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Histories of Transit-Oriented Development: Perspectives on the Development of the TOD Concept

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Transit-Oriented  
Development:  
Perspectives on the  
Development of the  
TOD Concept**  
Real Estate and Transit,  
Urban and Social Movements,  
Concept Protagonist

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**University of California, Berkeley**

**Fall 2007**

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**Histories of Transit-Oriented Development: Perspectives on the Development of the TOD Concept**

**Real Estate and Transit, Urban and Social Movements, Concept Protagonist**

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## **Introduction**

Peter Calthorpe codified the concept of Transit-Oriented Development (TOD) in the late 1980's and, while others had promoted similar concepts and contributed to the design, TOD became a fixture of modern planning when Calthorpe published "The New American Metropolis" in 1993. TOD has been defined generally as "a mixed-use community that encourages people to live near transit services and to decrease their dependence on driving."<sup>1</sup> Calthorpe saw it as a neo-traditional guide to sustainable community design. Beyond its definition of built form, it was also a community design theory that promised to address a myriad of social issues.

Calthorpe, a student of the environmental sustainability movement, developed TOD to address the ecology of communities. He also saw TOD as an easily comprehensible solution for regional growth. It also met the need of transit agencies for alternative revenue sources. And it was a natural evolutionary next-step from many familiar community design precedents. In its most bold promise, TOD was to help "redefine the American Dream."<sup>2</sup> As later TOD analysts explained, "These Transit-oriented developments have the potential to provide residents with improved quality of life and reduced household transportation expense while providing the region with stable mixed-income neighborhoods that reduce environmental impacts and provide real alternatives to traffic congestion."<sup>3</sup>

This paper looks at the development of the TOD vision from multiple perspectives. First, the paper looks at a long history of transit served real estate development. Second, it evaluates TOD's position in a long history of social and urban theory. Lastly, it tracks Calthorpe's TOD concept through his lifetime of work up to the publication of "The New American Metropolis." This paper is meant to serve as a foundation for further work that will seek to define the term TOD in its many uses across the fields of planning, design, transportation, and policy.

## **Brief History of Real Estate Development Coordinated with Transit**

It could be said that TOD is simply the 1990's branding of an old concept. Some might point to the development of New York City's boroughs along elevated lines as TOD while others might go a step further and point to the location of Ur along a transport enabling river. Transport and the built environment are mutually dependent entities that have consistently pushed and pulled to create urban forms. The idea that transit might orient development and visa versa is certainly not new. In fact, Peter Calthorpe considers himself "a reviver rather than an originator of ideas."<sup>4</sup>

Transit as a form of transportation has been a part of the American urban landscape since the horse-drawn streetcar was popularized in the mid 1800's. Since that time, transit has interacted differently with

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<sup>1</sup> Still, T.; "Transit-Oriented Development: Reshaping America's Metropolitan Landscape"; On Common Ground; Winter;; 2002.

<sup>2</sup> Calthorpe, Peter; "The Next American metropolis: Ecology, community, and the American Dream"; Princeton Architectural Press; 1993.

<sup>3</sup> Ditmarr, Hank, Ohland, Gloria; "The New Transit Town: Best Practices in Transit-Oriented Development"; Island Press, Washington; 2004.

<sup>4</sup> Newman, Morris; "Focus: Sacramento, Calif.; A Transit-Oriented Approach to Suburbia" The New York Times; November 10, 1991.

development and developers during different periods. But throughout the history of transit, development has been a key component of its planning, success, and need. In “New Transit Town,” TOD is differentiated from prior transit related real estate development theories by placing it in its historical context.<sup>5</sup>

“New Transit Town” characterizes transit related development in the early twentieth century as “Development-Oriented Transit.” The authors point to street car suburbs as the prototypical development type of this era. Electric streetcar systems evolved after the development of the electric traction motor in the 1890’s. The higher speeds and extended range of electric streetcars relative to horse-drawn streetcars extended the practical uses of transit. The range of the electric streetcars was leveraged by real estate entrepreneurs to access easily developable open land on the periphery of cities.<sup>6</sup> Once transit put the land within reach of jobs, the entrepreneur-developer could build and sell housing. In this era, transit was an enabler for real estate development.

Ebenezer Howard created a movement centered on satellite cities enabled by rail transit access. As he described in “To-morrow: a Peaceful Path to Real Reform” in 1898, and again in 1902, within “Garden Cities of To-morrow,” his urban planning concept was focused primarily on real estate development with rail as the primary conduit between developed areas. Though motivated by London social conditions, his theories were easily translated in the U.S.’s “Development-Oriented Transit” era in places like Hilton Village (Newport News, VA), Chatham Village (Pittsburgh, PA), Sunnyside & Jackson Heights (Queens, NY), the Woodbourne (Boston, MA), Garden City (NY), and Baldwin Hills Village (Los Angeles, CA).

Whether laid out in the Garden City form or otherwise, “Development-Oriented Transit” occurred on the edges of most major U.S. cities of the time. Clifton Hood described August Belmont’s 1900 development of the Interborough Rapid Transit Company to encourage growth on the unimproved upper west side of Manhattan.<sup>7</sup> The island, only half developed at the time, experienced tremendous northerly growth as commutes were made by rail rather than ferry to rail connections from other boroughs.

On various scales, this form of development shaped America. Warner’s “Streetcar Suburbs” described the genesis of development-oriented transit in the Boston, Massachusetts metropolitan area as the creation of “a two part city: a city of work separated from a city of homes.”<sup>8</sup> This suburban paradigm developing at the turn of the twentieth century eventually promoted the next phase of transit-related development.

The decline in transit’s prominence was signaled by the rise of the car as a primary transportation mode through the early half of the twentieth century. As David Jones points out, prior to 1916, the U.S. was the world’s leader in transit rail miles, streetcar ridership, and almost every other transit metric, primarily motivated by the profits reaped by real estate developers that installed streetcar lines.<sup>9</sup> But by 1945, after

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<sup>5</sup> Ditmarr, Hank, Ohland, Gloria; “The New Transit Town: Best Practices in Transit-Oriented Development”; Island Press, Washington; 2004.

<sup>6</sup> Fogelson, Robert. 1967. *The Fragmented Metropolis: Los Angeles 1850-1930*. Cambridge: Harvard University Press.

<sup>7</sup> Clifton Hood. “Subways, Transit Politics, and Metropolitan Spatial Expansion.” In David Ward and Oliver Zunz, eds. *The Landscape of Modernity: New York City, 1900-1940*. Baltimore: Johns Hopkins University Press; 1997.

<sup>8</sup> Warner, Sam Bass. “Streetcar Suburbs: The Process of Growth in Boston, 1870-1900.” Cambridge, MA: Harvard, 1978 (2nd ed.).

<sup>9</sup> Jones, David; “The American Journey from Mass Transit to Mass Motorization, 1890-2000”; Book notes; 2007.

major disinvestment in transit infrastructure during the depression and WWII, the stage was set for the dominance of the automobile. Rail systems were dismantled and replaced by bus transit in most U.S. cities. As cars became more affordable, buses had minimal competitive advantage over the automobile with which they shared lanes. With the development of the Eisenhower Interstate System in 1956 and the promise of quick and easy vehicular access, the proverbial nail was put in transit's coffin.

Soon afterwards, during the "Great Society" movement of President Johnson's first year in office in 1964, the Urban Mass Transit Act (UMTA) addressed funding inequities in the transportation system. In selling the original legislation to congress, President John F. Kennedy stated, "To conserve and enhance values in existing urban areas is essential. But at least as important are steps to promote economic efficiency and livability in areas of future development. Our national welfare therefore requires the provision of good urban transportation, with the properly balanced use of private vehicles and modern mass transport to help shape as well as serve urban growth."<sup>10</sup> By the 1970s, the Bay Area Rapid Transit (BART) system, the Metropolitan Atlanta Rapid Transit Authority (MARTA), and the Washington Metropolitan Area Transit Agency (WMATA) were providing rail transit in cities once served by extensive streetcar systems. The new transit systems were primarily commute alternatives that reached far into the suburban landscape with minimal downtown coverage. Additionally, it was anticipated that suburban commuters would access the systems in private vehicles in a system informally called "Park-n-ride." For this reason, "New transit town" calls this the period of "Auto-Oriented Transit."

Most of these "Auto-Oriented Transit" systems failed to achieve their ridership goals and required substantial operating subsidies. A typical transit agency recovered less than one-third of its costs in fare box revenues.<sup>11</sup> Transit agencies soon learned that they could lease their land to generate revenue. Their subsidizers, local, state, and federal governments, saw large scale land development as a means to reduce reliance on subsidies. Subsequently, transit agencies created small real estate leasing departments within their organizations. This form of development was referred to as "Joint Development" because it was accomplished through a joint partnership between the transit agency and a private developer "designed to decrease the costs of operating or constructing public transportation systems, stations, or improvements through creative...arrangements."<sup>12</sup> Throughout the 1970s and 1980s, the lease revenues from this form of development received great attention as a financial tool.<sup>13</sup> Because much of the joint development generated during this time was standard development meant only to generate lease value, "New Transit Town" labels this type of real estate focus "Transit-Related Development."

However, studies from the 1970s began to point out that joint development conferred other benefits by demonstrating that transit ridership was related to the intensity of development near transit stations. An early such study was carried out in the New York City area to determine the densities of residents or

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<sup>10</sup> "The Beginnings of Federal Assistance for Public Transportation" Federal Transit Administration website: [http://www.fta.dot.gov/about/about\\_FTA\\_history.html](http://www.fta.dot.gov/about/about_FTA_history.html)

<sup>11</sup> 2005 National Transit Database; National Transit Administration.

