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## How to Make Transit-Oriented Development Work

Number one: Put the transit back.

*By Jeffrey Tumin and Adam Millard-Ball*

Even a cursory glance around the country suggests that transit-oriented development is hot; new TODs are on the drawing boards everywhere, from Alaska to Florida. Its advocates tout benefits ranging from more compact development and less automobile dependence to new retail opportunities and improved quality of life.



But the same quick survey raises some basic questions about just how fundamentally different many TODs are from their auto-oriented counterparts. We now have "transit-oriented" big box stores and single-story office parks, set in seas of parking. In many cases, developments with just six housing units to the acre are being advertised as TODs.

"The amount of hype around TOD far exceeds the progress to date, with many transit proponents selling new transit investments on the basis of land-use changes yet to come," writes Hank Dittmar, president of the Great American Station Foundation, in a forward to a discussion paper prepared for the foundation and the Brookings Institution Center on Urban and Metropolitan Policy.

Most often, he continues, "TODs have conventional suburban single use development patterns, with conventional parking requirements, so that the development is actually transit-*adjacent*, not transit-*oriented*."

Instead of branding anything that is built near transit a successful TOD, Dena Belzer and Gerald Autler of Strategic Economics, the principal authors of the paper, suggest that projects should be judged against specific desired outcomes:

Those outcomes include choice (for example, diverse housing and transportation); livability (less pollution per capita); and financial return (for instance, to developers and transit agencies).

### **First on the list**

What can planners do to ensure that TODs actually achieve these outcomes? Robert Cervero, a professor of city planning at the University of California, Berkeley, talks about what he calls the 3Ds, or three dimensions (density, design, and diversity) that are needed for a TOD to work. Of these, says Tom Margro, general manager of the San Francisco Bay Area's BART system, the first is most important. "From the point of view of a transit agency, density is paramount," he says.



In fact, density is a key criterion in the new BART system expansion policy, which was adopted last December. "We're being courted by cities that want BART extensions," says Margro. "The policy helps us reward those communities that make the zoning and land-use changes that we're looking for."

Density is partly a matter of geometry. All else being equal, the more housing and jobs within a short walk of a transit station, the greater the ridership.

Nationally, a 10 percent increase in population density has been shown to correspond to a five percent increase in boardings, while doubling density can reduce vehicle travel by 20 percent, according to a 1996 report published by the Transit Cooperative Research Program.

Density has even farther reaching implications. Residents of denser communities are more likely to be able to walk to shops and services and thus to be able to live with just one car — or with none. According to research conducted for Fannie Mae's Location Efficient Mortgage program, vehicle ownership falls rapidly as density increases, reaching an average of just one car per household when density climbs to 20 to 30 housing units per acre.

Many of the best-performing TODs — such as those around Metro stations in Arlington County, Virginia — focus high density immediately around the station. Building height drops rapidly and housing forms change from attached to detached as they approach the existing single-family neighborhoods that surround many of these stations.

The same pattern is seen at the newly built King Farm development in Maryland, close to the Shady Grove Metro station. "We have a gradient away from the village center and a potential future light rail stop," says Neal Payton, director of town planning at Torti Gallas & Partners in Silver Spring, the architecture firm responsible for the King Farm town plan.

"At the center, we have the greatest mix of uses and the highest densities, with town houses and single-family houses appearing as one moves away from the center," he says.

### **Mixing it up**

Not all land uses are equal when it comes to generating transit ridership. Office or retail development tends to employ more workers and thus to produce more riders than industrial uses, for instance.

A less obvious example is affordable housing. Since low-income households tend to own fewer cars and are more likely to use transit, an affordable housing component of a transit-oriented development can add more riders, as well as furthering other public policy objectives.

A case in point is Alma Place in Palo Alto, California, where peak-hour parking demand has been measured at just four-tenths of a parking space per unit, even though parking is free. The location of this affordable housing development, just two blocks from the Caltrain commuter rail station in downtown Palo Alto, allowed many residents to sell their cars altogether.

