

Winnipeg

Transit-Oriented Development Handbook

City of Winnipeg

PB's PlaceMaking Group

Acknowledgements

Planning Executive Advisory Committee (PEAC):	Deepak Joshi	Chief Operating Officer	Office of the Chief Administrative Officer
	Barry Thorgrimson	Director	Planning, Property, and Development Department (PP&D)
	Barry MacBride	Director	Water & Waste Department
	Brad Sacher	Director	Public Works Department
	Dave Wardrop	Director	Winnipeg Transit
	Clive Wightman	Director	Community Services Department
Planning & Land Use Division:	Patti Regan	Manager, Planning & Land Use Division	PP&D
Project Manager:	David Marsh	Principal Planner – Advanced Planning	PP&D
TOD Technical Advisory Committee:	Brett Shenback	Planner	PP&D
	Michael Robinson	Senior Planner	PP&D
	James Veitch	Senior Planner	PP&D
	Donna Beaton	Park Strategic Planner	PP&D
	Valdene Buckley	Senior Planner	PP&D
	Lee Caldwell	Senior Urban Designer	PP&D
	Gary Holmes	Manager of Strategic Support Services	PP&D
	Martin Grady	Administrator of Zoning & Permits Branch	PP&D
	Bill Menzies	Manager of Service Development	Winnipeg Transit
	Bjorn Radstrom	Transit Planner	Winnipeg Transit
	David Hill	Chief Operating Officer	Winnipeg Parking Authority
	Diana Emerson	Traffic Management Engineer	Public Works Department
	Kevin Nixon	Active Transportation Coordinator	Public Works Department
	Frank Mazur	Development Engineer	Water & Waste Department
Parsons Brinckerhoff PlaceMaking Group:	GB Arrington	Project Manager	PB's PlaceMaking Group
	Keith Liden	Senior Planner	PB's PlaceMaking Group
	Kimi Iboshi Sloop	Senior Planner	PB's PlaceMaking Group
	Emily Hull	Urban Designer	PB's PlaceMaking Group
	Jim Hencke	Senior Urban Designer	PB's PlaceMaking Group
	Tom Bennett	Urban Designer	PB's PlaceMaking Group
Cover image Source:	City of Winnipeg		
Date:	2011		

Table of Contents

1. Introduction	1
1.A. Introduction to TOD Handbook	2
1.B. Organization of Handbook	4
2. Overview of TOD	5
2.A. TOD Defined	6
2.B. Scale of TOD	7
2.C. Benefits of TOD	8
2.D. Making TOD Work	11
2.E. Locating Transit Stations	13
3. Principles	15
3.A. Core Principles of TOD	16
4. Implementing TOD	31
4.A. Considerations for Locating TOD	33
4.B. Station Area Plans	33
4.C. TOD Assessment Tool	34
4.D. Implementation Toolbox	36
4.E. Typologies	37
4.F. Urban Parks and Open Space	51
Endnotes	65
Resources	66



1. Introduction

1.A. Introduction to TOD Handbook

The City of Winnipeg's new planning framework – anchored by **OurWinnipeg** and the **Complete Communities Direction Strategy** – is founded on environmental, social and economical solutions. This framework will prioritize building complete communities and accommodating growth and change in a sustainable way. This will be done by balancing growth in new and existing communities with intensification in certain areas of the city – namely, centres and corridors, major redevelopment sites, and downtown.

Transit-oriented development (TOD) is a key component of this balanced approach. By enabling density, mixed use, accessible urban design and sustainable transportation options, it:

- contributes to the overall sustainability of the city,
- provides a valued complement to existing land use patterns, and
- offers a lifestyle option that appeals to many people.

The average household spends 19% of its household budget on transportation. Those with good access to transit spend only 9% of the household budget on transportation.[1]

Sense of Place

Each station area in Winnipeg can provide a sense of place by creating a unique character and identity that enables the citizens of Winnipeg to have a personal connection and experience with the place in their daily lives and builds a great community recognized throughout the region.

A variety of sites can accommodate TOD, including, but not limited to, former industrial sites (brownfields) and under-utilized commercial areas (greyfields). Of course, every site and situation is different, and establishing TOD in Winnipeg brings unique climate challenges. However, there are "lessons learned" from elsewhere that may hold value for those looking to create TOD here.

This handbook provides TOD background information gleaned from examples across North America and around the world, expressed as best-practice TOD principles and real-world case studies. Section 4.0 includes several checklists of questions that may be helpful in evolving concepts for development in Winnipeg.

As a starting point for dialogue between developers, the community and the City of Winnipeg, it is hoped that the Transit-Oriented Development Handbook supports the building of partnerships and positive relationships that lead to the implementation of successful TOD projects in Winnipeg.

1.B. Organization of Handbook

This TOD Handbook is a synthesis of "best practice" TOD principles to help policymakers, developers, the Public Service, and members of the public in Winnipeg facilitate the broader implementation of TOD. The handbook is organized into three main sections:

- **Overview of TOD**. This section defines TOD, presents benefits and challenges of TOD and discusses the relationship of the transit station to the surrounding land uses.

- **Core Principles of TOD.** This section presents the six key elements every successful TOD should include. Supporting each principle is a best practice case study.

- **Tools for Implementing TOD.** This section builds on the core principles and presents tools that can be used to make TOD a reality.





2. Overview of TOD

2.A. TOD Defined

TOD focuses compact growth within an easy walk of transit stations, bringing potential riders closer to transit facilities, and promotes increased ridership by making riding transit that much easier. TOD can be defined as:

> *Moderate to higher density compact mixed-use development, located within an easy five to ten minute (approximately 400m to 800m) walk of a major transit stop. TOD involves high quality urban development with a mix of residential, employment and shopping opportunities, designed in a pedestrian oriented manner without excluding the automobile. TOD can be new construction or redevelopment of one or more buildings whose design and orientation facilitate the use of convenient and sustainable modes of transportation, including public transit and Active Transportation.*

A successful TOD will reinforce both the community and the transit system. Creating a mix of uses within a TOD or easily accessible from a TOD promotes activity around the clock. This in turn promotes the most efficient use of the transit system: travel in both directions, throughout the day. TODs produce a variety of other benefits by encouraging walkable compact and infill development.

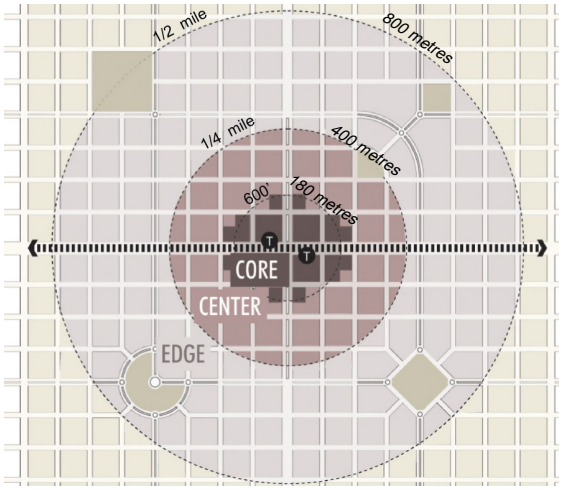
TOD presents a lifestyle option for citizens, and is another means of promoting Complete Communities. In general, people living and working in TODs walk more, use transit more and own fewer cars than the rest of the larger community. TOD households are twice as likely to not own a car, and own roughly half as many cars as the "average" household. At an individual transit station, TOD can increase ridership by 20 to 40 percent, and up to five percent overall at the regional level. People who live in a TOD are five times more likely to commute by transit than other residents.[2]

What Type of Transit Supports TOD?

Locating the right land uses adjacent to transit is only part of making a successful TOD. The ease of riding transit is also an important component. Important attributes that transit service must possess to support TOD include:

- Frequent service (every 10 minutes or less during peak periods, every 20 minutes or less during off-peak periods).
- Service throughout the day, every day of the week.
- High quality transit stops or stations that provide enhanced waiting amenities for passengers.
- The transit station can function as a major stop for through transit service and/or as a transit centre for several transit routes that terminate at the TOD.

The type of transit that serves the TOD is less important than the service it provides. Service can be provided by on-street mainline routes on an adjacent Transit Quality Corridor, by Bus Rapid Transit (BRT), or Light Rail Transit (LRT).



Highest Density at the Station
The immediate area around the station (core area) should generally contain the greatest intensity and mix of uses.

2.B. Scale of TOD

TOD is the area within the first 400 to 800 metres (1/4 to 1/2 mile) of transit stations – it is not one project, but a compilation of projects. Individually, each project may serve one primary function but as a whole, they create a place. Not all TODs function the same and not all are of the same size. The size of the TOD is dependent on the general scale or intensity of development appropriate for that station based on the function of the station and the accessibility of the TOD from the adjacent neighbourhoods. The table below illustrates potential types of TODs that can be located along high quality transit routes.

More detail, as well as best practice examples and questions to consider when determining the appropriate size and location of a TOD are included in Chapter 4.

TOD Zones:

TOD TYPE	Urban Centre	Urban Neighbourhood	Town Centre	Neighbourhood Medium Density	Neighbourhood Low Density	High Frequency Transit Corridor
Land Use Mix	Office Centre Urban Entertainment Multiple Family Retail	Residential Retail Class B Commercial	Office Centre Urban Entertainment Multiple Family Retail	Residential Neighourhood Retail Local Office	Residential Neighourhood Retail	Office Centre Urban Entertainment Multiple Family Retail
Net Housing Density*	124-371 units per hectare (50-150 units per acre)	99-247 units per hectare (40-100 units per acre)	86-247 units per hectare (35-100 units per acre)	49-124 units per hectare (20-50 units per acre)	25-49 units per hectare (10-20 units per acre)	62-148 units per hectare (25-60 units per acre)
Regional Connectivity	High, Hub of regional system	Medium access to downtown, Sub regional hub	High access to downtown, Sub regional hub	Medium access to suburban centre, Access to downtown	Low	High access to downtown, Sub regional hub
Frequencies	5 - 15 minutes	5 - 15 minutes	5 - 15 minutes	15 - 30 minutes	20 - 30 minutes	5 - 15 minutes

* Net densities, ie. the buildable area after the street right-of-way has been subtracted.

2.C. Benefits of TOD

Experience from other cities in North American has demonstrated that implementing TOD can have significant benefits to individuals, communities and regions. Coordinated investment in transportation and land use projects promotes many aspects of Complete Communities and improves the quality of life for citizens by: offering and supporting a variety of lifestyle choices; providing opportunities for people of all ages and abilities to live, work, shop, learn and play in close proximity to one another; reducing the need for travel and creating shorter journeys; providing easier and safer access to jobs, schools and services; supporting more efficient use of the land and existing infrastructure; and maintaining the environmental benefits of compact development. The extent to which this progress is made depends largely on the type and quality of transit service available as well as the primary characteristics of the TOD.

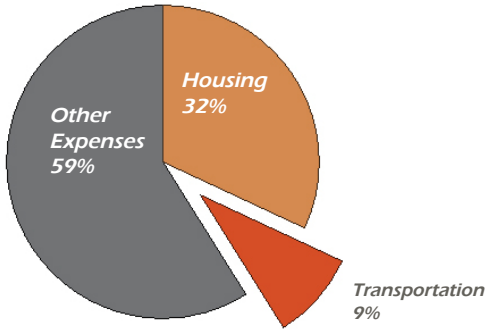
Best practices in North America have identified the following benefits from TOD at the personal, community and regional levels:

Personal Benefits

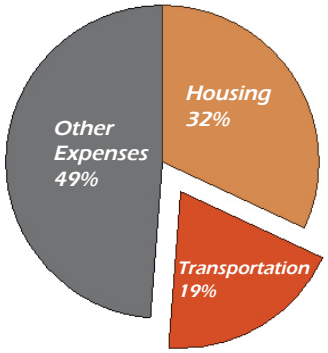
- **Increased mobility choices.** By creating "activity nodes" linked by transit, TOD provides much needed mobility options, including options for young people, the elderly and people who do not own cars or prefer not to use a car for the trip.

- **Increased disposable household income.** Housing and transportation are the first and second largest household expenses, respectively. TOD can effectively increase disposable income by reducing the need for more than one car and reducing driving costs. Research from the US shows that residents in transit rich neighbourhoods spend 16% less on transportation than those living in exurban neighbourhoods according to a recent study by the Center for Transit-Oriented Development.[3]

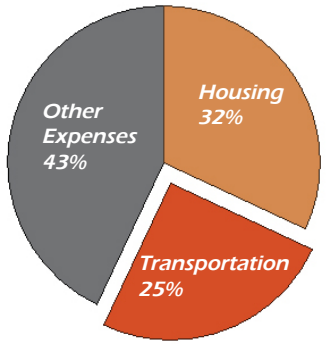
- **Increased health benefits.** TOD promotes a healthy lifestyle by making it convenient to walk and by providing the infrastructure that supports walking and biking. According to recent studies, people who live in neighbourhoods within an easy walk of shops and businesses are seven per cent less likely to be obese.[4]



Transit Rich Neighbourhood



Average US Family



Exurban Neighbourhood

Transit Rich Neighbourhoods allows for 16% more savings.

In each year since 2005 Emerging Trends in Real Estate rated TOD as the top real estate prospect for the future. They noted mixed-use, high quality urban environments appreciate faster in up-markets and hold their value in down-markets.