<sup>12</sup> The National Council for Urban Economic Development; "Moving Toward joint Development: The Economic Development-Transit partnership"; Washington D.C.; Urban Mass Transit Administration; 1989.

<sup>13</sup> Cervero, R ; Ferrell, C ; Murphy, S; "Transit-Oriented Development and Joint Development in the United States: A Literature Review"; TCRP Research Results Digest, Issue Number: 52, Publisher: Transportation Research Board; 2002.



office space needed to sustain transit operations.<sup>14</sup> Later studies, especially those by Robert Cervero, showed that this was not just a New York City anomaly and that localized densities around transit systems could produce positive synergies.<sup>15</sup> Analysts found that office uses generally attracted high numbers of transit users while housing near transit, both affordable and high-end, also offered synergies.

Transit authorities began to see that they could play a part in increasing ridership by guiding the type and scale of development on land near stations. The 1980's saw transit agencies look beyond joint development to become true promoters and instigators of development. Transit agencies looked for projects that increased pedestrian activity and had transit-supportive uses in addition to contributing lease revenue. A "double bottom line" approach was adopted by many transit agencies where new joint developments were judged on their financial contributions through lease rents as well as their probable financial contributions through fare gate revenues. Robert Cervero suggests that this era be named "Transit-Supportive Development."<sup>16</sup>

This period coincided with the anti-suburb, anti-sprawl movement of the 1980's. The environmentally conscious anti-sprawl movement was studying the linkages between auto-oriented suburbs, traffic, and pollution.<sup>17</sup> The movement advocated neo-traditional neighborhood design that promoted walking and reduced vehicle trips. The advocacy of both the transit agencies and the anti-sprawl groups for high-density, pedestrian-oriented development was synergistic.

An academic-based relationship began to form between transit advocates and the anti-sprawl contingent when overlapping research appeared. A study of 1980 Bay Area travel patterns found that three percent of trips were made by transit in standard suburban developments while nearly 22 percent occurred in traditional, pre-World War II neighborhoods with moderate to high densities.<sup>18</sup> Not surprisingly, studies indicated that residents of traditionally designed transit-served communities patronized transit more than residents of nearby auto-oriented neighborhoods.<sup>19</sup> The synergies were especially apparent in academic settings, like the UC Berkeley College of Environmental Design, where architecture studios on neo-traditional developments were being conducted in the same building as transport research on development density near transit.

San Francisco based urban designers, including Peter Calthorpe, participated in and promoted this research as it substantiated their claims that neo-traditional design conferred significant community benefits. Through this same research, transit agencies became great proponents of redesigning entire neighborhoods around their transit facilities.

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<sup>14</sup> Pushkarev, Boris; Zupan, Jeffrey M.; McKenna, John; "Urban densities for public transportation: a study" New York: Regional Plan Association; 1976.

<sup>15</sup> Cervero, Robert; Zupan, Jeffrey; "Commuter and light rail transit corridors: the land use connection" Parsons, Brinckerhoff Quade & Douglas, New York, N.Y.; 1996.

<sup>16</sup> Cervero, Robert; "Transit-Supportive Development in the United States: Experiences and Prospects." Federal Transit Administration, U.S. Department of Transportation, Washington, DC. 1993.

<sup>17</sup> Cervero, Robert. 1986. Suburban Gridlock. New Brunswick, NJ: Center for Urban Policy Research.

<sup>18</sup> Fehrs and Peers Associates. 1992. Metropolitan Transportation Commission Bay Area Trip Pate Survey Analysis. Oakland, CA: Metropolitan Transportation Commission.

<sup>19</sup> Maryland National Capital Park and Planning Commission (MNCPPC). 1992. Transit and Pedestrian Oriented Neighborhoods. Silver Spring: Maryland National Capital Park and Planning Commission.

Unlike prior periods, disparate entities sought synergies through extensive coordination. They proposed doing so on a neighborhood scale similar to “Development-Oriented Transit” rather than one-off “Transit-Supportive Developments.” The overlap between neo-traditional neighborhoods and the provision of transit services was readily apparent. It was out of this period in the history of transit that the concept of TOD emerged.

### **Evolution of the concept—Urban Design & Social Movement Precedents**

As Walter Creese points out about one of TOD’s foremost precedents, the garden city, “[It] has been especially plagued by the constant semantic confusion in the literature describing the model villages, garden villages, garden suburbs, garden cities, and new towns.”<sup>20</sup> Likewise, TOD has been confused with multiple definitions and evolutionary precedents. When discussing TOD, Calthorpe himself has noted closely related concepts like Pedestrian Pockets, Traditional neighborhood Developments, Urban Villages, and Compact Communities.<sup>21</sup> Great concepts, so simply branded and capturing the imaginative attention of so many, often are confused with other ideas and are sometimes molded into whatever form fits the user’s need. For instance, Lefaver even used the term TOD to describe development along freeways.<sup>22</sup> Looking at the historical movements preceding the TOD concept can help reorient one’s perspective towards the original definition. This section identifies the design precedents and social movements that helped give rise to TOD and Calthorpe’s publication of “The New American Metropolis.”

Perhaps the first precedent for TOD goes as far back as John Nash’s 1811 master planned Blaise Hamlet for estate workers in Bristol, England. Subsequent British worker housing in extremely close proximity to factories was another form of compact, master-planned development, with transportation in mind—in this case walking. It was not until Jonathan Carr’s development of Bedford Park around 1875 that a master planned community took on the transit-oriented nature of modern TOD. Bedford Park was connected by the railroad to Charring Cross Station in London. Stores, an inn, and schools were all located adjacent to the station so that middle class commuters to London could benefit from their proximity to their daily route to work. Additionally, the original advertising for the development spoke of the last London neighborhood “where the nightingale and the skylark could still be heard.”<sup>23</sup> A close association with nature and the environment would be a key component of TOD as well.

Other examples of master-planned communities after Bedford Park, like William Owen and Alexander Harvey’s late 1880’s utopian designs for worker villages, also had location decisions influenced by transport infrastructure. However, the basis of the decision to locate near road and rail was primarily for the conduit of goods and not people.<sup>24</sup> When Lever contracted Owen and Cadbury contracted Harvey to

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<sup>20</sup> Creese, Walter; “The Search for Environment: The garden City Before and After”; Reprinted by Johns Hopkins University Press; Baltimore; 1992.

<sup>21</sup> Calthorpe, Peter; “The Next American metropolis: Ecology, community, and the American Dream”; Princeton Architectural Press; 1993.

<sup>22</sup> Lefaver, S. “Private Land with Public Partnerships for Transit Based Development”; The Mineta Transportation Institute; 1997.

<sup>23</sup> Creese, Walter; “The Search for Environment: The garden City Before and After”; Reprinted by Johns Hopkins University Press; Baltimore; 1992.

<sup>24</sup> Creese, Walter; “The Search for Environment: The garden City Before and After”; Reprinted by Johns Hopkins University Press; Baltimore; 1992.

construct Port Sunlight and Bourneville, respectively, they were economic and social responses to the industrial age and their own personal situations. However, design components of these villages form the basis of the garden city and modern TOD. For instance, Cadbury specified that one tenth of the land be dedicated to parks and recreation and that no more than one fifteenth of the estate could be occupied by factory buildings. Singular ownership and central control allowed for such stipulations and would become an integral part of the garden city plan. In place of ownership as means of control for such park space allocation, the modern definition of TOD produced by Calthorpe relies heavily on design guidelines that municipalities can incorporate into zoning codes.

These examples, as well as other influences like Edward Belamy's 1888 description of a utopian Boston, the social democrat and architect William Morris, or Olmstead and Vaux's 1869 Riverside community, contributed to Ebenezer Howard's development of the garden city. Howard himself attributes his work to several prior theories, particularly 1) proposals for an organized migratory movement of population by Edward Wakefield and Professor Alfred Marshal, 2) the land tenure system developed by Herbert Spencer, and 3) the model city by James Buckingham.<sup>25</sup> However, Howard differed from earlier reformers like Owen and Buckingham because he sought a solution for an open economy without self-sufficiency as a core criterion.<sup>26</sup>

The name of Howard's design rests on descriptions of Chicago as the "Garden City" based on the tree-filled, in-town suburbs that were present prior to the 1871 fire. Through the design of the garden city, Howard was focused on reducing the overcrowding experienced in industrialized cities, especially the British capital, London. Howard's garden city was circular in diagram and consisted of 32,000 inhabitants with dwelling density limits and proximity requirements to the central core. A combination of multiple garden cities separated by "country" and connected by inter-municipal railways formed a metropolis with a central district of 58,000 people. Because of its influence on subsequent neighborhood design, the garden city ideal may be the most influential precedent for the development of Calthorpe's TOD. Howard's popularity and the communities his ideas inspired set the intellectual stage for modern transit-oriented neighborhoods.

After Howard came the developers of garden cities, Raymond Unwin and his second cousin, Barry Parker. After assisting with the development of New Earswick in 1902, a profitable master-planned community with small lot frontages and numerous footpaths but without major rail access, Parker and Unwin won a design contest in 1903 to plan a model garden city with other garden city enthusiasts. Howard formed a joint stock company and a board was established, including utopian idealists like Cadbury, to develop Letchworth. Letchworth was located along a rail line north of London on approximately 16 square kilometers of land. Parker & Unwin's plan for Letchworth leveraged the utopian industrial town designs while adding to it the axial connections and views defined in Chicago's City Beautiful movement. It also conformed to the slopes of the site in the Romantic tradition of Olmstead's Riverside. It contained ample open space, tree lined streets, a main commercial corridor, and was surrounded by a minimal greenbelt of "country." Letchworth also employed social experiment components of Howard's plan with rules regarding integrating income groups, a limit on public

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<sup>25</sup> Howard, Ebenezer; "Garden Cities of Tomorrow"; London; 1902.

