- Right-sizing new road and intersection improvements to reflect the actual transportation performance can result in more compact development patterns and a higher quality pedestrian environment since less land may be used for road improvements.
- The potential for higher densities in TODs because of the decreased amount of land dedicated to parking and the reduced cost of parking.

Smart growth requires smart calculations, thus impact fees, parking ratios and road improvements need to account for the likely trip reduction effects of TOD. The research study results indicate that residential TOD parking ratios can be tightened and, thus, fees lowered to reflect the actual transportation performance of TODs. Given that TODs have historically been over-parked, the incorporation of the research results into revised parking ratios is an important next step toward national recognition of the expected community benefits of TOD.

2. Literature Review

For the TCRP H-27A project, the panel identified a number of fundamental questions pertaining to transit ridership and TOD. For this literature review, the research team has taken the liberty to divide these questions into four general areas: 1) TOD Travel Characteristics; 2) Transit System and Land Use Characteristics; 3) TOD Ridership Strategies; and 4) TOD Resident/Tenant Characteristics. Findings related to these topic areas and specific questions follow.

To briefly summarize, the existing research provides a largely complete story about transit ridership and TOD. There is significant and very detailed information about specific TOD projects in places such as Portland, Oregon, Arlington County in suburban Washington, D.C., and the San Francisco Bay Area, where a significant amount of travel behavior data has been collected via resident surveys (and as the product of academic research). At the "macro level", US Census data has also been thoroughly analyzed to reveal differences between TOD households and other households with respect to travel behavior and demographics. All of these findings are consistent with each other, and consistent with economic and behavior studies that explain why people travel as they do. For many cities there still remains a lack of detailed primary (survey) data. That said, it is reasonable to assume that the transportation and economic forces that shape TOD residency and travel behavior in California, for instance, would also apply to other settings (e.g., Dallas).

Table 13. Summary of Analysis for Potential TOD-Housing Site Plan Case Studies: Impact of Lower TOD Parking Ratios

	Units		Density		Parking			Annual
	Total	Additional	Per acre	% increase	Spaces	Cost	Difference	Incremental Ridership
Garden Apartments								
TOD 1 ratio	256	+60 units	32	+33%	288	$2.02m	$98,000 savings	19,500 transit trips $19,750 fares
TOD 2 ratio	196		24		432	$2.1m		
Townhomes								
TOD 1 ratio	384	+96 units	48	+ 33%	448	$5.82m	$736,000 savings	31,200 transit trips $31,600 fares
TOD 2 ratio	288		36		648	$6.56m		
Mid Rise 6-Story								
TOD 1 ratio	963	+162 units	120	+20%	1152	$21.31M	$12 million savings	52,650 transit trips $53,330 fares
TOD 2 ratio	801		100		1800	$33.3m		
Texas Donut								
TOD 1 ratio	963	+225 units	120	+30%	1152	$21.31m	$5.3 million savings	82,875 transit trips $83,950 fares
TOD 2 ratio	738		92		864	$15.98m		

Assumptions: Parking ratios: TOD 1 - 1.1 spaces per unit; TOD 2 - 2.2 spaces per unit
Cost per space: surface parking $7,000; tuck under parking $14,000; structured parking $18,500
Transit ridership: 3.55 trips per TOD household allocated as follows: 1.5 work trips per TOD HH * TOD units * .40 TOD work mode share + 4 non-work trips per TOD HH * TOD units * .10 TOD non-work mode share. (Lund et al) = daily ridership x 325 annualization factor = annual incremental increase in ridership. Fare revenue: assumes average fare of $1.013 TriMet March 2008 Month Performance Report, year-to-date Average Fare, April 2008

The additional annual transit ridership which might be attributable from the potential units made possible by lowering parking ratios is summarized in Table 15.

Table 15: Impact of Lower TOD Parking Ratios

	Additional Units	Annual Incremental Ridership	Annual Incremental Fare Revenues
Garden Apartments	+60 units	19,500 transit trips	$19,750
Townhomes	+96 units	31,200 transit trips	$31,600
Mid Rise 6-Story	+162 units	52,650 transit trips	$53,330
Texas Donut	+225 units	82,875 transit trips	$83,950

- **Parking and the financial feasibility of TODs.** Apart from the impacts on the physical form of a TOD the shear amount and cost of parking can be a driver in the financial viability of a proposed TOD and in turn the financial return to a developer. As was discussed earlier, lowering parking ratios can impact the financial viability of a TOD in a number of ways. In particular lower capital costs for parking and a greater yield of units on a site could be expected to result in more TOD projects being financially viable since a developer would be able to potentially increase the number of units on a site while at the same time reduce the capital cost for parking.

  With land cost constituting a growing percentage of housing prices, potentially increasing the number of units on a particular site can play an increasingly important role in the financial viability of a TOD. A 2006 Federal Reserve study shows the growing impact of land on housing prices. Averaging across the 46 largest US cities, the value of residential land accounted for about 50 percent of the total market value of housing, up from 32 percent in 1984 according the study.[41]

- **Parking and urban form.** Creating an active pedestrian environment is a core principle and an essential characteristic of well planned TODs. For TOD designers that means creating as many active street edges (lining streets with people oriented uses) as possible. The TOD site plans help to demonstrate the impact different parking ratios can have on creating an active pedestrian environment. The result is most noticeable with the moderate density garden apartment example where surface parking is employed. With the 2.2 parking ratio approximately 50% of the "street edge" is

[41] Davis, Morris A. and Palumbo, Michael, "The Price of Residential Land in Large U.S. Cities" (June 2006). FEDS Working Paper No. 2006-26 Available at SSRN: http://ssrn.com/abstract=943771

dominated by parking. With the 1.1 parking ratio the amount of the street edge taken by parking decreases by half to 25% of the total site street edge.

8. Implications of Applying New Standards for TOD-Housing

The research findings and literature review provides solid evidence to support the belief that people living in TODs drive less often than their neighbors in conventional developments. Based on this evidence, public officials and government regulators may chose to develop new, more realistic standards for parking, assessing impact fees and mitigation for TODs. The research suggests important implications are likely to flow from permitting and developing TODs based on an accurate assessment of their parking needs and trip generation.

Some of the likely consequences of permitting and building TOD consistent with the findings of this research include:

More compact development. As the site plan case studies help to demonstrate, more compact environmentally sustainable development can result from less land being consumed for parking. The case studies showed an increase in density for residential TOD of 20 to 33% could be achieved. This tracks well with U.S. EPA estimates that each on-site parking space in infill locations can reduce the number of new housing units or other uses by 25 percent or more.[42] It must be noted that the ability to increase density should not necessarily translate to the higher density in all cases. Parking and trip generation are only two variables of many in the very complex issue of increasing density.

Easier development approvals. One of the major challenges developers face with TOD is the increased time and expense of getting development approvals for infill development because of inevitable neighborhood concerns about traffic. Interviews with TOD developers[43] reveal an interesting cycle which plays itself out over and over in response to community concerns about the traffic impacts of new development. One way to explain the sequence is in a five act TOD morality play:

1. Act One "vision": Planners, citizens and smart growth advocates secure adoption of a compact transit village plan allowing compact dense residential development around a rail station.
2. Act Two "optimism": Time passes and a progressive developer presents the local community a proposal for a dense TOD allowed under the transit village plan.

[42] U.S. Environmental Protection Agency, January 2006

[43] Parsons Brinckerhoff. *Factors for Success in California's Transit-Oriented Development.* Sacramento: California Department of Transportation, Statewide Transit-Oriented Development Study. 2002

3. Act Three "opposition": Community members concerns about change inevitably focus on perceived traffic impacts and overflow parking from the dense TOD development.
4. Act Four "compromise": The developer offers to cut the density below transit supportive levels in the adopted plan and increase the parking in order to get a development approval and recover his fixed costs.
5. Act Five "The lesson": Many of the hoped for community benefits of TOD at the rail station and the financial return to the developer are not realized because the development is built below the allowed density with increased parking, and the developer may be less apt to pursue TOD.

Getting new information on the performance of TODs out into the field may help to break this cycle of compromising away the benefits of TOD. Local officials and neighborhoods may be more apt to support increases in residential densities near transit if they are shown proof that up to half of the trips result from TODs than in conventional development. Using a 700-unit California condominium project as a reference point, the expected daily traffic rates would be reduced by as much as half with a likely number of 2350 trips with the TOD traffic generation rates rather than 4700 daily trips using the ITE rates.[44]

Lower fees for TODs. Applying new standards trip generation could result in wholesale changes in how we address the cost, impact and feasibility of residential development near transit. The implications of new standards are varied and would need to be scaled to the quality of transit service present.

Developers would likely pay lower fees and exactions by as much as 50% to reflect the actual performance of residential TODs. Those savings could be passed on to homeowners and tenants in the form of lower housing costs. For instance, that same 700-unit condominium development could see its traffic impact fee reduced by half—from $4,500 per unit to $2,250 per unit—if it were based on the likely traffic generation of a TOD rather than the ITE rates. In this case, the developer would save $1.6 million—presumably making the units more affordable.

Downsizing new road construction. Traffic based impact fees are used to help fund intersection and roadway improvements such as street widening. The same mathematical equations which result in over-charging impact fees for TODs also can result in over-building road facilities to serve TODs. With lower levels of traffic being generated from TODs it can be argued it makes no sense to construct roadway improvements to serve TOD related traffic that is likely not to materialize.

Right-sizing new road and intersection improvements to reflect the actual transportation performance can result in more compact development patterns and a higher quality pedestrian environment since less land may be used for road improvements.

[44] Estimate based City of West Sacramento impact fees. Email from Shanna Zuspan, West Sacramento Redevelopment Agency, November 5, 2007

Enhanced housing affordability. Housing affordability is one of the areas where the research may have significant implications. Housing affordability is driven by a myriad of factors. With land costs constituting 50 percent of the total market value of housing, the TOD site plan case studies suggest reducing parking ratios to reflect the transportation performance of TODs can also have the additional benefit of increasing the number of housing units on the same piece of land by between 20 and 33% which can translate into lower housing costs. [45]

The TOD housing affordability connection has received attention from some housing advocates because automobile ownership is one of a household's largest expenses, second only to the cost of housing.[46] The poorest families spend the greatest share of their income on transportation.[47] Instead of paying a quarter or a third of their income for housing, low-income families sometimes pay half or even more for a place to live. Reducing transportation expenditures by living in TODs can free-up disposable income to be used for other uses such as housing.

9. Conclusions and Recommendations

This research helps confirm what had been intuitively obvious: TOD-housing produced considerably less traffic than is generated by conventional development. Yet most TODs are parked on the assumption that there is little difference between TOD and conventional development with respect to the traffic they generate. One likely result of this fallacious assumption is that fewer TOD projects get built. Those TOD developments that do get built are certainly less affordable and less sustainable than they might be, because they are subject to incorrect assumptions about the traffic impact they generate. Therefore many of the hoped for benefits (less time stuck in traffic and lower housing costs to name two) from nearly $75 billion in public dollars invested in rail transit[48] over the past 11 years are not being realized.

One end result is that auto trip generation is likely to be overstated for TODs. This can mean that TOD developers end up paying higher impact fees, proffers, and exactions than they should since such charges are usually tied to ITE rates. Another implication of the research is that parking ratios for residential TODs are also likely to be overstated for TODs by the same

[45] Davis, Morris A. and Palumbo, Michael, 2006

[46] According to the Bureau of Transportation Statistics, in 1998 the average household spent 33 percent of its income on housing and 19 percent on transportation (Only 6 percent of transportation spending went toward travel by air, taxi, and public transportation). Food related expenditures come in third, at 14 percent. Bureau of Transportation Statistics. 2000. *Pocket Guide to Transportation.* U. S. Department of Transportation, BTS00-08.

[47] http://www.transact.org/Progress/jan01/table.htm

[48] Email from John Neff Senior Policy Researcher, American Public Transportation Association, October 26, 2007

order of magnitude since they are also based on ITE data. More research on parking generation will be needed to confirm whether TOD residents own cars at the same rate as conventional development, but use them less.

Some of the cumulative impacts of over-parking TODs are illustrated in the site plan case studies. The TOD site plan case studies help to demonstrate that under the right conditions lowering residential parking ratios by 50% for TODs in station areas with quality transit service can result in:

- An increase in the density of a residential TOD by between 20 to 33% depending on the residential building type;
- Savings on residential parking costs ranging from 5 to 36% after accounting for increases in the number units to be parked resulting from increased residential density, and;
- Potentially greater developer profits and/or increased housing affordability coming from achieving higher densities, lower capital costs for parking, and reduced traffic impact fees.

Right-sizing parking ratios and traffic generation to the actual performance of TOD is likely to result in some important implications on the physical form and performance of TOD developments:

- Local officials and neighborhoods may be more apt to support increases in residential densities near transit if they are shown proof fewer trips result from TODs than in conventional development.
- TOD developers would likely pay lower traffic related impact fees and exactions. Those savings can be passed on to consumers in the form of lower housing costs.
- With lower levels of traffic being generated from TODs it can be argued it simply makes sense no to construct roadway improvements for TOD related traffic that is likely not to materialize.
- Right-sizing new road and intersection improvements to reflect the actual transportation performance can result in more compact development patterns and a higher quality pedestrian environment since less land may be used for road improvements.

Clear policy directions fall out of this research. The appreciably lower trip generation rates of transit-oriented housing projects call for adjustments in the measurement of traffic impacts. For peak periods (that often govern the design of roads and highways), this research shows transit-oriented apartments average around one half the norm of vehicle trips per dwelling unit. The rates varied, however, from 70%-90% lower for projects near downtown to 15% to 25% lower for complexes in low-density suburbs. Regardless, smart growth needs smart calculus - those who build projects that reduce trips should be rewarded in the form of reduced traffic impact fees and exactions. The expectation is developers would pass on some of the cost savings to tenants, thus making housing more affordable near rail stations.

To date, few jurisdictions have introduced sliding scale fee structures to reflect the lowering of trip generation for TODs. Santa Clara County California's Congestion Management Agency has produced guidelines calling for a 9% trip reduction for housing within 2,000 feet of a light-

rail or commuter-rail station. While this is a positive step, according to our research findings, this adjustment is a bit tepid. Similarly, the URBEMIS software program sponsored by the California Air Resources Board, used to estimate the air quality impacts of new development, calls for up to a 15% lowering of trip rates for housing in settings with intensive transit services - again, likely on the low side based on our findings. More in line with the findings presented here are the vehicle trip reductions granted to the White Flint Metro Center project, a mega-scale, mixed-use joint development project now being built at Washington Metrorail's New Carrollton Station. With some 1.2 million square feet of office space, 250,000 square feet of commercial-retail, and 375 residential units scheduled at build out, the project was granted a 40% reduction in estimated trip rates for the housing component based on proximity to transit.

