordable housing developments. The following multifamily dwelling unit rates apply: 0- to 1-bedroom unit requires 1 parking space and a 2- to 3-bedroom unit requires 2 parking spaces.
- The City of Escondido reduces its standard retail parking requirements to 3 spaces per 1,000 square feet of gross floor area in their downtown retail core parking district.
- The City of Poway allows a reduced parking rate for affordable housing on a case-by-case basis.

- The City of Vista is working on reduced rates for their downtown smart growth areas as part of their downtown specific plan update (expected approval spring 2010).
- The City of El Cajon provides allowances for parking in smart growth settings within their downtown area.
- The City of La Mesa allows parking reductions in their Mixed-Use Urban Overlay Zone. They allow a minimum of 2 parking spaces per 1,000 square feet of commercial floor area.
- The City of Lemon Grove allows parking reductions in their Downtown Village Specific Plan. Multifamily residential requirements are reduced as follows: studio units require 1 space, 1-bedroom units require 1.25 spaces, 2-bedroom units require 1.75 spaces, and 3-bedroom units require 2 spaces. Commercial office requirements are reduced to 3 spaces per 1,000 square feet. Retail requirements are reduced to 4.3 spaces per 1,000 square feet. There also is a provision for 20 percent mixed-use reduction for a combination of residential, office, and retail.

Table 2
Typical San Diego Region Parking Standards by Jurisdiction*

JURISDICTION	SINGLE-FAMILY RESIDENCE	MULTIFAMILY RESIDENCE					COMMERCIAL OFFICE	RETAIL
		STUDIO	1 BEDROOM	2 BEDROOM	3 BEDROOM	4+ BEDROOM		
San Diego County	2 per du+ 1 per 10 du	1.5 per du + 1 per 5 du	1.5 per du + 1 per 5 du	1.5 per du + 1 per 5 du	2 per du + 1 per 5 du	2 per du + 1 per 5 du	5 per ksf < 25 ksf 4.5 per ksf 25,001-250 ksf 4 per ksf > 250 ksf	5 per ksf < 25 ksf 4.5 per ksf 25,001-250 ksf 4 per ksf > 250 ksf
NORTH COASTAL REGION								
Carlsbad	2 per du	1.5 per du + .3 per du < 10 du + .25 per du > 10 du	1.5 per du + .3 per du < 10 du + .25 per du > 10 du	2 per du + .3 per du < 10 du + .25 per du > 10 du	2 per du + .3 per du < 10 du + .25 per du > 10 du	2 per du + .3 per du < 10 du + .25 per du > 10 du	1 per 250 sq ft	1 per 300 sf
Del Mar	2 per du	2 per du + 1 per 4 du	2 per du + 1 per 4 du	2 per du + 1 per 4 du	2 per du + 1 per 4 du	3 per du + 1 per 4 du	1 per 300 sq ft	1 per 300 sf < 5 ksf 17 spaces + 1 per 150 sf 5-20 ksf 117 spaces + 1 per 100 sf > 20 ksf
Encinitas	2 per du < 2.5 ksf 3 per du > 2.5 ksf	1.5 per du + .25 per du	2 per du + .25 per du	2 per du + .25 per du	2.5 per du + .25 per du	2.5 per du + .25 per du	1 per 250 sq ft	1 per 200 sf 1 per 250 sf < 100k?? 1 per 200 sf > 100k
Oceanside	2 per du	1.5 per du + 1 per 4-10 units 1 + 20% of units > 10	1.5 per du + 1 per 4-10 units 1 + 20% of units > 10	2 per du + 1 per 4-10 units 1 + 20% of units > 10	2 per du + 1 per 4-10 units 1 + 20% of units > 10	2 per du + 1 per 4-10 units 1 + 20% of units > 10	1 per 300 sf	1 per 200 sf < 5 ksf 1 per 250 sf > 5 ksf
Solana Beach	2 per du	1 per du + 1 per 4 du	1.5 per du + 1 per 4 du	2 per du + 1 per 4 du	2 per du + 1 per 4 du	2 per du + 1 per 4 du	1 per 200 sf < 2 ksf; 1 per 225 sf from 2,001-7.5 ksf; 1 per 250 sf 7.5-40 ksf; 1 per 300 sf > 40 ksf	1 per 200 sf < 25 ksf 1 per 225 sf 25,001-250 ksf 1 per 250 sf > 250 ksf
NORTH INLAND REGION								
Escondido	2 per du	1 per du + 1 per 4 du	1.5 per du + 1 per 4 du	1.75 per du + 1 per 4 du	2 per du + 1 per 4 du	2 per du + 1 per 4 du	4 or 1 per 300 sf (whichever is greater)	1 per 250 sf
Poway	2 per du	1.75 per du	1.75 per du	2.25 per du	2.75 per du	2.75 per du	1 per 250 sf	1 per 300 sf
San Marcos	2 per du	2 per du + 1 per 3 du	2 per du + 1 per 3 du	2 per du + 1 per 3 du	2 per du + 1 per 3 du	2 per du + 1 per 3 du	1 per 250 sf	1 per 250 sf < 10 ksf 1 per 100 sf > 10 ksf
Vista	2 per du + 2 per du	2 per du + .33 per du	2 per du + .33 per du	2 per du + 1 per .5 per du	2 per du + 1 per .5 per du	3 per du + .5 per du + .5 per add'l bdrm > 2	1 per 250 sf	1 per 200 sf < 5k + 1 per 150 sf > 5k
CENTRAL REGION								
El Cajon	2-3 per du	2 per du	2 per du	2.25 per du	2.25 per du	2.25 per du	1 per 250 sf > 10 ksf floor area 1 per 300 sf 15-25 ksf 1 per 400 sf > 25 ksf	1 per 250 sf > 10 ksf floor area 1 per 300 sf 15-25 ksf 1 per 400 sf > 25 ksf
La Mesa	2-5 per du	2 per du	2 per du	2 per du	2 per du	2 per du	1 per 300 sf	1 per 250 sf
Lemon Grove	2 per du	1.5 per du + .25 per du	2 per du + .25 per du	2 per du + .25 per du	2 per du + .25 per du	2 per du + .25 per du	1 per 250 sf	.5-1 per 250 sf
San Diego	2 per du	1.25 per du < 400 sf 1.5 per du > 400 sf	1.5 per du	2 per du	2.25 per du	2.25 per du	ranges from 1-3.3 per ksf	ranges from 1-5 per ksf
Santee	2 per du	1.5 per du + .25 per du	1.5 per du + .25 per du	2 per du + .25 per du	2 per du + .25 per du	2 per du + .25 per du	1 per 250 sf	1 per 250 sf
SOUTHERN REGION								
Chula Vista	2 per du	1.5 per du	1.5 per du	2 per du	2 per du	2 per du	1 per 300 sf minimum 4 spaces	1 per 200 sf
Coronado Beach	2 per du	no less than 2 per du	no less than 2 per du	no less than 2 per du	no less than 2 per du	no less than 2 per du	1 per 500 sf + 1 per 2 employees	1 per 500 sf + 1 per 2 employees
Imperial Beach	2 per du	2 per du 1.5 for special zones	2 per du 1.5 for special zones	2 per du 1.5 for special zones	2 per du 1.5 for special zones	2 per du 1.5 for special zones	1 per 300 sf + 1 per 2 employees	1 per 500 sf + 1 per 2 employees
National City	2 per du < 25 ksf 3 per du > 25 ksf	1.3 per du + .5 per du < 20 units + .25 per du above 20	1.3 per du + .5 per du < 20 units + .25 per du above 20	1.5 per du + .5 per du < 20 units + .25 per du above 20	1.5 per du + .5 per du < 20 units + .25 per du above 20	1.5 per du + .5 per du < 20 units + .25 per du above 20	1 per 200 sf < 5 ksf 1 per 250 sf > 5 ksf, <10 ksf 1 per 300 sf > 10 ksf	4.5 per 1 ksf

