

Toward Mixed-Use Communities by Transit-oriented development (TOD) in the United States

Hanieh Shamskooshki

(Hanieh Shamskooshki, Urban and Regional Planning M.A., Faculty of Architecture and Urban Planning, Sh.Beheshti University, Tehran, Iran, Hanieh.Shams@yahoo.com)

1 ABSTRACT

Increasing social and environmental damages is certainly related to current urban forms. The linkage between low-density, separated-use development and increasing travel is undeniable. In order to recent concerns about today needs of cities and their future, Transit-oriented development (TOD) has rapidly emerged as one of the popular urban planning paradigm in the world. It seeks to maximize access to mass transit and non-motorized transportation with centrally located public transportation system surrounded by relatively high-density commercial and residential development. Therefore this strategy can improve quality of life in urban areas and encourage more compact development. In essence, TOD means the creation of denser, mixed-use activity nodes connected by high quality public transportation. TOD can enhance quality of life in urban areas at the same time provide benefits for individuals, communities and developers.

Transit-oriented development in the United States has gained wide acceptance among all of the policies and strategies that the federal and local government have adopted to respond to challenge of rapid social, environmental, economic, technological and cultural changes which cities are facing. To understand more about Transit-oriented development, this study presents details about definition and typologies. It also included key actors involved in TOD projects and their goals. Current scope of TOD and implementation tools in the United States are being discussed and the following key issues are associated with the recognition of TOD benefits and barriers in the United States. In order to create compact development and mixed-use communities according to key TOD components, some strategies about implementing TOD in the cities of the world and specially the United States follow at the end.

2 INTRODUCTION

2.1 Definition of Transit-oriented development

There is no universally accepted definition of TOD because development that would be considered dense, pedestrian-friendly, and transit-supportive in a middle-size city in the Midwest would be viewed quite differently in the heart of Manhattan or the District of Columbia. Some authors use the term TOD quite liberally, referring to any form of “transportation-oriented development”, including bus and rail oriented development as well as development along freeways (Lefaver,1997). This review takes a narrower definition, referring to development near or oriented to mass transit facilities.

The following represents a sample of TOD definitions found in the literature:

- “Development within a specified geographic area around a transit station with a variety of land uses and a multiplicity of landowners” (Salvensen,1996)
- “A mixed-use community that encourages people to live near transit services and to decrease their dependence on driving” (Still,2002).
- “Moderate to higher density development, located within an easy walk of a major transit stop, generally with a mix of residential, employment, and shopping opportunities designed for pedestrians without excluding the auto. TOD can be new construction or redevelopment of one or more buildings whose design and orientation facilitate transit use” (California Department of Transportation,2001).

Less universally subscribed to, though found in some definitions of TOD, are the following traits:

- Compactness
- Pedestrian- and cycle-friendly environs
- Public and civic spaces near stations
- Stations as community hubs (Cervero,2002,P5)

Traditional Transit-Oriented Development is designed so that residents can live, work, shop, and recreate in the same area. A TOD resembles a small, walkable neighborhood focused around a regional transit station. The transit stop (rail or bus) is the main focal point of the development and is immediately surrounded by high-level densities of commercial, office, and residential properties. The transit stop serves as the regional connection for the development as well as the connection to the urban center to which people commute. To maximize access and land-use efficiency, the transit stop is connected to vehicular, bicycle, and pedestrian traffic. As one walks further from the transit center, the building density decreases and becomes more uniformly residential. Density still remains higher than typical suburban densities to centralize the population and maximize land uses (Rappahannock Rapidan Regional Commission,2006).