The trip reduction benefits of TOD call for other development incentives, like lower parking ratios, flexible parking codes, market-responsive zoning, streamlining the project review and permitting process, and investments in supportive public infrastructure. Trip reduction also suggests TODs are strong markets for car-sharing. Recent research in the San Francisco Bay Area reveals that those who participate in carsharing lower their car ownership levels by around 10%, with higher vehicle-shedding rates among those living near rail stations (Cervero et al., 2007). The combination of reducing off-street parking and increasing carsharing options would yield other benefits, including reducing the amount of impervious surface (and thus water run-off and heat island effects) and the creation of more walkable scales of development. Such practices are not heavy-handed planning interventions but rather market-oriented responses - namely, efforts to set design standards and provide mobility options that are in keeping with the market preferences of those who opt to live near rail transit stations.

Recommendations

With this research data to support the belief that people living in TODs drive less often than their neighbors in conventional developments, public officials and government regulators have the evidence needed to develop new, more realistic standards for assessing impact fees and mitigation for TODs. Developing residential TODs based on an accurate assessment of their traffic impacts should result easier development approvals, better planned and more compact communities, increased transit ridership, and more affordable housing. Tightening residential TOD parking ratios to reflect the actual transportation performance of TODs will be a very important step toward realizing the expected community benefits of TOD and enhancing their financial feasibility. In many TODs, the community and developer benefits have been understated because they have been over-parked. Additional research is also suggested to further address some of the questions addressed in the Literature Review.

To help realize the benefits of TOD the team recommends the following:

1. **Work with ITE and ULI to develop new trip generation and parking guidance for TOD.**

In the opinion of the authors the highest priority should be placed on working with ITE and the ULI to develop and implement new guidance on trip generation and parking for TOD-housing. The research suggests developers are being charged impact fees for non-existent trips and required to build expensive parking spaces which are not needed. Parking ratios developed using ITE trip generation rates over-park TODs by as much as 50%. In developing new guidance

Parking Policy for Transit-Oriented Development: Lessons for Cities, Transit Agencies, and Developers

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Abstract

Parking policy is an important element of transit-oriented development (TOD). It shapes travel behavior, community design, and development economics; it can improve the performance of both rail transit and TOD. This article is based on the study of residential TODs, office TODs, and joint development of transit agency station parking in California. The research includes surveys of travel behavior, station-area characteristics, parking supply, interviews with real estate developers, and studies of replacement parking issues at joint development sites. Research results show that TOD parking supply and pricing policy seldom are structured to support transit ridership goals. Policy recommendations for improving parking policy for TODs are offered to transit agencies, cities, and developers.

Introduction

Transit-oriented development (TOD) has the potential to address pressing transportation, housing, and environmental issues in U.S. cities (Bernick and Cervero 1997; Cervero, Ferrell, and Murphy 2002; Porter 1997). TOD can reduce vehicle miles traveled (VMT) since residents and workers generally have higher transit mode shares than comparable areas (Lund, Cervero, and Willson 2004; Cervero 1993; Cervero 1994). However, the performance of both rail transit and TOD is

uneven (Pickrell 1992; Bae 2002). TOD potential has been explained by factors such as system design and siting, development control issues, and public finance (Loukaitou-Sideris and Banerjee 2000; Boarnet and Crane 1998; Willson and Anderson 1993).

Parking policy is an important determinant of travel behavior, regardless of proximity to transit (Shoup and Pickrell 1980; Shoup and Willson 1992; Willson 1992a, b, 1997; Hess 2000). Critics argue that parking is generally oversupplied and underpriced (Shoup 2005). Researchers have called for reforms in minimum parking requirements and the cashing out of parking subsidies (Shoup 1995, 1997, 2005; Willson 1995, 2000). Finally, developers report that parking is one of the most important issues to be resolved in proposing TODs.

Research on TOD policy and parking policy has largely proceeded on parallel tracks. This article connects these themes by examining parking requirements and policies at a series of TOD settings in California and asking whether current parking policies support transit and TOD outcomes. This question is addressed in terms of residential and office TODs, real estate issues, and replacement parking for joint development.

Methodology

The article draws information and insights from three efforts, summarized in Table 1.

Parking Supply and Policy in Residential TODs

Twenty-six *residential* sites were studied in the 2004 Travel Characteristics of Transit-Oriented Development in California (referred to hereafter as the Bay Area Rapid Transit district [BART] study). Fifteen of those sites are grouped into five station areas that have common characteristics (rail technology and station context) and sufficient response rates for statistical validity. The remaining 11 sites are shown in the "other" category, which includes a variety of rail transit modes.

Parking Supply

Jordan Station Parking Ratio per unit:

Parking supply levels at the California TODs studied are somewhat less than typical levels in the cities in which those TODs are located. The average parking supply per unit is 1.41, including visitor parking. Parking supply varies from 0.47 to 2.68 spaces per unit with a standard deviation of 0.5. The ratio of 1.41 spaces per unit means that the square footage of parking exceeds the square footage of living area

Table 1. Summary of Studies

Study	Rail System Studied	Methodology
Travel Characteristics of Transit-Oriented Development in California, Lund, Cervero, Willson (2004), Caltrans Statewide Planning Studies grant, carried out under the auspices of the Bay Area Rapid Transit District	Sacramento LRT, Bay Area Rapid Transit District heavy rail, Caltrain commuter rail (northern California), San Jose VTA light rail, Los Angeles Metrolink commuter rail, Los Angeles Blue Line light rail, Los Angeles Red Line heavy rail, San Diego Coaster commuter rail, and San Diego Trolley light rail	Study of 36 TODs using mail-back questionnaires of residents, employer-distributed worker questionnaires, studies of site and context analyses, regional characteristics, and parking policies. Study sites were non–CBD TOD locations within one-half mile of a transit station
The Pasadena Gold Line: Development Strategies, Location Decisions and Travel Characteristics along a New Rail Line in the Los Angeles Region, Lund and Willson (2005), Mineta Transportation Institute, San Jose State University	Los Angeles–Pasadena Gold Line light rail	Study of 37 residential TODs along the Gold Line. Data collected using mail-back questionnaires of residents, site and context analyses, measures of regional land-use and transportation characteristics, and interviews of developers and property owners
Replacement Parking for Joint Development: Access Policy Methodology BART/Willson, (2005)	Bay Area Rapid Transit District heavy rail	Principles and methodology for determining replacement parking. Four case study stations

unless the unit is greater than 493 square feet. A 1,000 square foot unit would require an additional building area amount of about 50 percent to accommodate parking. Table 2 summarizes the results.

Table 2 also shows the reported transit shares for journey-to-work trips and all "main" trips. For the five station groupings, there is a 0.98 correlation between transit mode share and percent of households with less than one vehicle per driver. Lower car availability means greater transit use. However, the correlation between parking supply (spaces per unit) and the journey-to-work transit share is -0.26. This is the expected sign (greater parking supply is associated with less transit use) but is not statistically significant.

Why was there not a statistically significant relationship between parking supply and transit share? First, and most importantly, most units had more than one space per unit. Most projects had plentiful supply. Parking was so generously supplied that the sensitivity of mode to parking supply could not be tested. Second, this analysis did not consider the availability of on-street parking as an alternative.

Table 2. Parking Supply and Pricing in Residential Buildings (n=26)

Station Area (n)	Parking Spaces per Unit	Percent Households with < 1 Vehicle/Driver	Transit Share (%) JTW/All trips*
BART: Pleasant Hill (4)	1.08	24.0	20.8 / 19.2
BART: So. Alameda County (4)	1.31	30.6	29.9 / 27.4
LA Blue Line: Long Beach (2)	1.25	16.7	2.8 / 2.2
SD Trolley: Mission Valley (2)	1.92	21.5	10.5 / 11.3
Caltrain: Commuter Rail (3)	1.35	21.6	11.0 / 11.3
Other (11)	1.42	39.2	28.0 / 25.4
Average (unweighted)	1.41	26.4	22.4 / 20.7

* The "All trips" category asked respondents to report on three main trips taken that day. It is not based on a full travel diary inventory.

Available on-street parking might make parking supply a weaker influence on mode choice.

The lack of a statistically significant relationship between supply and mode choice is of interest to planning regulation and development practices. Looking at the relationship in the other causal direction, projects with higher levels of transit use did not have statistically significant lower parking supplies. In other words, those projects *oversupplied* parking for the level of transit use, either as the result of city codes or developer/investor preferences.

Oversupplying parking in TODs uses scarce land for which there are better community uses. It also drives up occupancy costs (since parking is bundled with rent payments) and/or lowers return on investment. It encourages developers to build larger residential units so that they can amortize the cost of required parking across a greater per unit rent stream (Hitchcock 1999; Litman 1998), further harming housing affordability. Finally, unused spaces in residential projects are rarely shared with other uses because of the desire to control access to the parking. Excess residential parking rarely contributes to a district area parking supply.

Parking Pricing

Results from the BART survey indicate that apartment managers "bundle" parking charges with rent, providing free parking along with the rental unit. *None of the residential projects had a separate charge for parking, independent of the lease rate.* Bundled parking is problematic in all locations, but is particularly problematic for TODs. First, tenants receive no market signal about the cost of providing parking and are likely to have higher automobile ownership for that reason. Developers have no information on tenants' willingness to pay for parking. In the location where the greatest investment in transit has been made, residents perceive parking to be "free."

Because parking was bundled in all the cases studied, it is impossible to test the sensitivity of TOD residents to home-based parking charges. The cost of providing this parking is $16,920 per unit (estimated at the 1.41 space per unit ratio and a per space cost of $12,000). This cost is reflected in either higher rents or a reduction in land value.

As reported in the literature (Willson 1992a), *worksite* parking policies have a strong influence on the level of transit use among TOD residents. The BART study found that free parking at work is a significant predictor in the binomial logit model developed for that study. It is likely that the combination of parking charges at the residence and the workplace would have an even larger impact on increasing transit use.

Parking Supply and Policy in Office TODs

Parking Supply

Table 3 indicates that the TODs studied had an office parking supply that is generally lower than the 4.0 spaces per 1,000 square feet convention for office projects. However, since the average utilization of office projects nationwide is 2.84 occupied spaces per 1,000 square feet gross floor area (Institute of Transportation Engineers 2004), parking is still generously supplied in these projects. The projects studied averaged well over one space per reported worker. It is important to note that most of these projects were built prior to the 1990s, when workplace parking requirements were not an important public policy issue. Therefore, we should not expect to see an anticipation of transit access effect on parking demand in older projects.

Table 3. Parking Supply in Office Buildings (n=10)

	Date Project Built	Spaces per 1,000 Square Feet	Spaces per Worker	Transit Share
BART: Berkeley (1)	1971	4.0	1.6	38.5%
BART: Walnut Creek/Freemont (2)	1985, 1989	2.9	1.4	19.2%
LA Red Line: Hollywood, North Hollywood (2)	1921, 1987	2.6	1.4	7.5%
SD Trolley: Mission Valley (1)	1995	4.0	1.1	2.9%
Sacramento LRT (2)	1989, not known	3.6	1.0	22.8%
Metrolink: Anaheim (1)	1988	3.9	1.6	13.0%
Other (1)	Not known	1.7	1.4	13.0%
Average (unweighted)		**3.1**	**1.3**	**16.3%**

The project level groupings shown in Table 3 did not produce a positive and statistically significant correlation between supply and transit mode share. Every project had at least one space per worker, so there was no availability constraint that would affect supply. The BART project was an outlier in that it had the highest transit share and high parking supply (the project was built in 1971).

Parking Charges in Leases and to Workers

Arrangements for office parking charges varied more than those observed for residential units. In some situations, the cost of providing parking was bundled into lease payments, while in other situations there was a direct pass-through of parking charges to employees. However, many TOD employers offered their employees free parking. Table 4 summarizes the BART TOD study data according to station groupings. Several measures of parking cost are provided. The second column provides the market parking price determined in site research, which average $49 per month at the 10 sites. There is a 0.73 correlation between market price and transit share, indicating that higher parking prices are associated with a higher transit share. Of course, market price is not a reliable indicator of the price commuters actually pay, since it is common practice for employers to subsidize parking (Shoup 1997).

The third column lists the parking pricing policy reported by the property owners. This generally indicates subsidy policy, but may not reflect variation among employers or variation in benefits offered to different classes of employees.

Table 4. Parking Prices, Terms, and Transit Share

	Monthly Market Parking Price	Parking Payment (from Site Survey)	Daily Reported Price Paid (by Those Who Drove)	Employer Provides Free Parking (Employee Response)	Transit Share
BART: Berkeley (1)	$125	Paid by worker	$4.94	33.3%	38.5%
BART: Walnut Creek/Freemont (2)	$34	Employer invoiced, free	$2.50	76.5%	19.2%
LA Red Line: Hollywood (2)	$85	Bundled in tenant leases	$3.33	89.2%	7.5%
SD Trolley: Mission Valley (1)	$0	Free	$3.00	82.9%	2.9%
Sacramento LRT (2)	$50	Paid by worker, free	$4.71	24.6%	22.8%
Metrolink: Anaheim (1)	$25	Bundled in tenant leases	$0	86.5%	13.0%
San Jose VTA: Baypointe (1)	$0	Free	$0	100%	9.5%
Average (unweighted)	**$49**		**$2.64**	**70.6%**	**16.3%**

The fourth column shows the reported price paid by those who drove. Because respondents who *do not* drive often do not know what their parking costs would be, the survey instrument was not able to collect reliable individual level data on the price of parking for all commuters. We cannot assume that transit users faced the same parking price as those who drove (either due to differential policies among employee classes or different choices about parking location).

The fifth column indicates the percentage of employees who said that their employer offers free parking, which averaged 70.6 percent. The correlation between the percentage reporting free parking and transit use is -0.80, indicating that free parking undermines that transit access advantages that TODs provide. Parking charges are a source of potentially large gains in station area ridership.