* Based on summary provided by KDA Corporation Summary Table (revised Sep 2006) and updated by KTU+A based on the latest Web site downloads (Jun 2009)

- The City of San Diego offers parking reductions for developments located in their Transit Overlay Zone or developments that are deemed "very low-" income. Multifamily residential requirements are reduced as follows: studio units require 1 space, 1-bedroom units require 1.25 spaces, 2-bedroom units require 1.75 spaces, and 3-plus-bedroom units require 2 spaces. Commercial office requirements are reduced to 1.0 - 2.9 spaces per 1,000 square feet. Retail requirements are reduced to 1.0 - 4.3 spaces per 1,000 square feet. The City of San Diego also is in the process of studying parking demand at affordable housing developments, which will likely result in revised parking standards for affordable housing.
- The City of Santee offers reduced parking requirements for any affordable housing project.
- The City of Chula Vista details special parking requirements for their Urban Core Specific Plan area. Residential multifamily units in their transit focus area have the reduced requirement of 1 parking space per dwelling unit. All other residential units must provide 1.5 spaces per dwelling unit and an additional 1 space per 10 dwelling units for guests. Any nonresidential land use must provide 2 parking spaces per 1,000 square feet of floor area.
- The City of Coronado provides reduced parking requirements for their Orange Avenue Corridor Specific Plan. Commercial parking requirements are reduced to 1 parking space per 500 square feet of floor area. The city also provides reductions for affordable housing. For affordable housing the following rates apply: 1-bedroom units require 1 space, 2- to 3-bedroom units require 2 spaces, and 3-plus-bedroom units require 2.5 spaces.

The County of San Diego is currently in the process of updating its parking regulations and is reviewing the potential for parking reductions for shared parking on a case-by-case basis based on findings and recommendations of a qualified parking or traffic consultant.

Local jurisdictions in the region have expressed a great deal of interest in this study and are eager to use the results of this analysis, particularly at the specific plan level. Such interest and the policies listed above suggest that there is recognition at the local level that parking rates should be lower for some types of development, including smart growth projects.

ITE PARKING GENERATION: IMPLICATIONS FOR SMART GROWTH PARKING

This section and the two that follow summarize key research on actual parking demand from a variety of national and local sources. It provides perspective on the San Diego basic parking rates and the reductions currently being granted for smart growth in the region. It should be noted that in the analysis below, the basic parking requirements in Table 2 are used for comparative purposes.

The Institute of Transportation Engineers' (ITE) *Parking Generation* (3rd Edition) summarizes actual parking demand for a variety of land uses. It is based on a national database of parking demand studies. The studies that ITE incorporates into the manual are mainly single-use, suburban projects where all parking is provided on-site and free to the user. This single-use, suburban emphasis likely results in parking rates that are too high for Smart Growth sites, where use of non-auto modes and shared parking between different on-site uses serve to reduce parking demand.

On the other hand, it is important to recognize that *Parking Generation* summarizes parking demand rather than supply. In planning for parking supply, it is a common engineering practice to add a 10 percent buffer beyond the demand figure to allow a margin of safety and to make it possible for drivers to find the last few parking spaces without excessive cruising or idling.