<sup>26</sup> Creese, Walter; "The Search for Environment: The garden City Before and After"; Reprinted by Johns Hopkins University Press; Baltimore; 1992.

consumption of alcohol, and maximum factory sizes. Interestingly, demand for rail service was not great enough until 1913 when the Letchworth rail station was opened. Today, more than 33,000 people reside in Letchworth. The similarities with today's TOD principles are stunning. Though there were certainly later influences, the majority of Calthorpe's philosophies are encapsulated in the development of Letchworth.

Critics like Lewis Mumford point to Hamstead Garden Suburb near London as a more mature and successful garden city development incorporating all the best planning concepts developed by Raymond Unwin.<sup>27</sup> The project was instigated by the impending arrival of the London Tube to the outlying district in the first decade of 1900 and the desire to leverage rising property values in a new development. A new public green was established at the station and the city's form developed around it. Particular to this development were a medieval style perimeter wall and the minimal provision of space for traffic. Unwin unapologetically explained his aversion to automotive traffic by saying, "Streets are not a virtue in themselves. In fact, the less area given over to streets, the more chance one has of planning a nice town. To be obsessed with the idea of planning for traffic is a mistake."<sup>28</sup> Unwin varied the widths and materials of the roads to indicate their proposed use as throughways, streets, lanes, ways, and paths. This pro-pedestrian, anti-auto philosophy is strongly shared by the TOD guidelines set forth later by Calthorpe.

Part of the garden city design was based on the "stroll through nature" concept entrenched in romanticism and the craftsman view of environment. In fact, Lynch uses Hamstead Garden Suburb as a primary example of early "organic" city form.<sup>29</sup> Unwin told the Chicago city club in 1911 that "We began to realize that city planning must be a combination of the art of man and beauty of nature. We, therefore, preserved the trees and the hedge rows, so that the sites should not look so bare." He also did so in Letchworth where he designed with "regard for natural features of the site—which is undulating and wooded."<sup>30</sup> A similar regard for nature, thought not natural romanticism, was a key driver of Calthorpe's work.

After going on to produce Welwyn, a second garden city model in the late 1920's, Barry Parker went on to design a true satellite garden city called Wythenshawe. Though developed slowly between two world wars and through the heart of the great depression, the new satellite city provided much needed housing for the growing metropolitan area of Manchester, England on cheap land southwest of the center. The major difference between prior models and Wythenshawe was the development of the "Princess Parkway" as a primary means of travel to Manchester. This shift in the garden city model to the prevailing transport mode of the 1940s was an indication of the future. Garden cities were advancing with the times and adapting to the automobile.

Soon afterwards in 1949, Vällingby was developed as a garden suburb along one of Stockholm's commuter rail lines. Tapiola Garden City outside Helsinki was again developed along rail in 1956. But the garden city concept was quickly adapted in auto-oriented countries and lost its roots as a rail-served

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<sup>27</sup> Mumford, Lewis; "The City in History"; Reprinted by Harcourt, Inc.; New York; 1989.

<sup>28</sup> Unwin, Raymond; "Columbia University Lectures" found in Creese, 1992.

<sup>29</sup> Lynch, Kevin; "Good City Form"; The MIT Press; 1984.

<sup>30</sup> Unwin, Raymond; found in Creese, 1992.

community. British New Towns of the post war years were auto-focused. Likewise, greenbelt cities and new suburbs in America were adapted to the automobile.

Incorporating ideas from Olmstead and Howard, Radburn, New Jersey was designed as “a Town for the Motor Age” by Clarence Stein and Henry Wright in 1929.<sup>31</sup> The design incorporated ideals of natural romanticism, which would be incorporated into many later developments. Elbert Peet’s design for Greendale, a 1938 pre-war greenbelt town outside Milwaukee, was based on the garden city and was designed for the automobile. His later design for Park Forest, a 1946 postwar new town south of Chicago, combined formal designs in a natural setting. Ironically, while fitting within the environmental conservation movement of the day, natural romanticism and the garden city concept incorporated the automobile that would later be blamed for irreparable environmental harm.

To further the irony, natural romanticism was translated into the extensive parkways of the northeastern U.S. There was no bigger enthusiast than Robert Moses in New York City and no bigger opponent than Jane Jacobs. Where Moses saw the automobile as an inevitable part of cities and a key element of progress, Jacobs thought the car should remain subservient to the pedestrian and the pedestrian-scaled community. She saw a strong relationship between the garden city movement, its newly adopted parkways, and the potential destruction of her beloved Greenwich Village. In her 1961 book “The Death and Life of Great American Cities” she argued that the shortcomings of modern planning were attributable to the enthusiasm for Ebenezer Howard’s “paternalistic, if not authoritarian” design program.<sup>32</sup>

In fact, planning had adapted to the automobile in the post war years and by the 1960’s, when she wrote, was fully endorsing auto-oriented cul-de-sac suburbs. In cities, planners and designers were fully entrenched in the modern style. Urban renewal was on the scale of Corbusier’s 1925 Plan Voisin proposal for Paris. Model cities of the day came in the form of individual buildings. The 1969 completion of the John Hancock Center in Chicago, the original “Garden City,” provided a vertical example of a city. With 700 residences, offices, restaurants, shops, public observation deck, and a post office all located in a single 100 story structure, the age of the classical city was thought to have ended.

Creese attributes a shift away from modernism to Robert Venturi’s 1966 book “Complexity and Contradiction in Architecture” which popularized new concepts including vernacular architecture.<sup>33</sup> His descriptions of eclectic designs and theme parks helped American designers admit that their search for Shangri La in the main street of Disney Land was a desire for some part of the past. He opened the door for irreverence for the modern high-rise city and car-oriented suburbs.

Between 1976 and 1980, Robert Stern focused his attention on “Subway Suburbs” that were tree-lined, low-rise developments located near the heart of the city. His proposals for New York City sought to bring green space back into abandoned central city industrial land along subway lines. The concept built on ideas developed by Harvey S. Perloff, who proposed “New towns Intown” in 1966, and Gideon Golany’s 1974 proposal for the “New Town In-city.” But Stern’s “Subway Suburbs” had been more

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<sup>31</sup> “Radburn”; <http://www.radburn.org/>

<sup>32</sup> Jacobs, Jane; “The Death and Life of Great American Cities”; New York; Vintage Books; 1992; Originally 1961.

<sup>33</sup> Creese, Walter; “The Search for Environment: The garden City Before and After”; Reprinted by Johns Hopkins University Press; Baltimore; 1992.

strongly influenced by the garden city ideal. Rather than continuing to develop modern skyscrapers or ad-hoc auto-oriented suburbs on the fringes, he hoped to redevelop underutilized tracts into master planned suburban scale, transit-served, green-space-focused housing enclaves. Stern's proposals revived many of the same moral and physical advantages that Ebenezer Howard had elucidated 80 years earlier while fitting into the "Auto-Oriented Transit" paradigm of his day.

Simultaneously, Leon Krier, a German-educated and England-based urban theorist, focused on reverting to tried-and-true classical philosophies as a response to modernism.<sup>34</sup> His late 1970's and 1980's texts focused on neo-traditional urban design and its potential to redefine community and urban life. His ideas responded to the growing scale of urban blocks in European cities by focusing on human scale districts. He looked particularly to neighborhood quarters in European cities that had been defined by artisan industries and pedestrian-oriented transport infrastructure. A Krier definition that would later appear in Calthorpe's TOD work was the neighborhood defined by the 10-minute or quarter-mile walk.

Krier's neighborhood scale philosophy was first put in place in the 1980's resort town of Seaside, Florida.<sup>35</sup> In the 1970s, neighborhood developments like California's West Lake Village or Foster City emulated resorts, offering water features, bike paths, and shops. Planned Unit Developments (PUDs) like Columbia, Maryland offered all-in-one suburban solutions. As a response to what people desired in these suburban neighborhoods and as a critique of high-rise modernism, Andres Duany and Elizabeth Plater-Zyberk designed Seaside as a post-modernist traditional community. The Seaside resort design took what modernists would have proudly produced in one enormous multi-use, escalator-filled tower into an unapologetic "Disneyesque" town for wealthy vacationers. Unlike PUD examples, the town was reduced to Krier's human scale neighborhood diameter with small lots, low building heights, and pedestrian paths. As opposed to command and control modernism, they invited multiple architects to produce diverse housing designs for the low-density project. The project was heavily steeped in the garden city concept. In a direct tie to older precedents, Duany derived the development management of Seaside from Unwin's Hamstead Garden Suburb Trust. Roads radiated from a central square with public facilities similar to Letchworth. Lot sizes were small but allowed for private gardens. Road infrastructure was limited and supplemented by walking and cycling paths.

Another benefit of Seaside's design was to increase densities and preserve open space and coastal areas. While most suburban-style developments of the 1980's would have sprawled tremendously and relied heavily on the automobile, Seaside presented an environmentally friendly alternative. Early environmentalism focused on the preservation of resources, including the conservation of natural places. This view distinctly separated the built environment from the natural environment and, for the most part, allowed for "business as usual" in the urban design and real estate development sectors. Seaside did not adhere to this philosophy but fit a subsequent view that treated the world as an ecological system. Environmentalists focused on regaining equilibrium and minimizing the human footprint. At this point, designers had started to focus heavily on the natural component of their designs and reducing their overall impact on the environment.