Community Benefits

- **Increased public safety.** By creating active places that are busy through the day and evening and providing "eyes on the street," TOD can help increase safety for pedestrians, transit users, and many others.
- **Part of a balanced approach to accommodating growth.** TOD directs higher density development to appropriate areas near transit stations, thereby reducing pressure to build higher density development within existing mature neighbourhoods.
- **A component of compact, sustainable urban form.** TOD often uses infill, greyfield and brownfield sites to redevelop and intensify existing urban areas. Because TOD consumes less land, farmland and open space can be protected.
- **Enhanced local economic development.** TOD is increasingly used as a tool to help revitalize neighbourhood main streets and mature neighbourhoods, and to enhance tax revenues.
- **Sustainable Infrastructure.** Depending on local circumstances, TOD can help reduce new infrastructure costs (such as for water, sanitary sewer, and roads) to local governments and property owners by up to 25 percent through more compact and infill development. While upfront infrastructure improvements may be necessary to support additional density, other improvements to extend services to the urban fringe may not be needed, reducing infrastructure cost over time.[5]
- **Increased land values.** Locations next to transit can enjoy increases in land values by as much as 50 percent in comparison to locations away from transit stops. During the 2008-2009 economic downturn, neighbourhoods closer to city centres have held their value unlike suburban areas which have lost value. Consumer preference will continue to be for mixed-use infill TOD around high quality transit.[6]

Regional Benefits

- **Increased transit ridership.** TOD provides transportation options, 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.[7]

- **Reduced rates of vehicle kilometres traveled (VKT).** Vehicle travel has been increasing faster than population growth in many jurisdictions. TOD can lower annual household rates of driving by 20-40 percent for those living, working and/or shopping within transit station areas.[8]

- **Reduced air pollution and energy consumption rates.** By providing safe and easy pedestrian and cyclist access to transit, TOD can lower rates of air pollution and energy consumption. TOD can also reduce rates of greenhouse gas emissions by 2.27 to 3.35 tonnes (2.5 to 3.7 tons) per year per household.[9]

- **Greater affordable options for housing.** TOD can add to the supply of housing that is considered affordable by providing lower-cost and accessible housing, and by reducing household transportation expenditures. In 2008, households could have saved an average of $9,499 US if they used transit instead of driving.[10]

- **Greater housing choice.** As the Baby Boomer generation moves to the empty-nest phase of life and the traditional nuclear family shrinks as a percent of all households, the demand for smaller homes has increased. TOD promotes a variety of housing types, providing increased housing choice and opportunities for people to age in place.[11]



Is Cold Weather a Barrier to TOD?

The short answer is no - TOD always needs to adapt to climate. Examples abound in many climates: in the rain (Portland and Vancouver BC); in the heat (Miami and Phoenix); or in the snow (Chicago and Ottawa).

The design of TOD requires land uses to be in close proximity to each other increasing the feasibility of using transit. In Calgary, a recent study found that the walking distances to transit increase in the winter, likely due to people wanting to avoid the messy and potentially dangerous roads caused by snow and ice.[12]

Whether it be rain, snow or heat, the climate in a particular location must be considered in the design of TOD. Places with extreme weather often have more weather-protected connections from the transit station to adjoining land uses to allow people to stay indoors. They also provide transit shelters that protect people from the elements.

2.D. Making TOD Work

Although the benefits of TOD are great, many communities experience challenges the first time they try to implement TOD. Winnipeg will likely experience challenges similar to those experienced by other communities. Being aware of the typical challenges to successful TOD implementation can inform collaborative discussions and assist Winnipeg to frame a pro-active strategy for implementation that addresses the potential challenges before they become road blocks.

Typical challenges faced by cities implementing TOD for the first time fall into three broad categories:

1. **Communal Lack of Experience with TOD.** As with any new venture, those without first-hand experience tend to proceed with caution when it comes to developing TOD. In most places, the elected officials, city staff, developers and local constituents follow the same learning curve to understand the benefits of TOD and how to make it successful. Each group must support and encourage each other and understand each others' concerns through the process of making TOD a reality. One of the key factors in implementing TOD is seeing the "big picture", how each transit station and TOD is unique and different than the others, and how each TOD should complement, and not compete, with each other. Creating station area plans also help to keep the "big picture" in focus by clearly identifying the function, purpose, and vision for each transit station area. Keeping the big picture in perspective is important to address "NIMBY" (Not in My Backyard) sentiments. In order to overcome the challenge of a communal lack of experience, educating elected officials, city staff, developers, and local constituents as to the benefits of TOD and how it can improve the quality of life has proven to be a successful approach in other communities.

2. **Regulatory Constraints.** Throughout North America, existing local zoning by-laws and urban design standards tend to touch on the characteristics that support TOD, but do not go far enough to fully allow and encourage densities and pedestrian-orientated design that supports transit and walkable places. For example, land use policies and zoning regulations often do not address the presence of transit, tend to favour low-density, auto-oriented uses, and use terms such as "may" instead of "shall." An analysis of existing policy and planning efforts to determine how they can support or hinder TOD type development can help define the local government action plan and strategy for TOD implementation.

In addition to by-law and policy language, it is important that city policies and plans related to long-term infrastructure and land use, transportation, and parks plans be consistant and coordinated to facilitate the implementation of TOD. A lack of integration and coordination of these planning & infrastructure efforts may potentially increase the cost of development and may be a challenge to successfully implementing TOD.

3. **Market Constraints.** TODs throughout North America have historically performed well in the marketplace. Where absorption rates are more moderate, however, some cities are noticing that they may only be able to absorb one or two projects at a time and care must be taken to avoid a flood of the market. Another challenge to developing TOD is the availability of developable land along the key transit corridors or around transit stations. Land may not be available due to the fragmentation of land holdings or may be currently underutilized by older, less intense land uses. For example, the ability to develop land may be hindered if there are multiple land owners of small parcels that require development agreements or the purchase of land in order to secure a large enough parcel to make development financially viable.

   Greyfield sites, such as older commercial areas, are developed sites that are underutilized and may be ripe for major redevelopment. Greyfield development may be the key parcel in a TOD and should be redeveloped first, which may or may not coincide with the most financially feasible time to redevelop. A market analysis and leadership at the political level is critical to creating a strategy and partnerships that facilitates TOD redevelopment in a manner that is supported by the market.



2.E. Locating Transit Stations

To work well, transit facilities and surrounding development must be designed with an eye to each other. Unfortunately conventional transit design can separate transit from the community it is intended to serve. Simply having transit and development adjacent to each other is not enough. For transit facilities, they should be designed to be welcoming to the public and be well connected with the surrounding community. This transit facility design perspective is often referred to as Development-Oriented Transit (DOT).

Well planned and designed transit facilities can be instrumental in positively shaping a community's future. They can set the stage by being a catalyst for implementing the community's vision and creating economic value. Fitting transit into the community sometimes may require breaking the mold of generally accepted transit design. A DOT design perspective seeks to enhance transit system operation, passenger requirements, community fit and future development opportunities. It assumes that it is possible to meet user requirements and maintain cost-effective service while capturing synergies with station areas that exhibit TOD potential, encouraging environmentally friendly practices, and creating lively community spaces to visit and not just travel through.

For information on the city's planned transit & transportation system, see the **Sustainable Transportation Direction Strategy**, and **Transportation Master Plan**.

Proper station location is critical to the success of ridership. Visibility, access, and way-finding helps transit users get to and from desired destinations.





Characteristics of Development Oriented Transit

- **Visible to transit riders.** Transit patrons need to be able to see where they are going. A clear line of sight to the station from adjacent streets and land uses allows transit patrons an easy way to orient themselves and recognize where they are. Landmarks, vistas, and focal points are key visual orientation devices; they can be used to show the way, emphasize the hierarchy of space, or welcome transit patrons to the station entrance. The station canopy provides an excellent opportunity to exploit as a landmark.

- **Accessibility between station and destination.** The relationship between existing community elements (buildings, streets, sidewalks) and the new transit infrastructure should be assessed as part of the design process to determine if a linked series of spaces, visual cues, and available routes make it easy to access the station. Direct, attractive connections designed according to universally accessible design standards – without barriers or dead ends – should be provided.

- **Connected to allow system transfers.** Transit patrons will need to be able to conveniently transfer between different modes of transportation. Clear, direct routes for pedestrians are essential, but bus facilities should not overwhelm or dominate station areas since a high quality pedestrian experience is also an essential urban design objective.

- **Active uses that promote ridership.** A range of uses, conveniently located close to the station entrance, will promote activity within the station area. Higher intensity development (such as office and/or residential towers), with active ground floor uses (such as shops and/or restaurants), sensitively clustered within a short walk of station entries will assist in promoting transit ridership and the creation of “18 hour places”.





3. Principles

3.A. Core Principles of TOD

Planning and implementation of a successful TOD involves many small decisions to assure development is consistent with TOD principles. Some of the key principles needed to create a successful TOD are:

1. **Medium to high density development that is greater than the community average.**
2. **A mix of uses.**
3. **Compact, high quality pedestrian-oriented environment.**
4. **An active defined centre.**
5. **Innovative parking strategies.**
6. **Public leadership.**

The principles directly influence the land use, circulation, urban form and overall performance of a place. It is not enough for development to be near transit; it needs to be shaped by transit to be a TOD. TOD is more than an individual parcel or development project. TOD includes the entire area surrounding transit, between 400 to 800 metres (1/4 -1/2 mile) from the transit stop. Each TOD may look different and have a different function, but each successful TOD will have applied these six core principles in a manner unique to the place.

Principle #1: Medium to High Density Development Greater than the Community Average

Density matters in TOD. Density is all about scale, with the goal being to create a compact walkable district. Density within TODs raise the bar and achieve a higher net average resulting in greater ridership, both within the TOD district and within a 5 minute walk of transit.



Principle Characteristics:

- Highest densities immediately around the transit station, tapering down to transition density at the edges of the TOD following the core-centre-edge concept.
- Density at levels to support high quality transit. The general rule of thumb is that doubling density equates to a 60 percent increase in transit trips.
    - 15 - 17 dwelling units per hectare [du/ha] (6-7 dwelling units per acre [du/ac]) on net average for a street bus line
    - 22 - 62 du/ha (9-25 du/ac) on net average for rapid transit
- Site design for major projects should allow for intensification of densities over time.
- Minimum density should be a high percentage of the density maximum (e.g. minimum density is 80% of maximum density).
- Retail and office uses located closest to the transit station.

Rosslyn-Ballston Corridor Case Study



Arlington County, Virginia

Statistics

Site Size: 518 hectares (1280 acres)

Land uses: 5 Metro stations with over 1.9 million sq. m. (21 million sq. ft.) of office, retail, and commercial space; more than 3,000 hotel rooms; and almost 25,000 residences

Transit Elements: rail, buses

The Rosslyn-Ballston Corridor is arguably the best TOD success story in the United States. Located directly across the Potomac River from Washington, D.C., Arlington County has become an increasingly popular place to live, work, and shop due in part to high-density development along the Rosslyn-Ballston corridor. Before development began, Arlington County adopted a General Land Use Plan to concentrate dense, mixed-use development. More detailed sector plans which specify land use and zoning as well as urban design, transportation, and open space guidelines for the area 400 metres (¼ mile) from each of the five stations in the corridor, ensure a distinct sense of community at each station.

In addition to the county-wide and station-area plans, specific enabling zoning by-law language regarding density and setback configurations, circulation systems, and zoning classifications were changed. Developments that complied with these classifications could proceed through an expedited review process. The ability of complying developers to create TODs as-of-right was particularly important, for it meant that they could line up capital, secure loans, incur up-front costs, and phase in construction without the fear of local government “changing its mind.”

Today, the roughly two square-mile Rosslyn-Ballston Corridor has mixed-use, infill development focused at five Metro stations, and density tapers down to residential neighbourhoods. As of 2004, the corridor had over 1.9 million sq. m. (21 million sq. ft.) of office, retail, and commercial space; more than 3,000 hotel rooms; and almost 25,000 residences, creating vibrant “urban villages” where people live, shop, work, and play using transit, pedestrian walkways, bicycles, or cars. The stations along the corridor have captured 26% of the residents and 37% of the jobs on just 8% of the County’s land area. The station area boasts one of the highest percentages of transit use in the Washington D.C. region with 39% of residents commuting to work on transit.

Key Points:

- Planning followed the text book - TOD plans were done early, providing clear direction and incentives.
- The corridor is well located, lying just across the river from Washington D.C.
- There was a well orchestrated collaboration between the political leaders and neighbourhoods.

Principle #2: A Mix of Uses

Creating a mix of land uses provides diversity and variety, encouraging people to walk to meet their needs regardless of how they arrive at the TOD. The key is to locate the various compatible uses close together, making them easily accessible to each other in order to improve walkability



Principle Characteristics:

- "Active" first floor uses oriented to serve pedestrians along key street edges.
- A mix of uses including residential, commercial, service, employment, and public uses.
- Vertical and horizontal mixed-use.
- Land uses that emphasize pedestrians and de-emphasize motorists within 400 metres (1/4 mile) of transit.
- Discourage the introduction of new auto-oriented uses nearest to transit.
- A mix of uses consistent with the character, needs, opportunities, and constraints of the area.

Ottawa Case Study



City of Ottawa Website

Ottawa, Ontario

Key Site Statistics

Site Size: 31km corridor. TOD Stations include Tunney's Pasture, Westboro, Mackenzie King, Laurier and Campus

Land Uses: Primary employment centres, regional shopping centres

Transit elements: Bus Rapid Transit

Ottawa's 31 km bus rapid transit route is one of the world's most effective bus transit systems. A key to its success is the decision to treat the stations as significant, substantial "places." The city's official plan and the transportation master plan include policies that regulate transit-supportive land uses, such as locating mixed-use centres at rapid transit stations so the city is able to impose requirements on TOD by imposing requirements on mixed-use centres.

More than one quarter of the 28 transitway stations are physically integrated with adjacent development creating a place. The most significant example is at St. Laurent Shopping Centre, where the owners donated the land (in return for relief on parking requirements) and a bi-level station, linked directly to the mall, was created. Approximately 30 percent of St. Laurent patrons now come by bus.

The transitway has been one of the key components of making public transit an important part of everyday life in Ottawa. Enclosed walkways and heated shelters meant that to transfer between buses in February no longer risked being a bitter, uncomfortable ordeal. Ottawa's transitway benefited from provincial funding; without the 75 percent contribution to capital cost from Ontario it never would have been built.