Among the office sites surveyed, the California Department of Conservation building in downtown Sacramento had the highest transit share—41.3 percent. This is achieved on a light rail system that is relatively new and limited in scope. Parking is $100 per month, with a reserved space costing $130 per month. There are other transit-supporting factors present as well—the project is located in a dense,

mixed-use downtown with high employment density (37.6 workers per acre) and is within 165 feet of a light rail station.

Real Estate Aspects of Parking Supply and Policy

Parking Supply

Research on parking utilization and pricing often concludes that conventional practice results in the oversupply and underpricing of parking (Willson 1995, 2000). Furthermore, parking policies often favor automobile access and automobile-oriented land-use planning in a way that has a self-reinforcing effect of discouraging transit use. Planners often point to developer and lender "rules of thumb" for supply (e.g., 1.0 space per bedroom for residential and 4.0 spaces per 1,000 square feet for offices) and leasing arrangements (bundling the cost of parking with rent) as part of the problem. Eleven telephone interviews were conducted with developers working on residential projects in the Los Angeles-Pasadena Gold Line TOD study in July/August 2004 to better understand their perspectives and practices (Lund and Willson 2005).

Although most developers expected light rail proximity to influence the travel behavior of their tenants, they were cautious about predicting effects on parking demand. Most developers did not systematically collect data on rail ridership, mode choice, or levels of car ownership. An intuitive sense that rail and TOD were well suited seemed to drive their decision-making. Importantly, the rail/TOD connection also facilitated the process of obtaining development entitlements, making it easier for developers to justify additional density to the community and decision-making bodies.

The interviews did suggest that parking practice is changing, albeit slowly, with some developers reducing the number of free parking spaces provided with a unit, and renting additional spaces at a market price. The change is most pronounced in downtown areas, where parking is being decoupled from rent or purchase price and where some cities have eliminated traditional minimum parking requirements.

Jurisdictions in the Gold Line corridor provide relief from conventional parking requirements through TOD specific plan provisions and/or variances. In one case, a developer reported that the City of Pasadena requested that the developer seek a variance to their own code to reduce parking supply to 1.5 spaces per unit. In another Pasadena case, the developer did not seek to build below code require-

ments but exceeded them, building 1.7 spaces per unit despite the fact that the underground spaces cost an estimated $30,000 per space. Explanations for this approach include the fact that the Gold line was untested when the parking supply decisions were being made and that the income profile of the expected residents was higher than the average apartment unit. Remaining prominent in developers' and investors' minds is the perception of market risk associated with a project being undersupplied with parking in comparison to its competitors.

Interviews suggest that the development community is becoming more favorable to rationalizing parking supply and using unbundling strategies. However, developers need market-specific experience and examples before they consider meaningful reductions in parking supply. Leasing agents must be convinced that they can market projects with less parking and/or unbundled parking. This must be supported by project planning, design, construction, and sales processes that are better integrated in terms of parking. Developers indicated that projects get locked into parking ratios early on in ways that inhibit innovations in parking management and pricing.

Because parking is so expensive to provide, parking ratios and pricing policies strongly influence developers' ability to provide affordable housing. Most of the projects surveyed provided little affordable housing, despite this issue being high on the priority list of many cities and regional agencies. TODs' location efficiency should be carefully worked into minimum parking requirements and other parking policies to ensure that savings on parking are realized and are passed on to residents.

Impact of Parking on Joint Development on Transit Agency Land

The case of TOD construction on transit district land presents special parking challenges. Unlike office and residential TODs, transit station area parking is frequently fully utilized during peak hours. In the Bay Area, BART has long had a practice of requiring one-for-one replacement of station-area parking. Developers were required to build to city code requirements for the TOD and replace all surface commuter spaces for BART patrons. The reason for this practice was to ensure that existing patrons were not lost because of a reduction of commuter parking. There are some problems with this practice. For example:

- It is a financial and site design impediment to joint development projects.
- Private and/or public resources are not available to fund replacement parking.

- The 1:1 replacement approach focuses on only one access mode (those who drive and park).
- Parking generates less net return than development.

BART has adopted a broader approach to access and replacement parking, aligned with the following principles: support ridership; improve the agency's fiscal condition; reduce the share of station access by those who drive alone and park; support the management of system and station capacity; and support the broader goals of the transit agency, local cities, and regional entities.

A methodology was developed to deal with the replacement parking issue. It addresses riders potentially lost due to space reductions, plus riders gained from joint development (Willson 2005). New attention is given to the fiscal impacts of alternatives to 1:1 replacement. The following categories are considered in terms of revenue gains or losses:

- fare revenue (net ridership gain or loss, considering new riders from the joint development, any lost riders associated with reduced commuter parking supply, impact of parking charge programs and other access programs);
- parking revenue associated with new parking charge programs (net of collection costs, plus amortized equipment cost);
- parking operating costs (associated with a change from surface to structure spaces);
- transit system operating costs (related to greater ridership, changes in peaking of ridership, etc.);
- ground rent from the joint development; and
- grant revenue and revenue from potential partnerships with other parties (e.g., cities, transit operators, regional agencies, etc.).

The revenue bottom line is considered along with other key objectives listed above to generate a matrix display of the performance of alternative joint development/replacement parking scenarios. BART has conducted tests with the replacement parking methodology on four stations and has adopted this methodology. The key initial findings suggest the following:

- Requiring less than 1:1 replacement of commuter parking produces gains in ridership and revenues and fulfills most BART goals as compared to requiring full replacement parking. Development feasibility improves as replacement parking requirements are relaxed.

- Aggressive development scenarios that include no replacement of parking, the institution of parking charges, and more intensive development produce the net greatest benefits, although less ridership gain them moderate alternatives. These types of scenarios generate more than $1 million per year, per station, in net proceeds for BART, funds that are ongoing and unrestricted in use. In contrast, 1:1 replacement of commuter parking, combined with lower density joint development and no use of parking charges, produce negative results for BART.
- The right decision about replacement parking is dependent on station context. For example, parking at end-of-the-line stations provides an important source of ridership, while mid-line stations are much less dependent on parking for their ridership. The availability of alterative access modes is critical as well.
- A wide variety of alternatives for replacement parking are available, including relocating it off site or at an underused station, or not fully replacing it and instead funding alternative access improvements.

Conclusions and Policy Recommendations

Current parking supply and pricing policies do not support the transit objectives of TOD. Although planners often emphasize urban design qualities, streetscapes, feeder bus services, and the like, they should not ignore parking policy. Initiatives in this area should include local governments, transit agencies, and developers. Now that transit systems are maturing and the market for TOD has strengthened, local planners should team up with transit agencies and developers to ensure that parking policies support high transit ridership.

The process of adjusting parking supply and policies from status-quo, parking-focused approaches is different in each community. Some communities embrace these changes, while others doubt the impact of rail transit on travel behavior and automobile ownership. If TODs are *transit adjacent* but not *functionally related*, developers and cities have justification in being cautious about reducing parking supply. Fortunately, the growing body of evidence about the types of circumstances where TODs substantively change mode choice and automobile ownership will help communities assess their own conditions. It is also important to recognize that many existing regulations and building practices have the effect

of creating a self-fulfilling prophecy—high parking requirements mean low or zero parking prices, which undermine the realization of full transit or TOD benefits.

The following sections provide a series of suggestions for cities, transit agencies, and developers, based on the research reviewed above.

Suggestions for Cities

- Adopt *demand-based, locally-calibrated TOD parking requirements* that reflect expected transit shares and automobile ownership in the particular TOD under consideration. The data provided in this article and Lund, Cervero and Willson's (2004) report will soon be supplemented by data on TOD parking generation from other studies (Institute of Transportation Engineers, California TOD studies, etc.). Alternatively, cities can deregulate parking in transit districts if they properly manage on-street parking. The City of Los Angeles, for example, recently had success in partially deregulating parking in its Adaptive Reuse Ordinance. This approach puts decisions about parking supply for housing and offices in the hands of developers, who assess market demand and prices in determining the best use of capital.
- Adopt a district-based approach to assessing parking demand and require *shared parking.* Create urban design standards that make the sharing of parking resources possible. Use in-lieu provisions to create district-based parking facilities. Find ways to reduce developers' risks of undersupplying parking on a particular project through shared parking and district parking resources.
- Pursue *partnerships with transit agencies* for shared station-area parking planning and supply, and use legal arrangements, such as joint powers authorities, to implement multiagency and multiproperty owner strategies.
- Encourage/require *unbundling* of parking charges from space leases in agreements for residential and office developments.
- Encourage/require employer tenants to *cash-out parking* in office developments.
- Actively *manage on-street parking* to control overspill parking and encourage rapid turnover of on-street spaces. Prioritize on-street parking for short-term, visitor parking. Show community groups how parking management can manage demand and provide a revenue stream for neighborhood improvements.

- Consider the economic impact of parking requirements on *housing affordability* in station areas.

Suggestions for Transit Agencies

- Design stations and station-area parking in a way that *places housing* and *mixed-use development in convenient proximity to stations*. Alignment and station location planning should consider how parking affects the walkability of the station vicinity and possibilities for shared parking.
- *Convert park-and-ride surface lots to TODs* with less than full replacement of parking. Consider development schemes that coordinate multiple property owners and optimize land allocation. Assess the degree to which replacing parking with TOD reduces the demand peaks on the transit system.
- Partner with local jurisdictions in developing *parking requirements and policies that support transit use*, adopting an access perspective rather than a parking-supply perspective.
- Partner with local jurisdictions, employers, and other transit agencies to support *growth in the capacity of nonautomobile station access modes*, such as feeder bus services, bicycle, and pedestrian facilities, etc.

Suggestions for Developers

- *Align parking supply with actual demand* when the parking is priced at its true cost. Supply parking to average demand, not peak demand, using shared parking to accommodate demand peaks. Design projects so shared parking can be realized and modified with ease.
- *Unbundle parking* from space rent or sales price.
- Pursue *shared parking* opportunities, in terms of legal agreements and design features.
- Involve project architects, market researchers, and leasing agents in early conversations about ways to *alter conventional parking supply and leasing practices*.

Parking in TOD provides a critical connection between design characteristics and transportation behavior, yet stakeholders have been slow to address this issue. Careful design of both parking supply and policy holds great promise to improve the outcomes of TOD. These transit districts provide just the ridership characteristics that rail transit operators seek, with a high transit share, multiple trip purposes, multidirectional trips, and a broad time-of-day distribution.

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HIDDEN IN PLAIN SIGHT

Capturing The Demand For Housing Near Transit

Reconnecting America's
Center For Transit-Oriented Development

September 2004

ON THE COVER (left to right): Dallas Area Rapid Transit in Plano, TX; station in Solana Beach, CA; the Portland streetcar.

Photo Credits (left to right): Dallas Area Rapid Transit; Rob Quigley Architects; City of Portland.

The Center for Transit-Oriented Development

The Center for Transit-Oriented Development (CTOD) was launched in 2003 to help bring transit-oriented development (TOD) to scale as a nationally recognized real estate product. The CTOD is working with transit agencies, developers, investors and communities to use transit investments to spur a new wave of development that improves housing affordability and choice, revitalizes downtowns and urban and suburban neighborhoods, and provides value capture and recapture for individuals, communities and government. The Center for TOD is based in Oakland, California and is headed by Shelley Poticha and by Hank Dittmar, president and CEO of Reconnecting America. The Center for TOD is a major program of Reconnecting America, a non-profit organization that is working to integrate transportation networks and the communities they serve in order to generate lasting public and private returns, improve economic and environmental efficiency and give consumers greater choice.

The CTOD is a joint venture with the Center for Neighborhood Technology in Chicago, led by Scott Bernstein, which has the largest in-house public interest Geographic Information System (GIS) group in the Midwest, and with Strategic Economics in Berkeley, led by Dena Belzer, who has helped to establish best practices for TOD and adds expertise in real estate and urban economics and regional TOD capacities and challenges. The CTOD's governance team works closely with an advisory group, whose skills include mixed-use development, transit agency management, community development, local government, and investment banking.

Reconnecting America Board of Directors

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C-07-04

U.S. Department
of Transportation
**Federal Transit
Administration**

Administrator

400 Seventh St., S.W.
Washington, D.C. 20590

SEP 8 2004

Dear Colleague:

It is with great excitement and anticipation that we issue this report on the potential for transit oriented residential development.

With the recent surge in interest in and construction of rail transit systems, families and communities are seeking ways to take full advantage of their promise - seeking improved mobility, environmental benefits, and economically thriving neighborhoods.

In this report, the Center for Transit-Oriented Development has estimated the demand for housing within a half-mile of 27 existing rail systems and 15 planned extensions or new systems over the next 20 years. The findings are nothing short of astonishing.

Over 14.8 million households are expected to want housing within a half-mile of these rail systems by 2025 - more than double the number of households living there today. Meeting this demand would require building an average of 2,100 residential units near each of the 3,391 transit stations that was studied. For communities, transit systems, real estate developers, and financial institutions, this potential demand for housing presents not only a tremendous opportunity, but a challenge as well. To fully capture the benefits of our transit investments:

- Our communities must adopt policies to support the attractive, higher-density housing that families and individuals are seeking -- revisiting zoning rules, parking policies, and infrastructure investments;
- Our transit systems must make continued improvements, not only to the operations of the systems themselves, but to the surrounding plazas, streetscapes and other amenities that make transit attractive; and
- Real estate developers and financial institutions must fully embrace the economic potential of urban development.

We hope you will read this report with an eye toward your role in creating attractive, vibrant, and economically thriving communities for ourselves and our children.

Sincerely,

Jennifer L. Dorn

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EXECUTIVE SUMMARY

Photo by Dallas Area Rapid Transit

Demand for housing near transit spurred development that's revitalized the historic downtown of Plano, Texas.

Primary funding for this study was provided by the Federal Transit Administration (FTA). The Surdna Foundation and the Fannie Mae Foundation also contributed to this national market assessment of transit-oriented development (TOD).

The study looks at:

- national real estate and consumer trends that affect the potential market for housing within a half mile of fixed guideway transit stops (TOD);
- the demographics and travel behavior of residents who live near transit;
- the potential demand for housing within walking distance of transit stations in the year 2025; and
- the ability of transit-served regions to accommodate this emerging consumer market.

