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**Kid-friendly TODs**

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**Working Paper 2010-02**



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## **Kid-Friendly TODs**

**Robert Cervero and Cathleen Sullivan**

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# **Kid-Friendly TODs**

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## **Abstract**

Transit-oriented developments, or TODs, are commonly thought to appeal to non-traditional households. This paper reviews experiences with TODs, drawn mainly from Europe, that are kid-friendly. What makes them attractive to families are extensive shared green spaces and playgrounds in lieu of surface parking, no-traffic zones, and ample play spaces and cycling paths. Mixed land uses, high-levels of nearby transit services, and defensible spaces also have appeal. In some instances, higher rents reflect these benefits. Reducing on-site parking requirements and introducing transfer mechanisms that help cover the higher costs of family-size affordable units near rail stops can help promote kid-friendly TODs.

## 1. Introduction

TOD, or Transit-Oriented Development, has gained popularity as a sustainable form of urbanism (Calthorpe, 1994; Cervero, 2008; Renne, 2009). It typically features mixed land uses configured around light or heavy rail stations, interlaced by high-quality pedestrian amenities. As such, TOD is one of the more promising tools for breaking the vicious cycle of sprawl and car dependence feeding off each other, replacing it with a virtuous cycle: one where increased transit usage decreases traffic snarls and compact station-area development helps curb sprawl.

A common perception is that TOD appeals to a distinctive niche market – mainly non-traditional households, like childless couples, Generation X’ers, Millennials, and empty-nesters. Such cohorts value convenience and access to high-quality transit and – influenced by media images of *Seinfeld*, *Friends*, and *Sex in the City* -- place a premium on being in a walkable community with outdoor cafes, boutique retail, and urban amenities. The Center for TOD (2008) projects that 79% of U.S. households living in TOD by 2025 will be childless. Saying that TODs appeal to non-traditional households is tantamount to saying they are “kid-unfriendly.” After all, conventional wisdom holds that kids (and typically their parents as well) prefer the leafy suburbs, even if it means being isolated and relegates many parents to the role of chauffeur. Need this always be the case?

This paper argues that TOD can be kid-friendly and illustrates some examples that are. First, we present principles of kid-friendly TOD, defining ways in which it is well-suited to the lifestyles of families with kids. This is tied to the larger notion of planning cities with the needs of children in mind. We then turn to several international examples of kid-friendly TOD, drawn mainly from Europe. We conclude with some ideas on how America might go about kick-starting green and kid-friendly TOD.

## 2. Planning Places for Kids

The “gotta have a car to raise a kid” mindset is pervasive in middle-class America. Well-designed TODs that de-emphasize car usage and parking, however, can be perfectly suited for kids because many things are within a safer and walkable distance. Notably, removing the dominance of private cars from the residential landscape lowers accident rates, noise levels, and air pollution – i.e., it creates healthier and much more enjoyable environments for kids to play. Surface parking, which can consume half the land of many suburban multi-family dwelling complexes (Daisa, 2004), is replaced by more green space for play, less dangerous streets, and cleaner air (Figure 1). Shrinking parking’s footprint reduces heat-island effects and water pollution from oil-stained run-off into streams. Less impervious surfaces of concrete and asphalt helps recharge groundwater and replenish urban aquifers, thereby allowing greener and healthier gardens. Thus with kid-friendly TODs, the interiors of projects are comprised of lush and green communal gardens, playgrounds, tot-lots, and play-inviting open space. Having safe and secure interiors for kids to play becomes a form of defensible space (Newman, 1996), allowing the kind of natural surveillance embraced in the writings of Jane Jacobs (1961) and others.