The integration of stations with adjacent land use and the provision of innovative services to take advantage of the facility has meant that:

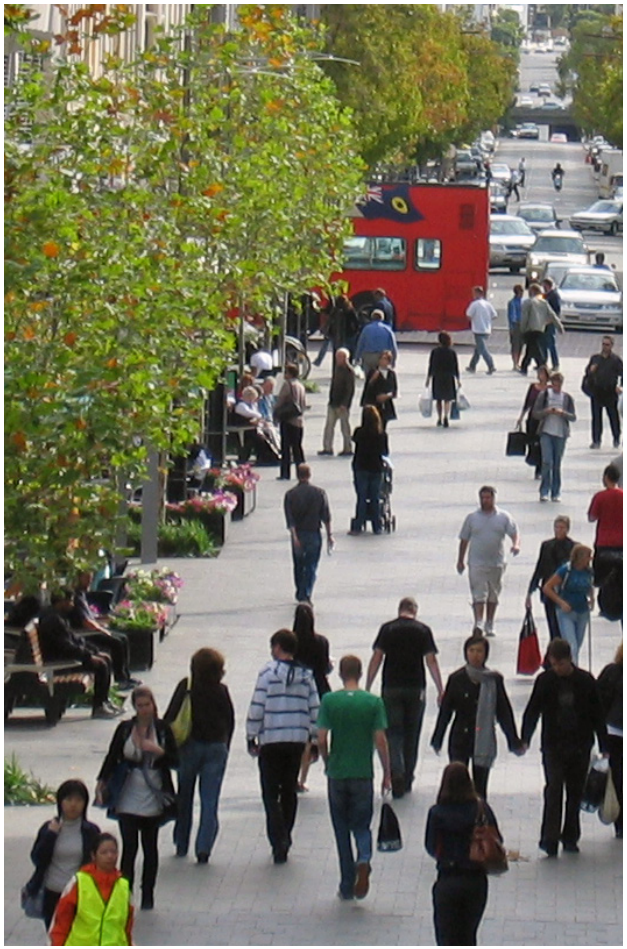
- more than 50 percent of all people entering downtown do so by bus.
- the suburban St. Laurent Shopping Centre features a remarkable 30 percent transit mode share for shoppers.
- 3,200 residential units and 440,000 sq. m. of institutional and commercial space was built near transitway stations in the eight years prior to 1996.
- bus is the fastest mode available between the airport and downtown.

Key Points:

- Ongoing commitment to an Official Plan that emphasizes transit as well as the important land-use/transportation interaction.
- The ease of using the system and the comfort provided by the amenities at the stations are key factors in achieving high transit ridership during cold weather.
- Province-city partnership to secure funding facilitated implementation.

Principle #3: Compact, High Quality Pedestrian Oriented Environment

Vibrant communities, with or without transit, are convenient and comfortable places for pedestrians. Subtle factors, focused on a pleasant environment for the pedestrian, encourage people to walk. Streets can be “calmed” by reducing traffic speeds to make them inviting for walking.



Principle Characteristics:

- Blocks sized for a 5-minute walk. A suggested maximum of 122 metres (400 feet), or a circumference of 488 metres (1,600 feet).
- Entrances oriented to be easily accessible from the public sidewalk.
- Interconnected multi-modal streets and pedestrian paths connecting to the street system.
- Streets designed to calm traffic.
- Centrally located, secure and convenient bicycle parking.
- Wide sidewalks. The more dense the development, the wider the sidewalk. In residential neighbourhoods, the suggested width should be 3 - 3.75 metres, from the face of curb to back of sidewalk (10 - 12 feet). Mixed-use main streets should be 4.25 -5.5 metres (14-18 feet). High density urban centres should be 5 – 7 metres (16 - 24 feet).
- Lanes, as appropriate, for dedicated service and delivery access point for commercial businesses.
- Street trees to soften the urban environment by blending natural features with built features.
- Pedestrian-scale lighting to enhance visibility and safety.
- High quality architectural design and detail conveying a sense of place and relating to the street and the pedestrian environment, including active first floor storefront with windows, awnings, architectural features, lighting and landscaping.

Eastside Village Case Study



Plano, Texas

Key Site Statistics

Site Size: 1.5 hectares (3.6 acres) site

TOD zoning: base zoning of 56 du/ha (40 du/ac), developer initiated planning process resulting in a density increase to 140 du/ha (100 du/ac)

Land uses: 234 residential units, 1,400 sq. m. (15,000 sq. ft.) of retail, 5-storey 351-space structure,
and 47 surface spaces

Transit elements: LRT station, 4 bus lines

Helping anchor the rebirth of downtown Plano, Eastside Village is a $17.7 million (US) high-density mixed-use project fronting directly onto Dallas Area Rapid Transit's (DART) light rail station plaza. The 1.5 hectares (3.6-acres) 22,750 sq. m. (245,000 sq. ft.) project features 234 apartment units and 1,400 sq. m. (15,000 sq. ft.) of ground floor retail. The three and four storey building wraps around 3-sides of a 5-storey 351 space parking structure.

Eastside Village was the first major step to achieve the City's vision to "Transform downtown into a compact, mixed-use, urban centre consistent with the principles of new urbanism and transit oriented design to enhance the community's quality of life and provide a model for sustainable development within a maturing suburban city."

The City of Plano provided the leadership to make the project happen. They advocated for the station location, saw opportunity to marry development with the DART LRT platform, assembled the site, offered it for development, leased the land to Amicus Partners, paid for public infrastructure and streetscape improvements, increased the allowable density from 56 to 140 du/ha (40 to 100 du/ac), and waived fees.

Key Points:

- A strong and effective partnership between the city and the developer delivered the project.
- The City displayed a willingness to support increased density to enable the project to be financially feasible.

Principle #4: An Active Defined Centre

Transit is particularly successful in communities and neighbourhoods that have defined centres, creating an 18-hour place by offering multiple attractions and reasons for pedestrians to frequent the area throughout the day and evening. Having a dense mix of uses near transit is important to creating a centre, but it must also have a sense of place and community so that people choose to gather there.



Principle Characteristics:

- A sense of vitality, a ‘people place’ with a compact urban form that is oriented toward walking and a mix of uses.
- Responsive to the fundamentals of market supply and demand (i.e., provide the products and services that are desired and needed in the local community).
- Highest density of buildings nearest the transit station, following the core-centre-edge concept.
- Different locations within a centre with different functions, such as residential, retail, employment, civic, cultural and recreation.
- Employment uses closest to the transit station. For every 30 metres (100 feet) from the station, the share of office workers using transit drops by about one percent.
- Buildings are typically taller than the surrounding area, oriented close to the street with window displays and main entrances.

Bloomington Central Case Study



Bloomington, Minnesota

Key Site Statistics

Site Size: 17.4 hectares (43 acres)

Land Uses: 1,100 housing units, 9,000 jobs, 350 room hotel, 185,800 sq. m. (2 m. sq. ft.) office, 0.6 hectare (1.59 acre) park.

Transit elements: light rail, park and ride, bus

Located south of the Minneapolis-St. Paul International Airport, the Bloomington Central Station Area is a destination station with the ten hotels, the Mall of America, a new IKEA store, Health Partners headquarters and restaurants, offices and other uses in the area not to mention the Minnesota Valley National Wildlife Refuge.

The TOD surrounding the station is currently going through a massive redevelopment and expansion. Much of the redevelopment is occurring on land that is underutilized as surface parking. The first phase of redevelopment includes two 17-storey condominium towers and underground parking. Phase II includes: 830 for-sale townhome and condominium units at a density of 126 du/ha (90 du/ac); a Central Park between the station and a new hotel; an extensive system of pedestrian trails and walkways.

The redevelopment will provide better connectivity and a mix of uses to support the light rail investment and should generate substantial transit ridership. The housing units will be within a walk of the transit station, reducing the need for an automobile. In response to the high density, the Central Park will create a plaza and a gathering place that ties the various uses together and provides visual relief from the towers.

Key Points:

- TOD resulted from adaptive reuse of existing office complex to create a mixed-use town centre.
- TOD is strategically located near airport, Mall of America, light rail station and open space.
- The underground parking and 0.6 hectares (1.59 acres) park adjacent to the station creates a quality public realm.

Principle #5: Innovative Parking Strategies

Parking to reflect the impact of transit is one of the most challenging aspects of any TOD. By creating a more managed parking supply, and moving parking from surface parking lots to on-street parking and parking structures, residents, shoppers and employees are encouraged to use transit to get to the TOD and walk within the TOD. Parking in a TOD should consider four fundamental components: size, location, design and management.



Principle Characteristics:

- Parking provided on an area basis (i.e., shared uses) rather than building by building.
- Reduced parking requirements through zoning by-laws, such as parking maximums.
- Parking facilities located behind buildings, in parking structures with ground floor retail, and screened from adjacent land uses.
- On-street parking on all streets except limited access arterials.
- Parking design integrated with the development to relate to the streetscape and circulation routes.
- Paid parking or time-limited free parking.

Ohlone-Chynoweth Case Study



San Jose, California

Key Site Statistics

Site Size: 2.9 hectares (7.3 acres) site

TOD zoning: Planned Unit Development with project specific zoning, required 2 spaces per unit

Land uses: 18,300 sq. m. (197,000 sq. ft.) with 195 units, 400 sq. m. (4,400 sq. ft.) retail

Transit elements: LRT station, 3 bus routes, 240 space park-and-ride

Located on Guadalupe light rail transit line in San Jose, Ohlone-Chynoweth Commons is a medium density mixed-use TOD. The project's housing, retail and community facilities were developed on an under-used light rail park-and-ride lot. For this project, Valley Transportation Authority (VTA) issued a request for proposal seeking a developer for the 2.9 hectare (7.3 acre) site. The former 1,100-space park-and-ride now includes: 240 park-and-ride spaces, 195 units of affordable housing, 400 sq. m. (4,400 sq. ft.) of retail and a day care centre.

At 38 du/ha (27 du/ac), the residential density of Ohlone-Chynoweth Commons is relatively high compared to the predominantly single family neighbourhood surrounding it.

Ohlone-Chynoweth is a rare example of where a park and ride has been converted to TOD without replacement of the commuter parking in structures or on another site. The developer, Eden Housing has a 75 year lease for the site from VTA. Ohlone-Chynoweth Commons provides affordable housing for families earning between 30% and 60% of the area median income in a community where an average market-rate two bedroom apartment is renting for as much as $1,600 (US) a month. The City has aggressively sought to locate housing next to transit. Since 1990 over 20,000 units of housing have been built or approved next to transit in San Jose.

Key Points:

- There was a lack of institutional knowledge on how to develop TOD that made implementation difficult.
- The orientation of retail spaces toward transit rather than the street resulted in problematic sites.
- An expedited review process helped to advance the project, but did not overcome homeowner concerns about traffic and density.

Principle #6: Public Leadership

Historically, TOD revitalization supports the strategy that the public sector must take the primary leadership role and the initiative before the private sector is willing to commit time and money. Public leadership is needed as a station area is being developed, as well as throughout the life span of the station area. A collaborative and enabling orientation, and use of new and innovative tools to complement and enhance planning efforts are important for successful implementation.



Principle Characteristics:

- "Political will" aligned with the TOD objectives.
- New and modified policies and by-law language to achieve the TOD goals.
- Continued collaborative relationships with developers to encourage and facilitate TOD.
- Corridor strategies to identify priorities, and linkages between station areas & surrounding context.
- Station area plans and improvements incorporated into the City's capital improvements budget.
- Necessary staff and capital resources dedicated to carry out implementation.
- Commitment to innovative development, a flexible approach, and removal of challenges to development.

Downtown Arlington Heights Case Study



City of Arlington Heights

Arlington Heights, Illinois

Key Site Statistics

Site Size: 55 blocks

Land Uses: 1,500 residential units, 14,500 sq. m. (157,000 sq. ft.) retail, performing arts facility and 2,180 parking spaces.

Transit elements: Commuter rail

The village of Arlington Heights, west of Chicago, on Metra's Union Pacific Northwest Line, has seized upon TOD as an integral component of the city's award-winning strategy to revitalize its historic downtown. The village has created a virtually new town centre that includes a new Metra station, a performing arts centre, high-density housing, commercial uses, and public parking decks. In 1980, 350 residents lived in the downtown in 150 units. By 2000, the numbers had jumped to 2,200 residents and 1,500 units. Since 1997, public investment of $27 million (US) has leveraged some $225 million (US) in private investment.

Critical to downtown redevelopment was the $4.7-million (US) construction and relocation of a Metra station in 2000. By moving the station one block west and the platforms two blocks west, rail transit is closer to the downtown core, and a large gap between the north and south sides of the tracks has been filled. The relocated site has substantially improved north/south access to the station, made all the more attractive by the addition of parks and public art next to the rail platform. The village-owned station itself is abuzz with activity, with a McDonalds restaurant, a bakery cafe, and a Gateway Newsstand. Funds for the station refurbishment were provided by six agencies, including Metra, Illinois Department of Transportation (IDOT), and the village (which used Tax Increment Financing funds). This project received a distinction award from the Chicago Metropolitan Agency for Planning (CMAP) for Central Business District (CBD) train-station design.

Key Points:

- There was a community vision to remake the suburban town as an urban place by focusing on TOD.
- Factors for success included the clear vision, a willingness to commit public resources, and strong and consistent leadership.

Fruitvale Transit Village Case Study



Oakland, California

Key Site Statistics

Site Size: 2.39 hectares (5.9 acres)

Land Uses: 47 housing units, 10,600 sq m (114,000 sq ft) of community service and office space, 3,700 sq m (40,000 sq ft) of retail, 150 space car park garage.

Transit elements: BART rail, 500-space car park structure, local and regional bus lines

In 1991, when Bay Area Rapid Transit (BART) proposed a new parking structure at the Fruitvale Transit Station where an existing surface parking lot stood, the community rebelled and opted to create its own plan. Although neighbourhood residents recognized the need for parking, they disagreed with the location and design of the structure. The residents wanted a place that would link the local economy to transit, thereby increasing pedestrian and bicycle traffic and revitalizing the neighbourhood.

With the leadership of an active community group called the Unity Council, the community created an alternative plan for the site that created a mixed-use village with local retail shops, a community centre, library, housing, and new structured parking. BART accepted the idea and decided to work with the community to construct their vision.

Today, Fruitvale Transit Village is a 2.39 hectares (5.9 acres) transit village with an active, retail-lined pedestrian connector between the BART station and the neighbourhood's primary retail artery. There are 47 mixed-income housing units, 10,600 sq. m. (114,000 sq. ft.) of community service and office space, and 3,700 sq. m. (40,000 sq. ft.) of retail.