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<sup>34</sup> Audirac, Ivonne; "An Evaluation of Neo-traditional Design's Social Prescription: Postmodern Placebo or Remedy for Suburban Malaise?"; *Journal of Planning Education and Research*; Vol 13; No 3; 1994.

<sup>35</sup> Creese, Walter; "The Search for Environment: The garden City Before and After"; Reprinted by Johns Hopkins University Press; Baltimore; 1992.

The rise of the U.S. environmental movement in the late 1950's and 1960s was capped by the establishment of the Environmental Protection Agency in 1971. Components of the Clean Air and Clean Water Acts mandated that designers and developers focus on aspects of the built environment that had been taken for granted. Federally funded transit projects had to pass through National Environmental Policy Act review and all projects in California, public and private, had to pass through California Environmental Quality Act review after a 1972 case law set a precedent in the development of Mammoth Lakes, California.<sup>36</sup> California had become a major player in the environmental movement, especially with degrading air quality in the Los Angeles basin. Compounded by both postwar industrial growth and highway construction, motor vehicle emissions had made the air in the Los Angeles area nearly unbreathable in the 1960's. Combined with the OPEC oil embargo of 1973, American's overreliance on the automobile became readily apparent. Anti-car sentiment began to emerge and led to an anti auto-suburb sentiment as well.

The academic community led the fight against low-density, auto-oriented "sprawl."<sup>37</sup> Historical analysis of suburbs, such as 1985's "Crabgrass Frontier," illuminated both the positive and negative attributes of suburban form and the style of community it engendered.<sup>38</sup> Neo-traditional urban designers capitalized on and participated in this movement. The National Association of Homebuilders directly attributed the development of Seaside and subsequent neo-traditional suburb designs to "a dissatisfaction of some people with some of the by-products of several decades of suburban development patterns."<sup>39</sup> It became vogue to not only critically evaluate suburbs as Mumford had, but also to propose drastic alternatives.<sup>40</sup> Doug Kelbaugh stated, "The search is for nothing less than a new American dream."<sup>41</sup>

In the 1980's, Traditional Neighborhood Design (TND) became the buzz word amongst designers and homebuilders. Post-modernists had found their own design vocabulary in neo-classical and turn-of-the-century design concepts like garden cities. Noted leaders of the group were the vocal couple from the Miami area, Andres Duany and Elizabeth Plater-Zyberk, that had produced the design for Seaside.<sup>42</sup> Their work at the University of Miami School of Architecture and in their private practice, Duany Plater-Zyberk & Company (DPZ), focused on reinventing the suburb. In their words, their designs were based on the "universal and time-tested principles of traditional planning and design that created the best-loved and most-enduring places throughout the world."<sup>43</sup>

DPZ were the biggest name in neo-traditional neighborhood design but were not the only design practitioners interested in new high-density communities. At the same point in the late 70's and early

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<sup>36</sup> "Friends of Mammoth versus Board of Supervisors of Mono County: Sac. No. 7924, Supreme Court of California"; [http://ceres.ca.gov/ceqa/cases/1972/f\\_o\\_mammoth\\_092172.html](http://ceres.ca.gov/ceqa/cases/1972/f_o_mammoth_092172.html)

<sup>37</sup> Hawkins, Brett; "The Politics of Academic Suburb-Bashing"; Research and Opinion, v. 6, No. 1; Urban Research Center; Milwaukee, WI; 1989.

<sup>38</sup> Jackson, Kenneth. 1985. Crabgrass Frontier: The Suburbanization of the United States. New York: Oxford University Press.

<sup>39</sup> "Traditional Neighborhood Development." National Association of Homebuilders. <http://www.nahb.org/generic.aspx?genericContentID=17372>

<sup>40</sup> Kunstler, James Howard "Geography Of Nowhere: The Rise And Decline of America's Man-Made Landscape." New York: Simon & Schuster. 1994.

<sup>41</sup> Kelbaugh, Doug; "The Pedestrian Pocket Book: A New Suburban Design Strategy." Princeton Architectural Press, New York, NY; 1989.

<sup>42</sup> Duany, Andres; Plater-Zyberk, Elizabeth; "Towns and town-making principles" Rizzoli; New York, NY. 1991.

<sup>43</sup> <http://www.dpz.com/company.aspx>

80's, other designers developed concepts such as Urban Villages. The Village concept was based on high-density self-sufficient neighborhoods.<sup>44</sup> Focused on pedestrians and auto-independence, Urban Villages were criticized for not taking into account the economic need for intra-regional travel and the realities of the current car-dependent landscape. Developers mostly dismissed the idea. While some proponents believed in car-free cities<sup>45</sup>, the utopian concept of Urban Villages matured over time into Transit Villages. The Transit Village concept maintained auto-independence while providing transportation options. The Transit Village looked similar to TOD but had arrived at the transit solution from a very different perspective, one focused on independence from the car.

Reduced auto-dependence was a theme coming from both the design profession as well as from environmentalists. The environmental sector had been promoting a "Compact Community" concept that promoted local gardens, addressed water runoff with minimized streets, and reduced energy usage with compact living quarters. However, research focused on neo-traditionalism led many to promote the compact, walkable neighborhoods envisioned by designers like DPZ and Dan Solomon.<sup>46</sup> Environmentalists, anti-sprawl advocates, and neo-traditional designers listened closely to early 1990's studies indicating that traditional neighborhoods generated fewer daily trips than predicted by the suburban-oriented ITE Trip Generation Manual.<sup>47</sup> A study of shopping trips in the San Francisco Bay Area found that residents from two areas with traditional forms made two-to-four more walking and bicycle trips per week to retail stores than did those living in nearby areas that were served mainly by automobile-oriented, strip retail establishments.<sup>48</sup> Investigators like Holtz-claw were proving that as residential densities double, vehicle miles traveled per household declined by 16 percent.<sup>49</sup> Based on the validation of sustainability arguments by neo-traditionalists, environmentalists forged a synergistic relationship with designers.

These environmentally-backed solutions were being developed on the building and neighborhood scale but were launched by environmentally-focused entities to the metropolitan scale. In the late 1980's, metropolitan transit agencies were beginning to develop design guidelines for their station areas that held tenets similar to the neo-traditional environmental designers.<sup>50</sup> Also in the late 1980's, Federal Air and Water Quality Districts, which had become the standard bearers of environmental regulation, were leveraging regional transportation organizations in an attempt to influence metropolitan land-use policies.

As early as 1959, California had enacted legislation requiring the state Department of Public Health to establish air quality standards and necessary controls for motor vehicle emissions but such statewide policy, technological advances, nor subsequent national regulation were able to overcome the U.S.'s increase in motor vehicle use spurred by urban-sprawl. Regional transportation studies like Portland,

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<sup>44</sup> "Urban Villages." [www.urbanvillages.com](http://www.urbanvillages.com)

<sup>45</sup> Crawford, J.H. "Carfree Cities." International Books. Utrecht, Netherlands. 2000.

<sup>46</sup> Solomon, Daniel. "ReBuilding." Princeton: Princeton Architectural Press. 1992.

<sup>47</sup> White Mountain Survey Company. 1991. City of Portsmouth Traffic/Trip Generation Study. Ossipee, New Hampshire: White Mountain Survey Company.

<sup>48</sup> Handy, Susan. 1992. Regional Versus Local Accessibility: Neotraditional Development and its Implications for Non-work Travel. *Built Environment* 18,4: 253-67.

<sup>49</sup> Holtzclaw, John. 1994. Using Residential Patterns and Transit to Decrease Auto Dependence and Costs. San Francisco: National Resources Defense Council, unpublished paper.

<sup>50</sup> Beimborn, Edward, Harvey Rabinowitz, Peter Gugliotta, Charles Mrotek, and Shuming Yan. "Guidelines for Transit Sensitive Land Use Design." Washington, DC: Urban Mass Transportation Administration. 1991.



Oregon's 1988 "Making the Land Use, Transportation, Air Quality Connection" study were some of the first attempts to regionally address the transportation and land-use connection.<sup>51</sup> The push for regional transportation coordination with regional was put into national practice in the 1991 passage of the Intermodal Surface Transportation Efficiency Act. The act was developed, in part, to "help State and local governments address environmental issues."<sup>52</sup> In doing so, it funneled federal transportation dollars through Metropolitan Planning Organizations that were established to coordinate regional land-use and transportation regulation. Regional planning organizations throughout the country gained new legitimacy and were provided with substantial funding for the creation of planning models. These models incorporated the high-density neo-traditional designs and thus neo-traditional neighborhood planning was cemented as a regional solution.

Transit agencies had determined that high-density development near their stations encouraged transit usage. Environmental and transportation groups coalesced to fight sprawl and reduce auto dependence. Neo-traditional designers were promoting high-density, pedestrian-friendly neighborhood design. Events were coalescing for a particular protagonist to bridge the gap between all of these concerns.

### **TOD's Protagonist**

The key individual in the definition, branding, and initial implementation of TOD was Peter Calthorpe. Calthorpe was born in London but grew up from the age of 5 in Palo Alto, California. He studied at Antioch College and then Yale's Graduate School of Architecture.<sup>53</sup> After dropping out of the Yale program, he moved back to the Bay Area to become the Director of Design at The Farallones Institute, a rural research organization that focused in the areas of sustainable gardening, water conservation, and green building. Based on this experience he started his own sustainably-oriented design firm and went on to be a founding member of the Congress of New Urbanism. Ultimately, his sustainability-focused urban design philosophies evolved into TOD and were published in his 1993 book "The Next American Metropolis."