**Figure 1. Kid-Friendly TOD in Rieselfeld, Germany:** Gardens and play areas replace surface parking.

In the TODs reviewed in this paper, cars are de-prioritized and children are clearly prioritized. Families are attracted to the extensive shared green spaces, low- or no-traffic areas, and ample play space and cycling paths. Rather than catering to single households, the young, or old, these projects are specifically designed for and marketed to families. Experiences show that thoughtfully and inclusively designed TODs are kid-friendly in three core ways: (1) they emphasize pedestrian infrastructure, including sidewalks, internal pathways, and crosswalks (and at the same time often de-emphasize the car); (2) mixed land uses not only bring destinations closer together but also create active, vibrant street life and interior spaces, instilling safety and security through more “eyes on the street”; and (3) high-levels of transit service provide kids with (and make them less dependent on their parents for) access to the offerings of a city, be they museums, sports venues, or retail attractions. Researchers at the Center for Cities and Schools (CCS) at UC Berkeley note that TOD can have even broader appeal to kids and families: parents

can efficiently drop off and pick preschoolers at childcare centers that are on- or near-site of a TOD when train-commuting; for teenagers, transit not only provides access to and from middle- and high schools, but also to afterschool enrichment activities, job sites, and special events (Bierbaum et al., 2010).

Kid-friendly TODs are part of a larger effort to create child-friendly cities. This view holds:

Too often, the built environment works against healthy child development in terms of the design and position of housing, parkland, and transport systems. We need to put children at the center of the planning process if we want to make an impact in reducing problems such as behavioral issues, rising rates of juvenile crime, domestic violence, and even the obesity epidemic”. (Lunn, 2006)

Critics might write off such claims as physical determinism at the extreme. However there can be little dispute that childhood obesity is tied to designing cities in ways that have engineered walking and cycling out of day-to-day life. In 1969, nearly 90% of U.S. children living within a mile of school walked or biked to school; by 2001, this figure had dropped to 63% and the estimated share today is less than 50% (Center for Disease Control, 2005). Putting schools on or near a TOD site can obviously promote safe routes to school. Research shows that distances between home and school, traffic concerns, and “stranger danger” are major barriers to kids walking and cycling to school (McDonald, 2007).

Kid-friendly TOD is by far more the exception than the rule in the U.S. today. Families interested in urban rather than suburban living have difficulty finding units spacious enough and with adequate amenities to accommodate young children (Lewis, 2010). It is faulty to believe that a lack of families living in urban area translates to a lack of demand for such lifestyles. Part

of the reason is a lack of supply. Notes Lewis (2010): “Unsubsidized apartments built today are almost exclusively designed for and marketed to people without school-age children”. In-city TODs taking form today, at least in the United States, are simply not being built with the needs of families in mind.

Several groups have actively sought to raise our collective consciousness about the importance of child-friendly city and transportation planning. Most notable have been the efforts (perhaps not surprisingly) of urban planners in the bike-friendliest countries of the world – the Netherlands (Dutch Institute for Design, Netherlands Ministry of Transport) and Sweden (Stockholm Institute of Education). Among the more notable publications of child-mindful planning are *Barnperspektiv på planeringen* (“Child’s perspective on planning”) by Swedish architect Nic Nilsson and *Child-Friendly Transport Planning* released by the Centre for Sustainable Transportation in Ontario, Canada. For the past decade, the Community-Based Education Resource (CUBE) has actively championed child-oriented community designs, ascribing to the “Bill of Rights for Kids” created by Aspen architect Harry Teague. The Bill holds cities that shall be:

- Safe
- At an appropriate scale – no walls over 4 feet in height
- Accessible – youth have the ability to get from one place to another
- Integrated – nature, the community, work, ages, sees, all part of the whole
- A manifestation of tradition – youth will be able to identify cultural anchors, be they building types and styles, monuments, landmarks, or natural areas.

Kid-friendly design principles also take expression in the writings and theories of such post-modern movements as New Urbanism, Complete Streets, and Active Living by Design.

The case studies that follow aim to move our thinking about kid-friendly TODs from theory to practice. What all have in common are high-quality public transit, notably a rail line and accessible stations that serve the immediate community. The communities, however, are more than buildings physically oriented to stations. All embrace principles of green urbanism in their design and architecture (Beatley, 2000). All emphasize pedestrian and cycling infrastructure and all promote efficient usage and recycling of natural resources, including renewable energy, low-impact building designs, and reduced waste. While people of all ages and backgrounds benefit from such practices, children, in particular, prosper in clean, safe, and healthy living environments.