Residential Parking Demand

Residential units in smart growth developments would generally fall under *Parking Generation's* multifamily residential category. Comparing typical code values against the ITE *Parking Generation* (3rd Edition) manual shows that the existing typical parking requirements in the region far outstrip observed ratios. *Parking Generation* shows weekday average peak-period parking demand for low/mid-rise apartments to be 1.20 vehicles per dwelling unit in suburban locations and 1.00 vehicle per dwelling unit in urban locations, for an average value of 1.1 per dwelling unit. By comparison, typical San Diego region parking requirements detailed in Table 2 average 1.75 to 2.00 parking spots per dwelling unit for studio and 1-bedroom multifamily, and 2.00 to 2.50 parking spots per dwelling unit for 2-plus-bedroom multifamily units. The lowest requirement was 1.25 parking spaces per dwelling unit in Solana Beach and Escondido for studio multifamily residential units. Taking the average *Parking Generation* demand rate (1.1 per 1,000 square feet) and adding the 10 percent buffer (0.11) results in a supply rate of 1.21 spaces per dwelling unit, a rate slightly lower than the lowest parking code rates for studio apartments. For smart growth, rates ranged from 1 to 1.25.

Parking Generation makes note of additional research on vehicles owned per household. It reports that for areas within one-third of a mile of a light rail station and more than ten miles from a central business district (which would describe many of SANDAG's SGOAs), the average vehicles owned per household was between 1.0 and 1.3. This is substantially lower than the national average of 2.0 vehicles per household in 2000 per the U.S. Census.

Office Parking Demand

With respect to office uses, *Parking Generation* found a weekday average peak-period parking demand of 2.84 vehicles per 1,000 square feet in suburban locations and 2.40 vehicles per 1,000 square feet in urban locations. The overall average demand rate was 2.62. This is lower than any of the San Diego region's parking requirements as summarized in Table 2; these average roughly 1 parking space per 275 square feet or approximately 3.6 parking spaces per 1,000 square feet. The lowest requirement found is 3.33 parking spaces per 1,000 square feet in Del Mar, Oceanside, and La Mesa. Adding a buffer of 10 percent (0.26) to the average demand rate of 2.62 results a calculated supply rate of 2.88, substantially below the lowest regional requirements for office. For smart growth, rates ranged from 1.95 to 3.

Parking Generation also summarizes demand studies in areas with priced parking and high-quality transit options available. Office parking demand in these areas is substantially lower in such areas than in areas with free parking. Studies in such areas have documented parking ratios between 1.00 and 2.00 vehicles per 1,000 square feet of office building area.

Retail Parking Demand

Retail parking demand varies widely among different types of retail uses. *Parking Generation* identifies five types of shopping centers: strip, neighborhood, community, regional, and super regional. The scale of the largest shopping centers is much larger than that of the SGOAs studied. The scale of SGOAs could be most closely compared to community shopping centers. The average size of study sites for the shopping center data is around 535,000 square feet. Rates reported in the Urban Land Institute's (ULI) *Shared Parking* range from 2.7 to 4.7 per 1,000 square feet for various types of shopping centers on different days of the week and different months. Again, the shopping centers studied are mainly in suburban, auto-oriented settings.

In view of the wide variety of demand rates found in *Parking Generation*, the *Shared Parking* (2nd Edition) was examined as a second source. *Shared Parking* reports parking demand of between 3.6 and 4.5 parking spaces per 1,000 square feet of retail (defined as shopping center).

Current San Diego typical parking requirements from Table 2 show a range of 3.3 (Carlsbad) to 5 (Chula Vista) parking spaces per 1,000 square feet with an average approximately 4 parking spaces per 1,000 square feet. These rates are in conformity with the parking demand rates found by ITE and ULI. For smart growth, parking requirements ranged from 2 to 4.65.

It is noteworthy that both *Parking Generation* and *Shared Parking* find that parking demand at retail centers in December is typically 50 percent higher than for the other months of the year. This suggests that if it can be established that the retail component of a smart growth development is not subject to such seasonal peaking (e.g., if the focus is on convenience goods for residents and transit commuters), retail parking rates could be substantially lower.

Table 3 summarizes the foregoing findings regarding parking demand versus current parking supply requirements in the San Diego region for both typical and smart growth development.

Table 3
Parking Demand vs. Existing San Diego Jurisdiction Parking Requirements

Land Use	Parking Demand[1]		Existing Rates for Typical Development		Existing Rates for Smart Growth Development	
	Urban	Suburban	Lowest	Average	Lowest	Average
Residential Multifamily[2]	1.00	1.20	1.25	1.00	1.00	1.10
Office[3]	2.40	2.84	3.33	2.40	1.95	2.19
Retail[3]	3.60-4.50	3.60-4.50	3.30	3.60-4.50	2.00	2.99

(1) Residential and office rates from ITE *Parking Generation,* Retail rate from ULI *Shared Parking*

(2) Rate is per dwelling unit

(3) Rate is per 1,000 square feet of leasable area

Sources: Fehr & Peers, 2009. Institute of Transportation Engineers (ITE) *Parking Generation* 3rd Edition, 2004. Urban Land Institute (ULI) *Shared Parking* 2nd Edition, 2005.

OTHER STUDIES OF SMART GROWTH PARKING DEMAND AND POLICIES

Cervero et al (2009)

A recent study led by Robert Cervero at the University of California, Berkeley found that the weighted average of peak-parking demand for residential units at TODs in the San Francisco Bay Area and Portland, Oregon was 1.15 parking spaces per dwelling unit, close to *Parking Generation*'s observed average value of 1.20 parking spaces per dwelling unit. By contrast, the weighted average parking supply at these sites was 1.57 parking spaces per dwelling unit, 30 to 35 percent above the observed parking demand. (Cervero et al, 2009).