Calthorpe's early professional practice was shaped by the emerging environmental design movement. The Farallones Institute's founder, Sim Van der Ryn, was a practicing architect, a professor at UC Berkeley, and a visionary in the sustainable development movement.<sup>54</sup> Van der Ryn was appointed the state architect of California under Governor Jerry Brown and instituted an energy efficient building statute for state structures. During his 30 year tenure as an architecture professor at UC Berkeley he was a major contributor to UC Berkeley's reputation as a socially and environmentally-focused design school. Though his connection to Van der Ryn, Calthorpe participated in UC Berkeley design studios where his design ideas were tested and furthered.

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<sup>51</sup> LUTRAQ. 1992. *The LUTRAQ Alternative/Analysis of Alternatives*. Portland, OR: LUTRAQ, with Cambridge Systematics, Inc., Calthorpe Associates, and Parsons Brinckerhoff Quade and Douglas, Inc.

<sup>52</sup> Transportation Secretary Skinner; "ISTEA - Summary"; Federal Bureau of Transportation Statistics; National Transportation Library; 1991; <http://ntl.bts.gov/DOCS/ste.html>

<sup>53</sup> Rebchook, John; "New Urbanism founder guiding Stapleton redevelopment"; Rocky Mountain News; March, 2000.

<sup>54</sup> "Sim Van der Ryn Bio"; <http://www.vanderryn.com>

In 1978, Calthorpe also joined Van der Ryn in private practice at their newly formed architecture firm, Van der Ryn, Calthorpe and Partners. Their work included commercial complexes, public buildings, and community plans incorporating early environmentally-sustainable features at the forefront of the industry and the emerging green building movement. Though his work, research, and publishing focused on his expertise in passive solar design, his interest veered towards urban planning issues. As Calthorpe once described his focus, “Starting in the mid-70s and right through the '80s, I was looking more and more at the environmental impact of growth.”<sup>55</sup>

In 1983 he formed his own firm, Calthorpe Associates, and began to focus more of his time on urban, new town, and suburban settings.<sup>56</sup> In 1986 he coauthored “Sustainable Communities: A new Design Synthesis for Cities, Suburbs, and Towns” with Van der Ryn. Calthorpe contributed to sections entitled “The Urban Context,” “The New Suburban Fabric,” and “A Short History of Twentieth Century New Towns.”<sup>57</sup> In promoting older cities as a model for sustainable development in “Sustainable Communities”, he said, “the framework and traditions for compact and efficient communities are already in place.” He focused on compact, pedestrian-friendly urbanism built around architecture focused on environmental sustainability.

However, his theories did not yet focus on transport as a key component. In fact, within a case study of his Sunnyvale, California project within “Sustainable Communities” he notes that “we did not assume a drastic change in travel patterns over the next twenty years.” They approached transport in an automobile centric manner and sought only to 1) shorten trips, 2) reduce through traffic, 3) and strengthen the hierarchy of streets. The introduction of transit was not at all considered.

The book becomes even more distanced from TOD in the content of another “Sustainable Communities” chapter by Fred Reid that focused on transportation myths, including “The Mass Transit Society Myth.” Reid’s suggestions for expanding transportation sustainability related to transit are limited to “refining the effectiveness of transit, parking, and traffic policies in dense commercial areas.” This is far from the TOD concept that Calthorpe would eventually propose which promoted the creation of new, dense, mixed-use nodes around transit to increase transit’s effectiveness.

But Calthorpe’s history section of “Sustainable Communities” does show indications of TOD’s early roots. He concentrates heavily on Ebenezer Howard’s Garden City Movement and points to the Stockholm satellite New Town of Vallingby as a modern success story based on Howard. Calthorpe compares Vallingby to the comparably populated Levittown that utilized nearly three times the land area. Beyond land-use and design, he also discussed Vallingby’s heavy reliance on commuter rail transport as a key sustainability feature. Though transit is not spelled out as a key design criterion, his selection of Vallingby is indicative of his theoretical progression towards TOD.

Calthorpe’s concepts continued to mature after publishing “Sustainable Communities.” In professional practice he began to work on compact, traditionally informed designs he and other neo-traditionalist

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<sup>55</sup> Rebchook, John; “New Urbanism founder guiding Stapleton redevelopment”; Rocky Mountain News; March, 2000.

<sup>56</sup> “Peter Calthorpe Bio”; <http://www.calthorpe.com/bios/pcbio.htm>

<sup>57</sup> Calthorpe, Peter, Van der Ryn, Sim; “Sustainable Communities: A new Design Synthesis for Cities, Suburbs, and Towns”; Sierra Club Books, San Francisco; 1986.

designers called Urban Villages. Informed and supported by the neo-traditionalist theories, Calthorpe's work began to focus on expanding the "environmental and technical basis of sustainable communities...to incorporate the 'urbanism' which makes communities socially vibrant and alive."<sup>58</sup> His projects began to include varied scale, affordable housing, and mixed uses that were tied together in a walkable environment.

Post "Sustainable Communities", Calthorpe felt that his work was especially advanced through his academic work at UC Berkeley and University of Washington (UW).<sup>59</sup> He attempted to shore up the shortfall of "Sustainable Communities", which he felt "failed to articulate the form of such an urbanism," and applied for a National Endowment of the Arts grant to investigate the theory of urbanism and environmentalism. His primary research partner on the project was one of Van der Ryn's colleagues at UC Berkeley, Mark Mack. Together, they began to develop a California centric neo-traditional new-town concept they called the Pedestrian Pocket. Other UC professors—Lars Lerup, Sim Van der Ryn, and Dan Solomon—hosted design studios in the architecture school with that focus.

The concept evolved further through design charettes Calthorpe conducted in Seattle with Doug Kelbaugh, chairman of the Architecture Department at UW. An undeveloped site along a proposed light rail line outside of Seattle had provoked Kelbaugh to contact Calthorpe. The problem statement mirrored the Pedestrian Pocket work he understood Calthorpe was conducting at UC Berkeley. The UW charettes were a joint effort between faculty members from UW, UC Berkeley, and other universities. One outside faculty contributor, Harrison Fraker, would later become the Dean of the College of Environmental Design at UC Berkeley. Dan Solomon, another key contributor to the charettes, went on, along with Calthorpe, to become a founding member of the Congress of New Urbanism. In 1989, the thoughts of the faculty and the design results of the student charettes were published in a booklet titled "The Pedestrian Pocket Book".<sup>60</sup>

The book described the Pedestrian Pocket as "a simple cluster of housing, retail space and offices within a quarter-mile walking radius of a transit system." The quarter mile concept borrowed from his colleagues Duany and Plater-Zyberk who had adapted the original philosophy of Leon Krier. Though he focused on the pedestrian, Calthorpe was explicit that the Pedestrian Pocket be a market-oriented solution and not a utopian car-free environment. "The Pedestrian pocket accommodates the car as well as transit and walking. Parking is provided for all housing and commercial space." He also dispels any thoughts that the Pedestrian Pocket might act as a panacea for the anti-sprawl advocates. "The Pedestrian Pocket is a concept for some new growth...and it will certainly not totally eclipse suburban sprawl."

With regard to providing for the automobile while designing for the pedestrian, Calthorpe states that "The goal is to create an environment that offers choices." With regard to the uses found within the Pedestrian Pocket he says, "It will...extend the range of choices available to the family buying a home, the business seeking relocation, the environmentalist hoping to preserve open space, and the existing community

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<sup>58</sup> Calthorpe, Peter; "The Next American metropolis: Ecology, community, and the American Dream"; Princeton Architectural Press; 1993. Acknowledgements

<sup>59</sup> Calthorpe, Peter; "The Next American metropolis: Ecology, community, and the American Dream"; Princeton Architectural Press; 1993. Acknowledgements

<sup>60</sup> Kelbaugh, Doug; "The Pedestrian Pocket Book: A New Suburban Design Strategy." Princeton Architectural Press, New York, NY; 1989.

attempting to balance the benefits and liabilities of growth.” And then making a land-use and transportation connection, “This mix of uses supports a variety of transportation means: walking, bus, light rail, car pool, and standard automobile.”

But the Pedestrian Pocket was not yet the full TOD concept. As he envisioned it, “The pedestrian pocket is located on a dedicated right-of-way which evolves with the development. Rather than bearing the large cost of a complete rail system as an initial expense, this right of way facilitates mass transit by providing exclusively for car pools, vanpools, bikes, and buses.” Interestingly, based on the pursuit of light rail by multiple west coast cities, he assumes that the ultimate transit solution for the Pedestrian Pocket would be light rail and not another transit mode. In the case of the UW studios, light rail was the predetermined solution for the site in suburban Seattle, and a key reason for the site’s selection. But in the prototypical Pedestrian Pocket, he believed that “as the cluster matures, transit investments are made for light rail in the developed right of way. But the growth of this land use pattern is not dependent on this investment; the system is designed to support many modes of traffic and to phase light rail into place when the population is great enough to support it.”

Though reminiscent of New Towns on the peripheries of British cities, Calthorpe sets Pedestrian Pockets apart from New Towns based on their small relative size. “In contrast [to New Towns] the Pedestrian Pocket grows at an incremental typical of current market-place activities; one hundred-acre projects are common for sub-divisions, office parks and shopping centers.” But historical precedents, including New Towns, are readily apparent in the design. In a literal throwback to Fredrick Law Olmstead or Radburn, “Walking paths connect the entire site without requiring the pedestrian to cross any streets.”