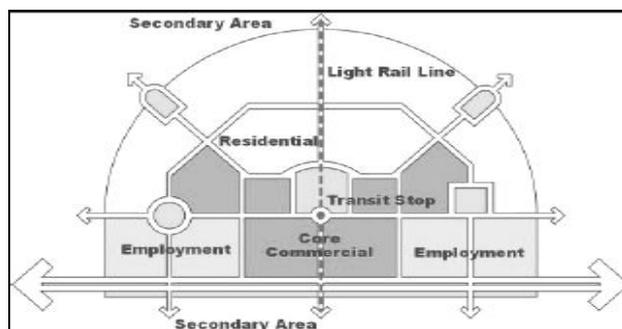


Fig. 1: Transit-oriented development Model

2.2 Transit-oriented development Typologies

City planners used a TOD typology to indicate the desired mix and intensity of development at specific transit stations and to show that not all stations will be built in identical patterns. This helped residents understand that their existing neighborhoods would change only modestly and signaled to developers where the city planned to support intensive, new TOD (An Issue Paper of the American Planning Association, 2007). The following table describes TOD typologies that should be considered in the United States:

Typology	Characteristics
Urban-Downtown	<ul style="list-style-type: none"> • Civic and cultural centres • Multiple transit lines and transfer points
Urban Neighbourhood	<ul style="list-style-type: none"> • Moderate to high density (>30 du per acre) • Extension of downtown street system • Shopping along a central street • Key crossroads • Usually more affordable housing • High pedestrian activity • Sometimes historic districts adjacent to downtown
Suburban Neighbourhood	<ul style="list-style-type: none"> • Opportunity for higher density and redesign • More commuter focused • Some retail and commercial in existence, but limited
Neighbourhood Transit Zone	<ul style="list-style-type: none"> • Mostly residential • Some shopping with limited retail or office space
Commuter Town	<ul style="list-style-type: none"> • Freestanding, with commuter service to downtown • Station area may be a “main street” with retail, offices, residential • Supports peak hour service but needs parking
University Centre	<ul style="list-style-type: none"> • Pedestrian and bike environment • Needs sidewalk and shuttle bus connectivity to student activity • centres, sports complex and libraries
Regional Town Centre	<ul style="list-style-type: none"> • Shopping centre, with ample auto access • Will require careful connectivity • Land use changes will likely be needed • Infill opportunities to make the area 24 hour

Table 1: Transit-oriented development Typologies

2.3 TOD Actors and Their Goals

A number of possible goals associated with each of the actors involved in TOD projects are shown in Table 2. Many of these goals—such as maintaining a high level of station parking and maximizing pedestrian access to the station—conflict with each other. Even a single actor may have goals that are incompatible, or at the very least, that require careful balancing if they are to be reconciled. Many of the incompatibilities reflect the basic tension between place and node.

Actor	Possible Goals
Transit Agency	<ul style="list-style-type: none"> • Maximize monetary return on land • Maximize ridership. • Capture value in the long term
Riders	<ul style="list-style-type: none"> • Create/maintain high level of parking • Improve transit service and station access • Increase mobility choices • Develop convenient mix of uses near station
Neighbours	<ul style="list-style-type: none"> • Maintain/increase property values • Minimize traffic impact • Increase mobility choices and access to transit, services and jobs • Enhance neighborhood livability • Foster redevelopment
Local Government	<ul style="list-style-type: none"> • Maximize tax revenues • Foster economic vitality • Redevelop underutilized land
Federal Government	<ul style="list-style-type: none"> • Protect “public interest” and set limits on federally-funded investments
Developer/Lender	<ul style="list-style-type: none"> • Maximize return on investment • Minimize risk, complexity • Ensure value in long term

Table 2: TOD actors and their goals

3 TRANSIT-ORIENTED DEVELOPMENT IN THE UNITED STATES

Transit-oriented development (TOD) has attracted interest as a tool for promoting smart growth, leveraging economic development, and catering to shifting market demands and lifestyle preferences. TOD is viewed and defined differently throughout the country, with its most common traits being compact, mixed-use development near transit facilities and high-quality walking environments. Joint development is a form of TOD that is often project specific, taking place on, above, or adjacent to transit-agency property. The results of a national survey suggest that the principal aim of TOD and joint development is to boost ridership and, thereby, boost revenue income. Community economic development and broader smart-growth agendas are secondary objectives.

A rich mix of TOD can be found across America today, and all indications are that the numbers and types of TOD will grow in years to come. Over 100 TOD projects currently exist in the United States, found overwhelmingly in and around heavy-, light-, and commuter-rail stations. While typically nodal in form, TOD corridors have taken or are beginning to take shape. In addition, over 100 joint development projects today exist on, above, or adjacent to U.S. transit-agency property. The most common joint development arrangements are ground leases and operation-cost sharing. Most often, joint development occurs at rail stations surrounded by a mix of office, commercial, and institutional land uses. However, examples of public-private joint ventures can be found among bus only systems as well, normally in the form of joint intermodal transfer and commercial-retail space at central-city bus terminals.