It is mixed use ("diversity" on Robert Cervero's 3D list), however, that has demonstrated some of the highest ridership gains. Dennis Leach, a consultant with the firm of TransManagement is currently researching the performance of TODs in the Washington, D.C., region. "Mixed use is where you get the real payoff in reduced vehicle trips," he says. "It allows residents to walk to shops and services, and it allows employees to take transit to work, since they can do without a car during the day."

In addition, says Leach, mandating or encouraging mixed use helps to avoid a dull monoculture. "Very high land costs tend to push a single use, such as offices," he notes. "That makes for a dead downtown" at night and on the weekends.

### **Managing demand**

Even the densest mixed-use developments will have only a limited impact if financial incentives discourage residents and employees from taking transit. To achieve the greatest success in reducing vehicle trips, projects need to encompass TOD + TDM, that is, both transit-oriented development and transportation-demand management.



Perhaps the most critical element of a TDM package is parking management. After all, unlimited free (to the user, but not the transit agency) parking is one of the biggest incentives to drive, and also encourages people to own a vehicle in the first place. Conversely, research by UCLA urban planning professor Donald Shoup has shown that ending parking subsidies is an effective way to get people out of their cars, reducing vehicle trips by an average of 25 percent.

Another demand management strategy, used to great effect in Portland,

Oregon; Boulder, Colorado; and Santa Clara County, California, is to provide free or discounted transit passes for residents and employees. In 1997, Shoup reported on a survey of Silicon Valley companies that gave their employees Eco-Passes, good for unlimited rides on the Santa Clara Valley buses and light rail. Employee parking demand at these work sites declined by about 19 percent as transit ridership swelled.

Increasingly, parking management strategies are being incorporated into TOD plans from the outset. At San Francisco's Balboa Park BART station, for example, the city's draft neighborhood plan proposes that new development on city-owned land be required to "unbundle" the cost of parking from rents.

"Currently most new ownership housing and some new rental housing has parking included in the base price of a unit," the plan says. "Individuals and families who do not own or may not need a car must pay for the space anyway, needlessly driving up the cost of their housing."

Considering TDM, and particularly parking management, in the earliest stage of planning lets its benefits affect a development's design and allows less parking to be provided. Moreover, if fewer vehicle trips are expected, streets can be designed for lower traffic volume, helping to improve the pedestrian environment.

"TDM is often used as a mitigation strategy," notes Peter Albert, station-area planning manager for BART. "Neighbors and others always use parking as a reason to kill a project. TDM can give local planning commissioners the elbow room to approve a project with less parking."

### **'Don't even think of parking here'**

In the end, TOD and parking are inextricably entwined. "If the parking requirement doesn't reflect the transit resource, it's not TOD," says Albert. "It's just development close to a transit station." Most conventional development, after all, uses parking ratios derived from suburbs that have little or no transit and where everyone is assumed to have a car.

Building projects with reduced parking is another matter. Larger projects are often constrained by the attitudes of developers and lenders. Nevertheless, an increasing number of small-scale developments are selling well with little or no parking. Examples include the 91-unit Gaia Building in Berkeley, California, and the Seaboard Building, where offices have been converted to apartments in Seattle's Westlake Mall.

"In almost every case, parking requirements aren't an issue with local jurisdictions," says architect Neal Payton. "They're willing to provide less parking." Developers are more hesitant. "They don't want to risk not being able to rent a unit because there isn't enough parking."

Transit agencies themselves are often a source of pressure to provide more parking, in the form of heavily subsidized commuter parking for their riders. The surface parking lots owned or leased by these agencies are often a source of conflict. On the one hand, they're prime sites for transit-oriented development. However, the transit agencies often insist that any spaces lost must be fully replaced as part of the project.

"The ability of the market to support development that includes 100 percent replacement parking, with no revenue to support that parking, has been a huge hurdle to TOD," says Peter Albert. BART is now beginning to charge for reserved spaces at many stations, where before virtually all parking was free. The new revenue may be helpful in supporting the construction of parking structures to replace the lots, he suggests.

In other parts of the country, agencies are moving away from a strict one-to-one replacement policy. In the D.C., region, WMATA's Joint Development Policies and Guidelines, revised last year, now allow projects to be approved with less than full replacement parking. In some cases, the agency is even authorized to cover part of the cost of parking garages.