The study resulted in four major accomplishments:

- analysis of the Center for Transit-Oriented Development's (CTOD) national TOD database, a Geographic Information System (GIS) platform for analyzing conditions around the nation's 3,341 existing fixed transit stops and the 630 additional stations that are scheduled to be built by 2025;
- regional housing demand projections for the types of households that show a preference for living in transit-oriented communities;
- a methodology for assessing the unused capacity of areas within walking distance of transit, which can be used to help measure a region's potential for TOD; and
- a demonstration of the study's methodology in seven case study regions.

There are tremendous shifts occurring nationally in demographics, consumer preferences, employer location strategies and transportation infrastructure investments. Consumers are choosing smaller, more compact housing in neighborhoods where shops and services are within walking distance, and where high-quality transit service is an option. While these trends have been documented and in some cases even quantified, there have been few attempts to calculate their impact on the demand for higher-density housing near transit. The Center for Transit-Oriented Development has built a national demand estimate for housing within a half mile of fixed guideway transit stops through 2025 for the 27 regions that currently have transit systems, as well as for 15 regions that are seeking to build new fixed-guideway systems by 2025 using the FTA New Starts program. This estimate is based on household demand projections for each region that capture the effect of different demographic trends in different metropolitan areas. Because the study considers only the half-mile radius around transit stations, a readily definable area but not the total area that can accommodate transit-oriented development, this is a relatively conservative estimate of potential demand for TOD in 2025. Studies have shown that people will ride transit from beyond the half mile if they have good feeder bus service or bike access. Development around these access modes could also be considered transit-oriented development. Inclusion of these areas would offer a more complete assessment of the demand for housing near transit, but is beyond the scope of this study.

This study finds there is likely to be significant demand for housing within a half-mile radius of fixed guideway transit stations – areas called "transit zones" for the purposes of this study — over the next 25 years. Our market assessment shows that at least a quarter of all new households — 14.6 million households — could be looking for housing in these transit zones. This is a staggering figure, since only a small portion of all new housing is being built in these locations today. Because there are currently about 6 million households living within a half mile of transit stations, this means there is the potential to more than double the amount of housing in transit zones by 2025. If this market is captured, transit-oriented development could become the armature for a significant portion of regional growth and help increase transit ridership.

Most of the demand will occur in the five metro regions that have mature and extensive transit systems – New York, Chicago, the San Francisco Bay Area, Boston and Philadelphia – and in Los Angeles, which has a large transit system and high population growth rate. But all of the regions that are expanding their systems have the potential for high rates of growth in demand, especially regions like Denver, Salt Lake City and Seattle, which have small systems but high rates of growth. Indeed, the study shows that many of these regions with newer systems could accommodate from a quarter to up to a third of all regional growth in housing in transit zones.

Photo by RTKL Associates

Housing in Addison Circle, a TOD project in Addison, Texas, is architecturally distinct, and there is every kind of residential real estate product.

A methodology was developed to assess the capacity for accommodating development around stations. The analysis indicates that urban downtowns in major cities are doing a very good job of accommodating residential densities sufficient to support high-quality transit, and urban neighborhoods in these cities are also making progress toward optimal densities. But these same neighborhood types in small and mid-sized cities and suburban town centers and suburban neighborhoods have not matured to the point where densities support high-quality transit, and these places offer significant opportunities for accommodating future demand.

Whether this potential demand is actually realized, however, has much to do with whether the market is able to deliver an attractive higher-density housing product near stations. This transit-oriented housing product will need to have the characteristics that consumers consider important, and it will have to

be priced so that it is both affordable and competitive with other housing options in the region. Whether the market is able to deliver more of this kind of housing product has much to do with whether appropriate public policies, such as higher-density zoning and reduced parking requirements, are put in place and the right infrastructure investments are made, including continued improvements to transit systems and "placemaking" elements such as plazas and streetscape improvements.

Photo by City of Portland

Portland's streetcar catalyzed development of 5,000 residential units around Portland State University and in the Pearl District.

As part of this study the Center for TOD analyzed its TOD database. This database contains information about every existing fixed-guideway transit system in the U.S., the 3,341 stations along these systems, and the 630 new stations scheduled to open by 2025. This information has been integrated into a Geographic Information System (GIS) with data from the 2000 U.S. Census and other sources, creating a powerful database that for the first time makes it possible to find out who lives near transit, including information about household size and type and the ages of residents, their travel behavior, income, home ownership, and car ownership. The database also includes information about the transit zones, such as average density, land area in residential use, block structure, age of housing stock, block size and distance to a region's Central Business District.

The assessment of the national TOD database, combined with an analysis of national and regional housing projections, focused on determining who lives near transit now, who is likely to want to rent or buy housing near transit in the future, where the most demand is likely to occur, and whether there is unused capacity around transit. Case studies were conducted in seven regions – Los Angeles, Chicago, Washington D.C., Denver, Cleveland, Memphis and Charlotte – to demonstrate the study's methodology and investigate regional similarities and differences. The case studies suggest many avenues for further inquiry, and support four major conclusions:

- First, any assessment of the importance of transit-oriented development nationally should also consider regional context. Transit-oriented development is not a national panacea; it is a specific tool that requires different policies in different contexts. In some regions more density may be needed around transit, whereas in other regions more transit may be required to better serve existing high densities. In still other regions both density and transit may be sufficient but there may not be the pedestrian connectivity that makes riding transit an easy and appealing alternative, or the transit system may not provide the regional connectivity that makes it a viable transportation option for residents.
- Second, not every region will experience the same magnitude of demand for higher-density housing near transit, but where the conditions are right transit-oriented development could accommodate a significant share of regional growth, even in those regions that only have small transit systems.
- Third, building higher-density transit-oriented development projects that are walkable and that contain a good mix of mutually supportive uses will have benefits beyond increasing transit ridership. This is demonstrated in regions such as Washington D.C. and Denver, where a high percentage of transit zone residents also walk to work and real estate values have risen substantially.
- Finally and most importantly, specific policies will have to be put in place to ensure that the market can deliver a product that will help realize the potential demand.

Changing demographics and consumer preferences are opening a window of opportunity that could allow for a transformation of the American dream of a single-family detached home in the suburbs into something more sustainable and affordable – like a row house or courtyard housing or a condo in a high-rise building in a walkable neighborhood next to transit. As both home prices and rents spiral ever higher and driving anywhere becomes more difficult and time-consuming, housing near transit at the very least offers the possibility of reduced transportation expenses and time to read the paper on the train while commuting in the morning. Realizing the growing demand in the marketplace for lively, walkable, transit-oriented developments will enable the national investment in transit to capture a greater return on that investment.

1 KEY TRENDS DRIVING DEMAND FOR TOD

Photo by Mary Volm/City of Portland

Changing demographics portend greater demand for housing in walkable neighborhoods like this one in Portland

Nationally there are tremendous shifts occurring in demographics, consumer preferences, employer location strategies, and transportation infrastructure investments. Consumers are choosing smaller, more compact housing in neighborhoods where shops and services are within walking distance, and where high quality transit service is an option. Regions are building more transit. Transit-oriented development, when done right, creates a mix of uses within walking distance of stations in a design that encourages walking, promotes transit ridership, and provides housing choices. A rich mix of land uses is central to transit-oriented development, and this means that rider-serving amenities such as retail and day care, as well as commercial spaces, are available in residential areas, and that office development is integrated into station areas. If transit-oriented development can capture this potential market then the investment in public transit will become the armature for a significant portion of regional growth, helping to increase transit ridership as well as decrease traffic and air pollution, increase housing affordability and choice, revitalize urban and suburban neighborhoods, and generate lasting public and private returns.

Unfortunately, many of the successful examples of transit-oriented development are the result of "clever exceptionalism," and have required persistent advocacy and extraordinary public attention. As a result, there aren't enough good examples of TOD to showcase, there are too few developers and planners with expertise in TOD, and too few elected officials and advocates to champion exemplary projects, and it's unlikely that without further action market demand will be met. The barriers to delivering high quality projects that meet the objectives of the marketplace, that succeed as places in their own right as well as nodes in regional transit systems, and that improve regional transportation system performance are great.

There are six major challenges to creating high-performing TOD:

- finding a common definition or agreement on the goals and outcomes;
- balancing the tension between the requirements of making a project a successful place and making it a successful transportation node;
- reducing complexity, time, uncertainty, and costs;
- creating a supportive regulatory and policy environment;
- acknowledging that more than transit is needed to drive real estate investments; and
- convincing investors that TOD is an asset class.

2 THE NATIONAL TOD DATABASE

Photo by Rob Quigley Architects

Business owners say this commuter rail station put Solana Beach, California on the map, making it a destination stop.

The Center for TOD has created the first national TOD database containing information about every fixed-guideway transit system in the U.S., the 3,341 existing stations along these systems, the half-mile radius around these stations, and the people who live in these transit zones. There are 27 metropolitan regions that are currently operating some form of fixed-route transit, including heavy and light rail, commuter rail, streetcars and trolley buses, bus rapid transit, and cable cars. Included in the database are selected Amtrak stations that serve commuters as well as long-distance travelers. Bus networks were not included in this study, but represent an important component of regional transit networks. The database also includes information about an additional 630 stations in 15 regions that are seeking funding to build new systems through the Federal Transit Administration's New Starts program and another 21 regions that are extending their fixed-route systems. Some of these systems have just opened; the rest are likely to open by 2025. This set of 630 stations was selected out of the universe of projects that are seeking federal funding as being most likely to be open by 2025. It is a conservative list of projects as it does not include many that are beginning the federal process and may be completed by 2025, nor does it include the projects being constructed without federal assistance. For example, the Metropolitan Transportation Commission is advancing 18 rail and rapid bus projects for planning and construction, and is only seeking federal New Starts funding for two of them. Table 1 lists the metro regions and the number of current and planned stations included in the database.

This information about transit has been integrated into a GIS format with data from the 2000 U.S. Census and other sources, creating a powerful database that makes it possible to find out who lives near transit, including information about household size and type and the ages of residents, their travel behavior, income, home ownership, and car ownership. The national TOD database was built with general support grants from the Surdna Foundation and the Fannie Mae Foundation, and a GIS layer identifying new rail starts was added as part of this study and funded by the FTA.

For the purposes of this study the half-mile radius around transit stations is called the transit zone, because it is the geographic area within which transit is most likely to have an impact on travel behavior of its residents. Information about the transit zones in the database includes the average density, land area in residential use, block structure, age of housing stock, block size and distance to a region's Central Business District. The fact that data is linked in a GIS system makes it possible to produce analytical

Metro Area	Metro Area Type*	Current Stations	Planned New Stations
Atlanta	Medium	46	-
Baltimore	Medium	77	-
Boston	Extensive	280	7
Buffalo	Small Static	15	-
Charlotte	New Start	-	18
Chicago	Extensive	418	9
Cleveland	Medium	50	33
Columbus	New Start	-	14
Dallas	Medium	54	23
Denver	Small Expanding	31	26
Fort Collins	New Start	-	15
Galveston	Small Static	10	6
Harrisburg	New Start	-	8
Hartford	New Start	-	12
Houston	Small Expanding	18	-
Kansas City	New Start	-	24
Lancaster	New Start	-	3
Las Vegas	New Start	-	5
Los Angeles	Large	124	40
Louisville	New Start	-	22
Memphis	Small Expanding	13	9
Miami	Medium	40	20
Minneapolis-St. Paul	New Start	-	27
Nashville	New Start	-	6
New Orleans	Small Static	17	47
New York	Extensive	962	30
Norfolk	New Start	-	11
Philadelphia	Extensive	337	28
Phoenix	New Start	-	30
Pittsburgh	Medium	72	9
Portland, OR	Large	110	22
Raleigh-Durham	New Start	-	16
Reading, PA	New Start	-	5
Sacramento	Medium	39	-
Salt Lake City	Small Expanding	24	12
San Diego	Medium	69	21
San Francisco Bay Area	Extensive	305	19
Seattle	Small Expanding	23	38
St. Louis	Small Static	20	2
Syracuse	Small Static	8	-
Tampa Bay Area	Small Expanding	10	4
Washington, D.C.	Large	169	9

* "New Start" refers to those regions that are building fixed-guideway systems for the first time.

Table 1: *National TOD Database Metro Regions*

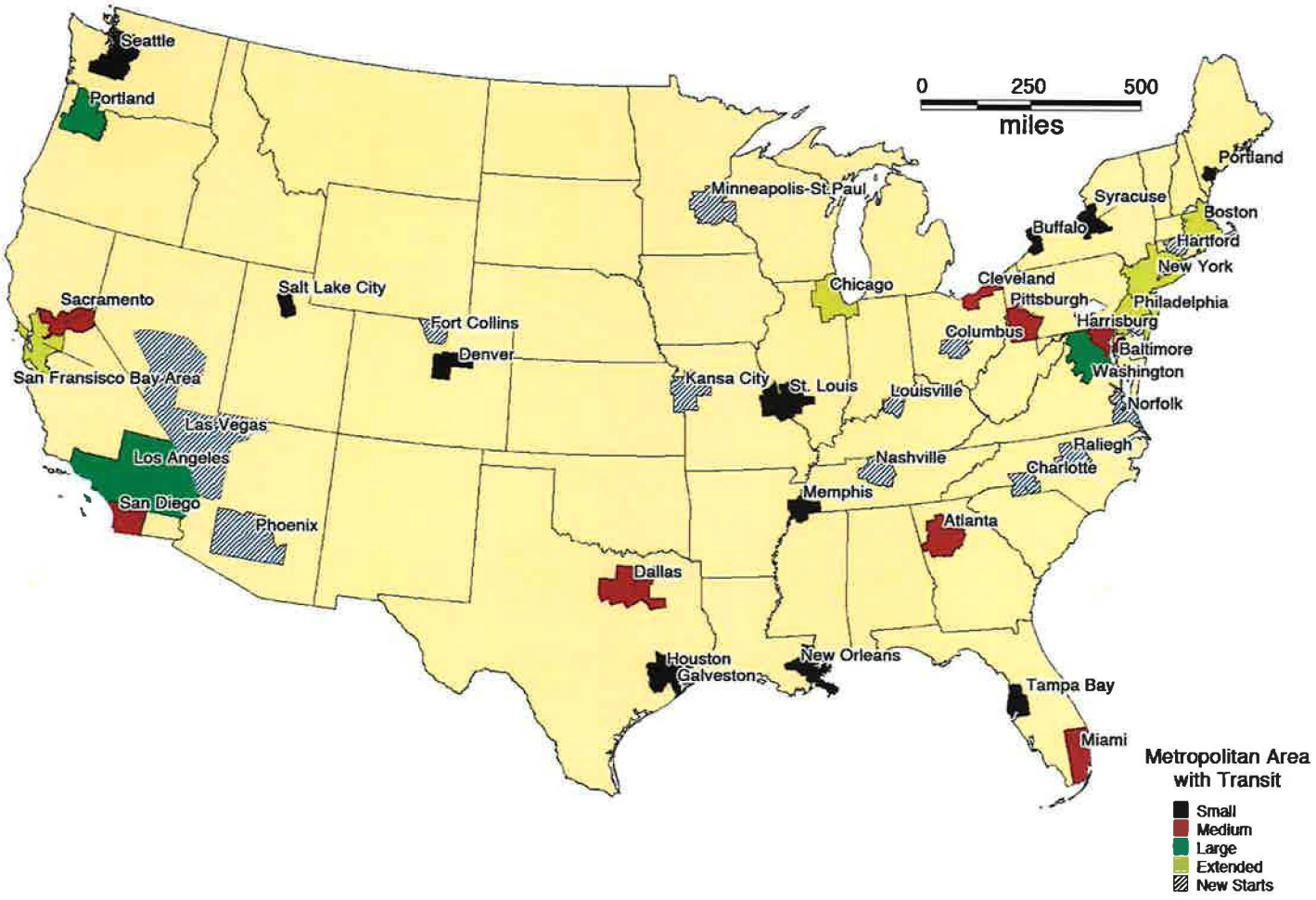


Figure 3: *Metro Regions by System Size with New Starts Regions*

and expository maps of individual station areas, metropolitan regions and the nation as a whole. It is possible to generate information that permits comparisons between residents of transit zones and residents of the regions at large, as well as between and among these residents in other regions and the nation.