Many voices shape the practice of TOD in contemporary urban America. A multi-layered, sometimes complex institutional and political environment has evolved that ensures accountability and instills a degree of responsibility and fairness into the decision-making process, but this environment can also form roadblocks to implementation.

The spectrum of participatory roles transit agencies can take on are wide-ranging— from roles as modest as providing technical guidance (e.g., transitsupportive design guidelines) to those as ambitious as being the self-anointed lead developer. Most transit agencies get involved in land-use affairs (broadly defined); however, they generally limit their involvement in TOD matters to interagency coordination. Most TOD

work concentrates on public outreach and education. A common method for drawing public input into the TOD planning process is organizing design charrettes—ranging from multi-day workshops led by professional designers to facilitated community discussions (inspired by the successes at the Pleasant Hill BART station in the San Francisco Bay Area and along the Wasatch Front under the guidance of Envision Utah). Local governments wield considerable control over TOD outcomes through zoning ordinances and building codes. Some states, notably California and New Jersey, have sought to jump-start TOD through transit village initiatives that critics view as mere window-dressing since little funding support is provided.

4 TOD IMPLEMENTATION TOOLS IN THE UNITED STATES

TOD implementation ideally starts with a vision, cultivated from broad-based public input, and proceeds to strategic station-area planning backed by appropriate zoning as well as policy incentives and regulations. Around half of surveyed transit properties in the United States state that their regions have a vision, policy, or plan in place that embraces TOD principles.

Overlay zones are the most common means of controlling land uses, densities, and site designs of TOD. Overlays, often introduced on an interim basis to head off automobile-oriented uses that might compromise a TOD, usually specify desired land uses as-of-right, such as housing and convenience shops. For urban TODs, densities of 20 to 30 dwelling units per residential acre and FARs of 1.0 and above are not uncommon. Some of the more progressive TOD zoning districts also lower automobile parking requirements and sometimes even set bicycle parking mandates.

The national survey of U.S. transit agencies revealed that besides standard zoning, the tools most frequently used to leverage TOD are funding for station area planning and ancillary capital improvements; the introduction of density bonuses, sometimes used to encourage the production of affordable housing units; and relaxation of parking standards. These measures, moreover, received high marks in terms of their overall effectiveness among transit professionals who responded to the survey. Next in the order of frequency of usage have been land-based tools, like land purchases on the open market (for land-banking and potential “deal-making”) and assistance with land assemblage. For the most part, redevelopment agencies have applied these tools, meaning their role in leveraging TOD has been mainly limited to economically depressed or blighted neighborhood settings. Because of the higher risk involved, redevelopment tools have often been accompanied by other funding sources, sometimes with a dozen or more participants involved in the process.

Implementation strategies that are procedural in nature, like expediting entitlement reviews and excluding TODs from concurrency requirements, have been applied less often in practice and are also viewed by public-sector interests as less effective than other measures in jump-starting TOD. This view, however, does not square with that of many TOD developers. In terms of what metropolitan planning organizations, state departments of transportation, and the federal government might do to help implement TODs, respondents from the local levels stated loudly and clearly that what is most needed is money—specifically for strategic station-area planning, infrastructure, and on-the-ground improvements. Smart-growth legislation that targets state infrastructure and urban renewal grants to transit station areas (such as that in Maryland) is also looked upon favorably by local interests. Regulations like concurrency requirements, on the other hand, generally received low grades among

survey respondents from the local level. For financing streetscape and other ancillary improvements around transit stations, monies have mostly come from federal and state grants such as the Transportation and Community System Preservation Pilot Program under the Transportation Equity Act for the 21st Century (TEA-21). The most common sources of non-grant funds used to leverage TOD are individual investor funds and nonprofit/foundation funds.