The project was designed by and for the neighbourhood surrounding the station. As a result, there are several social service facilities including a health clinic, library, senior centre, and child development centre. Of the 47 rental units in the Village, 10 are designated affordable. In addition, a block or two off the Village, there is a 68-unit senior housing project and a planned 500 unit facility in phase II of the Village plan. Phase II includes constructing 500-600 housing units on BART's surface parking lots and the two blocks adjacent to Fruitvale Transit Village.

Key Points:

- Implementation was hampered by the complexity of the project.
- The placement of the transit facilities away from the TOD did not result in the hoped for synergy between the two.
- The project has helped revitalize the community.



"Most people do not feel comfortable walking in a wide-open area with busy traffic passing closely by. Pedestrians are drawn to streets and paths with a feeling of intimacy and enclosure. This feeling can be created by locating buildings close to the sidewalk, by lining the street with trees, and by buffering the sidewalk with planting strips or parked cars. People on foot enjoy small details, such as displays in shop windows, street level lighting, and signs, and public art and displays."

– Creating Transit Station Communities in the Central Puget Sound Region – A Transit-Oriented Development Workbook



4. Implementing TOD

Successful implementation of TOD projects in Winnipeg will result from strong collaboration between public and private stakeholders. Implementing TOD is similar to any other long-range planning project: it starts with a vision and requires clear direction and tools for implementation. It also takes time – TODs are not developed overnight and involve careful planning and discussion. This Handbook provides a starting point for conversations to encourage and enable TOD as a building block to support the building of complete communities that accommodate growth and change in a sustainable way.

While there are many implementation strategies that can be applied to move TOD forward in Winnipeg, five overarching strategies have been identified for further discussion:

- **Considerations for Locating TOD**
- **TOD Station Area Plans**
- **TOD Assessment Tool**
- **Implementation Toolbox**
- **Typologies**

30 percent of current housing demand is for dense, walkable, mixed-use communities -- less than 2% of housing is in this category. [13]

4.A. Considerations for Locating TOD

When determining the most appropriate location for a new walkable community that supports transit, the size of the TOD as well as the specific location need to be considered. The following list is intended to provide questions for thought when considering the placement of new walkable communities within 400 to 800 metres of the transit station:

- ☐ What is the function of the station in relation to the other stations on the transit line (i.e., is it a Central Business District, end-of-line station, etc.)?
- ☐ How does that function support the increased density and a walkable community?
- ☐ What land uses, beyond the proposed station area, exist to support the higher density mix of uses?
- ☐ Does a higher density mix of uses complement or compete with other land uses within walking distance?
- ☐ Are there key opportunities for redevelopment around the proposed station?
- ☐ What is the market for increased development in the area?
- ☐ Does the existing street network support a walkable community?
- ☐ Are there major physical barriers that hinder access to and within the area, including to and from the proposed transit station?

TOD housing generates 50% less traffic than conventional housing (3.55 daily auto trips per unit versus 6.67)[14]

4.B. Station Area Plans

A Station Area Plan can provide the vision and guidance for building a walkable community. It should be created early in the planning process and set a clear vision, with guidelines, roles and responsibilities for implementation. The elements of the Station Area Plan should include:

- ☐ Community vision.
- ☐ Land use, including mix and intensity.
- ☐ Transportation, including circulation and parking.
- ☐ Urban parks and open spaces.
- ☐ Urban design, including guidelines.
- ☐ By-law amendments to support the Station Area Plan.
- ☐ Implementation strategy, including roles and responsibilities for implementation.

4.C. TOD Assessment Tool

When reviewing a potential project within a TOD, it should be assessed against the TOD Station Area Plan to ensure consistency. The following tool is intended to guide communities in reviewing proposed projects, and as a basis for constructive dialogue.

Within an easy walk of a major transit stop [e.g., 400 to 800 metres (1/4 -1/2 mile)], consider the following:

Land Use

- ☐ Are key sites designated for “transit-friendly” uses and densities (walkable, mixed-use, not dominated by activities with significant automobile use) ?
- ☐ Are “transit-friendly” land uses permitted outright, not requiring special approval?
- ☐ Are higher densities allowed near transit?
- ☐ Are multiple compatible uses permitted within buildings near transit?
- ☐ Are the first floor uses “active” and pedestrian-oriented?
- ☐ Is a mix of uses generating pedestrian traffic concentrated within walking distance of transit?
- ☐ Are auto-oriented uses discouraged near transit?
- ☐ Is it prezoned for TOD?





Site & Building Design

- ☐ Are buildings and primary entrances sited and oriented to be easily accessible from the street?
- ☐ Do the designs of buildings and the spaces around them allow direct pedestrian movement between transit, mixed land uses, and surrounding areas?
- ☐ Does the site's design allow for the intensification of densities over time?
- ☐ Do buildings incorporate architectural features that convey a sense of place and relate to the street and the pedestrian environment?
- ☐ Are amenities, such as storefront windows, awnings, architectural features, lighting, seating, and landscaping, provided to help create a comfortable pedestrian environment along and between buildings?
- ☐ Are there sidewalks along the site frontage? Do they connect to sidewalks and streets on adjacent and nearby properties?
- ☐ Are there trees sheltering streets and sidewalks? Pedestrian-scale lighting? Places for people to sit and mingle?
- ☐ Are buildings and parks used to provide a focal point or anchor the area?

Street Patterns & Parking

- ☐ Are parking requirements reduced in close proximity to transit, compared to the norm?
- ☐ In high density areas, is structured parking encouraged over surface parking?
- ☐ Is the parking located to the rear or to the side of the buildings?
- ☐ Is secure and convenient bicycle parking available?
- ☐ Are street patterns based on an interconnected system that simplifies access for all modes?
- ☐ Are pedestrian routes buffered from fast-moving traffic and parking areas?
- ☐ Is some short-term parking allowed in front of street-fronting retail?

4.D. Implementation Toolbox

Implementation of TOD in Winnipeg will be supported by new and innovative tools, created as part of **OurWinnipeg** and **Complete Communities Direction Strategy.** These tools, which will be further detailed through the development of an "Implementation Toolbox" will include some proven existing planning and sustainability tools but also include new and innovate tools such as partnerships and demonstration projects. Examples include:

Planning

- This includes a variety of planning tools, ranging from statutory plans with their own localized policies guiding an area's growth, to non-statutory concept plans also able to guide an area's growth. The TOD Handbook itself is an example of a planning tool.
- In the future, the development of a Planning Handbook that guides the selective use of the wide array of available planning tools will support and enable TOD in Winnipeg.

Capital Budget/Infrastructure Alignment

- Alignment of capital budget forecasts with growth-related infrastructure requirements to further expedite planned development and provide more certainty for private investment

Incentive Tools

- Incentive tools (non-fiscal and fiscal) where there is a supportive economic argument

Leadership, Partnership, and Sponsorship

- Community partnerships and sponsorships to increase capacity toward common, mutually beneficial objectives

Demonstration Projects

- Identification of and support to development projects that demonstrate the policies and objectives of Complete Communities

TOD households are twice as likely not to own a car as comparable households.[15]



4.E. Typologies

Built Environment

Not every TOD is the same. The TOD principles and tools are applied in different ways depending on the function and form of the land uses and transportation network. Typologies can add definition to the type of TOD that is appropriate. The following six typologies apply a different scale and mix of uses, ranging from high densities with a significant mix of uses to low density, predominately residential uses and corridor development.

- Urban Centre. Urban centres have the highest density and greatest mix of uses within a TOD, located nearest the transit station.
- Urban Neighbourhood. The next ring of development, urban neighbourhoods have the same land uses as the urban centre, but at a slightly lower density.
- Town Centre – High Density. High Density Town Centres serve as a transition between the higher density urban centres and neighbourhoods and the lower density, primarily residential uses. These are generally aligned with the Regional and Community Mixed Use Centres, and Major Redevelopment Sites identified in the **Complete Communities Direction Strategy.**
- Neighbourhood– Medium Density. Primarily residential, with some neighbourhood serving retail and local office uses, medium density suburban development scales down the density in a TOD to begin the transition to the adjacent, non-TOD land uses.

- Neighbourhood – Low Density. The low density neighbourhood land use type provides a transition to the adjacent non-TOD land uses. The residential and neighbourhood retail land uses are likely the same as those located outside the TOD.

- High Frequency Transit Corridor. The high frequency transit corridor has supporting land uses that are linear in nature rather than extending out from the core. The highest density is located along the corridor, and density is scaled back in the blocks behind the corridor. These are generally located along Regional Mixed Use Corridors and Winnipeg Transit's designated Transit Quality Corridors as identified in the **Sustainable Transportation Direction Strategy** and the **Transportation Master Plan.**

The following pages present the application of the specific built environment. Design and character details vary for each TOD typology.

TOD Zones:

TOD TYPE	Urban Centre	Urban Neighbourhood	Town Centre	Neighbourhood Medium Density	Neighbourhood Low Density	High Frequency Transit Corridor
Land Use Mix	Office Centre Urban Entertainment Multiple Family Retail	Residential Retail Class B Commercial	Office Centre Urban Entertainment Multiple Family Retail	Residential Neighourhood Retail Local Office	Residential Neighourhood Retail	Office Centre Urban Entertainment Multiple Family Retail
Net Housing Density*	124-371 units per hectare (50-150 units per acre)	99-247 units per hectare (40-100 units per acre)	86-247 units per hectare (35-100 units per acre)	49-124 units per hectare (20-50 units per acre)	25-49 units per hectare (10-20 units per acre)	62-148 units per hectare (25-60 units per acre)
Regional Connectivity	High, Hub of regional system	Medium access to downtown, Sub regional hub	High access to downtown, Sub regional hub	Medium access to suburban centre, Access to downtown	Low	High access to downtown, Sub regional hub
Frequencies	5 - 15 minutes	5 - 15 minutes	5 - 15 minutes	15 - 30 minutes	20 - 30 minutes	5 - 15 minutes

* Net densities, ie. the buildable area after the street right-of-way has been subtracted.

Urban Centre

Density

124 - 371 units per net hectare (50 -150 units per net acre) enabled by:
Height: 4 - 30 storey buildings.
Site Coverage: 90% min. - 100% max.

Pedestrian Environment

5 -7 metres (14 -18 feet) wide sidewalks (typ.), convenient connections, and other amenities.

Land Use Mix

Employment: Office centre, retail, commercial, urban entertainment, and civic/cultural uses. Regional-oriented, destination-retail opportunity; need for local-serving and community serving retail.

Residential: Mixed-use, multi-family housing with ground floor retail or office use required. High to Mid-rise residential with minimum ground floor height of 4.8 metres (16').

Transit Frequency

5- 15 minutes.

1 High density: Distinctively designed high density buildings near station serve as identifying features, and contribute to the quality of the city skyline.

2 A mix of uses: Horizontal and vertical mix of uses that include office or residential above retail spaces with continuous facades that align to the build-to-line.





4 Active defined centre: Taller buildings extend above streetwall (i.e. buildings that frame pedestrian zone), but do not impede the comfortable pedestrian scale it defines.

5 Innovative parking strategies: Structured parking integrated into development. Parking ratio minimums based on proximity to station.



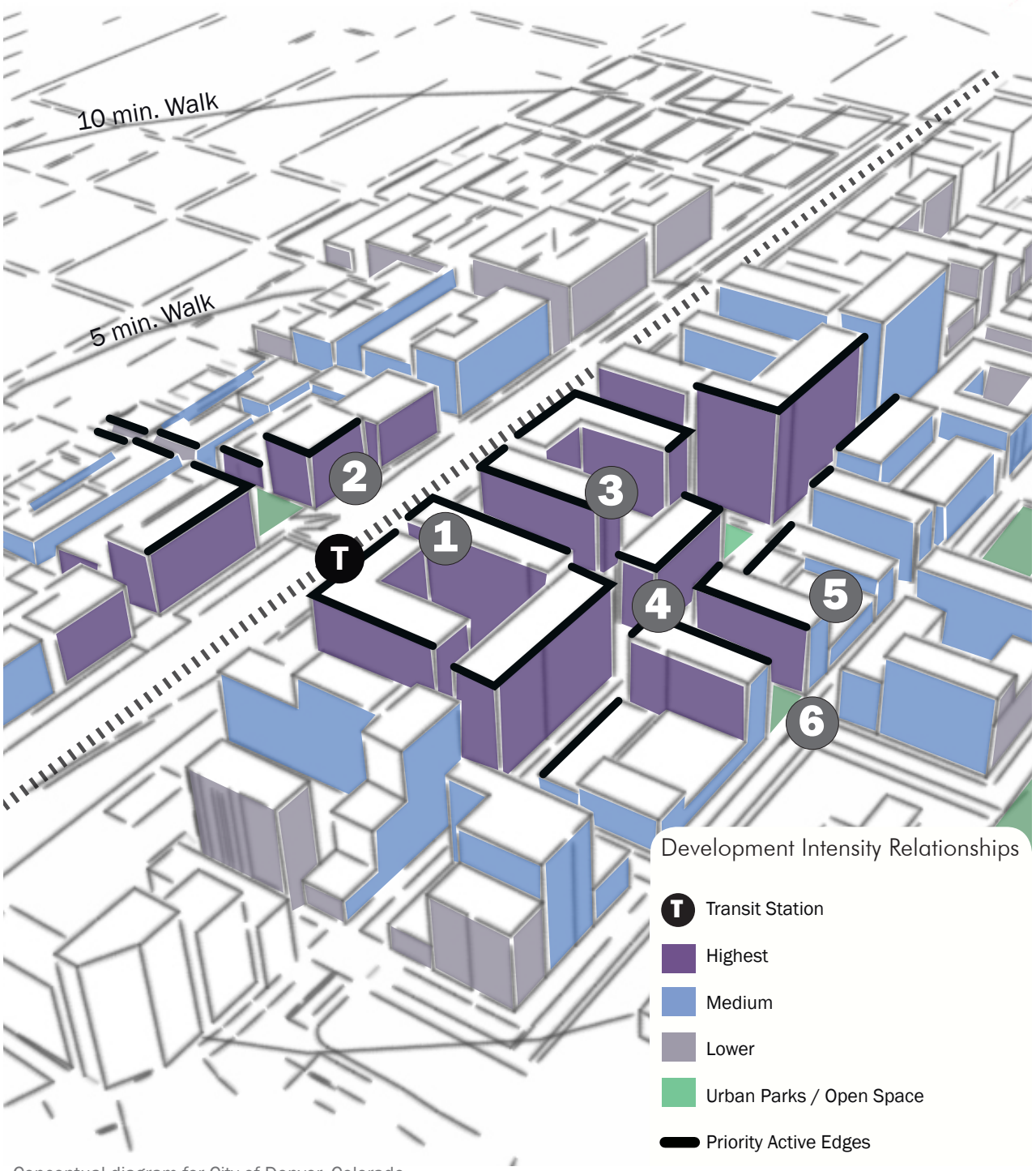


3 Compact, high quality, pedestrian-oriented environment: Highly active and clear pedestrian paths are defined by street amenities and transparency of building frontages.