### **3. Kid-Friendly TODs: Global Experiences**

The cases reviewed in this section are presented in roughly chronological order, starting with some of the first kid-friendly TODs built in Europe. Since details on all cases can easily be found on the Internet, the focus here is on isolating elements of these projects that are kid-friendly. Where possible, statistics are presented on projects' demographics (focusing on the share of households with kids and without cars) and travel characteristics of residents.

#### **GWL-Terrein (Amsterdam, The Netherlands)**

Completed on the site of Amsterdam's former municipal waste water utility, 3 kms from the city center, GWL-Terrein features 625 dwellings of mostly high-density housing on 14 acres

of land. The project has a car-free interior and is well connected by tramway, train, and bus. Parking is assigned to the project's periphery, as are several car-share depots.<sup>1</sup> Linked public spaces and communal gardens lace the project. Bicycle storage is readily available as well (Figure 2).

As a car-restricted project in a very liberal city known for its cannabis shops and red-light districts, one might assume that GWL-Terrein caters to counter-culturalists and bohemians of all stripes and persuasions. To the contrary, GWL-Terrein appeals to families with children mostly because of its plentiful green spaces (in short supply in a city like Amsterdam) and ease of transit access to the city's many cultural offerings. As a traffic-calmed project, safe play areas are also valued by parents. A survey from 2001 showed that 42% of households had children under 18 years of age, higher than the share of those living in the surrounding Westerpark neighborhood and well above the average of 24% for the city of Amsterdam as a whole (Scheurer, 2001). The survey also found that a third of residents were drawn to the project because it is car-free and emphasizes green urbanism and healthy living. Additionally, just one out of five households in GWL-Terrein owned a car the first few years following the project's opening. The survey also found that 73% of trips made by residents were by walking or cycling, 17% by public transit, and just 10% by car. Four out of 10 residents had a monthly transit pass. Vehicle kilometers traveled (VKT) per capita – the strongest correlate to sustainability in the urban transport sector – was 25% less than the average for residents of Amsterdam as a whole (Scheurer, 2001).

Through casual conversations with parents while visiting GWL-Terrein, most said they

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<sup>1</sup> When residents sign a lease or deed, they also sign a non-obligatory declaration of support for the car-free nature of housing. Residency in GWL-Terrein, however, does not preclude car-free living. Lotteries are used to distribute 110 residential and 25 visitor parking spaces on the project's edge. As of 2001, 110 households were thought to have sold cars because of the unavailability of parking (Scheurer, 2001).

were happy to let their kids roam freely through the project, comforted by its insular, secure-feeling design, commons areas, and well-defined edges, including a canal to the south. Because of green spaces, the absence of cars, and well-lit, clearly defined pathways throughout the project, children can play safely and within eyeshot of a grownup. Local shops and a restaurant provide on-site destinations for kids to pick up a snack and a commons area for social activities. Most notably missing from the project is a neighborhood school or childcare center, though both can be found nearby.



**Figure 2. GWL-Terrein, Amsterdam, The Netherlands.** Interior green spaces.

### **Houten, The Netherlands**

Houten, a city of some 40,000 inhabitants on an inter-city train line between Utrecht and Amsterdam, was explicitly designed for non-motorized movements. What makes it kid-friendly is the fact that the only convenient way to reach the rail-served town center is by foot or bicycle. Houten was master-planned and designed in the shape of a butterfly, absent any through roads that enable motorists to go from one side of the city to the other via the core (Figure 3). Instead, cross-town drivers must follow a circuitous ring road to go from one corner of the community to the other. Among Houten's distinctive features are continuous and protected bicycle paths,



Rieselfeld's population is under 18 years of age and almost half of households have children (Siegl, 2010). The district's market literature touts its pro-family aims: "The Rieselfeld project succeeds in keeping families within the city" (Rieselfeld Project Group, 2007).