Many cities, counties and state/federal agencies across the United States are achieving TOD in their jurisdictions, using a variety of implementation tools. A number of implementation “best practices” have emerged, which are outlined below.

4.1 Provide a Vision for TOD and Keep Focused on the Long Term Vision and Interim Development

A comprehensive, strategic vision establishes TOD as a key element of a City’s overall land use and mobility plan. The vision encompasses broader city-wide land use and development goals, as well as performance expectations for future development around transit stations.

Full build out of many station areas may take decades to complete. A commitment to the long term vision is necessary. However, timely plan re-assessments may be needed to facilitate small, incremental development opportunities which still contribute to long term goals.

Establish guidelines for “interim” developments that will maintain the long term vision for the station area is also necessary. Interim development can be used to provide key public infrastructure, identify future development patterns and establish quality pedestrian environments. Interim uses that prematurely fragment land or create negative external impacts that discourage TOD opportunities are avoided.

4.2 Build Community Support for Public and Private Participation

A broad understanding and acceptance of TOD is important. Community wide information and education programs should be promoted. Planning processes that involve neighbourhoods, elected officials, land owners and the development industry can create a TOD program that is supported and will be implemented.

The participation of both the private sector and local government is important in reducing project risk. Foremost, it is governments and transit authorities that will encourage supportive land use policies that facilitate TOD. Secondly, there are typically large public land holdings around transit stations. These lands can be leveraged to reduce developer risk, speed development timing and ensure other public benefits are achieved through TOD.

4.3 Identify Priority Transit Station Area Plans and Market Responsive

Wherever there is an LRT¹ station there is an opportunity for TOD. However, the market is not limitless. Identify priority stations where there is market interest, sufficient land and a reasonable opportunity for success. Focus attention at these priority stations to ensure early TOD projects are successes.

Individual stations need specific plans that recognize local market strengths, site opportunities and community interests. These plans will outline clear goals for TOD at the individual station and provide guidelines for land use, density, public systems, urban design and parking management.

TOD plans will only be implemented if they can entice the local real estate market to build. Development industry participation in preparing station area plans, land use mixes and marketing strategies is essential. Station area plans need to provide flexibility to allow the market to evolve, adapt to this new form and ultimately flourish.

4.4 Financing and Incentive Strategies and Eliminate Roadblocks

TOD and mixed use development provide financing challenges. Creative solutions have often been needed to make it happen. In many U.S. jurisdictions federal grants, tax incremental financing, public-private partnerships, joint ventures and “Location Efficient Mortgages” have been used to encourage development. Local governments also provide density bonusing, key public infrastructure and reduced approval timelines as incentives for TOD.

TOD is a unique and emerging form of urban development. It is one that many developers are not willing to risk. Often cited reasons for this uncertainty are difficulty in obtaining financing, lack of clear policy direction, lengthy approvals processes and NIMBY-ism². Municipalities help reduce this risk by ensuring planning policies, zoning and approvals processes are in place to eliminate roadblocks and reduce timelines.

5 BENEFITS OF TRANSIT-ORIENTED DEVELOPMENT IN THE UNITED STATES

A recent study, "Factors for Success in California's Transit-Oriented Development", commissioned by the California Department of Transportation, identified the following 10 potential benefits of TOD. The study cites research showing that TOD can have the following benefits.

¹ Light Rail Transit

² NIMBY or Nimby is an acronym for the phrase "not in my back yard". The term (or the derivative Nimbyism) is used pejoratively to describe opposition by residents to a proposal for a new development close to them.

5.1 Economic Benefits

- Increase households' disposable income. Housing and transportation are the first and second largest household expenses, respectively. TOD can free-up disposable income by reducing the need for more than one car and reducing driving costs, saving \$3000-\$4000 per year.
- Play a role in economic development. TOD is increasingly used as a tool to revitalize aging downtowns and declining urban neighborhoods, and to enhance tax revenues for local jurisdictions.