Like the New Town and utopian city planners that came before, Calthorpe assumes a level of social engineering bordering on physical determinism.<sup>61</sup> “The goal of this tight mix of housing and open space is not jut to provide more appropriate homes for the different users or to offer the convenience of walking but hopefully to reintegrate the currently separated age and social groups of our diverse culture. The shared common spaces and local stores may crate a rebirth of our lost sense of community and place.” Like the garden city ideal, urban form and architectural design were thought to relieve an ailing society. But Calthorpe defends himself from social engineering critics by arguing that “In one way, Pedestrian Pockets are utopian—they involve the directed choice of an ideal rather than of laissez-faire planning, and they make certain assumptions about social wellbeing. But by not assuming a transformation of our society or its people, they avoid the full label, and its subsequent pitfalls, of most utopian schemes.”

While he differentiates Pedestrian Pockets from a utopian concept, Calthrope is perhaps overly idealistic about the impact that transit provision might provide the community. Without any background or foundation, he states that if Pedestrian Pockets can be “configured to allow the pedestrian comfortable and safe access, up to fifty percent of a household’s typical automobile trips can be replaced by walking, car pool and light rail journeys.” This sort of unsubstantiated prediction is a precursor to the profession’s eventual disappointment in the performance of TODs.

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<sup>61</sup> Audirac, Ivonne; “An Evaluation of Neo-traditional Design's Social Prescription: Postmodern Placebo or Remedy for Suburban Malaise?”; *Journal of Planning Education and Research*; Vol 13; No 3; 1994.

Likewise, today we know that few, if any, TODs have been developed without public subsidies. But, just as he does later with TODs, Calthorpe wrongly depicts the market demand for Pedestrian Pockets and states that “the public sector’s role is merely to organize the transit system and set new zoning guidelines, leaving development to the private sector.”

Calthorpe was extremely optimistic about the influence the Pedestrian Pocket concept might have and he was a convincing promoter. His design skills helped to convincingly depict what could be. His salesmanship as an architect and extensive experience defining the benefits of sustainable architecture served him well in describing and disseminating the benefits of Pedestrian Pockets. While already quite well known as an environmentalist architect, Calthorpe began to gain national recognition as an urban theorist. In a serendipitous turn of events, the rise in popularity of Calthorpe’s concepts paralleled a project in nearby Oregon.

In 1988, just as Calthorpe was working on Pedestrian Pocket design studios, a new land-use and transportation research program was taking shape in metropolitan Portland, Oregon. Original opposition to the proposed Western Bypass suburban freeway evolved into a project to redefine Portland’s metropolitan land-use plan. A land-use focused public interest group called 1000 Friends of Oregon, gathered funding from the Federal Highway Administration, the Environmental Protection Agency, The Energy Foundation, and others to hire outside consultants for the project they called “Making the Land Use, Transportation, Air Quality Connection” or the shortened name, LUTRAQ.<sup>62</sup> Elizabeth Deakin, a UC Berkeley professor and transportation engineering consultant, was one of the major contributors to the project and grew concerned about the lack of urban design capabilities present within the consulting team they had assembled.<sup>63</sup> Through professional engagements with her colleague Dan Solomon on urban design projects like the redevelopment plan for Downtown Hayward or the neighborhood plan for Communications Hill, she was introduced to the Pedestrian Pocket work of Peter Calthorpe. She says, “I suggested Peter because he was experienced and had been doing these high-density project proposals that worked well with transit.” Calthorpe was brought onto the LUTRAQ project as the primary urban design consultant.

The LUTRAQ study evaluated side-by-side options for either interstate or rail focused corridor development. Calthorpe proposed neo-traditional Pedestrian Pockets be implemented along rail corridors. The transportation model that the team developed projected forward to 2010 and the light rail transit proposal coupled with neo-traditional development showed a vehicle-miles-traveled rate that was 35 percent below that of the freeway alternative. Through this research, the LUTRAQ study achieved its first objective: to influence policymakers to replace the proposed Western Bypass with an alternative that emphasized transit improvements and complementary changes in land-use policy.

But it was the project’s secondary objective, as dictated by the nationally focused LUTRAQ financiers, that propelled Calthorpe’s proposal to the next level. They stipulated that LUTRAQ was meant “to promote development patterns that reduce land consumption, vehicle trips, and air pollution nationwide.” Their desire for national application was explicit. “The lessons of the LUTRAQ project, gleaned from

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<sup>62</sup> LUTRAQ. 1992. *The LUTRAQ Alternative/Analysis of Alternatives*. Portland, OR: LUTRAQ, with Cambridge Systematics, Inc., Calthorpe Associates, and Parsons Brinckerhoff Quade and Douglas, Inc.

<sup>63</sup> Deakin, Elizabeth; Personal interview, November, 2007.

years of research, analysis, and grassroots involvement, are as relevant in Portland, Maine, as they are in Portland, Oregon.”<sup>64</sup>

Calthorpe not only received encouragement to disseminate his Pedestrian Pocket concept but also received financial backing to do so. He worked with Washington County officials (the LUTRAQ project’s study area) to conduct research on the potential impacts of pedestrian-friendly design. As they moved towards implementing the plan they also needed to develop local design and zoning guidelines for these transit nodes. Calthorpe and his firm assisted the city as they set out to create new zoning codes based on Pedestrian Pocket principles.

At the same time as the LUTRAQ project, Sacramento, California was also evaluating their long-range transportation plan and was strongly influenced by the work going on in Portland. Sacramento had opened their first light rail line in 1987 and, just as 1000 Friends of Oregon had sponsored the Portland study, a local Sacramento nonprofit, Local Government Commission (LGC), pressed for an evaluation of a transit-focused land-use scenario similar to the LUTRAQ proposal. Sacramento County hired Calthorpe in 1989 to propose “Pedestrian/Transit Oriented Development” along the County rail stations. This was the first official use of the TOD term but Calthorpe continued to brand his proposals as “Pedestrian Pockets.”

Calthorpe was not the only practitioner pushing the TOD agenda in those earliest days. Also in 1989, the Board of Directors of the Bay Area Rapid Transit District (BART) undertook a study of possible high-rise housing near BART stations.<sup>65</sup> A “Transit-Based Housing” Committee of land-use attorneys, real estate economists, architects, planners and others was formed to determine if a market demand existed for high-rise development near BART and whether it was consistent with surrounding uses. The debate centered heavily on housing near BART since it had successfully connected employment centers but not living quarters, today defined as “jobs-housing balance.” Sedway & Associates, a real estate analytics firm, and ROMA, a design group, were chosen to evaluate the potential. Coming from a market and acceptability standpoint, the group proposed surrounding BART stations with three to four story apartments at densities of 70-90 units per acre. Additionally, to promote the local tax base and provide amenities for renters, they promoted the inclusion of ground floor retail throughout the development.

The “Sedway/ROMA” concept, developed at the request of a transit agency, focused on housing development to promote the balance of land uses along transit corridors in the Bay Area. Based on prior research, it was understood that a large proportion of residents proximate to BART stations used BART for their daily commute.<sup>66</sup> The transit agency believed that building the housing near the station would encourage would-be drivers or bus passengers to utilize the transit system.

In contrast, Calthorpe’s Pedestrian Pocket work in Sacramento was promoted as part of a scenario analysis for a particular vision of Sacramento’s potential urban growth and concerned itself little with

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<sup>64</sup> “Making the Connections: A Summary of the LUTRAQ Project”;

[http://www.onethousandfriendsoforegon.org/resources/lut\\_vol7.html](http://www.onethousandfriendsoforegon.org/resources/lut_vol7.html); 1000 Friends of Oregon; 1997.

<sup>65</sup> Bernick, Michael; “The Promise of California’s Rail Transit Lines in the Siting of New Housing”; Senate Transportation Committee & Senate housing and Urban Affairs Committee; Oakland CA, 1990.

<sup>66</sup> Bernick, Michael; “The Promise of California’s Rail Transit Lines in the Siting of New Housing”; Senate Transportation Committee & Senate housing and Urban Affairs Committee; Oakland CA, 1990.

promoting transit usage. In a report to California's Senate, Michael Bernick, a member of BART's "Transit-Based Housing" Committee explained the difference between the two concepts.

"'Pedestrian Pockets' enlarge a number of time the Sedway/ROMA concept of high density residential around transit stations. 'Pedestrian Pockets' in fact constitute mini-cities. They are approximately one-half mile wide islands of 5,000 or so residents, ringed by open lands. The Pocket mixes four story commercial buildings, two story townhouses, condominiums, and single family homes."

As Bernick saw it, Pedestrian Pockets were idealistic self-contained communities. He noted, "The Pocket seeks to create a setting of homes, schools, work, and shops all within easy walking distance. The hoped-for result: reduced auto dependency." Subsequently, he stated that the Pedestrian Pockets would be connected to the region by transit. Thus, it was the internal design of the area that would most influence behavior and not the presence of transit, a contrast to the Sedway/ROMA concept.

The Sedway/ROMA concept may, in fact, be more aligned with later understanding of the TOD concept. However, it did not benefit from the same branding and outreach that Calthorpe's concepts enjoyed. While the Sedway/ROMA report provided information to the BART Board of Directors, Calthorpe's Pedestrian Pocket work in Sacramento brought his work national attention.