Figure 2 (based on Cervero et al's Figure 3) shows the parking demand at individual residential projects. It is noteworthy that even the highest observed demand is below the typical parking requirement in the San Diego region.

Caltrans (2002)

A 2002 study by the California Department of Transportation found evidence supporting parking reductions for commercial and office land uses in TODs. A number of case studies showed that after parking reductions were negotiated by the developer, parking supply was sufficient, but not excessive. Three key case studies are summarized below:

- Pacific Court, a mixed-use, infill development in urban Long Beach, California, is a development containing 142 apartments above 96,000 square feet of retail and commercial development. The site is served by light rail transit (LRT) every 5 to 10 minutes. The developer was able to negotiate a 60 percent reduction in retail parking standards (5 spaces to 2 spaces per 1,000 square feet and elimination of 3 spaces per 10 units for guest parking), and experience has shown parking to be sufficient, but not excessive.

- Pleasant Hill Bay Area Rapid Transit (BART) TOD is a development containing 411,000 square feet of office space, 40,000 square feet of retail space, and around 350 apartments and townhouses in suburban San Francisco Bay Area. The site is served by heavy rail every 5 to 10 minutes during weekday peak hours, every 15 minutes during off-peak hours. The developer was able to negotiate a 34 percent reduction in office parking standards (5 spaces to 3.3 spaces per 1,000 square feet) and 20 percent reduction in retail parking standards (5 spaces to 4.0 spaces per 1,000 square feet). The development appears to have sufficient parking and has been able to lease some spaces on a monthly basis to BART patrons

- Dadeland South, a TOD in suburban Miami, Florida, is a development containing 500,000 square feet of office and 605 hotel rooms. The site is served by LRT every 5 minutes during peak hours and every 15 minutes during off-peak hours. The site also is served by bus service every 10 minutes. The developer was able to negotiate a 38 percent reduction in office parking standards (1 space per 250 square feet to 1 space per 400 square feet), and experience has shown that there is generally excess capacity in the office garages.

Figure 2
East Bay Results: Peak-Parking Generation Rates*
Relative to Supply Levels and ITE Standard

Site	Supply per Unit	Peak Demand per Unit	Demand: % diff. from Supply	Demand: % diff. from ITE Rate
Walnut Creek: Pleasant Hill BART Station				
Diablo Oaks	1.05	0.74	-29.5%	-38.3%
Iron Horse Park	1.42	0.80	-43.7%	-33.3%
Archstone Walnut Creek	1.12	0.92	-17.9%	-23.3%
Park Regency	1.47	1.06	-27.9%	-11.7%
Archstone Walnut Creek Stat.	1.29	1.09	-15.5%	-9.2%
Villa Montanaro	2.05	1.23	-40.0%	2.5%
San Leandro: Bayfair BART Station				
The Hamlet	1.28	1.07	-16.4%	-10.8%
Union City BART Station				
Verandas	1.50	1.11	-26.0%	-7.5%
Parkside	1.46	1.13	-22.6%	-5.8%
Fremont BART Station				
Presidio	1.82	1.23	-32.4%	2.5%
Watermark Place	1.84	1.27	-31.0%	5.8%
Mission Peaks	1.75	1.35	-22.9%	12.5%
Archstone Fremont	1.98	1.45	-26.8%	20.8%
Sun Pointe Village	1.98	1.47	-25.8%	22.5%
Park Vista Apartments	1.97	1.48	-24.9%	23.3%
Alborada	1.78	1.69	-5.1%	40.8%
ALL 16 EAST BAY STATIONS				
Weighted Average	1.59	1.20	-24.7%	0.0%

* parked vehicles per dwelling unit

Figure 2 (continued)
Portland LRT Results: Peak-Parking Generation Rates*
Relative to Supply Levels and ITE Standard

Site	Supply per Unit	Peak Demand per Unit	Demand: % diff. from Supply	Demand : % diff. from ITE Rate
Beaverton Creek Station				
Center Pointe	1.6	1.23	-23.1%	2.5%
Elmonica Station				
Elmonica Court	1.50	0.90	-40.0%	-25.0%
Cambridge Crossing	2.15	1.04	-51.6%	-13.3%
Willow Creek				
Wyndhaven	1.35	0.90	-33.3%	-25.0%
Quantama Station				
Briarcreek Apartments	1.50	1.12	-25.3%	-6.7%
Quatama Crossing	1.55	1.32	-14.8%	10.0%
Quatama Village	1.41	1.37	-2.8%	14.2%
Orenco Station				
Orenco Gardens	1.53	0.76	-50.3%	-36.7%
Gateway Station				
Gateway Terrace	1.58	0.53	-66.5%	-55.8%
Gateway Park	1.34	0.82	-38.8%	-31.7%
E. 148th Ave. Station				
Rachel Anne	1.41	0.88	-37.6%	-26.7%
Dalton Park	1.31	1.17	-10.7%	-2.5%
E. 162nd Ave. Station				
Morgan Place	1.31	0.65	-50.4%	-45.8%
Sequoia Square	0.84	0.79	-6.0%	-34.2%
Gresham Central Station				
Gresham Central	1.44	1.00	-30.6%	-16.7%
ALL 15 PORTLAND STATIONS				
Weighted Average	1.52	1.07	-30.0%	-11.0%

* parked vehicles per dwelling unit

Table 4 summarizes these findings (Caltrans, 2002).