5.2 Environmental Benefits

- Reduce rates of vehicle miles traveled (VMT). TOD can lower annual household rates of driving 20–40 percent for those living, working, and shopping within transit station areas.
- Reduce air pollution and energy consumption rates. By providing safe and easy pedestrian access to transit, TOD allows households to lower rates of air pollution and energy consumption. Also, TODs can help households reduce rates of greenhouse gas emissions by 2.5 to 3.7 tons per year.
- Conserve resource lands and open space. Because TOD consumes less land than low-density, auto-oriented growth, it reduces the need to convert farmland and open spaces to development.
- Decrease local infrastructure costs. TOD can reduce costs for water, sewage, and roads to local governments and property owners by up to 25 percent.

5.3 Social/Community Benefits

- Provide mobility choices. By creating “activity nodes” linked by transit, TOD provides important mobility options, very much needed in congested metropolitan areas. This also allows young people, the elderly, people who prefer not to drive, and those who don't own cars the ability to get around.
- Increase public safety. By creating active places that are busy through the day and evening and providing “eyes on the street”, TOD helps increase safety for pedestrians, transit-users, and many others.
- Increase transit ridership. TOD improves the efficiency and effectiveness of transit service investments by increasing the use of transit near stations by 20 to 40 percent, and up to five percent overall at the regional level.
- Contribute to more affordable housing. TOD can add to the supply of affordable housing. It was recently estimated that housing costs for land and structures can be significantly reduced through more compact growth patterns (Cervero,2002).

6 BARRIERS TO TRANSIT-ORIENTED DEVELOPMENT IN THE UNITED STATES

The literature sorts barriers to TOD into three basic categories: fiscal (factors that detract from the financial feasibility of TOD projects, such as questionable market viability and lack of conventional financing); organizational (structural impediments lodged in the institutional fabric of transit agencies and other governmental entities responsible for projects); and political (land-use policies and NIMBY forces that impede multifamily housing and infill development more generally). Of course many barriers are interrelated automobile-oriented development patterns form barriers to TOD in large part because overcoming them raises costs and political flak.

6.1 Fiscal Factors

The market viability of the housing product is questionable. The market for high density housing is thought to be soft due to consumer preference for low density living. There is often a lack of conventional financing. Transit-based housing is a largely untested market. Markets fluctuate and the market demand for each element of a mix of uses seldom follows the same cycles (Bernick and Cervero,pages 139-140). For example the recession of the late 80s to early 90s hurt the office market.

6.2 Institutional Factors

The public transportation institution itself is part of the problem. The culture inside many transportation authorities is focused on operations keeping the wheels rolling. Land development in those cases is not

considered to be part of the core business. The skills required to be effective are outside of traditional transit planning expertise. The goal of using land use policies to boost ridership represents a major shift in American transportation planning. Prior to the mid- 1980s, transportation planners rarely sought to influence travel behavior by manipulating land use patterns. Furthermore, rail systems by their nature involve several stations, often in multiple jurisdictions and land use authorities. This level in intergovernmental land use policy coordination, while found in other nations, is not typical of American planning. Thus both in intellectual disposition and in the required amount of coordination, TOD is a departure for transportation planning in the United States (Boarnet and Compin,page 1). The public transit institution has been slow to adopt new policies, play new roles, and use new tools (Cervero,2002).

6.3 Political Factors

Local governments prefer retail developments at stations because of the sales tax revenue. Ironically, some governments oppose retail development at stations in order to protect other commercial areas in town such as the traditional central business district (Bernick and Cervero,page 195).

High-density housing usually increases demand for schools, city services, and public streets (Bernick and Cervero,page 140). TOD is not a priority in jurisdictions with other pressing problems such as crime and poverty (Bernick and Cervero,page 285).

There is often NIMBY political opposition. Ironically, this phenomenon can take the form of resistance to high density housing in more affluent communities where the concern is to protect against decline caused by those of a different race and class; and in less affluent communities where the concern is to protect against gentrification by those of a different race and class (Anastasia Loukaitou-Sideris, “Transit-Oriented Development in Integrating Rail Transit, Land Development And Telecommunications Mineta Transportation Institute).

7 KEY STRATEGIES FOR IMPLEMENTING TOD IN THE UNITED STATES

A review of practices from cities across the United States indicates that TOD is a unique form of urban development. How a station area is planned and developed will depend on the particular attributes of that station and surrounding community. However, the following key strategies are commonly found to be critical to the success of any transit-oriented development.