Rieselfeld can be described as "transit-led development" (TLD). The tramway opened in 1997, a year after the first families had moved in and when there were just 1,000 inhabitants. The presence of 3 tramway stations enabled urban growth to wrap itself around rail nodes. With 7-minute peak headways, residents can reach the city center in 10 minutes. Extensive bikeways and ped-ways -- along with carsharing, narrow shared "play" streets that slow traffic, a grid layout, and preferential treatments for trams, buses, pedestrians, and bicycles at intersections -- have further reduced the reliance Rieselfeld's residents on private cars (Figure 4). And parks, playground, green medians, and borders rimmed by nature reserves and hiking trails promote active living. Green mobility is reflected by modal split statistics: 16% of resident trips are by walking, 28% by bike, and 25% by public transit (Rieselfeld Projekt Group, 2007). Also, 90% of Rieselfeld residents buy monthly transit passes.



**Figure 3. Rieselfeld District, Freiburg, Germany.** Green spaces, kid zones, traffic calmed streets. Tram line runs through the tree-lined center of the village (left photo).

Southwest of Freiburg on 40 hectares of land, with 5,000 residents, is what has been called one of the greenest places in the world, Vauban. In addition to its ecological design (low-energy buildings, co-generation heating and power plants, extensive solar collectors), Vauban is widely known for its car-restricted living (in contrast to Rieselfeld which averages 1.1 parking spaces per dwelling unit). Seventy percent of households have no car and 57% sold their cars upon moving to Vauban.<sup>2</sup> Most of Vauban's streets ban cars and most housing has no driveways or garages (Nobis and Welsch, 2003). Vauban's inhabitants exercise "judicious automobility," choosing to use a car only when needed – in 2003, 39% of households had joined a carsharing co-op. Of course, the flip-side of auto-restricted living has been high transit, walk, and bike modal shares. With the district organized around a tramway spine with three stops, Vauban is a prototypical Green TOD. Seven-minute peak headways draw many residents to the trams that nestle nicely into the streetscape.

Separate accounts highlight the kid-friendliness of these two projects. The city's marketing literature holds that Vauban and Rieselfeld are "Freiburg's youngest districts" (FWTM, 2009, p. 41). In reviewing Vauban's architectural and design qualities, Cerfontaine (2007, p. 32) concluded: "a child-friendly, attractive urban neighborhood for young children has been fully achieved" (Figure 5). Adds Steven Melia (2007, p. 6) in his comparative study of Vauban: "The carfree streets were full of young children, often unsupervised, playing or cycling – noticeably more so than in the Spielstrasse (homezones) with parking which are common elsewhere in Freiburg". Broaddus (2010, p. 3) has weighed in as well, concluding that Rieselfeld and Vauban constitute a "re-invention of the suburb as a high density, mixed-use place where cars are hardly used and children and low-consumption lifestyles can flourish".

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<sup>2</sup>The car ownership rate is just 150 per 1000 inhabitants compared to 430 per 1000 inhabitants for the city of Freiburg as a whole (Sustainability Office, City of Freiburg, 2009).



**Figure 5. The Kid-Friendly Vauban District, Freiburg, Germany.**

### **Kronsberg: Hannover, Germany**

The transit-friendly community of Kronsberg, in Hannover, is a young district with a high portion of families. Almost one third of residents are less than 18 years old and the average age is 31 years, much lower than Hannover City as a whole (where the average age is 42). It is clear upon walking through Kronsberg why the community is so popular among families with children. High-quality urban environs and open space were a high priority in the design of Kronsberg. Placement of parking underground and limiting the private parking ratio to 0.8 spaces per unit freed up space and funding for ample, lush inner courtyards. Space was carved out for play areas and green zones throughout the development and Kronsberg's adjacency to a large open space provides a clean, healthy environment for raising children (Figure 5). While the scale is perhaps larger than ideal and parks and plazas can feel oversized, Kronsberg's aim of creating a kid-friendly environment served by high-quality transit has largely been accomplished.



**Figure 5. Kronsberg, Germany.** Interior play areas dot this child-centric TOD

### **Hammarby Sjöstad: Stockholm, Sweden**

Widely applauded for its eco-city designs (largely energy self-sufficient and low levels of household waste due to aggressive recycling), the brownfield redevelopment site of Hammarby Sjöstad in Stockholm is also attractive to families with kids. The opening of an inner-city tramway line (Tvärbanan) that serves the development along with calmed traffic and ample car-free green space has made Hammarby Sjöstad a very popular place to live – so much so that it commands higher rents and averages a higher income than many other growing areas in and around central Stockholm.