6 Urban parks and open space: Programmed environments with pedestrian amenities that encourage community interaction and gathering places for large groups.





Conceptual diagram for City of Denver, Colorado

Urban Neighbourhood

Density

99 - 247 units per net hectare (40 - 100 units per net acre) enabled by:
Height: 3 - 12 storey buildings
Site Coverage: 80% min.- 90% max.

Pedestrian Environment

4.25 - 5.5 metres (14 - 18 feet) wide sidewalks (typ.), convenient connections, and other amenities.

Land Use Mix

Employment: Office centre, retail, commercial, and urban entertainment. Primarily local-serving retail; need for some community-serving retail.

Residential: Mid-rise residential, condos, ground-related units, and mixed-use structures, with ground floor retail or office use required. Minimum ground floor height of 4.8 metres (16').

Transit Frequency

5-15 minutes.

1 High density: Predominantly residential district with a diversity in housing types. Good access to other regional and subregional centres.



2 A mix of uses: Horizontal and vertical mixed-use helps create an 18 hour activity zone. Retail spaces should articulate corners to help define a comfortable pedestrian zone.



4 Active defined centre: Public amenities creates a dynamic area for a variety of users. Art installations, farmer's market and programmed events activate these spaces all year around.



5 Innovative parking strategies: On-street parking, minimum surface parking, and some structured parking integrated into development.

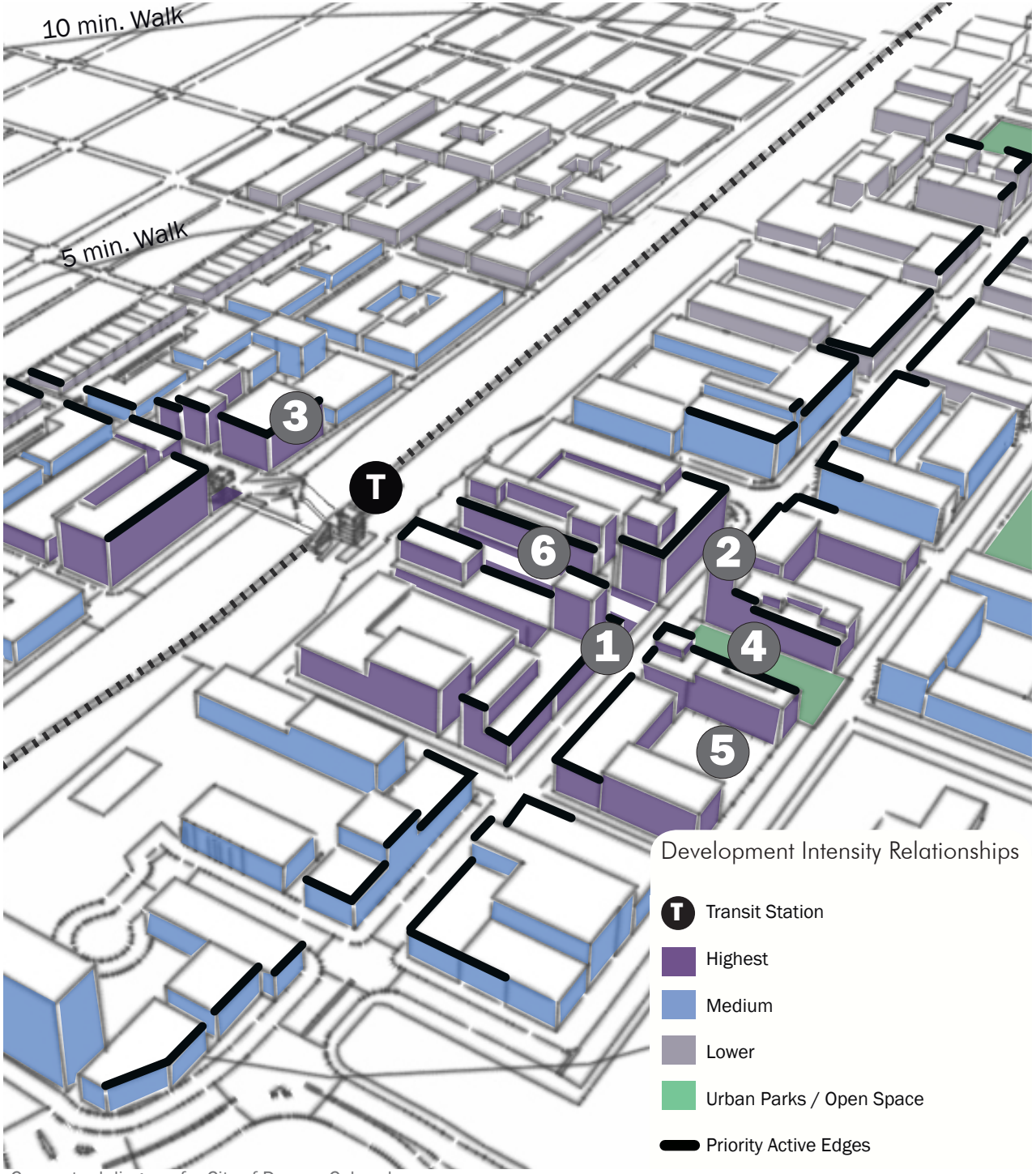


3 Compact, high quality, pedestrian-oriented environment: Pedestrian connections mid-block offer a safer pedestrian/bike circulation and create smaller walkable blocks.



6 Urban parks and open space: Landscaped areas offer visual relief in higher density neighbourhoods. Public space can be used as green infrastructure solutions.





Conceptual diagram for City of Denver, Colorado

Town Centre

Density

86 - 247 units per net hectare (35 - 100 units per net acre) enabled by:

Height: 2 - 20 storey buildings

Site Coverage: 75% min.- 85% max.

Pedestrian Environment

4.25 - 5.5 metres (14 - 18 feet) wide sidewalks (typ.), convenient connections, and other amenities.

Land Use Mix

Employment: Regional- serving destination retail opportunity; need for local-serving and community-serving retail.

Residential: Mid-rise to low density residential. Mixed-use structures with a minimum ground floor height of 4.8 metres (16'). Multi-family in some areas; with the majority being single family, duplexes, accessory dwelling units, and ground-related units.

Transit Frequency

5-15 minutes.

1 Moderate- high Density: Transition scale of density to fit into existing community. Include destination retail with housing.

2 A mix of uses: Mostly residential with local-supporting commercial and employment uses. Articulate building facades to create interest. Architecture should reflect existing environment.





4 Active defined centre: Calm streets by using a variety of paving and making the streets smaller to create a place for people that is not dominated by vehicles.

5 Innovative parking strategies: Some structured parking integrated into development, on-street parking, and surface parking. Surface parking occurs behind development.



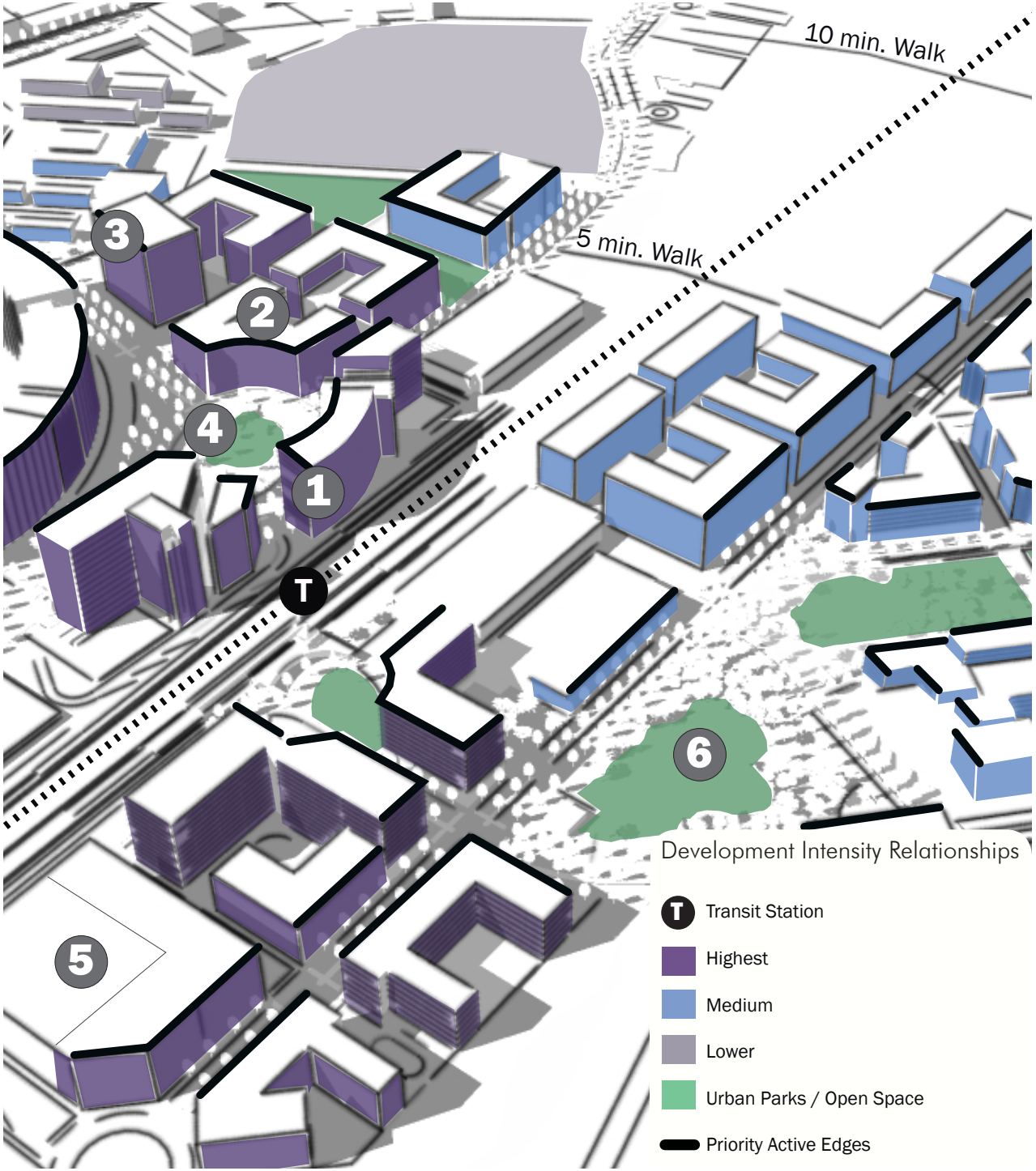


3 Compact, high quality, pedestrian-oriented environment: Amenities such as lighting, signage, and street trees frame the pedestrian zone and separate vehicular traffic.



6 Urban parks and open space: Programmed spaces for active and passive uses. May have recreation fields, town plazas, or neighbourhood parks.





Conceptual diagram for New Carolton, Prince George's County

Neighbourhood Medium Density

Density
49 - 124 units per net hectare (20 - 50 units per net acre) enabled by:
Height: 2 - 5 storey buildings.
Site coverage: 70% min.- 80% max.

Pedestrian Environment
3 - 3.75 metres (10 -12 feet) wide sidewalks (typ.), convenient connections, and other amenities.

Land Use Mix
Employment: Neighbourhood retail and local office.

Residential: Mid-rise to low density residential. Mixed-use structures with a minimum ground floor height of 3.7 metres (12'). Limited multi-family, with the majority of residential being single family, duplexes, accessory dwelling units, and ground-related units.

Transit Frequency
15 - 30 minutes.

1 Medium density: Residential district organized around transit station. Convenience retail (e.g. coffee shops, dry cleaners, etc.) located on ground floor.

2 A mix of uses: Integrate moderate density housing and supporting local-serving retail with limited vertical mixed-use.





4 Active defined centre: Active edges create a 12 hour activity zone. Central gathering space with pedestrian amenities.

5 Innovative parking strategies: On-street parking, parallel or angled. Surface parking should be placed behind development, accessed by driveway or secondary local road.