While the Sedway/ROMA project remained a regional study, the LGC in Sacramento sought to make their project a model. Just as he had in Oregon, in 1989 Calthorpe was asked to consult on the zoning guidelines for Sacramento's TODs. However, this time the LGC also brought together and a broader set of nationally recognized designers to confer on the development of transit station area design guidelines.

To develop the guidelines, The LGC leveraged the design contacts of their San Francisco-based strategic consultant, Peter Katz. LGC and Katz invited architects Michael Corbett, Andres Duany, Elizabeth Plater-Zyberk, Elizabeth Moule, Stefanos Polyzoides, and Dan Solomon, in addition to Calthorpe, to confer on the design principles.<sup>67</sup> Miami-based Duany and Plater-Zyberk were internationally recognized neo-traditional designers while Moule and Polyzoides had a well regarded southern California-based urban design practice. Michael Corbett was a Sacramento area architect and Dan Solomon had been an integral part of developing the Pedestrian Pocket concept and was an early advocate against urban sprawl. The commission of designers presented the principles to over one hundred government officials in the fall of 1991. The guidelines were named the Ahwahnee Principles after Yosemite National Park's Ahwahnee Hotel where the ideas were introduced to the public.

Sacramento's evaluation of neo-traditional development predicted substantial benefits just as Portland had found and the County planning staff was anxious to apply the concept. River West Development secured permits for 3,600 home and development as an extension of their commercially successful Laguna Creek development of wide streets and winding cul-de-sacs. Planners and Calthorpe met with River West and convinced them to redesign their development, an 800 acre site of former rice paddies owned by developer Phil Angelides (later a California State Treasurer) that were located along right-of-way anticipated to become part of Sacramento's Blue Line light rail service. Angelides agreed to scrap his

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<sup>67</sup> The Local Government Commission; <http://www.lgc.org/>

original plans for a standard suburban development and transform the project into a neo-traditional neighborhood with narrow tree-lined streets and a town center.

The resulting development, Laguna West, was considered to be the first built example of Calthorpe's Pedestrian Pocket. The design included a mixed-use town center, pedestrian paths, and riparian zones. The proposed housing consisted of homes pushed to the street frontage with short driveways or vehicular access by rear alleyways. The narrow streets were designed to encourage slow driving. A description of the project in the *New York Times* was also one of the first times that the term TOD was put into print in a widely circulated publication.<sup>68</sup> The article described TOD as the “next evolutionary stage of the American suburb.”<sup>69</sup>

The use of “Transit-Oriented Development” rather than “Pedestrian Pocket” had been calculated. While working on the Sacramento and Portland guidelines, Calthorpe consulted with UC Berkeley professor Robert Cervero, a well-regarded expert in the field of land-use and transportation coordination.<sup>70</sup> In early studies of transit Joint Development, Cervero had found a correlation between urban densities and transit ridership on the Bay Area's BART rail system. Calthorpe sought information on land-use densities that he could stipulate in the Portland and Sacramento zoning guidelines to promote light rail ridership. It was at this time that Cervero suggested Calthorpe change the name of the Pedestrian Pocket to reflect his new focus on the transit component of the Sacramento and Portland codes. Cervero suggested “Transit-Supportive Development” but Calthorpe felt that the term he had discussed with Sacramento planners, “Transit-Oriented Development,” had a preferable acronym that would “help build a better brand.” He used the acronym TOD in the *New York Times* article and it was firmly set in the design lexicon.

While the name had taken hold, the concepts were becoming more concrete, especially as TOD was vetted during Calthorpe's participation in the Congress for New Urbanism. In 1992, Calthorpe and the other members of the committee that had developed the Ahwahnee principles, excluding Corbett, reconvened at the behest of Peter Katz to discuss their mutually held design principles and to plan for future meetings he called congresses. Upon reconvening in 1993, Katz summarized the principles in their Charter of the New Urbanism: “We advocate the restructuring of public policy and development practices to support the following principles: neighborhoods should be diverse in use and population; communities should be designed for the pedestrian and transit as well as the car; cities and towns should be shaped by physically defined and universally accessible public spaces and community institutions; urban places should be framed by architecture and landscape design that celebrate local history, climate, ecology, and building practice.” The founding group was called the board of the Congress of New Urbanism and Calthorpe was elected to be its first board president.

In a later interview, Calthorpe described New Urbanism as an evolutionary step from several growing trends. “Environmental groups have developed to defend the ecosystems and farmlands threatened by sprawl. Inner-city activists have mobilized to revitalize urban neighborhoods. Historic preservation

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<sup>68</sup> Newman, Morris; “Focus: Sacramento, Calif.; A Transit-Oriented Approach to Suburbia” *The New York Times*; November 10, 1991.

<sup>69</sup> Note: Interestingly, in the same article Calthorpe is quoted continuing to call the concept a Pedestrian Pocket even though the term TOD had been adopted in the Sacramento planning lexicon at this point.

<sup>70</sup> Interview with Robert Cervero; November, 2007.



groups have expanded their agenda from individual buildings to whole districts and urban economies. New Urbanism builds on all of these movements and attempts to bond them together with a common set of principles."<sup>71</sup>

Calthorpe was considered the regionalist amongst the members. His participation in the Portland and Sacramento studies gave him substantial credibility at the regional scale whereas the work of others had mostly focused on neighborhood and campus projects. Calthorpe contended, "The task of the New Urbanism is to learn from [prior urban design] failures, avoiding their sterile and suburban character while defining a form of growth which can help mend the metropolis."<sup>72</sup>

This definition of form is a recurring theme of New Urbanism. Whether at the scale of the home or the region, the pragmatic founders realized through their experience that replicable guidelines and zoning criteria were key for their strategies to be widely adopted. In fact, many of the distinguishing characteristics of the neo-traditional design that they promoted—narrow streets, on-street parking, shops near residences—were forbidden by codes written with automobile transport in mind. Andres Duany perhaps summarized it best in an interview with a Florida paper: "Planning codes and zoning ordinances are the genetic codes that determine what communities will look like in the future. It's unrealistic to think that we can retrain 35,000 planners. The most effective route is to get this [kind of town design] in the codes, and then let them follow it."<sup>73</sup>

Following this strategy, Calthorpe focused on providing a metropolitan planning "handbook" built around the TOD model. He began compiling materials in 1992 for publication. Calthorpe relied on the design staff of his private practice to help develop the design guidelines. He credits Shelly Poticha as the primary contributor. Poticha went on to become the Executive Director of the Center for TOD where she has continued to refine the guidelines while conducting TOD related research and consulting on TOD projects. Her original guidelines were published in Calthorpe's "The Next American Metropolis" in 1993. Knowing the historical precedents leading up to TOD, none of the design elements are that surprising.

Perhaps the best summation of Calthorpe and Poticha's guidelines in "Then Next American Metropolis" were written for a Center for TOD sponsored book, "New Transit Town."<sup>74</sup> The key components of TOD are as follows:

- Organize growth on a regional level to be compact and transit-supportive
- Place commercial, housing, jobs parks, and civic uses within walking distance of transit stops
- Create pedestrian-friendly street networks that directly connect local destinations
- Provide a mix of housing types, densities, and costs
- Preserve sensitive habitat, riparian zones, and high-quality open space
- Make public spaces the focus of building orientation and neighborhood activity

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<sup>71</sup> Rebchook, John; "New Urbanism founder guiding Stapleton redevelopment"; Rocky Mountain News; March, 2000.

<sup>72</sup> Katz, Peter; "The New Urbanism: Toward an Architecture of Community"; McGraw-Hill, Inc.; NY, 1994

<sup>73</sup> Hagerman, Erik; "Town planners find a better idea in the past"; St. Petersburg Times; Pg. 5D; July 28, 1991.

<sup>74</sup> Ditmarr, Hank, Ohland, Gloria; "The New Transit Town: Best Practices in Transit-Oriented Development"; Island Press, Washington; 2004.

“The Next American Metropolis” was the first book to define TOD. Many subsequent definitions, guidebooks, and manuals followed. But everything since has built on Calthorpe’s synthesis of ecological, aesthetic, pedestrian, anti-sprawl, regional, and equitable planning principles.

### **TOD implementation**

The implementation of TOD has not occurred as rapidly as the adoption of other New Urbanist concepts. Calthorpe originally believed that TOD fit within the needs, preferences, and purchasing power of the public but his perceived level of demand has not led to a substantial supply of TOD. As Calthorpe notes in his forward to “New Transit Town”, “[TOD] is in its adolescent phase. The concept is developing but the body of work lags a bit behind.”

Soon after Calthorpe published “New American Metropolis,” Anthony Downs proposed that we could have accommodated the all the growth of the 1980s in TODs “if large amounts of resources had been devoted to building a rapid transit system” (assuming construction of radial light rail transit systems in major metros, Calthorpe’s proposed densities, and 2000 feet radii around stations).<sup>75</sup> He also noted it would have required extensive resources and an acceptance of higher densities. Neither the resources or densities have occurred since, thus his conclusion that TOD would always be limited has been the case.