Design features that are integral to TOD, like buildings that go up to sidewalk line (i.e., no set-backs), are kid-friendly because they offer comfortable, cozy, and secure walking corridors with clear sight-lines at a human scale. Buildings that hug the sidewalk also end up calming traffic. One mother of Hammarby Sjöstad who we met while touring the project noted that a school built to the sidewalk line allowed the amount of rear-lot play space to be increased while also providing a buffer from traffic.

Interestingly, Hammarby Sjöstad was originally planned for empty nesters moving back to the center city from larger suburban homes. However, only 5% of the population is older than 65 (Grontmij, 2008). Instead, 22% of residents are families with children 19 years of age or younger, higher than for Stockholm as a whole (Table 1). As shown in the table, there is a particularly large portion of children ages 0-5 years.

**Table 1. Age Distribution Comparison: Hammarby Sjöstad and City of Stockholm**

| Age                | Hammarby<br>Sjöstad | Stockholm |
|--------------------|---------------------|-----------|
| <b>0-5 years</b>   | 13%                 | 5%        |
| <b>6-15 years</b>  | 6%                  | 8%        |
| <b>16-19 years</b> | 3%                  | 4%        |

Source: Grontmij, 2008.

What is especially attractive to households with very young kids is the car-free interior of Hammarby Sjöstad (Figure 6). When touring the project, one mother we talked with voluntarily traced her walking route to day care on a map, excited about only having to cross one street with cars. Transit is also an attraction; the tramway spine/boulevard served as an organizing feature of the development from the start. The tram runs every 7 minutes in the peak and it takes only 5 minutes to connect to Tunnelbana subway trains or inter-city commuter trains. Bike lanes and bridges, ample bike parking, and 3 carsharing schemes, combined with a congestion pricing zone that lies between the project and central Stockholm, have drawn many residents out of their cars. In 2002, the project's modal splits were: public transport (52%), walking/cycling (27%), and private car (21%) (Grontmij, 2008). Non-car travel shares are thought to be considerably higher

today and even in 2002 well exceeded that of comparison suburban neighborhoods of Stockholm with similar incomes (Table 2). Also, 62% of Hammarby Sjöstad's households had a car in 2007, down from 66% in 2005 and in line with averages for the denser, core part of Stockholm city (Grontmij, 2008). Studies show the carbon footprint of residents is also lower than a comparison community: 438 versus 913 kg CO<sub>2</sub> equivalent/apartment/year (Grontmij, 2008). This is in keeping with the city of Stockholm's goal to become fossil-fuel free by 2050.

High-quality transit, pedestrian, and cycling infrastructure have played pivotal roles in shrinking the environmental footprint of Hammarby Sjöstad. However, the “greenness” of developments like Hammarby Sjöstad, not just the availability of rail-services or TOD design qualities, is every bit as important to their family friendliness. In combination, green mobility options and green urbanism have proven been a powerful lure in attracting environmentally conscientious households to Hammarby Sjöstad.



**Figure 6. Hammarby Sjöstad, Stockholm Sweden.** Kid-accessible transit and playgrounds.

**Table 1. Mode Splits for Journeys with destination in Stockholm County\***

| Transport Type   | Inner City | Southern Suburbs | Western Suburbs | Hammarby Sjöstad |
|------------------|------------|------------------|-----------------|------------------|
| Car              | 17%        | 39%              | 43%             | 21%              |
| Public Transport | 36%        | 28%              | 23%             | 52%              |
| Bike/Walk        | 47%        | 32%              | 34%             | 27%              |

Source: Grontmij (2008).