7.1 Get the Land Uses Right

- Ensure transit supportive uses: Transit supportive uses are high pedestrian generators that directly promote greater transit ridership. They also provide opportunities for multi-purpose trips that can be made as a pedestrian. Medium to high density residential, offices, high schools and colleges are significant transit supportive uses. Appropriate retail, restaurants, personal service and civic functions will support these major uses and generate activity in both peak and off-peak hours.
- Discourage non-transit supportive uses: Non-transit supportive uses generate little or no ridership. They consume large areas of land, or create bleak or unsafe environments for pedestrians. They are often dependent upon a vehicle for transporting goods, or require significant land areas for low intensity development and parking. Large format wholesale stores, warehouse storage, car dealerships, auto service centres and regional sports fields are examples of uses that are not transit supportive.
- Encourage a mix of uses: A mix of residential, office and supporting services in station areas can generate transit trips throughout the day. It provides opportunities for people to live closer to their jobs or to take advantage of reverse flow transit capacities. Workers can run daily errands within walking distance of their jobs; transit riders can access convenient services while at the station. Residents and visitors can continue a variety of activities in off-peak times.
- Locate the uses as close to the LRT station as possible: Locating a majority of transit-supportive uses within a 400 to 600 m walking distance of the LRT station makes transit the most convenient and attractive travel mode for the site.

7.2 Promote Density

- Promote density: Development densities are “as great as possible” within the context of a particular station and surrounding community. Minimum residential densities around rail stations are high enough to support higher frequency transit service and to foster lively, walkable communities. Housing forms include townhouse, walk-up apartment and high-rise buildings. Minimum employment densities are established in station areas to create a destination which generates transit trips.
- Density concentration and transition: The highest densities are ideally located closest to the station, to optimize transit rider convenience. This includes high-density housing and offices. Intensity of development can taper off away from the station, to create an appropriate transition and interface with the surrounding community.

7.3 Create Convenient Pedestrian Connections

- Walking distances are to be short: Pedestrian routes between the station and key destinations are short and direct. Key destinations are located within a 400 to 600 meter radius of the station. Circuitous routes are avoided.
- Pedestrian connections are to be continuous: Sidewalks and pathways are continuous routes that are easy to find and follow. Major connections to the station for pedestrians and bicycles are constructed at the outset. Routes are universally accessible to wheelchairs, strollers, scooters and other mobility aids.
- Accesses are to be direct: Sidewalks connect directly to the entrances of the station and buildings. Bus stops are located as close as possible to building entrances. Walking distances from the station to the nearest bus stop are generally shorter than the distance to the nearest parking space.
- People are to be at street level: Pedestrian routes are at ground level, with minimal stairs and grade changes. Adjacent buildings provide “eyes on the street” and informal security here. Pedestrian routes are located on public streets unless there are good opportunities to tie in to a safe, existing above-grade system.
- Separate vehicular and pedestrian functions: Vehicular and pedestrian ways are designed to minimize points of conflict. Sidewalk and pathway routes have as few driveway or parking lot crossings as possible.

7.4 Ensure Good Urban Design

- Create high quality streets: A pedestrian-friendly street is visually interesting and makes walking enjoyable. Trees, landscaping, wide, separate sidewalks and on-street parking protect people from vehicle traffic and create a pleasant pedestrian zone. Benches provide places for people to rest.
- Make the most of architecture: Architectural variety on the lower three to four storeys can define an interesting public realm. Articulated building facades incorporate attractive windows and varied architectural elements, and are built to the sidewalk. Upper floors of tall buildings can be set back to allow sunlight to reach the street and help reduce the sense of scale of the building.
- Relate the ground level to pedestrian uses: Foot travellers tend to relate to the ground storey of buildings. This level accommodates residential units, building entrances and retail shops oriented to the sidewalk. Surface parking lots, parkade accesses and blank exterior walls are limited along major pedestrian streets.
- All season design: Where possible, pedestrian connections and transit waiting areas provide weather protection in the form of awnings, building projections and colonnades. Ample enclosed shelters make waiting for transit more comfortable.
- Lighting, landscaping, and signs: Stations are well-lit and designed to accommodate “around-the-clock” activity. Landscaping features can define special precincts and encourage transit patrons to linger and explore the station area. Convenient and legible signs orient visitors to buildings and activities around the station.