Such a policy makes sense from the point of view of increasing ridership and revenue for transit agencies, as well as promoting TOD. After all, an acre of dense, mixed-use development is likely to generate more transit trips than an acre of surface parking. More important, TOD helps to spread ridership more evenly throughout the day, compared to peak-oriented park-and-ride lots. That's a major concern for agencies

facing crushing peak-hour loads.

### **Looking good**

Even better is a transportation-demand policy that invests in alternatives. Pedestrian improvements, bicycle paths, and feeder transit often provide more bang-for-the-buck than parking.

Even with the best of management, however, most TODs still require huge amounts of parking, either in lots or structures. The question then becomes, how can planners reduce its impact?

Neal Payton sees ground-floor uses as key to reducing the impact of parking structures. At Harrison Commons, a planned TOD in Harrison, New Jersey, Payton's firm designed a 2,500-space garage that will accommodate commuters on the PATH commuter rail line. The development will include 3,000 apartments and 100,000 square feet of retail.

The garage will be wrapped on three sides with narrow "liner buildings" containing loft apartments above convenience retail. "You won't be able to see the garage from the street," he says.

In California, liner buildings will wrap around both existing and new garages at Bay Area Rapid Transit's Pleasant Hill station. The garages are part of a transit-oriented development designed by Lennertz, Coyle & Associates of Portland, Oregon.

The location of the parking facility is also important. At Harrison Commons, the mass of the largest garage will serve as a soundwall to buffer neighboring residences from the railroad. Payton warns, however, that this strategy may not be applicable everywhere. "In the New York area, people are used to having their car some distance from their apartment, which gives you a lot of flexibility in the design," he says. "This isn't true in most other places."

### **Design solutions**

Even the third of Cervero's 3Ds — design — comes back to parking. "Reduced parking allows a finer grain of development," says Payton. "With smaller garages, you can achieve smaller block sizes. And small blocks create variety and interest," he says, encouraging walking.

Dennis Leach says the street pattern and other design factors help to explain why some of the most walkable developments are often in established urban areas. He cites Washington's Dupont circle as an example. "The framework of the street and building pattern is extremely strong," he says.

That's less true in suburban neighborhoods like Bethesda, Silver Spring, and Arlington County, where wide arterials, surface parking, and the lack of a fine-grained street grid make walking a challenge. "The framework for urban development isn't really there," he says. "It has to be retrofitted."

All else being equal, walkability is maximized when streets are designed to accommodate lower traffic volumes in the first place. The key, then, is to factor the reduced trip-making benefits of TOD back into the street design — avoiding the error of widening roads for traffic that never arrives, or worse still, arrives only *because* of the widening.

Many agencies grant generic trip generation credits for transit-oriented development. The Los Angeles Metropolitan Transportation Authority, for example, offers a 15 percent credit for residentially oriented, mixed-use projects that have at least 24 units per acre and that are within a quarter-mile of a light rail station.

An important tool for creating a framework for walkable streets is likely to be the street hierarchy and design standards currently being written by the Congress for the New Urbanism, together with the Institute for Transportation Engineers and the U.S. Environmental Protection Agency. These standards envisage a new hierarchy of streets — from mews and lanes up to main streets and boulevards, rather than local, collector and arterial.

While many of these techniques have been used by new urbanist designers, engineers, and planners —

and others — for years, they have generally resulted in one-time exceptions rather than fundamental change. That could change with these new standards.

*Jeffrey Tumlin is a partner of Nelson\Nygaard, a transportation consulting firm. Adam Millard-Ball is a senior associate with the firm.*