The 27 regions with existing transit systems all have fixed-guideway systems, but otherwise they are very different. The most salient difference, for the purpose of this analysis, is the size of their transit systems. Obviously, the more extensive the system, the more origins and destinations are accessible by transit, making transit a more viable alternative to driving. The 27 regions have been grouped according to the number of stations they serve, and they have been classified as small-static-system, small-expanding-system, medium-system, large-system and extensive-system regions. The distinction between static and expanding is made only for the regions with small systems because the regions with medium, large and extensive systems are all expanding their systems to some degree. Figure 3 shows the 27 regions by system size, along with the 15 New Start regions.

To illustrate the impact that the size of a transit system has on a region's ability to support transit-oriented development, four transit systems representing the four categories — small, medium, large and extensive — are depicted in Figure 4 at the same geographic scale. Clearly, there is an order-of-magnitude difference between each of these systems, and between their differing potentials to influence residents' decisions about where to live and developers' decisions about where to invest.

Four Transit Systems Shown at the Same Geographical Scale

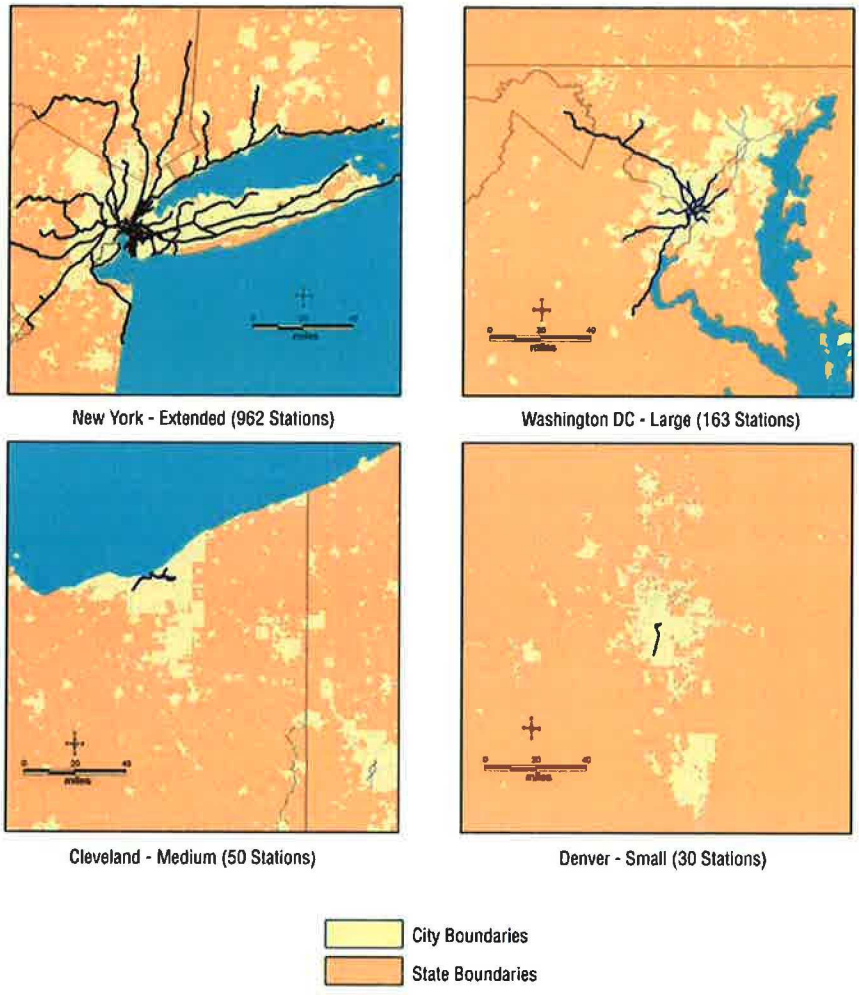


Figure 4:
Four Transit Systems Shown at the Same Geographical Scale

3 WHO LIVES NEAR TRANSIT NOW?

Photo by Art Cueto

The transit mall in Santa Monica, CA, anchors high-density residential and commercial around a pedestrian promenade.

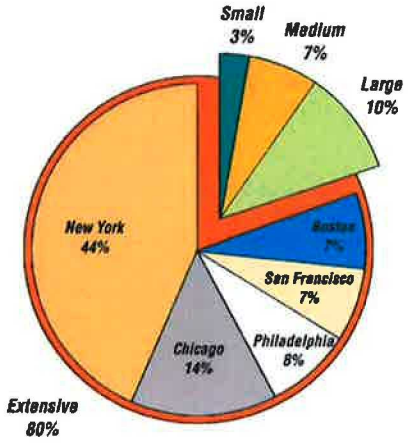


Figure 5: *Percentage of population living in transit zones sorted by region.*

A total of 14 million people or 6.2 million households live within a half-mile radius of existing fixed-guideway transit stations, according to the 2000 U.S. Census and the national TOD database. This equates to 12 percent of the total population of the 27 metro regions covered in this study. These transit zones represent only 1 percent of the total land area in these regions, clearly demonstrating that transit zones tend to be more densely populated than these regions as a whole. Eighty percent of the total transit zone population in the U.S. lives in the five regions that have extensive transit systems – New York, Chicago, Philadelphia, San Francisco and Boston. Despite the fact that only 20 percent of the total number of transit zones residents live in the regions with small, medium and large systems, these residents still total 2 million people.

Those metro regions with large and medium-sized systems that have either located fixed-guideway systems in densely populated areas or aggressively promoted TOD appear to have had some success in accommodating a higher than average proportion of residents in transit zones. In the Washington D.C.

metro region, for example, 10 percent of all residents live in transit zones, and in San Diego, California, 7 percent of residents live in transit zones – a percentage that is nearly twice the average capture rate for other metro regions with similarly sized fixed guideway transit systems. Figure 5 depicts the percentage of the population living in the transit zones by region.

Household Sizes Are Smaller In Transit Zones

In general, the average household size in transit zones is smaller than in the metro regions as a whole. However, the size difference is most pronounced in regions with small transit systems. Houston and Memphis, both small-expanding-system regions, have an average household size of less than two people in transit zones compared to two to seven for the regions as a whole. Interestingly, Los Angeles, a large-system region, has the highest average household size in transit zones with three people, which is also the average household size for the region as a whole.

Regions with small transit systems also have a higher percentage of single-person households in transit zones compared to the regions as a whole. On average, 51 percent of transit zone households in the small-system regions are single-person households, as compared to 27 percent for those metro regions as a whole. In the regions with extensive transit systems, in contrast, 34 percent of households in transit zones are single-person households compared with 27 percent for the region as a whole.

While the census data is not explicit about which types of households classified as "families" have children under the age of 20 living in them, it is interesting to note that more than 30 percent of the households in transit zones in medium-, large- and extensive-system regions are families of three or more people, as compared to between 42 and 45 percent in those metro regions as a whole. This seems to indicate that families with children are much more prevalent in transit zones in regions where the transit system offers a more viable alternative to the car.

	One Person Households		Families of Three or More People*	
Metropolitan Area	Metro	Transit	Metro	Transit
Small	27%	51%	40%	19%
Medium	26%	38%	41%	31%
Large	24%	38%	45%	34%
Extensive	27%	34%	42%	36%

* Families are households of related individuals.

Table 2: *Selected Household Types by System Type*

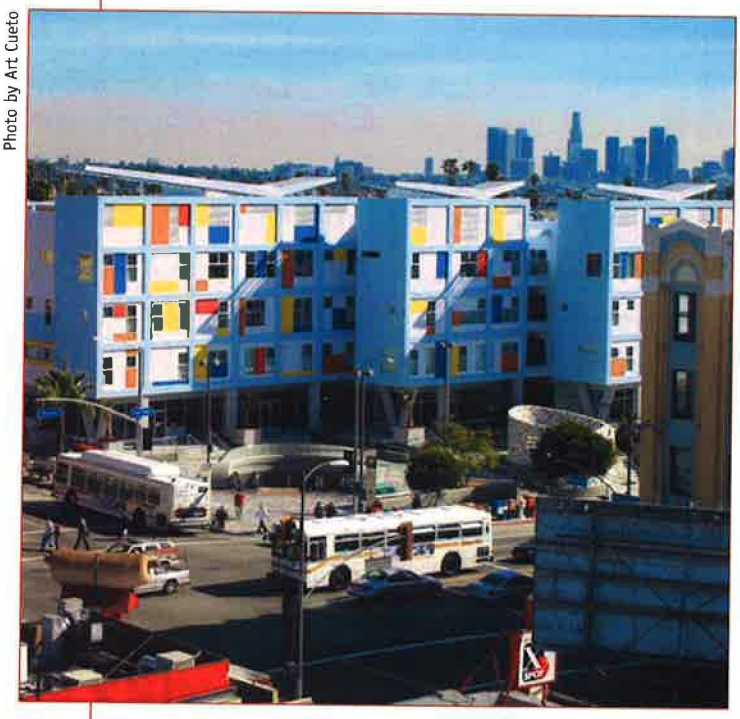
Householder Age In Transit Zones Similar To Region

The age of residents of transit zones is relatively similar to the age in the metro regions as a whole. As with some of the other demographic variables, the difference is greatest in the regions with small systems, and most similar in regions with large or extensive systems. Not surprisingly, the biggest difference is for those under the age of 17; clearly there are fewer children living in transit zones. In contrast, there tend to be more people aged 18-24 in transit zones than in the regions as a whole. The difference,

	Age 0-17		Age 18-24		Age 25-64		Age 65+	
Metro Area Type	Metro Region	Transit Zone	Metro Region	Transit Zone	Metro Region	Transit Zone	Metro Region	Transit Zone
Small	28%	17%	9%	16%	51%	55%	11%	12%
Medium	28%	22%	9%	13%	52%	53%	11%	12%
Large	29%	24%	9%	12%	51%	54%	10%	9%
Extensive	27%	23%	9%	11%	52%	54%	12%	11%

Table 3: *Age Breakdown of Current Households By System Type*

Photo by Art Cueto



Affordable housing at a Metro stop in Hollywood, CA; transit helps make housing affordable in tight housing markets.

again, is not that much, and it is greatest in regions with small systems. As the median age increases the percentage living in transit zones becomes more similar to the percentage living in the region as a whole.

Incomes Of Transit Zone Residents Are Similar In All Regions

Median incomes of households in transit zones tend to be lower than those of households in the larger metro region. There are three regions where transit zone median incomes are slightly higher than the regional median income – Houston, Tampa, and Pittsburgh – and another ten regions where the median incomes are only 10 to 15 percent lower than the regional median – including New York, Boston and Chicago. However, there are some regions where incomes are dramatically lower in the transit zones, including Los Angeles, Seattle and Baltimore.

Virtually every metro region has a significantly higher proportion of households with incomes of less than $10,000 living in transit zones. But for households with incomes between $10,000 and $60,000, the proportion of households living in transit zones is very similar to the proportion of households with these incomes living in the region as a whole. Going up the income scale, there are fewer households with incomes ranging from $60,000 to $100,000 in transit zones. But there is less of a disparity between the number of residents with incomes in the $100,000 to $200,000 range, and most regions have almost the same proportion of households with incomes of more than $200,000 in transit zones as in the region as a whole. Thus, while incomes in transit zones are clearly skewed toward the lower end of the distribution, transit zones are by no means enclaves of only low-income households. Indeed, as transit systems get larger, there are significantly fewer very-low-income households and more upper-income households.

Home Ownership Rates Are Lower In Transit Zones

As one would expect given the higher proportion of low-income households in transit zones and the higher density housing stock in urban areas, there are also lower rates of home ownership in transit zones than in the region as a whole. The average home ownership rate across all transit zones in all metro regions was only 31 percent, compared to 66 percent for the metro regions overall. However, there is considerable variation in home ownership rates depending on the size of the transit system. Those regions with small systems had lower than average home ownership rates in transit zones, and higher than average home ownership rates overall. Metro regions with medium-sized transit systems had higher than average home ownership rates in transit zones, and slightly higher home ownership rates in the regions as a whole. In the regions with large transit systems and in those with extensive systems home ownership rates tended to be below average for the metro regions as a whole, while some of these regions had relatively high rates of home ownership in the transit zones.

It is interesting to note that in regions with very high median home prices, including the San Francisco Bay Area and New York, overall home ownership rates tend to be low. This may indicate that in regions with tight housing markets, transit helps make housing more affordable for residents by reducing household transportation expenditures.