7.5 Create Compact Development Patterns

- **Compact Street Network:** Frequent, interconnected streets increase the efficiency of transit circulation and offer more choices for pedestrians. Blocks of 100 to 150m in length keep walking distances short and provide alternative route options. A gridbased street pattern offers multiple accesses to the station and forms the overall development framework for long term transit supportive uses.

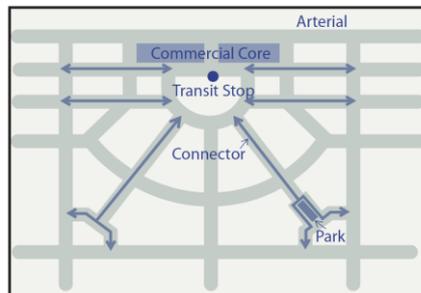


Fig. 2: Compact Street Network

- **Cluster buildings:** Buildings that are grouped together, or clustered, offer a “one-stop” opportunity to conveniently access a variety of destinations on foot. Clustered buildings can frame distinct character areas and create an easily navigable walking environment.
- **Leave room to grow:** Buildings can be thoughtfully sited on a property to accommodate future intensification. Placing buildings to one side of a parcel, instead of in the centre, leaves sufficient land that can be developed later. This will allow an initially low density area around an LRT station to intensify over time.

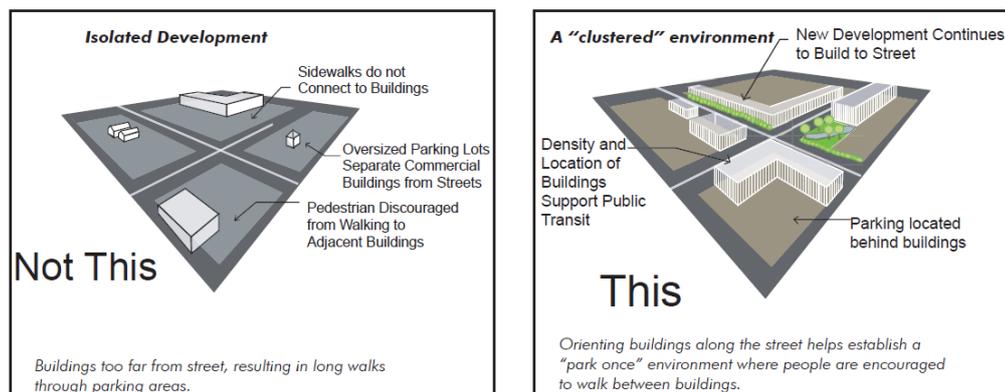


Fig. 3: Clustered Environment not Isolated Development

7.6 Manage Parking

- **Accommodate the automobile:** By design, TOD lessens the need for automobile use in a station area. However, accommodating vehicles is still critical to the success of a vibrant TOD district. Convenient parking and drop-off zones need to be planned for in all station area plans.
- **Parking - enough, but not too much!:** TOD provides an opportunity to reduce the amount of parking in the station area through increased transit riderships, reduced residential vehicle ownership and shared off-peak parking at public Park & Ride sites. Setting both minimum and maximum parking standards can help ensure the success of a station area as well as optimize transit ridership.
- **Locate parking to the rear and sides of buildings:** Parking lots are located at the periphery of the station area and to the rear or sides of buildings. This keeps the station and building entrances oriented to the sidewalk and to pedestrian users.
- **Smaller parking lots:** Surface parking areas do not overwhelm a station area. Larger parking lots can be divided into smaller lots and separated by landscaped walkways. These smaller lots also create an internal movement network and establish a framework for longer term intensification.

- Phased parking from surface lots to structures: Structured parking consumes less land than surface parking and allows maximum development. Station areas are designed to allow for the evolution of parking from surface lots to parking structures. If parking structures are located along key walking routes, they can enhance the public environment with pedestrian-friendly facades.
- Bicycle parking: Bicycles can extend the local commuting range beyond the typical 600 m. Ample, convenient and secured bicycle storage locations are provided at each station, close to the entrance of the transit station.