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## Resources

**Images:** Top — San Francisco's Bay Area Rapid Transit District is now putting a high priority on a walkable environment. This is Station Square in Pleasant Hill, designed by LCA Town Planners & Architects of Portland, Oregon. Drawing by Seth Harry. Middle — The numbers are there at Maryland's 440-acre, mixed-use King Farm development, near the Shady Grove Metro Station: 3,200 residential units, 3.17 million square feet of office and employment space, and 125,000 square feet of retail. Drawing by Torti Gallas & Partners. Bottom — Urban Village: Del Mar Station in Pasadena is one of the 13 stops on the Los Angeles area's new light rail line, the Gold Line. The station and 600 parking spaces are expected to be ready in July. Phase II, scheduled for early 2004, will add 347 apartments (some affordable), 10,000 square feet of shops, and underground parking for residents. The developer is Urban Partners of Los Angeles. Project architect is Moule & Polyzoides. Melendrez Design Partners designed the plaza and open space. The square block site was vacant except for the city's historic Santa Fe Depot, which is being restored. It is adjacent to Pasadena's celebrated Old Town shopping district. Drawing by Moule & Polyzoides architects.

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**Reading.** The paper by Dena Belzer and Gerald Autler, "Transit Oriented Development: Moving from Rhetoric to Reality," is available at [www.stationfoundation.org](http://www.stationfoundation.org). A new book, with chapters by Dena Belzer and Dennis Leach, will be published this year by the Great American Station Foundation.

Research for the Location Efficient Mortgage ([www.locationefficiency.com](http://www.locationefficiency.com)) is summarized in a 2002 article by John Holtzclaw and others entitled "Location Efficiency: Neighborhood and Socio-Economic Characteristics Determine Auto Ownership and Use." It's in *Transportation Planning and Technology* (Vol. 25, pp. 1-27).

Robert Cervero and Michael Duncan noted in a recent working paper for the University of California Transportation Center ("Residential Self Selection and Rail Commuting") that residents who live within a half-mile of suburban BART stations — and who have no more than one car per household — are twice as likely to take transit to work as their neighbors. "This indicates that the transit-ridership benefits of transit-based housing come from those with relatively few — i.e. under two — cars in the household," they write. This and other papers by Robert Cervero are available at [www.uctc.net/papers/papersalpha.html](http://www.uctc.net/papers/papersalpha.html).

City CarShare is at [www.citycarshare.org](http://www.citycarshare.org).

**Campus car sharing.** MIT is one of several universities that have car sharing programs. According to Mark Chase, the director of planning and market development for the year-old Zipcar program in Cambridge, Massachusetts, during the past year, 660 MIT students, faculty, and staff (out of a total campus population of 14,000) signed up to take advantage of six campus "Zipcars" and an additional five cars near campus. Program members also had access to 120 cars in Boston, and 42 each in Washington, D.C., and New York. Noting that surveys showed that 10 percent of the Zipcar users would otherwise have owned a car, Chase adds: "Thus we feel we have taken about 60 cars off the road." For more, see [www.zipcar.com](http://www.zipcar.com).

**Chicago-style.** A good source of information on car sharing is the Center for Neighborhood Technology in Chicago, 773-278-4800; [www.cnt.org](http://www.cnt.org). CNT's I-GO program, in existence since 1991, provides cars for hourly rental in three Chicago neighborhoods.

**Facts and figures.** Quantifying the costs and benefits of public projects should be easier with the help of

*Estimating the Benefits and Costs of Public Transit Projects: A Guidebook for Practitioners*, a product of the Transit Cooperative Research Program (TCRP). The guide and a companion CD-ROM are both free to planners. The book includes sections on benefit-cost evaluation concepts and their application to transit projects, along with information on transit's impacts on land use, land development, and economics. The CD-ROM contains worksheets, which may be downloaded to organize project information, and presentation templates, which can be customized for specific audiences. There is also a photo gallery and a clip art feature.

Order online at [www.tcrponline.org](http://www.tcrponline.org), or e-mail [tcrp@apta.com](mailto:tcrp@apta.com).

The guidebook was prepared under the direction of Parsons Brinckerhoff in Portland, Oregon, and ECONorthwest in Eugene. TCRP is a cooperative effort of the Federal Transit Administration, the Transportation Research Board, the Transit Development Corporation, and the American Public Transportation Association.