Car Ownership Rates Are Significantly Lower In Transit Zones

Households in transit zones own an average of 0.9 cars, compared to an average of 1.6 cars in the metro regions as a whole. But there is little variation between car ownership rates in the transit zones versus the regions as a whole in those regions with small, medium or large systems. All of these regions average about 1.1 or 1.2 cars per household in transit zones, and 1.7 cars per household in the regions as a whole. Even some of the regions with extensive transit systems fall into this range. However, New York, which has the most extensive transit system in the country by far, has lower car ownership rates both for the region as a whole (1.5 cars per household) and for the transit zones (0.7 cars per household). Renters in the transit zones have even fewer cars per household than homeowners do. Renters in the New York region have an average of just 0.4 cars per household in transit zones. Evidently, the more a region is widely accessible by fixed-guideway transit, the easier it is for residents not to own cars. Evidence from Arlington County, Virginia suggests that lower rates of car ownership near transit may be by choice. According to research by Reconnecting America, car ownership rates near Metro stations in Arlington County are much lower than in the region as a whole, while average household income is higher than the regional average.

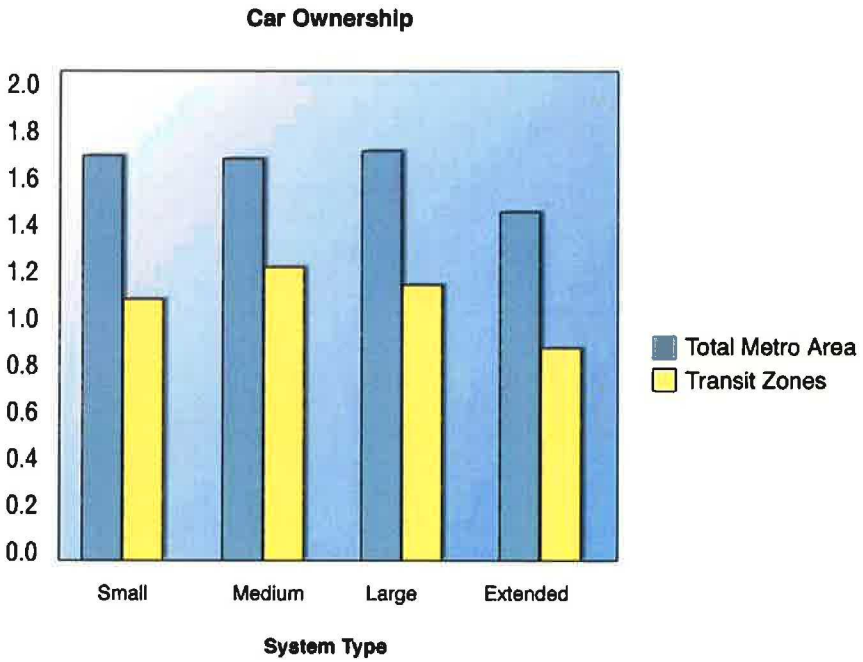
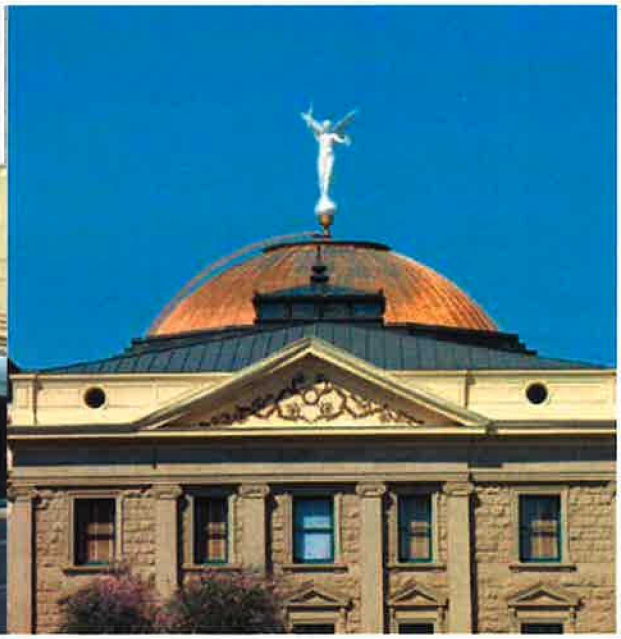


Figure 6: *Car Ownership Rates by Transit System Type*

Significantly Fewer Residents Commute By Car In Transit Zones

Only 54 percent of residents living in transit zones commute by car, compared to 83 percent in the regions as a whole. More residents commute by car in the regions with small and medium-sized systems (72 percent and 77 percent, respectively) than in the large and extensive systems (65 percent and 49 percent, respectively). The regions with the lowest percentage of residents commuting by car are New York (36 percent), Washington D.C. (54 percent), and Seattle (54 percent). The regions with the highest percentage of residents commuting by car are Memphis (86 percent), Dallas (86 percent), Tampa (79 percent) and Sacramento (89 percent) — all systems with newer, smaller fixed-guideway transit networks. As with car ownership, the size of the transit system seems to be a significant determinant of whether or not residents commute by car.



Encouraging Transit Oriented Development

Case Studies that Work

EPA United States Environmental Protection Agency

METRO

City of Phoenix

mesa·az

GAMMAGE & BURNHAM

LISC Phoenix *Helping neighbors build communities*

Sonoran Institute

Lincoln Institute of Land Policy

Urban Land Institute Arizona

LIVABLE COMMUNITIES

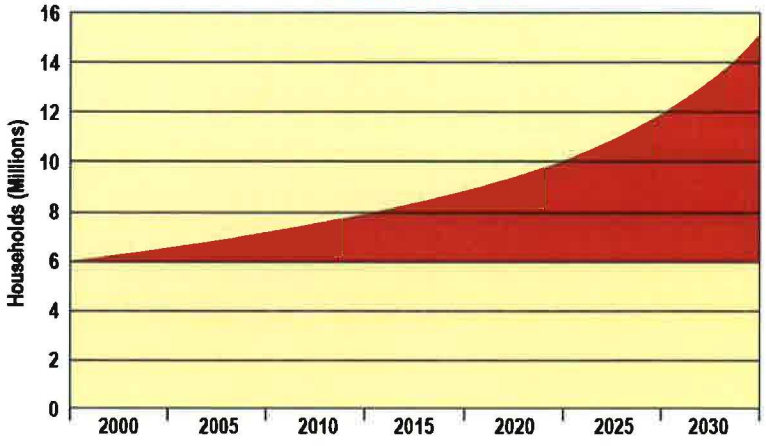
Keeping affordable housing in the transit-oriented mix

Good transit-oriented development can provide all the benefits associated with livable communities: a mix of uses that makes it possible to get around without a car, a greater mix of housing types and transportation choices, an increased sense of community among residents, a heightened sense of place. This kind of development produces lower greenhouse gas emissions (a recent study by the Center for Transit-Oriented Development shows that TOD produces 43 percent less emissions than conventional suburban development, www.reconnectingamerica.org), it promotes walking and biking and more active lifestyles, and it creates value for property owners, businesses, local governments, transit agencies and residents. This is development that responds to the concerns of the 21st century because it's more environmentally and economically sustainable. And it provides a convenient, affordable and active lifestyle for people of all ages, including those who don't drive.

Local jurisdictions control multiple pools of funding that can be used to support affordable and mixed-income housing in transit zones

Increasingly Americans are showing a preference for more compact, walkable, mixed-use communities over typical suburban development, in part because traffic is so bad that no one wants to spend time commuting. But the changing housing market has as much to do with demographics: While the vast majority of US households used to be families with both a mom and dad and more than one child, this demographic group now comprises just 25 percent of households and it is shrinking. More and more households are childless or headed by single parents, and single adults comprise 41 percent of households. The demographic groups that are increasing in size – households that are smaller, older and more ethnically diverse – are the same demographic groups that have historically shown a preference for higher density housing near transit.

Projected Demand for Housing In Transit Zones



Today many people want a "room with a view" within walking distance of coffee, restaurants, yoga, a dog park, art, film and culture. Lifestyles are changing, and convenience and affordability are paramount considerations. Research by the Center for Transit-Oriented Development shows that by 2030 nearly a quarter of all US households looking to rent or to buy are likely to want higher-density housing near transit. The Urban Land Institute has also noted the changing real estate market: ULI's annual "Emerging Trends in Real Estate"

The Rosslyn Ballston Corridor in Arlington, VA, illustrates how TOD can accommodate tremendous development in a livable community that provides benefits to both new and existing residents. This was a declining low-density commercial corridor 30 years ago when the local government decided to focus development around five closely spaced rail stations. Despite the enormous amount of development that has occurred, single-family neighborhoods have been preserved just a short walk away.

report has ranked locations near transit as a best bet for investors five years in a row.

Moreover, transit is proven to generate value that can be captured and reinvested in communities because it concentrates development and business activity and the tax base in a way that allows for focused value capture strategies. Tried and true value capture strategies include: property and sales taxes, real estate lease and sales revenues, farebox revenues, fees on everything from parking to business licenses, joint development, special assessment districts and public-private partnerships.

The Rosslyn Ballston Corridor in Arlington, VA, illustrates how TOD can accommodate tremendous development in a livable community that provides benefits to both new and existing residents. This was a declining low-density commercial corridor 30 years ago when the local government decided to focus development around five closely spaced rail stations, working with residents and the private sector. Despite the enormous amount of development that has occurred, single-family neighborhoods have been preserved just a short walk away, and there has been only a modest increase in traffic. The overall results have been extraordinary:

- The assessed value of land around stations increased 81 percent in 10 years;
- 8 percent of county land generates
- 33 percent of county revenues – allowing Arlington to have the lowest property tax in Northern Virginia;
- 50 percent of residents take transit to work; 73 percent walk to stations.

Shifting demographics and the changing real estate market have opened up an unprecedented window of opportunity to channel growth into livable communities near transit. This opportunity should be exploited since it is increasingly clear that one of the most sustainable, low-cost, long-term solutions to a host of pending problems – including climate change and dependence on foreign oil -- is public-private investment in neighborhoods where people don't have to drive.

STATION AREA PLANNING

Getting the most out of transit-oriented development

Station area plans are conceptual or specific plans for the areas around transit stations or along transit corridors. There is some variation in what these plans contain, but they all lay out the basics, including zoning, design standards, parking requirements and information about transit access and bike and pedestrian circulation. The most effective plans have a clear time frame and strategy for implementation, such as an investment or infrastructure improvement plan that has clearly identified funding sources. Station area plans work best for encouraging TOD when there are significant development opportunities such as a large surface parking lot or other underutilized land; they are far less useful for development of a limited scope. Detailed station area planning efforts are especially important for high-priority sites.

Detailed station area plans help leverage the potential of transit-oriented development

The neighborhood surrounding Highlands Garden Village, a mixed-income, mixed-use urban infill project near downtown Denver, provided significant input on the project design, greatly enhancing its success.

VISIONING NEW STATIONS

Station area plans that are based on a visioning process with community input can help set standards and expectations before projects are proposed, smoothing the way for the approval of appropriate development. This certainty and predictability can help ensure that projects will be approved without delay or community opposition–both of which increase risk and result in increased development costs. The community should be involved in determining what public infrastructure is needed, the desired mix of uses, whether there should be public space and what kind, as well as other design considerations. In some cases plans may be advanced enough to allow for "by-right" zoning that can greatly expedite the time it takes to move from project conception to construction.

The developer of Mission Meridian Village in South Pasadena, just north of downtown Los Angeles, solicited the input of residents before building what was a relatively high-density mixed-use TOD project in a historic single-family neighborhood that had long resisted development. By cultivating their interest, input and enthusiasm he succeeded in getting their support for what became a catalytic and immensely popular development that activated and improved the entire neighborhood. Similarly, the neighborhood surrounding Highlands Garden Village, a mixed-income, mixed-use urban infill project near downtown Denver, provided significant input on the project design,

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greatly enhancing its success. In both instances community input resulted in a design that located new single-family homes on the sides of the development that faced existing single-family homes, with more density and commercial space facing the commercial streets. The result was a truly sensitive design that integrated significant density a into single-family neighborhood.

Some elements of station area plans may be proscriptive, such as prohibitions on auto-oriented retail, or prescriptive, such as a provision that 50 percent of groundfloor space should be devoted to retail. Other elements can be "permissive." For example, the developer may have the option of providing a certain feature, but it is not required. The challenge lies in finding the right balance between what is optional and what is required with the goal of ensuring that the plan will result in a successful project, but not scare developers away. Planners and policymakers should be careful not to let perfection get in the way of the good.

While some plans are custom-designed for specific stations, a "transit district" or "transit village" overlay zone can be applied more generally to ensure that plans or projects near stations meet certain criteria including a mix of uses, a pedestrian orientation, or a standard of affordability. A "floating" TOD overlay zone offers more flexibility; it can be applied when the opportunity arises instead of pre-zoning the site before the market is ready – which can cause land speculation and higher costs, as well as difficulties for existing property owners. Transit agencies and cities should consider the corridor as well as the station area, and balance overall considerations about system performance with each station area plan. Considering the corridor as well as the station allows local governments to identify those stations that should serve as parking lots for commuters, and those that should be developed as high-activity nodes. Parking ratios can be reduced as neighborhoods near stations develop. At BART's Fruitvale station in Oakland, for example, parking was reduced to allow for a higher density, mixed-use, mixed-income transit village that was developed by a local community organization. The lower parking requirements reduced development costs, which reduced the cost of housing and commercial space, resulting in a vibrant mixed-use pedestrian corridor with high-quality public space and plazas leading from the BART station to Fruitvale's nearby commercial center.

COMMUNITY EFFORT

Following the lead of community-based organizations

Community development corporations (CDC) can use transit-oriented development to bring about comprehensive and lasting revitalization in neighborhoods and increase affordability because families that use transit spend less money on transportation. Community development corporations can play an especially important role in neighborhoods that have been bypassed by the market and that aren't a high priority for local governments or transit agencies by initiating projects that will benefit the community.

Community Development Corporations play an important role in neighborhoods bypassed by the market

Community support for a CDC's efforts can go a long way toward convincing lenders to invest in and retailers to move into a community. It may be possible, for example, to attract an otherwise reluctant vendor, such as a grocery store, if community members say they will support the store.

The Dudley Village project developed by the Dorchester Bay Economic Development Corporation in Boston will bring 50 afforable housing units to Roxbury.