7.7 Make Each Station a “Place”

- Create a Destination: A transit station is a destination in its own right, as well as a gateway to the rest of the city. A station area with a collection of unique places will attract visitors, while also serving transit patrons and the local community.
- Make buildings landmarks: Landmarks create notable places and aid in local wayfinding. LRT stations and other significant buildings with distinctive design elements can make the area attractive and memorable.
- Sightlines and views: Sight lines to and from the station help orient pedestrians to their surroundings. Views are critical for pedestrians to find their way. Sight lines can be terminated by important features such as the station, a community building, monument or public art.
-
- Orient buildings to the street: Buildings that are adjacent to and overlook public areas create a visually interesting and safer pedestrian environment. Buildings oriented towards the street edge can enclose important vistas and shape the public realm.
- Public open spaces: Open spaces near an LRT station emphasize the station as a public place. They provide comfortable waiting and drop-off areas for users and act as central activity and gathering points for the local community. The station area can be strategically punctuated with small parks or plazas, which might incorporate fountains or other landmark features.

8 CONCLUSION

There is considerable evidence that interest in transit-oriented developments is on the rise in the United States. Transit Oriented-Development shifts the focus from diffuse, automobile-oriented development to denser, mixed-use neighborhoods centered around transit station. TOD can have a myriad of social, environmental and economic benefits for people and communities, from reduced costs of living, better access to jobs, and economic growth, to healthier lifestyles and, through reduced automobile use. transit-oriented development is still challenged by a lack of public and private financing and adequate policies and legislation to encourage TOD construction.

The wise use of land around LRT stations and high volume bus stops is one approach to help the United States achieve its smart growth objectives. Strategically planned station areas help promote the economic, social, and environmental well-being of a city by:

- Highlighting transportation alternatives and increasing transit ridership
- Taking advantage of non-peak direction transit capacity
- Decreasing auto dependency and exhaust emissions
- Using serviced land efficiently to help create a more compact urban form
- Making better connections between jobs and housing
- Revitalizing commercial corridors and older communities
- Providing market housing in a variety of forms and price ranges
- Creating opportunities for affordable housing
- Providing increased neighbourhood and travel options for those not owning cars
- Making identifiable and walkable neighbourhoods

- Creating more street activity and a safer station environment
- Acting as a catalyst for private investment and development
- Increasing assessment values of vacant and underused land

The desire to coordinate the planning of land use and transit investment is a growing trend across the United States. Many cities and regions are promoting better use and intensification of land around major transit facilities as a means to achieve a number of their broader planning goals.

9 REFERENCES

- Belzer, D. and G. Autler. *Transit-oriented development: Moving from Rhetoric to Reality*. Washington, D.C.: The Brookings Institution Center on Urban and Metropolitan Policy, 2002.
- CA: Reconnecting America's Center for Transit-Oriented Development, 2007, 24 p.
- Calthorpe, Peter, *the Next American Metropolis: Ecology, Community, and Planning*, Princeton, NJ, Princeton Architectural Press, 1994.
- Center for Transit-oriented development: www.reconnectingamerica.org
- Cervero, Robert, et al. *Transit-oriented development And Joint Development in the USA: A literature review* Washington, DC: Transportation Research Board, 2002, 144 p. (No. 52)
- Cervero, Robert, et al.: *Transit-oriented development In the USA: Experiences, challenges, and prospects*. Transportation Research Board (TRB), Washington, DC: TRB, Transit Cooperative Research Program (TCRP), 2004, 534 p. (TCRP Report 102)
- Rappahannock Rapidan Regional Commission. *Transit-Oriented Development in the Rappahannock-Rapidan Region*, Culpeper, VA 22701, 2006.
- Transit and Transit-Oriented Development*, an Issue Paper of the American Planning Association Hawaii Chapter, August 2007.
- Transit and Transit-Oriented Development, Best Practices Handbook*, the City of Calgary: Land Use Planning and Policy, January 2004.
- Transit-Oriented Development in the United States: Experiences, Challenges, and Prospects*, Transit Cooperative Research Program, Report 102, January 2004.