Table 4
TOD Nonresidential Parking Reduction Case Studies

Transit-Oriented Development	Land Use	Parking Reduction	Experience
Pacific Court (Long Beach, CA)	Retail	60%	Parking sufficient, but not excessive
Pleasant Hill BART Station (Pleasant Hill, CA)	Office Retail	34% 20%	Parking sufficient, leasing space to BART
Dadeland South (Miami, FL)	Office	38%	Excess capacity in office garages

Sources: California Department of Transportation. "Statewide Transit-Oriented Development Study: Parking and TOD: Challenges and Opportunities (Special Report)", 2002.

COMPLEMENTARY PROGRAMS TO ENSURE AND ENHANCE SMART GROWTH PARKING DEMAND REDUCTIONS

The foregoing sections have established that current typical parking requirements in the region are probably higher than typical parking demand at smart growth development. Intrinsic smart growth development characteristics, such as higher densities, proximity to transit, mixed uses with local-serving retail, and bicycle facilities, serve to reduce parking demand. Other supplementary demand management measures and programs can help ensure and enhance parking demand reductions. Inclusion of measures described in this section can provide a factor of safety for cities who grant smart growth projects reduced parking requirements.

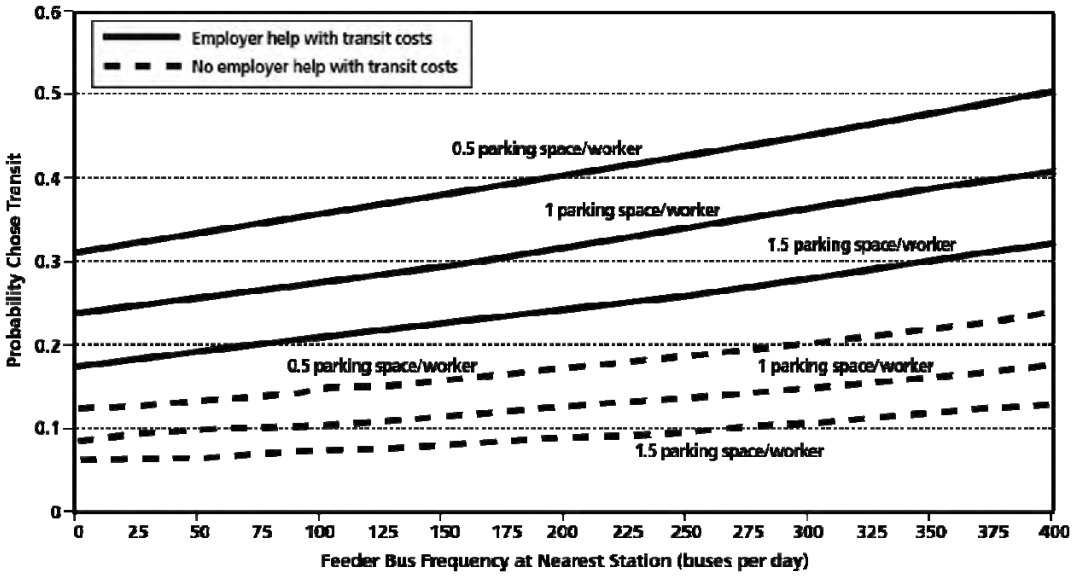
Transit Pass Purchase Programs

Transit pass purchase programs are a popular measure for both transit agencies and consumers. Portland's TriMet LRT initiated a TOD Pass Program in September 1998 to coincide with the start of the Westside LRT project. From September 1998 to May 1999, there was a 22 percent increase in the number of residents that used transit for commuting purposes (TCRP 128).

Employer Assistance With Transit Costs

Employer assistance with transit costs can also encourage transit use. Figure 3 shows results from a model that predicted the probability of a TOD resident using transit considering the ratio of parking spaces to workers and feeder bus frequency in buses per day. A worker near a TOD station with 400 daily feeder buses heading to a worksite where the employer provides transit assistance and one parking spot per two workers has a likelihood of taking transit of 50 percent (TCRP 128, Lund et al., 2004).

Figure 3
Probability of Transit Use by Employees at TODs Relative to Employer Transit Assistance and Parking Supply



Shared Parking

The concept of shared parking has increasingly gained prominence beyond downtown areas where it is the norm. The ULI *Shared Parking* defines the ability to share parking spaces as the result of two conditions: variations in the accumulation of vehicles by hour, by day, or by season at the individual land uses and relationships among the land uses that result in visiting multiple land uses on the same auto trip. The *Shared Parking* manual defines recommended peak-parking demand rates, but then modifies each land use by time of year, week, and day factors. There also are inputs for what the manual defines as "mode adjustment" and "noncaptive ratio." Mode adjustment is a variable based on the percentage of trips that are made to the site using auto vehicles. Noncaptive ratio is an estimate of percentage of parkers at a land use in a mixed-use development who are not already counted as being parked at another of the land uses. This ratio captures trip-chaining and the essence of shared parking – one parking spot used for multiple land uses (ULI, 2005). Many of the SANDAG member jurisdictions already have adopted shared parking methodologies into their parking zoning ordinances.

Car-Sharing

A recent development with potential for reducing parking demand for residential projects has been the concept of car-sharing. Car-sharing is a neighborhood-based, short-term vehicle rental service that makes cars easily available to residents and commuters whose primary mode of transportation is transit, bicycle, or walking. Car-sharing can eliminate the need to own a vehicle, especially if near quality transit options and mixed-use developments. In San Francisco, approximately 60 percent of households that owned vehicles before joining a car-sharing program have given up at least one of

them within a year. Zipcar, which operates in 50 plus cities across North American and the United Kingdom, reports that 15 percent of members sell their private car. The city of Bremen, Germany, states that each shared vehicle takes between four and ten private cars off the road and out of city parking spaces (Environmental Protection Agency, 2006).