### **Kogarah Town Square: Sydney, Australia**

While European cities can lay claim to having advanced the art and science of building kid-friendly TODs more than anywhere else, Sydney's Kogarah Town Square has made pretty good headway. Newman et al. (2009, pp. 120-121) cite it as a sustainable, rail-served, and thriving "mixed-use development consisting of 194 residents, 50,000 square feet of office and retail space, and 35,000 square feet of community space, including a library and town square." The authors coined the term POD/TOD/GOD to describe Kogarah Town Square – a development oriented to Pedestrians, Transit, and Green Urbanism. Liberal use of photovoltaic collectors, building orientations that maximize thermal in-take, and close proximity to a train station, have shrunk the carbon footprint of Kogarah Town Square relative to similar districts in Sydney. As with European Green TODs, ample open space wrapped around an attractive and well-lit town center has contributed to the project's kid-friendliness (Figure 7). Kogarah's central location, assortment of land uses, and stock of well-preserved heritage buildings also

appeal to young professionals and empty-nesters, making for a culturally rich and demographically diverse community.



**Figure 7. Kogarah Town Square: Sydney, Australia.** Traditional architecture, central rail stations, and open civic squares add to the project’s kid-friendliness.

#### 4. Close

Contrary to popular opinion, TODs can be kid-friendly. European experiences underscore this. By taming private cars, giving preference to non-motorized mobility, shrinking surface parking lots to open up space for playgrounds, gardens, and communal spaces, providing superb access to the surrounding city, and greening the landscape, TODs can be superb environments for raising kids. This holds for central city settings (e.g., GWL-Terrein and Hammerby Sjöstad) as well as outlying suburbs (e.g., Rieselfeld, Houten, Kronsberg).

The cases reviewed in this paper are clearly more the exception than the rule. It would be a stretch to label any TOD in the United States today as “kid-friendly.” The Fruitvale Transit Village in Oakland, California features a Chartered High School and day-care center near the BART (Bay Area Rapid Transit) station, however parking is plentiful and there are no significant public playgrounds or green spaces to speak of. America’s dearth of kid-friendly TODs is

unquestionably tied to its car dependence and auto-oriented designs, at least in contrast to the European examples reviewed in this paper. Planning and zoning practices bear part of the blame. One culprit is the excessive amount of parking provided. Recent research shows most American TOD is grossly “over-parked,” providing more spaces than needed since so many TOD residents shed cars and rail-commute (Cervero et al., 2010). Embracing child-friendly city and transportation planning practices would also help. This is no more than honoring the principle of inclusive planning, bringing the views, ideas, and aspirations of kids to the table of every charrette and neighborhood meeting held on TOD (or for that matter, any kind of proposed neighborhood land-use change).

Moving beyond the rhetoric to the reality of kid-friendly TODs will take money, time, and political leadership. The built-in structural forces that work against designing safe, secure, and pedestrian-friendly settings around America’s rail transit stations are immense, and most likely can only be pared down through small victories, perhaps a little bit of luck, and some good, inspiring real-world examples. Economic barriers need to be overcome. Lewis (2010) observes: “Given the value of urban -- or urbanizing -- land and the cost of construction, making family-size units affordable would require financial incentives. Counties would have to subsidize development by directly or indirectly reducing the per-unit cost of land, and by providing tax breaks for developers and occupants”. Transfer mechanisms – like impact-fee offsets or tax abatements – that reward more family-oriented and sustainable development are but one way to leverage kid-friendly TODs. To the extent they shrink a city’s carbon footprint, cap-and-trade programs could be another way of underwriting the cost of more expensive development and redevelopment.

Putting up the funds to pilot-demonstrate the potential benefits and virtues of kid-friendly

TODs would be a huge step forward. This might happen at the local level, as in the case of some “Transportation for Livable Communities” (TLC) demonstration projects funded by the Metropolitan Transportation Commission (MTC), the regional planning authority for the San Francisco Bay Area. MTC has awarded numerous grants to rail-served municipalities in the Bay Area that have gone to build safe and attractive pedestrian connections to transit stops. More significant could be specific language in any federal transportation reauthorization bill that explicitly sets aside money for such purposes. The inclusion of Safe-Routes-to-School programs in past national transportation bills, along with the recent sustainable communities partnership between the Federal Transit Administration (FTA), Department of Housing and Urban Development (HUD), and the Environmental Protection Agency (EPA), suggest a receptivity to such programs at the federal level. It will take the collective voice of environmentalists, child-advocacy groups, sustainability-minded planners, pro-transit interests, PTAs, and the like to marshal the resources necessary to move make kid-friendly TODs a reality in 21<sup>st</sup> century America.

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