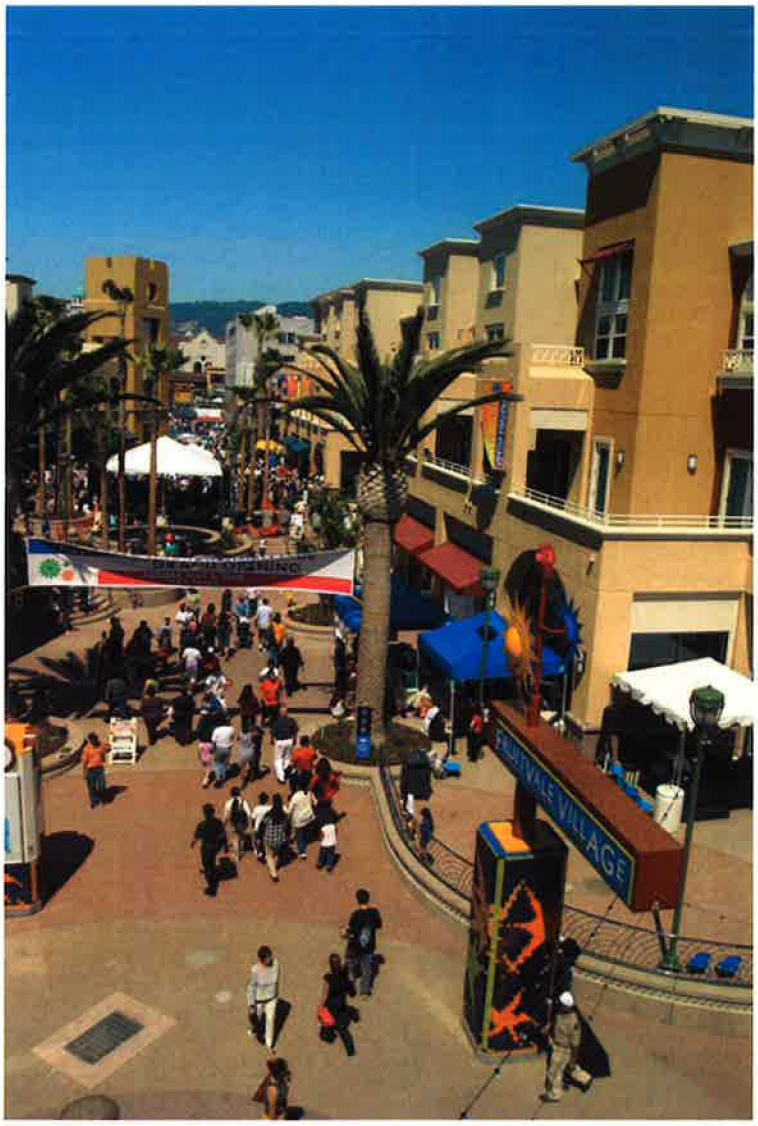
TOD success stories

There are many TOD success stories involving CDCs: San Diego's transit-oriented Barrio Logan neighborhood was developed by a community services organization, as was the Lake-Pulaski neighborhood in Chicago, where a CDC named Bethel New Life made an El station the anchor for its revitalization efforts. Beginning with $10,000 raised from a church congregation, Bethel New Life has since assembled and brokered land around the station, building or rehabilitating 1,000 housing units and a new "green" station building that houses a child care center and retail, creating a comprehensive mixed-use development. The cities of Chicago and San Diego were both supportive of these developments but had prioritized development in neighborhoods where it was easier to attract developers. Bethel New Life had to buy land, develop the housing and negotiate with the city, developers and the transit agency in order to realize their vision. Financing came together through a combination of loans, grants, tax credits to make the deal work.

Similarly, four CDCs have come together in Boston to build mixed-income transit-oriented projects along the Fairmount commuter rail line to help ensure that gentrification doesn't displace current residents. The combination of a strong housing market and improvements to the commuter rail line -- including

better service and new infill stations -- had prompted developers to build market-rate housing in what had been high-poverty transit-dependent neighborhoods. The four CDCs mobilized support for the transit improvements, raised funds for planning and development capacity, and are developing projects near the new stations that provide affordable units and economic development opportunities for lower-income residents.

Perhaps the most famous example of a CDC-led TOD effort is the Fruitvale BART (Bay Area Rapid Transit) station near Oakland, California. This large mixed-use mixed-income TOD project grew out of community resistance to BART's plan to build a parking garage between the BART station and the Latino neighborhood's commercial center, which the community worried would hasten the decline of the already distressed neighborhood. BART withdrew the plan and agreed to work with the neighborhood on an alternative. The Spanish-speaking Unity Council, which had led the opposition, became the developer, working with a variety of federal and local partners to build the project. Fifteen years later, the Fruitvale "transit village" links the commercial center and BART station with a pedestrian corridor and plazas lined with shops, offices, apartments and community services – the village includes a clinic, child development center, senior center and library.



The Fruitvale BART station in Oakland, a large mixed-income TOD project, grew out of community resistance to BART's plan to build a parking garage between the BART station and the Latino neighborhood's commercial center, which the community worried would hasten the decline of the already distressed neighborhood. The Spanish-speaking Unity Council became the developer, working with a variety of federal and local partners to build the project.

All of these examples illustrate how TOD can be used to catalyze neighborhood revitalization, ensure affordability, leverage public and private investment, provide more choices for residents, increase transit ridership, reduce traffic and pollution, and enhance the economic and environmental sustainability of a neighborhood. There are also some lessons learned: In each of the examples discussed above there were effective public-private-nonprofit partnerships, effective leadership, public involvement, creative financing, quality design and construction and -- perhaps most importantly -- perseverance.

RIGHT-SIZING PARKING

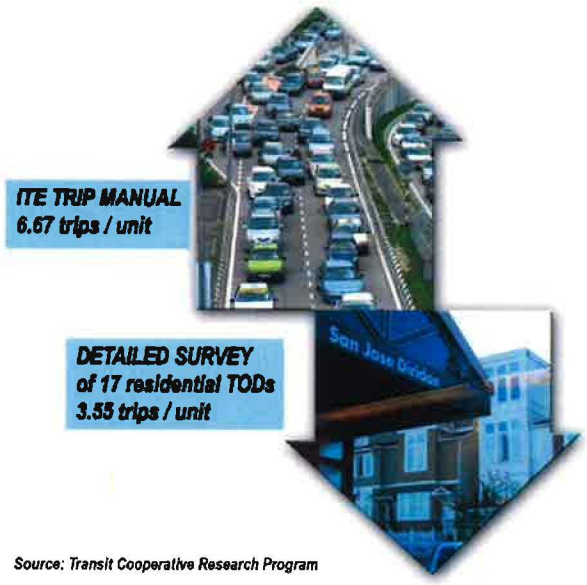
Taking advantage of transit-oriented development

Parking mandates crafted for single land uses overestimate the parking needs of development near transit and undermine opportunities for higher-value uses. Providing parking is expensive – estimated to cost from $20,000 to $40,000 per space in a parking structure and as much as $60,000 or more per space in high-value real estate markets like San Francisco. Because parking requirements can drive the budget for TOD projects, parking becomes a key factor in determining real estate prices.

Housing in transit-oriented developments produces as much as 50 percent less traffic than conventional developments

Local parking standards are usually set in accordance with the Institute of Transportation Engineers trip generation and parking forecasts. The ITE model, however, is based on suburban examples where parking is typically inexpensive and plentiful, and because surrounding low-density uses make travel by car necessary. The Center for Transit Oriented Development's database of transit systems and TOD shows that, in contrast, homeowners in walkable communities with a mix of uses and good transit access own 43 percent fewer cars than those who live in suburban communities.

There's increasing proof that TOD projects generate less traffic. The Transit Cooperative Research Program (TCRP) released new research in 2008 by PB PlaceMaking, Robert Cervero of UC-Berkeley, the Urban Land Institute and the Center for TOD that shows that transit-oriented housing produces just half as many car trips as conventional suburban development. The study counted the number of cars driving

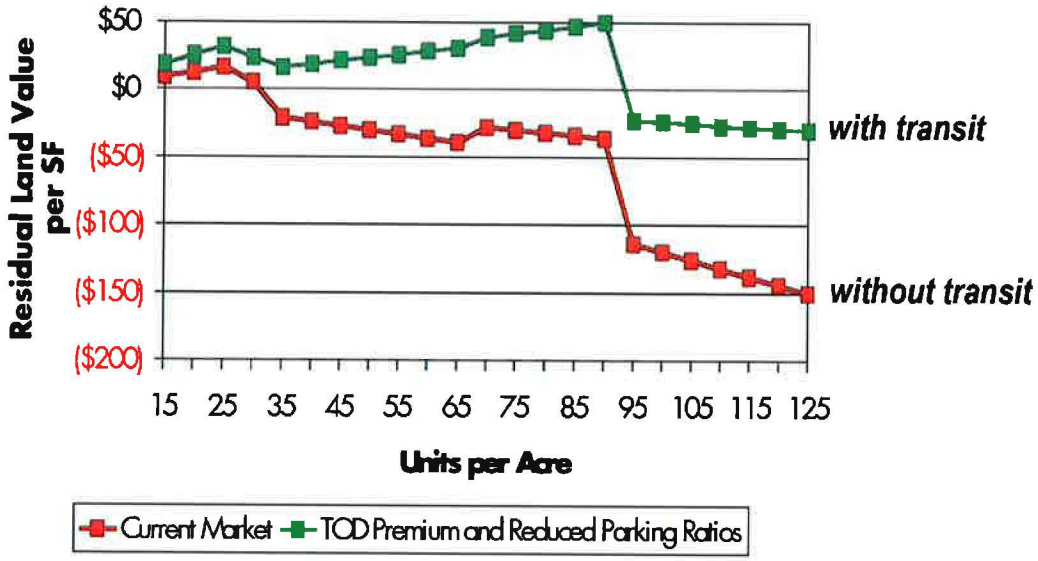


Source: Transit Cooperative Research Program

across pneumatic tubes stretched across the driveways of 17 transit-oriented housing projects in Philadelphia, Washington D.C., the San Francisco Bay Area, and in Portland, OR. The research was intended to provide guidance for an update of the ITE trip generation and parking generation rates.

ECONOMICS OF PARKING

Reducing parking requirements can increase the feasibility of mixed-income and mixed-use development, and from a design perspective largely determines if there is space for retail, childcare or other nonresidential uses. Consider, for example, a one-acre parcel zoned for up to 100 units of residential development. A parking requirement of two spaces for each residential unit would consume 320-350 square feet per space at a cost of $20,000 to $40,000 per space. Reducing the requirement to 1:1 would allow the project to save as much as $2 million. By reducing the parking requirement to 0.75:1, enough ground floor space would be available to allow



Source: Strategic Economics.

Higher-densities in transit-oriented developments are often not enough to make them pencil out. The lower line shows that a developer would require subsidies in order reach densities of more than 35 units per acre and 25 units per acre would be the optimal density. But if the higher rents a project near transit can demand and the lower development costs from reduced parking are added to the equation, the site's profitable maximum moves to the 90 units per acre range.

for a childcare center and 10,000 square feet of retail.

Similarly, the TCRP study showed that under the right conditions lowering residential parking ratios by 50 percent for TOD projects near high-quality transit service could provide for increases in residential density of between 20 to 33 percent and a savings to the developer ranging from 5 to 36 percent. The TCRP research suggests that reducing residential parking ratios for TOD makes sense and would help these projects realize the expected community benefits by limiting traffic, encouraging walking and biking and transit use, making TOD housing prices more affordable by limiting project costs, and providing room for higher-value uses.

COUNTING TOD TRIPS

In addition, neighborhoods may be more likely to support density near transit if they understand that TOD produces fewer trips than conventional development. The savings to developers can be passed on to consumers in the form of more affordable housing. Lower parking ratios will help promote transit ridership. And less parking will mean that TOD projects are more compact and sustainable.

In Evanston, IL, for example, recent multifamily residential developments included a minimum of 1.25 spaces for housing units that are one bedroom or smaller and 2 spaces per unit for three or more bedrooms. But an onsite survey to determine whether all these parking spaces were actually used found an actual parking demand of 0.8 spaces to 1.18 spaces per unit. As a result, Evanston planners proposed reducing parking requirements and shifting from a per-bedroom rule to a per-square-foot rule that will range from one parking space for an 800 square-foot-unit to 1.5 spaces for 1,500 square feet or more.

For more information see: Parking Spaces/Community Places: Finding the Balance through Smart Growth Solutions. http://epa.gov/smartgrowth/parking.htm

SHARED PARKING

Making parking work 24/7 in mixed-use districts

Parking policy is every bit as important to creating vibrant, pedestrian-friendly mixed-use districts as streetscapes, parks and high-quality public space, because it largely determines whether a neighborhood is compact and walkable. Shared parking is a valuable tool because it provides for a more cost-efficient use of parking resources, and frees up land for higher-value uses, creative site planning and landscaping – all of which will enhance the vibrancy, appeal and value of the development.

Shared parking is most effective when land uses have significantly different peak parking characteristics

Shared parking is a parking management policy that allows for parking spaces to be shared by more than one user, since most parking spaces are only used some of the time and many parking facilities include many unused spaces with patterns of usage that follow predictable daily, weekly and annual cycles. For example, an office complex can efficiently share parking facilities with restaurants or theaters, since offices require maximum parking during weekdays, while restaurants and theaters require maximum parking in the evenings and weekends. As a result, it is estimated that the total amount of parking can be reduced 40-60 percent.

One of the best ways to provide shared parking is to build shared parking facilities rather than having each building provide private off-street parking, thereby allowing each public space to serve many users and destinations. It is estimated that 100 public parking spaces can be the equivalent of 150 to 250 private parking spaces, and developers or building owners can be asked to pay in-lieu fees to fund construction of these public parking facilities. On-street parking is also easy to share since it's so visible and convenient, but in order to make this work the on-street parking must be managed for maximum use, particularly in busy commercial centers, by limiting the time to two hours or less, or applying short-term pricing. Parking can also be shared among a group of employees or residents: For example, 100 employees or residents can usually share 60-80 spaces since not all employees will drive to work at one time.

WEEKDAY **EVENING** **WEEKEND**

Shared parking works best with multiple destinations with different peak parking demand periods.