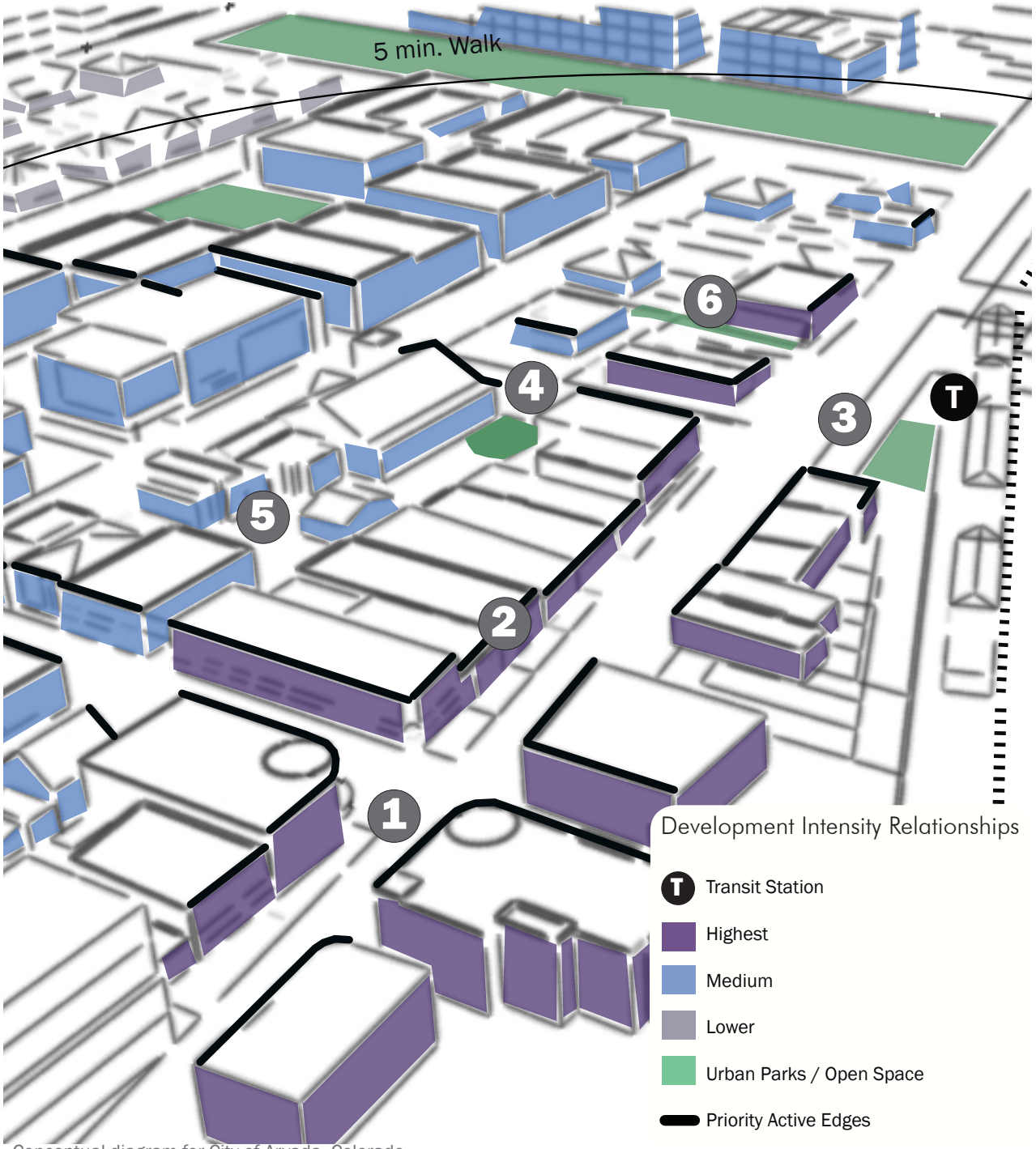


3 Compact, high quality, pedestrian-oriented environment: Use landscaping, paving and street furniture to create a comfortable pedestrian zone.



6 Urban parks and open space: Programmed spaces for active and passive uses. Spaces in between developments can be an opportunity for public or private open space.





Conceptual diagram for City of Arvada, Colorado

Neighbourhood Low Density

Density
25 - 49 units per net hectare (10 - 20 units per net acre) enabled by:
Height: 1-3 storey buildings; and
Site Coverage: 60% min.- 75% max.

Pedestrian Environment
3 - 3.75 metres (10 - 12 feet) sidewalks (typ.), convenient connections, and other amenities.

Land Use Mix
Employment: Neighbourhood retail

Residential: Single family houses duplexes, and accessory dwelling units.

Transit Frequency
20 - 30 minutes.

1 Low density: Neighbourhoods offer a variety of housing stock that are single family attached or detached, with moderate multi-family housing units.

2 A mix of uses: Primarily residential with periodic small-scale local retail uses.





4 Active defined centre: Community centres, schools, and recreation facilities help to stimulate a pro-active neighbourhood.

5 Innovative parking strategies: Angled or parallel on-street parking can help mitigate over-flow from parking in the neighbourhood. Create clear paths to and from retail and residential development.



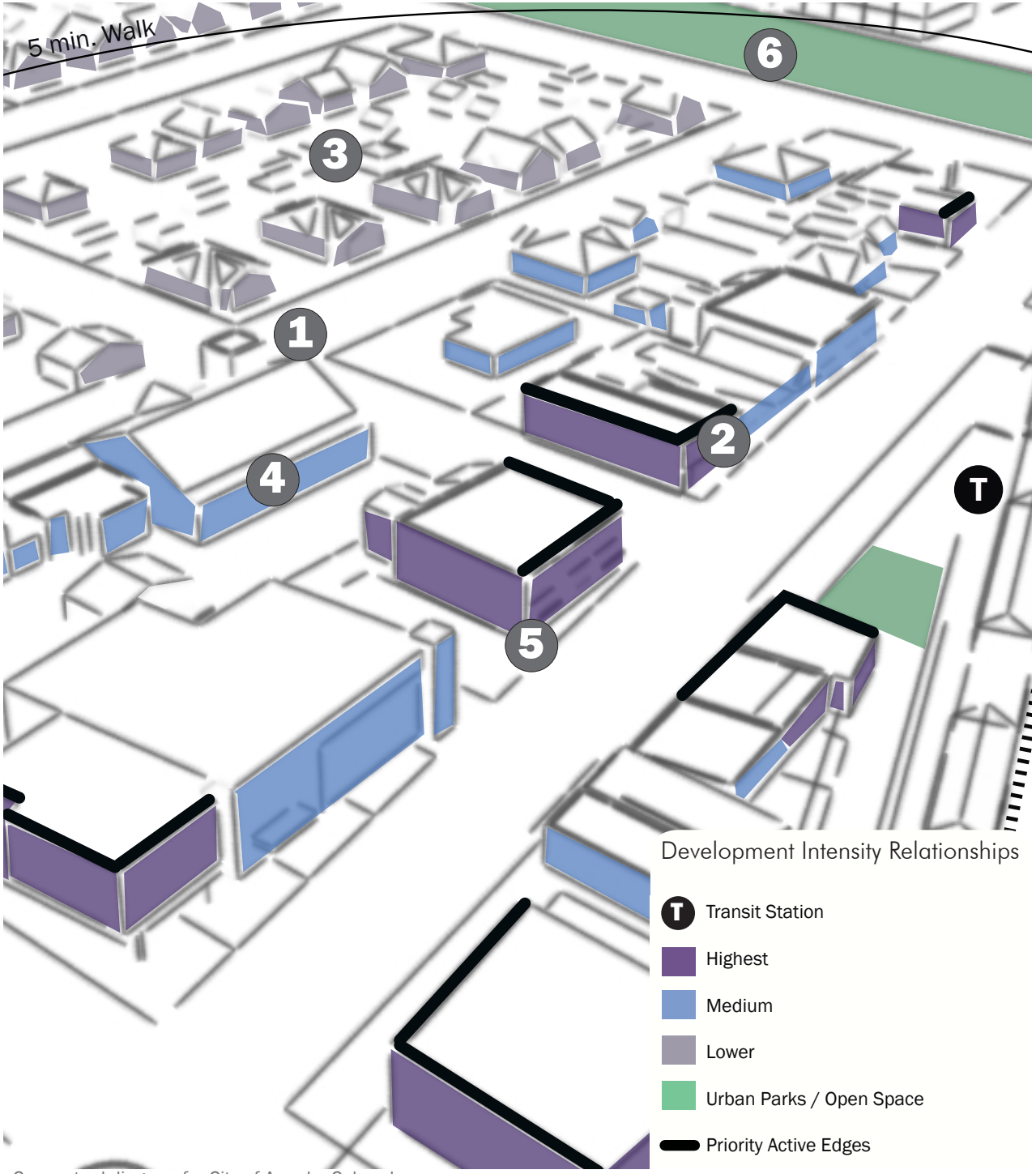


3 Compact, high quality, pedestrian-oriented environment: Lighting, paving, and secondary access from main road offer safer places for pedestrians.



6 Urban parks and open space: Larger scale public space can offer a variety of uses within a centralized location. Recreation fields, community gardens, picnic amenities, etc.





Conceptual diagram for City of Arvada, Colorado

High Frequency Transit Corridor

Density

62 - 148 units per net hectare (25 - 60 units per net acre) enabled by:
Height: 1 - 5 storey buildings.
Site coverage: 70% min.- 80% max.

Pedestrian Environment

3 - 3.75 metres (10 - 12 feet) sidewalks (typ.), convenient connections, and other amenities.

Land Use Mix

Employment: Neighbourhood retail, and local office.

Residential: Mid-rise to low density residential. Mixed-use structures with a minimum ground floor height of 3.7 metres (12'). Limited multi-family, single family, duplexes, accessory dwelling units, and ground-related units.

Transit Frequency

5-15 minutes

1 Medium density: Corridor has a local focus of economic and community activity without a distinct centre.

2 A mix of uses : Moderate density with ground floor mixed-use. Primarily local-serving retail with some opportunity for community serving retail.





4 Active defined centre: A corridor can have several centres, usually occurring near intersections with active retail frontages.

5 Innovative parking strategies: On-street parking can help delineate the pedestrian zone from high capacity transit zone. Safe pedestrian crossings are a priority.



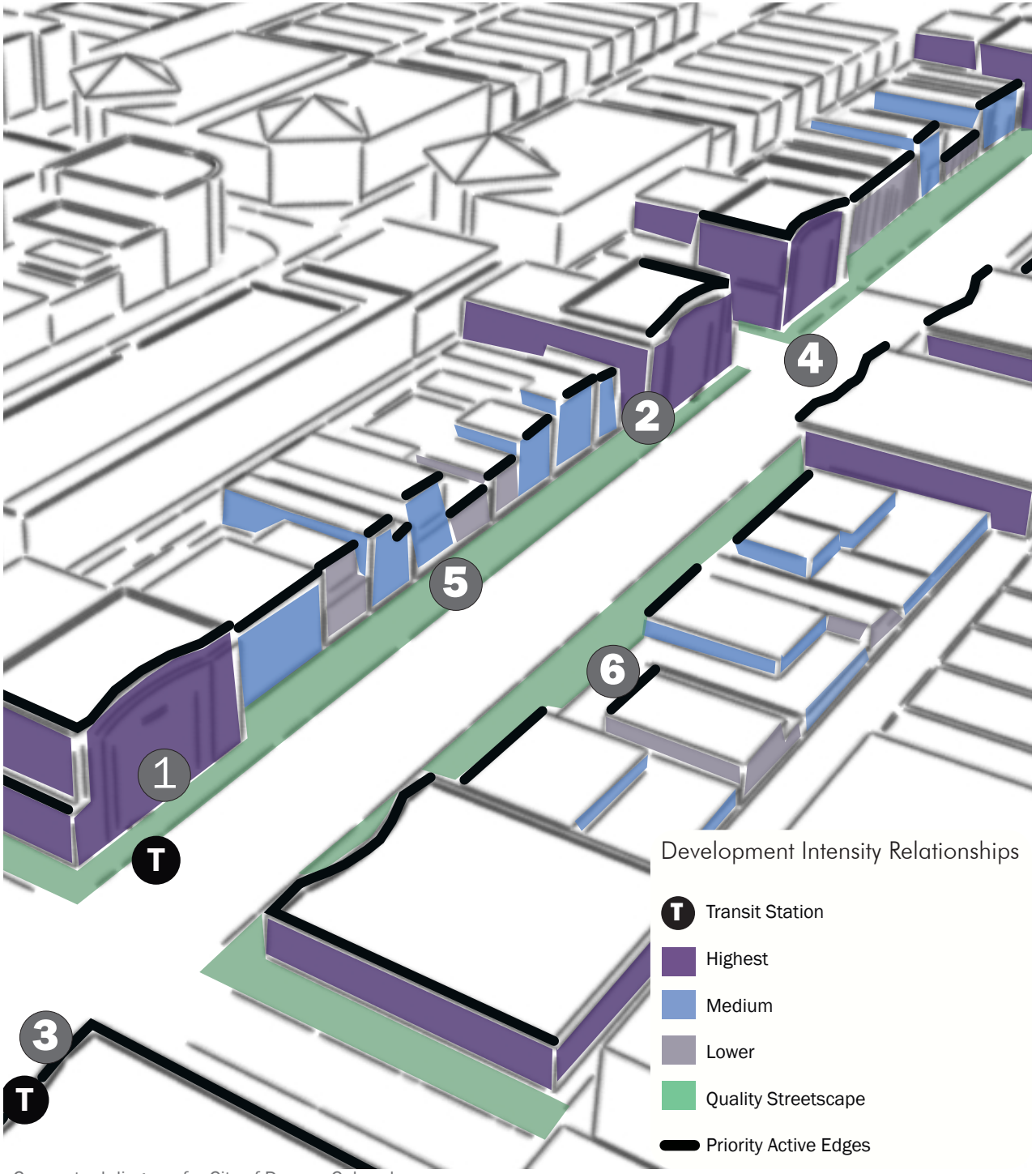


3 Compact, high quality, pedestrian-oriented environment: Clear sight lines, lighting, and pedestrian amenities are essential for comfortable transit stops.



6 Urban parks and open space: Small public spaces along the corridor are opportunities for seating, art installations, and refuge from the bustling street.