**Changing parking standards.** A new APA Planning Advisory Service report gives local planners some new tools to measure how their own parking standards compare with those of others. *Parking Standards: A Survey with Commentary* (PAS Report No. 510/511), edited by APA researchers Michael Davidson and Fay Dolnick, reports on a nationwide survey of off-street parking requirements for nearly 800 different uses. Included is an article on "The Dynamics of Off-Street Parking," by Jason Wittenberg, a Minneapolis transportation planner, who discusses shared parking, maximum parking standards, and downtown parking standards. The report provides separate listings of minimum/maximum parking requirements for more than 300 uses, as well as bicycle parking standards for nearly 150 uses.

Click here for information on joining PAS.

**More on parking.** Strategies to support brownfields and infill development by reducing the amount and cost of parking are outlined in the U.S. EPA's Parking Alternatives guide, which is currently being updated. See [www.smartgrowth.org](http://www.smartgrowth.org).

**WALKArlington.** The results of the WALKArlington charrette can be seen at [www.commuterpage.com/greenway1.htm](http://www.commuterpage.com/greenway1.htm). For more information contact: Jan Goldstein, WALKArlington project manager, at [Jgolds@co.arlington.va.us](mailto:Jgolds@co.arlington.va.us).

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## The Car-Sharing Solution

*By Adam Millard-Ball*

A promising new addition to the transit-oriented development armory is car sharing. Members of car-sharing programs have access to a fleet of vehicles on a per-use basis, allowing them to live without a second or third car — or to do without a car altogether. In turn, developments need less parking, allowing increased densities and bringing down the cost of housing.



"Car sharing is one of the most practical ways to reduce vehicle ownership," says Gabriel Metcalf, deputy director of the nonprofit San Francisco Planning and Urban Research Association, and chair of City CarShare. "We're not telling people they have to give up their cars," he says. "We recognize that a car is essential for many trips. We're giving them an attractive alternative."

According to Metcalf, surveys show that each City CarShare vehicle takes five to six privately owned vehicles off the road, as members sell or scrap their cars after joining.

CarShare joins forces with Bay Area developers to win approval for reduced parking. The group has negotiated agreements with developers and the city planning department for more than a dozen developments, totaling more than 3,000 units that have been built or approved in San Francisco. A recent approval: a 98-unit affordable housing complex on Folsom Street that will provide just 16 parking spaces. More projects are under way in Oakland, Berkeley, and San Jose, says Metcalf.

According to the San Francisco planning department, the city is now seeking to amend its zoning code to support the development of car-sharing programs, through reductions in minimum parking requirements, and exemptions from planned impact fees and parking maximums for car-sharing spaces.

**Image:** Programs like City CarShare offer an alternative for occasional Car use. Photo by City CarShare.

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## Is It Really TOD?

*By Patrick Siegman*

What's the difference between a true transit-oriented development, which will deliver promised social and economic benefits, and a transit-adjacent development? A true TOD will include most of the following:

- The transit-oriented development lies within a five-minute walk of the transit stop, or about a quarter-mile from stop to edge. For major stations offering access to frequent high-speed service this catchment area may be extended to the measure of a 10-minute walk.
- A balanced mix of uses generates 24-hour ridership. There are places to work, to live, to learn, to relax and to shop for daily needs.
- A place-based zoning code generates buildings that shape and define memorable streets, squares, and plazas, while allowing uses to change easily over time.
- The average block perimeter is limited to no more than 1,350 feet. This generates a fine-grained network of streets, dispersing traffic and allowing for the creation of quiet and intimate thoroughfares.
- Minimum parking requirements are abolished.
- Maximum parking requirements are instituted: For every 1,000 workers, no more than 500 spaces and as few as 10 spaces are provided.
- Parking costs are "unbundled," and full market rates are charged for all parking spaces. The exception may be validated parking for shoppers.
- Major stops provide BikeStations, offering free attended bicycle parking, repairs, and rentals. At minor stops, secure and fully enclosed bicycle parking is provided.
- Transit service is fast, frequent, reliable, and comfortable, with a headway of 15 minutes or less.
- Roadway space is allocated and traffic signals timed primarily for the convenience of walkers and cyclists.
- Automobile level-of-service standards are met through congestion pricing measures, or disregarded entirely.
- Traffic is calmed, with roads designed to limit speed to 30 mph on major streets and 20 mph on lesser streets.

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