Only a small percentage of the anticipated TOD projects have been developed and what has been produced does not fully incorporate the philosophies Calthorpe outlined in “New American Metropolis.” San Francisco’s BART system anticipated extensive TOD development around its stations in the 1990’s but through 2007 has struggled to encourage more than two or three projects classifiable as TOD per year.<sup>76</sup> Across the U.S. there are too many things impeding TOD development: free and excessive parking, poor pedestrian environments around transit, poor-quality transit service, incorrect mixes of land uses near transit, lack of transit link between housing and jobs, and antiquated zoning codes. Dittmar laments, “Sadly, our review of the projects that are emerging across the country reveals that many of the first phases of these new “transit towns” fail to meet [TOD’s] objectives.”<sup>77</sup>

Unlike the spirit of change captured in the “Pedestrian Pocket Book,” today’s TOD projects lack ambition regarding the impact they can have on cities, the environment, communities, and individuals. Projects acquiesce to suburban-based parking requirements, disregard the call for mixed-income housing, and often ignore their relationship with transit altogether. Dittmar states, “Somewhere between the conceptualization and opening day, many projects end up becoming fairly traditional suburban developments that are simply transit-adjacent.”<sup>78</sup>

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<sup>75</sup> Downs, Anthony. “New Visions for Metropolitan America”; Washington, D.C.; Brookings Institution & Lincoln Institute of Land Policy; 1994.

<sup>76</sup> Interviews with Tom Radulovich, BART Board of Directors, Jeff Ordway, BART Manager of Property Development, Bruno Peguese, BART Senior Real Estate Officer, and Darryl Connelly, MARTA Director of Transit Oriented Development and Real Estate; 2007.

<sup>77</sup> Dittmar, Hank, Ohland, Gloria; “The New Transit Town: Best Practices in Transit-Oriented Development”; Island Press, Washington; 2004.

<sup>78</sup> Dittmar, Hank, Ohland, Gloria; “The New Transit Town: Best Practices in Transit-Oriented Development”; Island Press, Washington; 2004.

TOD projects, especially those of Calthorpe, were actually criticized in this regard from their inception. Elizabeth Deakin noted early on that Calthorpe's guidelines seemed to be making a lot of sustainability-based excuses for building something relatively environmentally insensitive.<sup>79</sup> "There would be a freight railroad running along the side of a property and [Calthorpe] would say overoptimistically—or self-reassuringly depending on how you look at it—that this 'middle-of-nowhere' would one day become part of a commuter rail system." Planners, such as Sir Peter Hall, have held Calthorpe's own Laguna West project up as an example of a TOD failure because, ultimately, transit was not extended to serve the project.<sup>80</sup> He comments, "New Urbanist communities are no different—from a sustainability standpoint—than any other form of tract suburban housing if they are not adequately connected by mass transit."

Other critics have said that TOD has not provided a substantially differentiated experience from the sterile suburban master planned developments it was meant to replace. This might have been foretold by Jane Jacobs in the 1960's. Jacobs spoke out vehemently against the master planned developments of urban renewal believing that they killed the evolved character of community. One of the most influential and oft-quoted components of her philosophy was that of "eyes on the street."<sup>81</sup> This focus on the pedestrian was also a fundamental tenet of Krier's work and subsequently that of Calthorpe. While they shared a desire of enlivened, human-scale streets, the two schools, that of Jacobs and that of neo-traditionalism, came from opposite directions on how to achieve the goals. Jacobs vehemently disliked Ebenezer Howard's command-and-control planning style while Calthorpe's ideas argued for "eyes on the street" but rested on massive master planned developments built on the theories of the garden city.

Critics have also focused on the contrast between Calthorpe's strong pro-pedestrian rhetoric against automobile priority and the substantial provision for cars in most TOD projects. Counter arguments are strong since it could be said that no successful real estate projects can be built today without bowing, at least to some extent, to the transport mode representing 95% of all trips in the U.S..<sup>82</sup> A fundamental disconnect exists between the theory and implementation of TOD. Regional planning agencies promote TOD in its pure form and use it as land use criteria in transportation modeling, but little has actually changed in the behavior of Americans or their transport preferences to indicate such a demand for TOD versus car-oriented suburban development.

Understanding that there are flaws and critiques to be made, a major issue with TOD since Calthorpe published "The Next American Metropolis" has been a confusion of the concept. It has been used to describe neighborhoods with limited transit access or even neo-traditional neighborhoods along highways with no transit access. There is no clear definition of TOD or agreement on desired outcomes. While Calthorpe provided guidelines, there are no standards or systems on which to judge the success or failure of a Calthorpe inspired TOD. Without these outcome-based guidelines, the actors involved in the

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<sup>79</sup> Interview with Elizabeth Deakin; 2007.

<sup>80</sup> Land Online; "Sir Peter Hall Spots the Unicorn in the Garden"; Recap of Hall's "The Sustainable City: A Unicorn in the Garden" at the National Building Museum; Landscape Architecture News Digest; December 19, 2005.

<sup>81</sup> Jacobs, Jane; "The Death and Life of Great American Cities"; New York; Vintage Books; 1992; Originally 1961.

<sup>82</sup> Jones, David; "The American Journey from Mass Transit to Mass Motorization, 1890-2000"; Book notes; 2007.

development process that do to bring successful transit-oriented projects into existence are reliant on “clever exceptionalism”<sup>83</sup>

Also, whereas Calthorpe envisioned TOD being ground-up development along new light rail lines, TOD is being promoted as an infill solution around existing transit infrastructure. Transit agencies have adapted relatively little from their days as pure joint developers to a new role as station area planners and promoters. Real estate development remains minimal within their overall budget and organizational structure. In fact, their real estate and land-use planning departments typically consist of less than 10 people, a stark contrast to the entrepreneurs of the “development-oriented transit” era.<sup>84</sup> When a real estate market is not present in a station area, transit agencies must determine ways to make the area more attractive. Transit agencies have not found a way to compete with ground-up development on the periphery of cities and do not have the marketing skills, manpower, or mission to do so. Although transit adds accessibility and value to a place, transit alone is insufficient to drive real estate markets.<sup>85</sup>

Additionally, TOD project sizes are often limited when employed as infill developments. Infill is a flawed strategy to meet metropolitan growth requirements on a project-by-project scale. Calthorpe never envisioned TODs as a single building infill development. “The Pedestrian Pocket grows at an increment typical of current market-place activities; one hundred-acre projects are common for sub-divisions, office parks and shopping centers.”<sup>86</sup>

More than any other deterrent to TOD projects coming to fruition, the risks associated with TOD relative to other development types are too great. The market flows towards profit and the returns on TOD are not yet proven. Ebenezer Howard found this to be the case as well and was forced to adapt his trust ownership model to sustain the development of his early example projects. Also, TOD requires the participation of many more actors than a typical development project. It calls for mixed-use which requires multiple skill sets and commingles different risk profiles in a single project. TOD often occurs in a fragmented regulatory environment with transit agencies and local agencies pushing and pulling projects in different directions. This is a far cry from the utopian factory town developers that singularly determined the planning of their idealistic towns. TOD also calls for mixed-income communities which require multiple product types, varied sales strategies, and may yield different returns to investors. Relative to other real estate investments, TODs are more complex, take more time, are considered riskier, and are ultimately more expensive.

However, the difficulties inherent in TOD development and numerous examples of “failed” TOD projects have not kept people from conducting regional planning models based on TOD. Sacramento was the first to adopt a TOD scenario and include it in their zoning codes but now almost every metropolitan region with major transit infrastructure has adopted some form of high-density TOD scenario. Atlanta has

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<sup>83</sup> Ditmarr, Hank, Ohland, Gloria; “The New Transit Town: Best Practices in Transit-Oriented Development”; Island Press, Washington; 2004.

<sup>84</sup> Interviews with Tom Radulovich, BART Board of Directors, Jeff Ordway, BART Manager of Property Development, Bruno Peguese, BART Senior Real Estate Officer, and Darryl Connelly, MARTA Director of Transit Oriented Development and Real Estate; 2007.

<sup>85</sup> Ditmarr, Hank, Ohland, Gloria; “The New Transit Town: Best Practices in Transit-Oriented Development”; Island Press, Washington; 2004.

<sup>86</sup> Kelbaugh, Doug; “The Pedestrian Pocket Book: A New Suburban Design Strategy.” Princeton Architectural Press, New York, NY; 1989.

adopted Special Public Interest Districts around MARTA stations and incorporates optimistic results in to their regional planning models. Envision Utah contained a TOD scenario, Chicago's metropolis 2020 includes TOD, and the Bay Area's MTC has a TOD focused scenario for its long range transport plan.

Perhaps the next big step in TOD development is the establishment of LEED guidelines for neighborhood development.<sup>87</sup> The U.S. Green Building Council (USGBC) developed Leadership in Energy and Environmental Design (LEED) criteria for individual buildings in 1998. USGBC has certified thousands of buildings and LEED has become an official standard in the zoning requirements of many cities. USGBC has expanded its scope from the scale of the single building to rate and certify entire neighborhoods. They joined with the Congress for the New Urbanism and the Natural Resources Defense Council (NRDC) in a four-year project to develop the certification program. In describing developments currently in the projects pilot phase, the Director of NRDC's Smart Growth program, Kaid Benfield, summarized, "They are located overwhelmingly in more urban, more transit-accessible places with lower rates of driving than the average." Such news is encouraging for future TOD development.

TOD maintains a loyal following and still inspires developers and planners to pursue its end goals. It is not surprising that something based on the often cited and still promoted garden city model is also able to generate such loyalty. Perhaps after nearly 200 years of historical precedents, the evolution of the environmental movement, the regional coordination of land-use and transportation, and the development of LEED guidelines for neighborhoods, a truly viable TOD project will emerge that fully respects the spirit and guidelines laid out by Calthorpe 15 years ago in "The New American Metropolis."

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<sup>87</sup> Berg, Nate; "LEED-ND: Creating A More Complete Vision Of Neighborhood Sustainability"; Planetizen; November, 2007; <http://www.planetizen.com/node/28493>





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