Conceptual diagram for City of Denver, Colorado



4.F. Urban Parks and Open Space

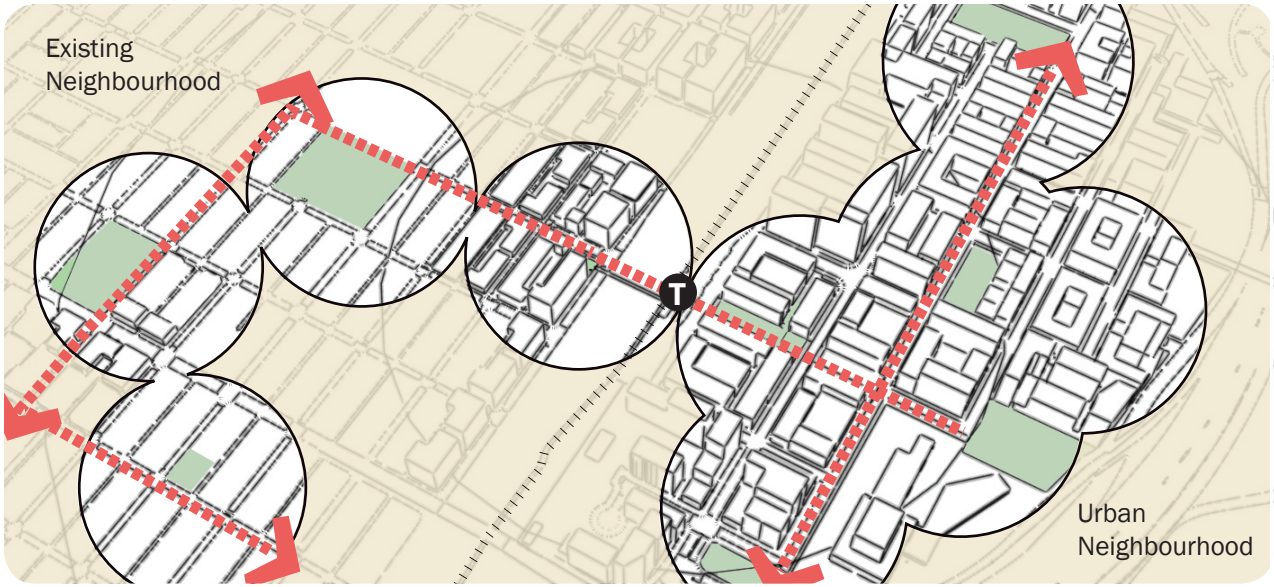
To support TOD's typically higher densities, a variety of parks and public open spaces should be integrated into walkable station areas to provide a balance between what is 'built' and what is 'green'. Park design and location should take advantage of existing vegetation and other natural resources of the area. Combined with well designed, multi-modal streets, these parks and open spaces help form a station area 'public realm' – areas that are open and accessible to all.

TOD parks and open spaces can be small in size, such as a plaza or square, and do not necessarily need to include programmed athletic facilities. A small green lawn with benches can provide a place to relax, enjoy the outdoors, or throw a Frisbee. Typically ten to fifteen percent of land within the TOD should be dedicated to parks and open space. There are four factors for park/open space location and program that should be considered:

1. Walkshed – provide parks and open spaces within a 5 minute walk of residents
2. Adjacent land uses – maximize the relationship between adjacent land uses and provide a range of formal and informal gathering places.
3. Ownership – distribute parks and open spaces throughout the TOD
4. Adjacent streets – consider parks as part of the comprehensive traffic calming approach.

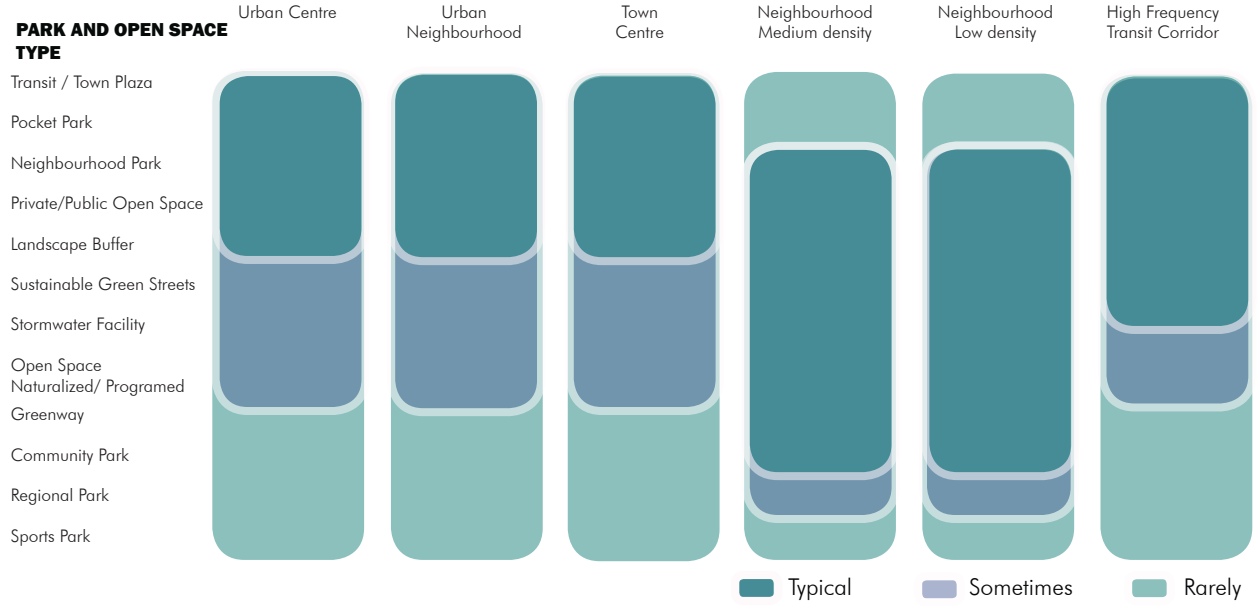
The park prototypes on the following pages provide further detail as to the different types of parks that are appropriate in a TOD.

The City is also currently developing a **Parks, Places and Open Spaces Management Plan**, as outlined in **Section 07 Parks, Places and Open Spaces** of the **Complete Communities Direction Strategy.**



Urban parks and open space within a TOD reinforce connectivity and safely brings transit users to and from the transit station and the desired destination.

Urban Parks and Open Space Zones:



Redevelopment of an area should consider a variety of scales and programs for urban parks and open space appropriate to built typology.

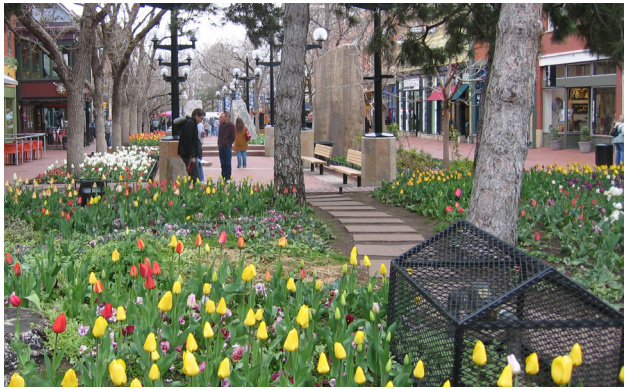
Transit/Town Plaza

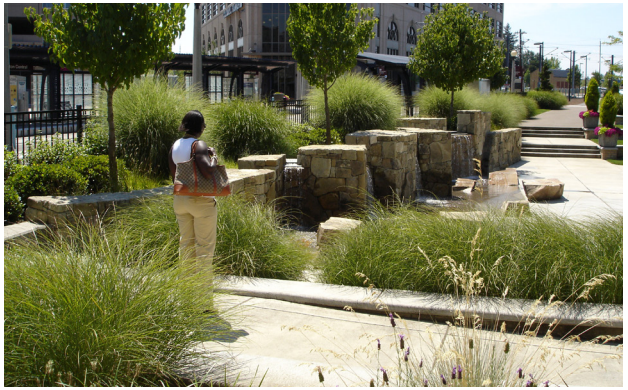


Description:

Transit /Town Plazas are public spaces set aside for civic purposes. These public spaces are often landmarks, transit station entries, and gathering places for people. They are usually located at the intersection of important streets or other significant locations. Plazas are enclosed by streets and active building frontages. These plazas are the highest quality public spaces with special attention to pedestrian amenities, accessibility, and adjacency to commercial or civic uses. They balance paving and planting, and are well lit at night.



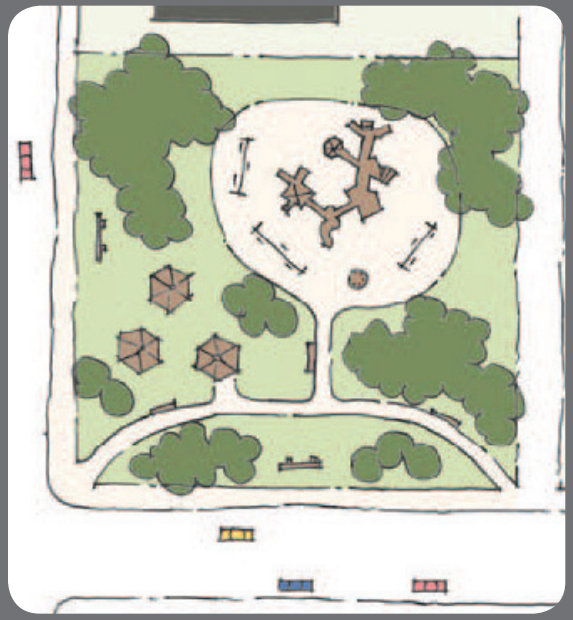




Attributes:

- Size approximately .2 - .8 hectares (.5 - 2 acres).
- Service area with a maximum 400 metre (1/4 mile) radius.
- Located in primarily urban areas with commercial and civic uses.
- Street access on at least three sides, preferably four sides.
- Not more than 50% of the site should have a slope greater than 4%.
- Takes advantage of proximity to transit.
- Signage and wayfinding should be included into plaza design.

Pocket Park



Description:
Pocket parks address limited, isolated or specialized recreational needs at small sites in heavily developed areas and at sites with unique recreational opportunities. These parks serve the immediate neighbourhood.



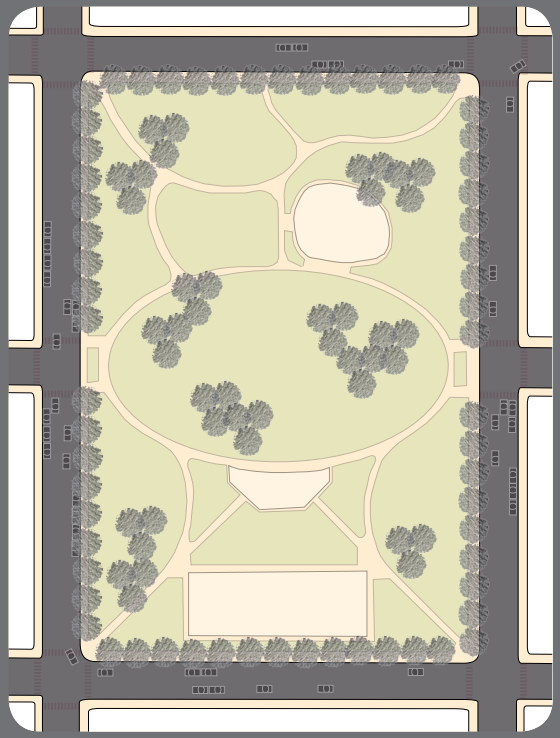




Attributes:

- Size approximately under .2 hectare (.5 acre).
- Service area with a maximum 400 - 800 metre (1/4 - 1/2 mile) radius.
- Located in primarily commercial, civic or residential areas.
- Street access on at least one side.
- Site has less than a 4% slope.

Neighbourhood Park



Description:

Naturalistic or formal landscaped public space, active, and passive recreation, play equipment, and seating. Provides neighbourhood facilities within a 5-10 minute walk of home.



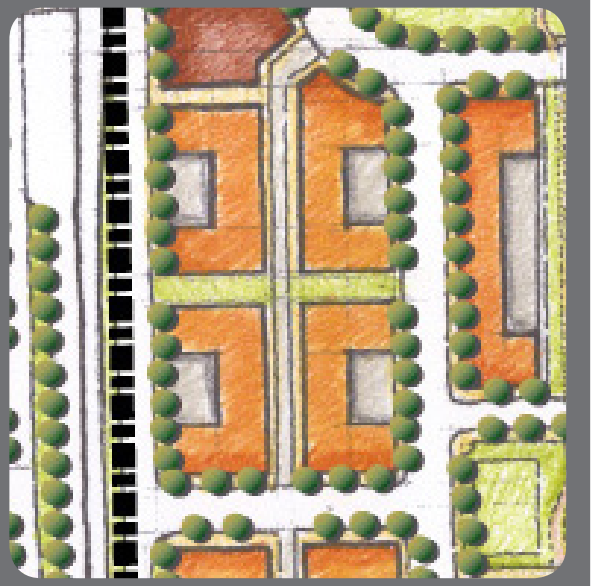




Attributes:

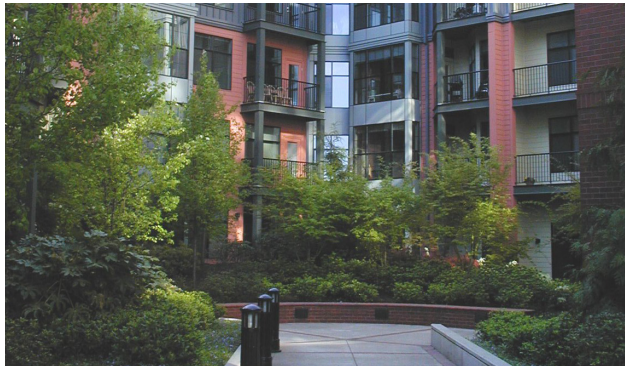
- Size approximately .2 - 4 hectares (5 - 10 acres).
- Service area with a maximum 400 - 800 metre (1/4-1/2 mile) radius.
- Surrounding land uses are variable.
- Street access on at least two sides, preferably four sides.
- Not more than 50% of the site should have a slope greater than 4%.

Private/Public Open Space



Description:
Private and open spaces that offer aesthetic relief in higher density TODs. These spaces can be internal courtyards, pedestrian ways or plazas that not only serve the occupants but the general public as well. These spaces can be maintained by the City or by the adjacent development.







Attributes:

- Size approximately under .2 hectare (.5 acre).
- Service area with a maximum 400 - 800 metre (1/4 -1/2 mile) radius.
- Located in primarily commercial, civic or residential areas.
- Street access on at least one side.
- Site has less than a 4% slope.

Landscape Buffer



Description:

Native or ornamental plantings that help buffer incompatible land uses. Lanscaped buffers contribute aesthetically , defuse noxious noise, and can address saftey concerns. Plantings should also be used to soften hard edges along parking lots, driveways, highways and railways.