AGREEING TO SHARE PARKING

Shared parking is typically implemented by municipal governments, with sharing arrangements made between individual facility developers

The seven-story Gaia complex in downtown Berkeley, less than a block from the Berkeley BART station and the University of California-Berkeley campus, was allowed a height bonus in exchange for providing a performance and arts space. In addition to the cultural space, there is a cafe on the ground floor, a rooftop garden and a solarium as common areas. The 91-unit project has 42 spaces in parking lifts along with space for car sharing and bike storage facilities.

and managers. Some local jurisdictions incorporate language in local ordinances to permit and even encourage shared parking. These jurisdictions allow shared parking to meet minimum parking requirements for uses located in the same building and also permit off-site shared parking arrangements to meet on-site requirements for complementary uses within a defined area. These location requirements are typically based on acceptable walking distances. San Diego's municipal code, for example, states that shared parking facilities must be located within 600 feet of the uses served, while Eugene, Oregon, and Los Angeles both allow for 1,320 and 1,500 feet, respectively.

IN-LIEU PARKING FEES

The city of Long Beach recognizes that parking is expensive and consumes valuable land, and allows for shared parking and in-lieu parking fees. For example, the city's minimum parking requirements would have required a proposed 162-room downtown hotel to provide 302 spaces, costing an estimated $4.83 million, making the project financially infeasible. In the interest of encouraging urban revitalization the city agreed to lower the parking requirements to 218 and allow the developer to pay in-lieu fees of $3,000 per space for a quarter of these spaces plus an additional $50 per space per month to cover parking operating and maintenance expenditures. The revised parking requirements provided a savings of more than $2 million to the developer and has facilitated the revitalization of the surrounding area, increased pedestrian traffic, generated approximately $300,000 in property tax revenues and helps to support Long Beach's downtown.

C.1. Issue: HARVEST VILLAGE AT SOUTH JORDAN PHASE 4 SUBDIVISION AMENDMENT

Address: Approximately 3350 West South Jordan Parkway
File No: SUB-AMEND-2014.33
Applicant: Paul Stringham, KS Corners, LLC

Planning Commission Vote **Approved as per Staff Recommendation (5-0)**		
Planning Commissioner	**Vote (yes/no)**	**Comments**
Beverly Evans	Yes	
Richard Feist	Absent	
Jason Haymore	Yes	
Earl Jolley	Yes	2nd
Sean Morrissey	Yes	Motion
Russ Naylor (alternate)	Yes	
Public Comments of Note		
None.		

D.1. Issue: JORDAN STATION APARTMENTS SITE PLAN

Address: 10464 S. Jordan Gateway
File No: SP-2014.14
Applicant: Dale Watson, Construction Management

Planning Commission Vote **Decision tabled until July 8th meeting (5-0)**		
Planning Commissioner	**Vote (yes/no)**	**Comments**
Beverly Evans	Yes	
Richard Feist	Absent	
Jason Haymore	Yes	Motion
Earl Jolley	Yes	2nd
Sean Morrissey	Yes	
Russ Naylor (alternate)	Yes	
Public Comments of Note		
Julie Holbrook requested the Commission deny the application because of inadequate parking, too much traffic on Jordan Gateway to be generated by development, children living at the complex will run down the slope of the hill to the River and drown, residential use not necessary for commercial development and open space within project is needed. The Commission tabled their decision because they were uncomfortable in approving the		

applicant's proposal for a reduction in parking spaces of approx. 14.2% without reviewing studies backing up the request. The applicant was asked to bring back studies showing justification for a parking reduction because of proximity to mass transit increase the parking to meet City standards. Without justification they cannot approve reduction.

E.1. Issue: CVS PHARMACY
SITE PLAN AND CONDITIONAL USE

Address: SWC of Daybreak Parkway (11400 South) and 4000 West
File No: SP-2014.17
Applicant: Brett B Gelbert, Boos Development Group

Planning Commission Vote **Approved as per Staff Recommendation (5-0)**		
Planning Commissioner	**Vote (yes/no)**	**Comments**
Beverly Evans	Yes	Motion
Richard Feist	Absent	
Jason Haymore	Yes	2nd
Earl Jolley	Yes	
Sean Morrissey	Yes	
Russ Naylor (alternate)	Yes	
Public Comments of Note		
None.		

F.1. Issue: SUMMIT ENERGY MANAGEMENT CORPORATION OFFICE
CONDITIONAL USE PERMIT

Address: 10447 S. Jordan Gateway
File No: CUP-2014.08
Applicant: Larry Williams

Planning Commission Vote **Approved as per Staff Recommendation (5-0)**		
Planning Commissioner	**Vote (yes/no)**	**Comments**
Beverly Evans	Yes	
Richard Feist	Absent	
Jason Haymore	Yes	Motion
Earl Jolley	Yes	
Sean Morrissey	Yes	2nd
Russ Naylor (alternate)	Yes	
Public Comments of Note		
None.		

SOUTH JORDAN CITY
PLANNING COMMISSION REPORT

Meeting Date: 06/24/2014

Issue: **JORDAN STATION APARTMENTS SITE PLAN**
Address: 10464 S. Jordan Gateway
File No: SP-2014.14
Applicant: Dale Watson, Construction Management

Submitted by: Damir Drozdek, Planner III
Jared Francis, Senior Engineer

Staff Recommendation (Motion Ready):

- **Approve** Application SP-2014.14 to allow for construction of two multi-family buildings, including a commercial component located at the NE corner of the NE building, on property generally located at 10464 S. Jordan Gateway.

ACREAGE:	Approximately 5 acres
CURRENT ZONE:	TOD-MU (Transit Oriented Development – Mixed Use)
CURRENT USE:	Vacant Land
FUTURE LAND USE PLAN:	TOD-MU (Transit Oriented Development – Mixed Use)
NEIGHBORING ZONES/USES:	North – I-F / Retail Buildings South – C-F / Vacant Lot West – C-F / Vacant Lot East – C-F / Jordan Gateway

BACKGROUND:

Jordan Station apartments is a project proposed to be constructed at approximately 10464 S. Jordan Gateway. It consists of two multi-family residential buildings and a commercial space located at the corner of the northeast building. Both buildings are four-story buildings with underground parking. Surface parking will be provided as well. Two access points will be provided off Jordan Gateway. There will be ample pedestrian walks around the development that will connect to each building and to the public sidewalk on Jordan Gateway.

The project is proposed to be slightly under-parked as compared with City Parking Ratio requirements. As per City Development Code the project is required to have 511 parking stalls. The project as proposed has 442 parking stalls. However, section 17.74.080 (Development Standards Applicable to Mixed Use Zones/Subdistricts) of the City Code, states that developments that can demonstrate walkable design or where transit opportunities are available, can be approved by the Planning Commission as 'under-parked'. The Jordan Station development is within a walking distance (1/4 mile) of the FrontRunner Station and thus provides ample transit opportunities.

The buildings architecture was reviewed by the ARC twice. Initially the Committee was not pleased with the proposed project containing as much stucco as it did and asked the applicant to return with some revised elevations as per Committee's suggestions. The first meeting was held on May 7th of 2014. The second meeting was held the following week, the May 14th. The newly submitted revised elevations show the stucco product to be no more than 40% of the building façade. The Applicant also presented a new material called 'Crystone" that may replace stucco in certain areas of the building. ARC was in favor of the use of 'Crystone'

as long as it was not used to replace brick or stone on the buildings (can only be used to replace stucco product). With the new revisions, ARC recommended approval of the project.

There will be no fencing installed with the project and the landscaping will follow typical City Code requirements. Public improvements along Jordan Gateway will be installed with the project except that some of the improvements that typically are part of the Public ROW will remain private but will have public access easements. Public ROW on Jordan Gateway will not end at the back of sidewalk however most of the parkstrip will remain within the Public ROW. Sidewalk along Jordan Gateway will remain on private property but will have public access easement.

Project amenities will include a clubhouse area, an internet café, a swimming pool and a barbeque area. There is also a small drainage pond at the east end of the project, adjacent to Jordan Gateway, which will also serve as a small dog park. Underground parking is also provided for a portion of the apartment residents.

STAFF FINDINGS, CONCLUSIONS & RECOMMENDATION:

Findings:

- Multi-family dwellings, varied and integrated with adjacent uses and retail sales and services, excluding auto services such as stand along car wash, tires, repairs, gas stations and/or convenience store are listed as Permitted Uses in the TOD-MU Zone (see section 17.74.100).
- The project meets all the terms of the Development Agreement as adopted as part of the rezone process on April 25th of 2014.
- There will be 186 one-bedroom units and 116 two-bedroom units for a total of 302 units in the project.
- The project is in conformance with the Goals and Policies of the General Plan as follows:
  - H-1.2 Create and adopt a 'village' style mixed use zone to be used in appropriate locations along arterial and collector streets, with a TOD (Transit Oriented Development) sub-district for use adjacent to the FrontRunner Station and a Town Center subdistrict for use around the existing South Jordan Town Center.
  - H-2.3 Provide limited areas for higher density as 'infill' and/or in mixed use developments, based on superior design and development integration, spreading density rather than concentrating it in large pockets.
  - H-4.4 Require that all new developments have complete pedestrian and vehicular circulation facilities with appropriate curb, gutter, sidewalk, street lights, street trees, and proper storm drainage.
  - H-4.6 Require appropriate pedestrian connections from housing to various activity centers (i.e. shopping facilities, schools, churches, parks, open space, and trail systems) to facilitate development of walkable self-sustaining neighborhoods.
  - H-5.1 Provide locations and densities within the City, as necessary, to assure moderate income housing within economically viable inclusionary developments.

Conclusion:

- The proposed project will meet the Goals and Policies of the General Plan as well as meet the requirements of the Development and the Planning and Land Use Codes.

Recommendation:

- Based on the Findings and Conclusions listed above, Staff recommends that the Planning Commission take comments at the public hearing and **approve** the Application, unless, during the hearing, facts are presented that contradict these findings or new facts are presented, either of which would warrant further investigation by Staff.

FISCAL IMPACT:

- Typically, residential projects result in a net negative fiscal impact however the higher density residential projects tend to neutralize fiscal impacts due to a number of residents and units located on a relatively small area.

ALTERNATIVES:

- Approve the amended Application.
- Deny the Application.
- Schedule the Application for a decision at some future date.

SUPPORT MATERIALS:

- Aerial Map
- Zoning Map
- Site Plan CS.2
- Parking Level Plan Overall A-1.1
- Architectural Site Plan SD-1.1
- Building Elevations A-2.1
- Color Renderings
- Landscape Plan L101

Damir Drozdek
Planner III
Development Services Department

Legend

STREETS

PARCELS

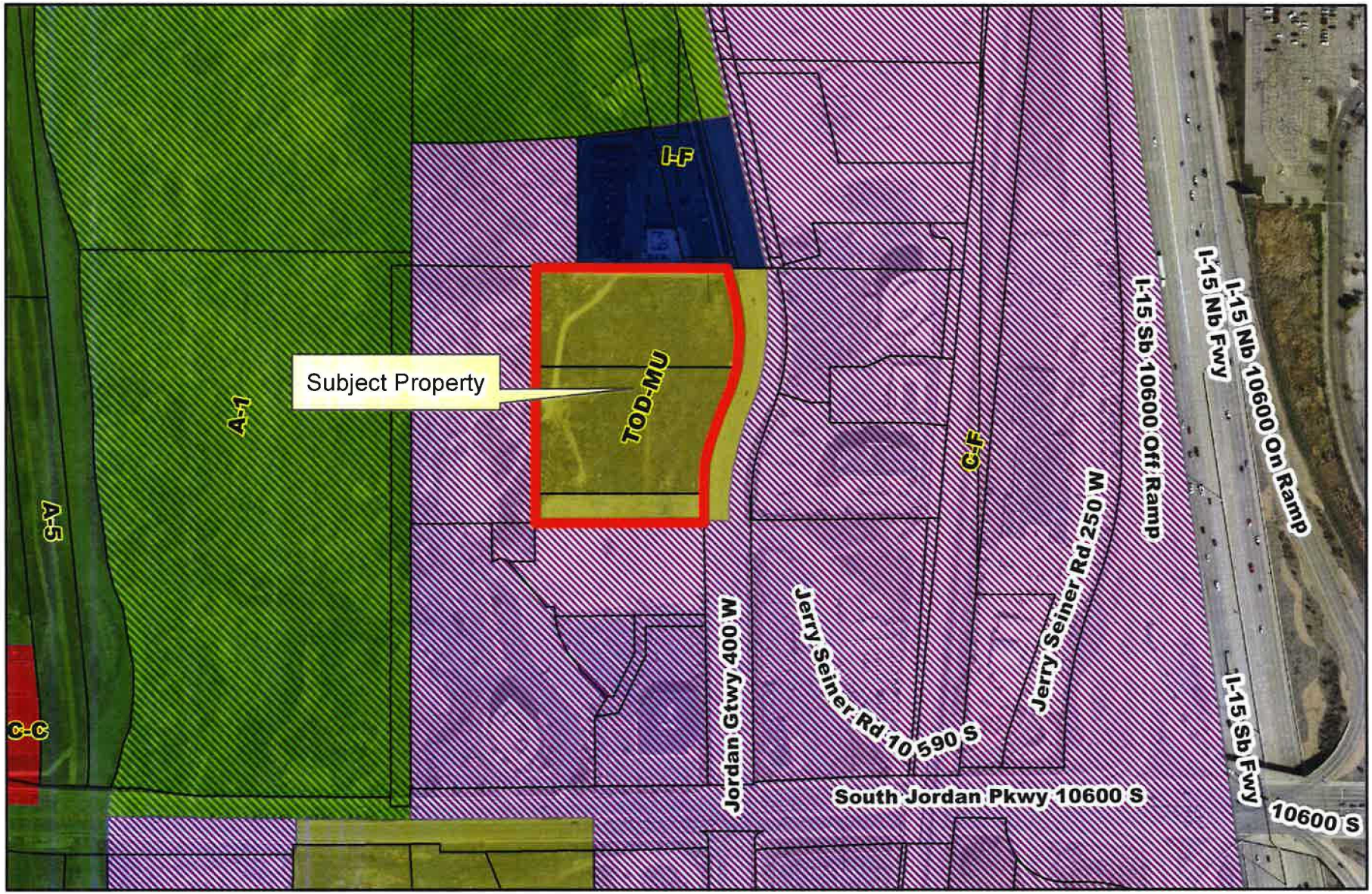
Aerial Map

City of South Jordan

0 105 210 420 630 840 Feet

Aerial Imagery
April 2012

ESRI



Legend

STREETS

PARCELS

Zoning Map

City of South Jordan

0 105 210 420 630 840 Feet

Aerial Imagery
April 2012