Unbundling Parking

Unbundling parking costs is another concept that can reduce parking demand. Because parking is typically included (bundled) into tenant leases, the true cost of parking is hidden. Unbundling parking addresses this issue. For example the price for an apartment with two parking spaces may be rented for $1,000 per month. However, if the parking spaces were unbundled, the price for rent for the apartment would be $800 per month, plus $100 per month for each space. Unbundled parking helps tenants to understand the cost of parking – and provides an incentive (lower rent) for reducing their parking demand. This can lead to other pricing strategies that can help travel management at the project scale (Metropolitan Transportation Commission, 2007). On-street parking should be carefully considered when proposing unbundled parking. There is a potential for on-street parking impacts in the area surrounding the project with the unbundling of parking if such parking is not priced and managed appropriately.

Table 5 summarizes parking policies that can potentially reduce parking demand and the range of effectiveness observed in case studies.

POTENTIAL PARKING RATES FOR SMART GROWTH DEVELOPMENTS

Residential Multifamily

ITE's *Parking Generation* (3rd Edition) showed weekday average peak period parking demand for low/mid-rise apartments to be 1.20 vehicles per dwelling unit in suburban locations and 1.00 vehicles per dwelling unit in urban locations. A study by Robert Cervero at the University of California, Berkeley found a weighted average of peak parking demand for residential units at transit oriented developments (TODs) in the San Francisco Bay Area and Portland, Oregon of 1.15 parking spaces per dwelling unit. It should be noted that there were outliers in the south San Francisco Bay Area lifting the weighted average for Cervero's study to higher than what was observed at most of the transit oriented developments. Taking the average of these three demand analyses (1.00, 1.20 and 1.15) gives a blended demand rate of 1.12; adding a 10 percent buffer suggests a parking supply rate of 1.25 parking spaces per dwelling unit. This value represents a reduction from existing typical standards yet still conforms to the upper bounds of observed values for multi-family units.

Table 5
Potential Reduction in Parking Demand and Effectiveness of Parking Strategies*

POTENTIAL EFFECTIVENESS	REDUCTION POTENTIAL[1] MIN[2]	MAX[3]	MEASURE	DESCRIPTION	SOURCE
HIGH	10%	50%	Housing Wth Less Parking and Higher	Housing that supports and requires reduced car-ownership housing.	Urban Emissions Model (URBEMIS)
HIGH	5%	20%	Transit Pass Purchase Programs	Free transit passes for all residents/employees.	Nelson/Nygard and URBEMIS
HIGH	5%	20%	Higher Charges for Parking	Pricing is known as the most effective way to manage parking demand.	Parking Policies to Support Smart Growth-Metropolitan Transportation Commission-Oakland,
HIGH	10%	20%	Shared Parking Resources	Depending on the mix of land uses and parking demand in relative close proximity.	Parking Policies to Support Smart Growth-Metropolitan Transportation Commission-Oakland,
MEDIUM/HIGH	5%	10%	Unbundled Parking or Parking Cashout	Unbundling residential parking (charge for parking separate from housing costs. Parking cashout program (employer pays staff not to drive to work).	Parking Policies to Support Smart Growth-Metropolitan Transportation Commission-Oakland,
MEDIUM/HIGH	5%	10%	Proximity to Transit	Location within 1/4 mile of a light rail transit or bus rapid transit stop.	Valley Transportation Authority (VTA) and Metopolitan Transportation Commission-Oakland,
MEDIUM/HIGH	3%	10%	Mixed Uses With Local Serving Retail	Sevices within a walkable 1/4 to 1/2 mile distance from the project site.	Nelson/Nygard and URBEMIS
MEDIUM/HIGH	3%	10%	Affordable or Senior Housing	Reducing car-ownership housing resulting in less parking.	Nelson/Nygard and URBEMIS
MEDIUM/HIGH	2%	10%	Telecommuting	Offset office and work-at-home options can reduce the overall parking requirement.	Nelson/Nygard and URBEMIS
MEDIUM	3%	9%	Bike Facilities	If area is conducive to cycling, then bike commuting can be enhanced by providing safe and protected bike parking	UREBMIS
MEDIUM	3%	9%	Transportation Demand Management (TDM) Program	a) Pretax commuter benefit program; b) Guaranteed Ride Home program; c) Reduced parking fee or preferential parkign for carpools/ vanpools; d) Transportation coordinator; e) Distribution of TDM information package to all residents/employees; f) Ride-matching assistance; g) Showers/changing rooms; h) Telecommuting and compressed workweek; i) Provision of on-site child care.	Schreffler (1996)
LOW	2%	5%	Car-Sharing	Having a safety net of car access can decrease car ownership and increase transit use. Free car-sharing memberships for all residents/employees	Parking Policies to Support Smart Growth-Metropolitan Transportation Commission-Oakland,
LOW	1%	3%	Shuttle Service	Increased access from origins to destinations and other transit connections can be provided through a shuttle.	VTA methodology

Maximum combined should generally not be more than 75%. Most projects are ikely to receive a 25% reduction unless several of these elements are utilized.
1 - Amount of actual reduction expected depends on an analysis of area conditions and specific project design element review.
2 - Minimum reduction may be useful if specific design and analysis has not been completed or extraordinary measures are not proposed.
3 - Maximum reduction should only be used if the project and its setting has been fully analyized and extraordinary measures are integral to the project.