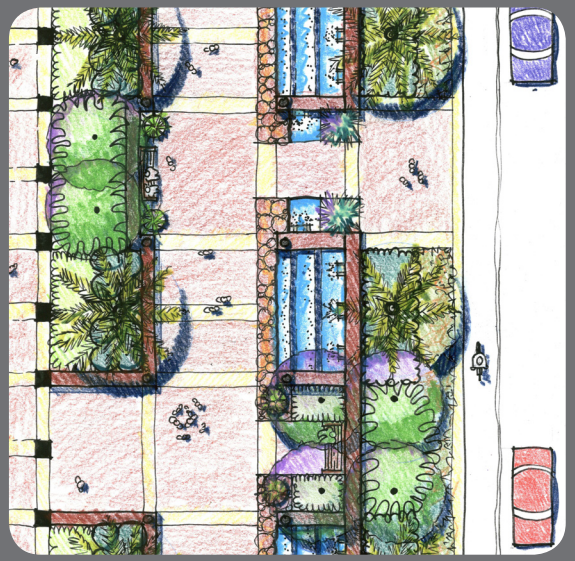




Attributes:

- Varies in size.
- Service area with a maximum 800 metre (1/2 mile) radius.
- Located near incompatible uses, barriers, and infrastucture.
- Not more than 50% of the site should have a slope greater than 4%.

Green Streets



Description:
Wide sidewalks with public amenities and pedestrian demarcation to create walkable streets connecting the transit station to the surrounding land uses. Green streets incorporate elements to improve water quality at the site specific and regional scale by adding natural filtration and vegetation to the design.







Attributes:

- Varies in size.
- Service area is generally linear and incorporated into the pedestrian network within the 800 metre (1/2 mile) radius.
- Surrounding land uses are variable.

See also the **Sustainable Water & Waste Direction Strategy.**

Stormwater Garden Facility



Description:
Natural or landscaped areas that are used to manage drainage. Can be day-lighted streams previously piped; incorporated into new development infrastructure; or used to buffer noxious uses from development.







Attributes:

- Varies in size.
- Service area with a maximum 800 metre (1/2 mile) radius.
- Surrounding land uses are variable.
- Public or limited access from adjacent uses.
- Not more than 50% of the site should have a slope greater than 4%.

See also the **Sustainable Water & Waste Direction Strategy.**

Natural Open Space/ Preserves



Description:
Natural and landscaped public space, typically passive recreation: native plantings, habitat refuge, and water retention facilities. Some low-impact recreation uses are appropriate, such as seating, biking, and walking trails or dog runs. These parks provide buffering and visual relief.



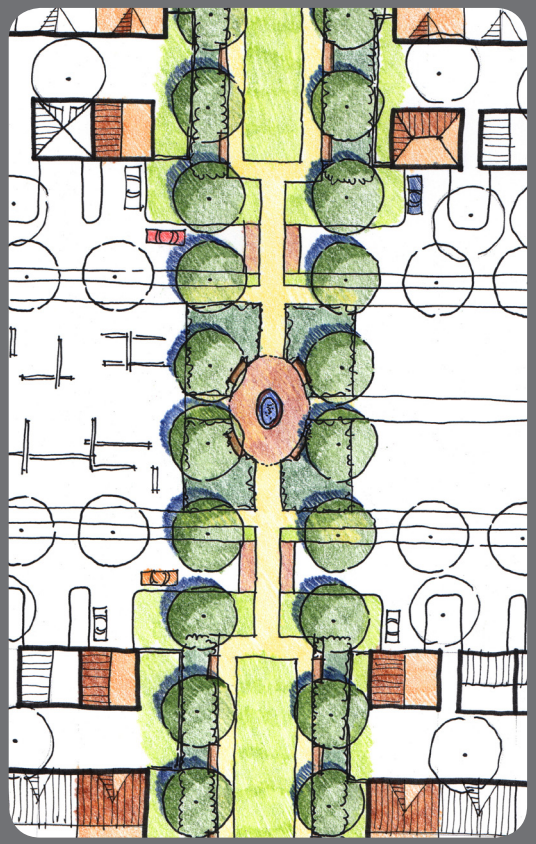




Attributes:

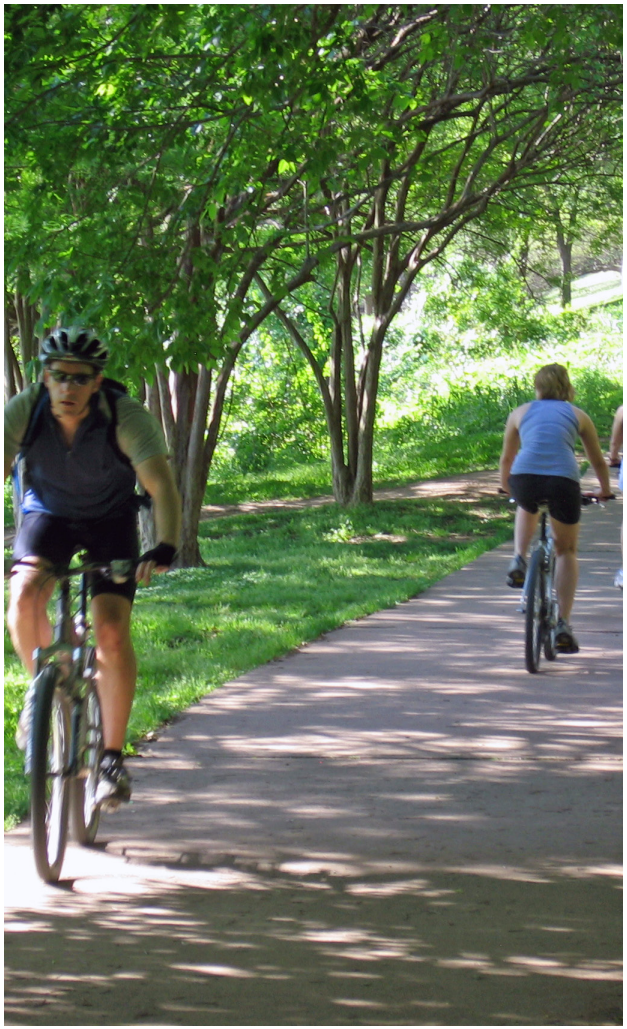
- Varies in size.
- Service area with a maximum 800 metre (1/2 mile) radius.
- Located in primarily residential areas.
- Street access on at least two sides.

Greenway



Description:
Natural or limited landscaping. Typically smaller than a neighbourhood park. Bordered at least 50% by streets or other public ways, at least 6 metres (20 feet) wide.





Attributes:

- Varies in size.
- Service area is generally linear within the 800 metre (1/2 mile) radius and links other urban parks or open space.
- Surrounding land uses are variable.
- Street access on at least two sides, preferably four sides.
- Not more than 50% of the site should have a slope greater than 4%.

Community Park



Description:
Provide for active and passive recreational needs of several neighbourhoods, allowing for group activities and other recreational opportunities not feasible or desirable at the neighbourhood park level.







Attributes:

- Size approximately 8 - 20 hectares (20 to 50 acres).
- Service area with a 800 (1/2 mile) to 4.8 km (3 mile) radius.
- Surrounding land uses are variable.
- Street access on at least two sides, preferably four sides.
- Adjacent to an arterial or collector street.

Regional Park



Description:
Large urban parks provide a city-wide recreation resource. The size and location provide a unique natural environment and contains a wide range of recreation opportunities.







Attributes:

- Size approximately 20 hectares (50 acres) to 30+ hectares (75+ acres).
- Service area is city-wide.
- Surrounding land uses are variable.
- Street access for visitors and residents may require several access points.
- Usually developed in relation to a natural water feature.

Sports Park



Description:
Provide for ball fields and active recreational needs of several neighborhoods, allowing for group activities and other recreational opportunities not feasible or desirable at the neighbourhood park level.







Attributes:

- Size approximately 16+ hectares (40+ acres).
- Service area is community and city-wide.
- Surrounding land uses are variable.
- Street access on at least two sides, preferably four sides. Adjacent to an arterial or collector street.
- Not more than 50% of the site should have a slope greater than 4%.

Endnotes

1. Livable Communities Act of 2009, Senate Bill 1619. Introduced in United States Senate, August 8, 2009.
2. Arrington, G.B., and Robert Cervero. *Effects of TOD on Housing, Parking and Travel.* Transit Cooperative Research Program Report 128, Transportation Research Board of the National Academies, Washington D.C., 2008.
3. Reconnecting America's Center for Transit-Oriented Development. *Five Years of Progress.* 2009.
4. Frank , Lawrence, Martin Andresen, and Tom Schmid. "Obesity Relationships with Community Design, Physical Activity and Time Spent in Cars," *American Journal of Preventative Medicine.* Volume 27, Issue 2, pp. 87-96.
5. Cervero, Robert, et.al. *Transit-Oriented Development in the United States: Experiences, Challenges, and Prospects.* Transit Cooperative Research Program, Report 102 Transportation Research Board of the National Academies, Washington D.C., 2004.
6. Reconnecting America's Center for Transit-Oriented Development. *TOD 101: Why Transit-Oriented Development And Why Now?* 2007.
7. Arrington.
8. Ibid.
9. Parsons Brinckerhoff. "Factors for Success in California's Transit-Oriented Development". Sacramento: California Department of Transportation, Statewide Transit-Oriented Development Study. 2002
10. Reconnecting America's Center for Transit-Oriented Development. *Five Years of Progress*
11. Myers, Dowell, and Elizabeth Gearin. "Current Preferences and Future Demand for Denser Residential Environments," *Housing Policy Debate.* Volume 12, Issue 4, pp. 633-659.
12. O'Sullivan, Sean, and John Morrall. "Walking Distances to and from Light-Rail Transit Stations," *Transportation Research Record: Journal of the Transportation Research Board, No. 1538,* Transportation Research Board of the National Academies, Washington D.C., 1996, pp. 19-26.
13. United States, Livable Communities Act of 2009.
14. Arrington.
15. Ibid.

Resources

Weblinks

http://www.reconnectingamerica.org/public/tod
Center for Transit Oriented Development

http://www.railvolution.com/
Rail~Volution resources link includes dozens of TOD PowerPoints

http://onlinepubs.trb.org/Onlinepubs/tcrp/tcrp_rpt_102.pdf TCRP 102
Transit-Oriented Development In The United States: Experiences, Challenges, and Prospects. Transit Cooperative Research Program

http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_128.pdf TCRP 128
Effects of TOD on Housing, Parking, and Travel

http://www.uli.org/ResearchAndPublications/Reports/~/media/Documents/ResearchAndPublications/Reports/TenPrinciples/TP_DevTransit.ashx
ULI 10 Principles for Development Around Transit

http://www.brookings.edu/es/urban/publications/belzertod.pdf Transit-Oriented Development: Moving From Rhetoric To Reality, Dena Belzer and Gerald Autler, Brookings Institution Center on Urban and Metropolitan Policy

Journals, Books, and Publications

Arlington County, “Development in Metro Corridors 2000,” Department of Community Planning Housing and Development, Planning Division, Arlington County, VA.

Arrington, G.B. “Light Rail and the American City: State-of-the-Practice for Transit-Oriented Development”. Washington D.C. Transportation Research Circular E-C058, 2003

Arrington, G.B., and Robert Cervero. *Effects of TOD on Housing, Parking and Travel.* Transit Cooperative Research Program Report 128, Transportation Research Board of the National Academies, Washington D.C., 2008.

Cambridge Systematics, Inc. “Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions”. Urban Land Institute. July 2009.

Cervero, Robert, et.al. *Transit-Oriented Development in the United States: Experiences, Challenges, and Prospects.* Transit Cooperative Research Program, Report 102 Transportation Research Board of the National Academies, Washington D.C., 2004.

Dittmar, Hank and Ohland, Gloria. *The New Transit Town: Best Practices in Transit-Oriented Development.* Island Press. Washington, D.C. 2004

Frank, Lawrence, Martin Andresen, and Tom Schmid. “Obesity Relationships with Community Design, Physical Activity and Time Spent in Cars,” *American Journal of Preventative Medicine.* Volume 27, Issue 2, pp. 87-96.

Livable Communities Act of 2009, Senate Bill 1619. Introduced in United States Senate, August 8, 2009.

Myers, Dowell, and Elizabeth Gearin. “Current Preferences and Future Demand for Denser Residential Environments,” *Housing Policy Debate.* Volume 12, Issue 4, pp. 633-659.

O’Sullivan, Sean, and John Morrall. “Walking Distances to and from Light-Rail Transit Stations,”_ *Transportation Research Record: Journal of the Transportation Research Board, No. 1538,*

Transportation Research Board of the National Academies, Washington D.C., 1996, pp. 19-26.

Parsons Brinckerhoff. “Factors for Success in California’s Transit-Oriented Development”. Sacramento: California Department of Transportation, Statewide Transit-Oriented Development Study. 2002

Parsons Brinckerhoff. “North Fifth Street Transit-Supportive Concept Plan”. City of North Las Vegas: Planning and Zoning Department, Transit Oriented Development Strategy. 2006

PriceWaterhouseCoopers. “Emerging Trends in Real Estate 2009” Urban Land Institute. October 2008.

Puget Sound Regional Council, Creating Transit Station Communities in the Central Puget Sound Region - A Transit-Oriented Development Workbook, June 1999.

Reconnecting America’s Center for Transit-Oriented Development. *Five Years of Progress.* 2009.

Reconnecting America’s Center for Transit-Oriented Development. *Hidden in Plain Sight: Capturing the Demand for Housing Near Transit.* September 2004.

Reconnecting America’s Center for Transit-Oriented Development. *Realizing the Potential: Expanding Housing Opportunities Near Transit.* April 2007.

Reconnecting America’s Center for Transit-Oriented Development. *TOD 101: Why Transit-Oriented Development And Why Now?* 2007.

Reconnecting America’s Center for Transit-Oriented Development. *TOD 202: Station Area Planning: How to Make Great Transit-Oriented Places.* February 2008.

Venner, Marie and Liisa Ecola. “Financing Transit-Oriented Development: Understanding and Overcoming Obstacles,” *Transportation Research Record: Journal of the Transportation Research Board, No. 1996*, Transportation Research Board of the National Academies, Washington D.C., 2007, pp. 17-24.