Additional information on sources:

- Kuzmyak, J Richard; Pratt, Richard H and Douglas, G Bruce (2003). Traveler Response to Transportation System Changes. Ch. 15 – Land Use & Site Design. Transportation Research Board, TCRP Report 95.
- Litman, Todd (2004) Parking Requirement Impacts on Housing Affordability. Victoria Transport Policy Institute.
- NTI — National Transit Institute (2000), Coordinating Transportation and Land Use Course Manual. Rutgers University, New Brunswick, NJ.
- Parsons Brinckerhoff Quade and Douglas, Inc., with Cambridge Systematics, Inc. and Calthorpe Associates (1993), Making the Land Use Transportation Air Quality Connection.
- The Pedestrian Environment. Report prepared for 1000 Friends of Oregon. Available at: ntl.bts.gov/DOCS/tped.html
- Shoup, D. (1997) Evaluating the Effects of Parking Cash Out: Eight Case Studies. California Environmental Protection Agency. Air Resources Board Research Division.
- Valley Transportation Authority (1998, revised 2003) Transportation Impact Analysis Guidelines.
- Cervero, Robert & Tsai, Y-Hsin (2003), San Francisco City CarShare: Travel Demand Trends and Second-Year Impacts. UC Berkeley Institute of Urban and Regional Development. Working Paper 2003-05.
- Schreffler, Eric. "TDM Without the Tedium," Presentation to the Northern California Chapter of the Association for Commuter Transportation, March 20, 1996
- Findings from an unpublished study conducted in 1995/96 for the Transportation Cooperative Research Program evaluating the impacts of different trip reduction programs at suburban employers.

* parked vehicles per dwelling unit

Office

ITE's *Parking Generation* (3rd Edition) showed weekday average peak-period parking demand for commercial office to be 2.84 vehicles per 1,000 square feet in suburban locations and 2.40 vehicles per 1,000 square feet in urban locations; adding a 10 percent buffer to each of these rates results in corresponding supply rates of 2.64 and 3.12 spaces per 1,000 square feet.

The 2002 TOD study by Caltrans cites two case studies in which office parking requirements were decreased. The Pleasant Hill BART TOD station negotiated office parking standards of 3.3 spaces per 1,000 square feet, and parking has been sufficient to the point that some spaces are leased to BART patrons. Dadeland South, a TOD in suburban Miami, Florida, was able to negotiate office parking standards of 2.5 spaces per 1,000 square feet and excess parking has been observed.

These four supply rates (i.e., the calculated supply rates of 2.64 and 3.12 and the observed rates of 3.3 and 2.5) average out to 2.9 spaces per 1,000 square feet. This value represents a reduction from existing typical standards while conforming to the upper bounds of observed values for commercial office.

Retail

The ULI *Shared Parking* (2nd Edition) recommends between 3.6 and 4.5 parking spaces per 1,000 square feet of retail based on a nationwide collection of case studies. The 2002 TOD study by Caltrans noted one case study in which retail parking requirements were decreased. Pacific Court, a mixed-use, infill development in urban Long Beach, California, was able to negotiate retail parking standards of 2 spaces per 1,000 square feet, and parking has been sufficient. Several of the case studies document that parking reductions in office and retail land uses for TODs can be granted without resulting in significant parking shortages. While some of the reductions documented are much lower than typical parking rates in use in the region, it is conservatively suggested to reduce the basic retail parking standards only slightly to 3.60 parking spaces per 1,000 square feet. Use of the ULI *Shared Parking* methodology is recommended to determine the reasonableness of further reductions.

Setting parking rates at levels observed for conventional development in national parking demand studies (specifically, ITE *Parking Generation*, and ULI's *Shared Parking)* would represent a significant reduction from typical current code requirements for residential and office uses. Nonetheless, there would still be a high probability of accommodating actual demand at smart growth sites.

Current parking requirement accommodations for smart growth development in the region are at or below the rates suggested above; however, it should be noted that these smart growth accommodations have not yet become standard practice for smart growth throughout the region, and in many cases are limited to specific plan areas.

Table 6 summarizes the suggested guidance on parking rates for smart growth development based on the studies mentioned above, relative to existing parking requirements in the region in both typical and smart growth settings.

Table 6
Potential San Diego Smart Growth Development Parking Rates

Land Use	Parking Demand[1]		Typical Current Rates (San Diego Region)		Current Accommodations for Smart Growth (San Diego Region)		Suggested Rates	Reduction From Typical
	Urban	Suburban	Lowest	Average	Lowest	Average		
Residential Multifamily[2]	1.00	1.20	1.25	1.75-2.50	1.00	1.10	1.25	0-50%
Office[3]	2.40	2.84	3.33	3.60	1.95	2.19	2.90	12-20%
Retail[3]	3.60-4.50		3.30	4.00	2.00	2.99	3.60	1%

(1) Residential and office rates from ITE *Parking Generation,* Retail rate from ULI *Shared Parking*

(2) Rate is per dwelling unit

(3) Rate is per 1,000 square feet of leasable area

PARKING MANAGEMENT STRATEGIES TO CONSIDER FOR SMART GROWTH DEVELOPMENTS

In addition to reduced parking rates for smart growth developments, other strategies (shown in Table 7) should be pursued to manage and reduce the demand for parking. Such measures will also help ensure that the advantages of mixed-use development are realized to their full potential.

As described earlier in this discussion, shared parking is the most important aspect of a mixed-use development's ability to realize reductions in parking. The other parking strategies require a change in transportation behavior that is often strongly ingrained in suburban areas, e.g., a modal shift away from personal auto vehicles (towards walking, bicycling, transit and shared cars) and the introduction of transparent parking costs.

Table 7
Potential San Diego Smart Growth Development Parking Strategies

Parking Strategy	Potential Parking Reduction	Cost to Implement
Shared Parking	10-20%	More detailed parking analysis during planning stages
Transit Pass Purchase Program	5-20%	Developer includes in price of building, overall decrease in cost because of fewer parking spaces
Charging for Parking	5-20%	Charge tied to use of parking
Unbundled Parking	5-10%	Minor administrative costs
Car-Sharing	2-5%	Developer dedication of parking spaces to car-sharing operations

Source: Fehr & Peers, 2009.

CONCLUSIONS

These strategies, along with reduced parking rates, can further reduce the number of parking spaces required and thus play to smart growth development's strength – its ability to bring together accessibility and convenience through diversified land use and accommodation of all transportation modes.

The following should also be considered:

- While Table 6 rates can be used as defaults for initial planning purposes, further study is required to examine if parking demand in San Diego smart growth areas deviates significantly from demand observed in nationwide studies and to determine appropriate strategies for particular locations. SANDAG, the cities, and the County should conduct their own parking surveys of local smart growth projects in the region on different days of the week and at different times of year. Further analysis should occur at a neighborhood level in order to capture on-street parking demand and to understand the dynamics of parking behavior that occurs at this level.
- Further research is called for to address specific sites where mixed use/transit-oriented development shares parking supply with park and ride facilities.
- Appropriate parking supply for transit stations should be studied; such a study should address whether or not parking should be provided free of charge at transit stations.
- Additional study should also be undertaken to analyze parking demand at rural village SGOAs, as such communities do not have the same access to public transportation as TODs in urban locations.
- The validity of using parking as a placeholder for future development where appropriate should be studied, as some communities may not be ready to implement the parking strategies described in this study, and may need to phase them in over time. Additional data should be provided regarding methods to phase in parking management strategies over time.
- Smart growth areas should attempt to maximize the utilization of pre-existing parking. To this end it would be useful to conduct areawide parking studies and surveys in infill SGOAs and create parking management districts for such areas. The goals of these actions would be to determine if parking spaces are available, and if so, make arrangements for infill development to utilize them (e.g., through lease agreements).
- As new smart growth developments are approved, cities and the County should monitor parking demand at smart growth developments on a regular basis to establish a regional database on smart growth parking demand and parking demand management effectiveness.
- With respect to parking management practices, SANDAG and the cities should document – and then duplicate – strategies that prove effective.

REFERENCES

California Department of Transportation. *Statewide Transit-Oriented Development Study – Parking and TOD: Challenges and Opportunities (Special Report)*. 2002.

Carlsbad, California, Municipal Code § 21.44, 2009.

Cervero, R., Adkins, A., and Sullivan, C. *Are TODs Over-Parked?* University of California Transportation Center Research Paper No. 882, 2009.

Cervero, R., Golub, A., and Nee. B. City CarShare: Longer-Term Travel-Demand and Car Ownership Impacts. In *Transportation Research Record: Journal of the Transportation Research Board, No. 1992.* Transportation Research Board of the National Academies, Washington, D.C., 2007.

Chula Vista, California, Municipal Code § 6.58, 2009.

Coronado, California, Municipal Code § 86.58, 2009.

Del Mar, California, Municipal Code § 30.80, 2009.

El Cajon, California, Municipal Code § 17.64, 2009.

Encinitas, California, Municipal Code § 30.54, 2009.

Environmental Protection Agency. *Parking Spaces / Community Places – Finding the Balance through Smart Growth Solutions*. Washington, D.C., 2006.

Escondido, California, Municipal Code § 17.64, 2009.

Imperial Beach, California, Municipal Code § 19.48, 2009.

Institute of Transportation Engineers. *Parking Generation,* 3rd edition. Washington, D.C., 2004.

La Mesa, California, Municipal Code § 24.04, 2009.

Lemon Grove, California, Municipal Code § 17.24, 2009.

Lund, H. M., Cervero, R., and Willson, R. *Travel Characteristics of Transit-Focused Development in California*. Oakland. Bay Area Rapid Transit District and California Department of Transportation, 2004.

Metropolitan Transportation Commission. *Toolbox/Handbook: Parking Best Practices & Strategies For Supporting Transit Oriented Development in the San Francisco Bay Area.* Oakland, CA, 2007.

National City, California, Municipal Code § 18.58, 2009.

Oceanside, California, Municipal Code § 31, 2009.

Poway, California, Municipal Code § 17.42, 2009.

San Diego, California, Municipal Code § 142.05, 2009.

San Diego Association of Governments. *Designing for Smart Growth, Creating Great Places in the San Diego Region*. San Diego, CA, 2009.

San Diego County, California, Municipal Code § 6000, 2009.

San Marcos, California, Municipal Code § 20.84, 2009.

Santee, California, Municipal Code § 17.24, 2009.

Solana Beach, California, Municipal Code § 17.52, 2009.

Shoup, Donald, *The High Cost of Free Parking*, Chicago: Planners Press, 2005.

Transportation Research Board. *Transit Cooperative Research Program Report 128 - Effects of TOD on Housing, Parking, and Travel*. Washington, D.C., 2008.

Urban Land Institute. *Shared Parking*, 2nd edition. Washington, D.C., 2005.

Vista, California, Municipal Code § 18.54, 2009.