



A Collection of Primary Tools



Compact Urban Development

Tool CUD 2: Transit-oriented Development (TOD).

What this tool does:

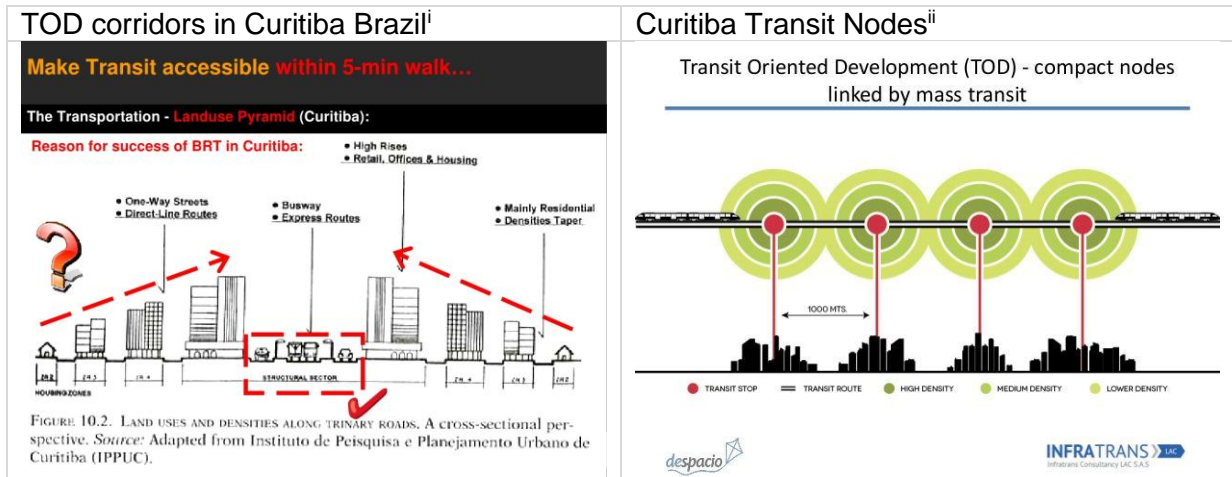
This tool provides city planners with an understanding of the density opportunities of creating urban transport nodes for real estate development. TOD has become a popular means for generating financial development gains through the creation of public transport nodes. In many TOD project these revenues have been able to finance other infrastructure components through cross-subsidies. This tool introduces selected TOD design parameters for commercial centers, urban centers, and town centers.

The benefits of Transit-Oriented Development

- Promoting higher densities and the concentration of jobs within relatively small areas, **TOD creates agglomeration effects proven to boost a city's competitiveness.** Studies have shown that doubling job density, for instance, increases economic productivity by 5 to 10%.
- This concentration creates vibrant communities with high-quality public areas and shorter commuting distances—**making cities more livable.**
- **Compact urban development and high-quality public transit also mutually reinforce each other:** mass transit can support the large passenger flows that come with high density development, while the concentration of jobs and housing around stations helps make public transport financially viable.
- Proximity to mass transit improves access to TOD neighborhoods, boosting their attractiveness and **increasing real estate value.**
- **Cities can capture a part of these increases in value and use it to finance additional transit improvements,** affordable housing, and other initiatives that promote sustainable inclusive growth. In Hong Kong SAR, land value capture brought in about HK\$140 billion in revenues between 1980 and 2005, and unlocked land for 600,000 public housing units.
- While TOD can drive up property prices and accelerate gentrification, this can be offset by allocating a significant portion of the new development to affordable housing. This type of inclusive TOD approach **enhances access to job opportunities and services for residents at all income levels.**



- By concentrating jobs, services, and housing within the catchment area of transit stations, TOD makes public transport a more attractive and efficient option, while reducing dependence on private cars and promoting shorter commutes. As a result, **TOD typically translates into higher productivity and a smaller carbon footprint**. In Stockholm, where development has generally followed the city's main public transport corridors, the gross value added per capita grew 41% between 1993 and 2010, while GHG emissions per capita decreased by 35% over the same period.



When located in areas that are less exposed to natural hazards, the TOD approach can **enhance resilience to disaster** risks by supporting high-density housing and activities in low-risk zones.”ⁱⁱⁱ

Transit-Oriented Districts^{iv}

TOD Districts and second zoning these areas are tied to its level of regional transit service. The following are the criteria for identifying TODs:

TOD Land-use Criteria: Generally mid to high density residential, commercial, office, services and retail. Low intensity uses such as manufacturing, light industrial, warehousing and a range of large institutional uses are not appropriate for TOD.

TOD Transit Criteria: Minimum of Bus Rapid Transit level trunk-line service and/or at least one metro station. It is typical that a TOD will have a regional transit line and several feeder transit systems.

TOD Distance Criteria: Land within 800 meters of a major transit stop or station. Areas further than 800 meters may be included in order to consolidate consistent land uses not isolated by major roads or open space areas.

TOD Required Density: Minimum of 300 people and jobs combined per gross hectare. The mix will vary dependent on the level of transit service.

TOD Required Circulation System: Defined as an ‘Urban Network’ or equivalent, a circulation network that distributes traffic over parallel routes, creates small human-scaled blocks; and provides generous pedestrian spaces and secure bike lanes.

TOD Boundary Criteria: Having met the other criteria, the extent of a new TOD will extend to the following boundaries: any open space or natural feature that creates a significant edge; a change in land use to a non-pedestrian orientated use; and an expressway or major arterial throughway.

Concentrating Density at Transit Stations^v

COMMERCIAL CENTER

Definition: The highest-density commercial area with mixed-use that acts as regional employment, retail and civic/ cultural hub; with a variety of high-density housing

Location Criteria: Located within 600 meters of the intersection of at least two metro transit stops or a major BRT hub

Minimum Density/Use Criteria: Employment density (Jobs/Ha gross) = 500 Population density (Pop/Ha gross) = 200

Minimum Land Allocation (Percentage): Parks: 10%

Typical massing - Commercial Center



URBAN CENTER

Definition: A high-density mixed-use district that acts as sub-regional employment, retail and civic/ cultural center; with a variety of high and mid-density housing

Location Criteria: Located within 400 meters of a regional transit station that is a hub for several local transit lines

Minimum Density/Use Criteria: Employment density (Jobs/Ha gross) = 300 Population density (Pop/Ha gross) = 200

Minimum Land Allocation (Percentage): Parks: 10%

Typical massing - Urban Center



TOWN CENTER

Definition: A high density housing area with retail, civic and open space amenities; with a mix of high and mid-rise buildings

Location Criteria: Served by a single regional transit station

Minimum Density/Use Criteria: Employment density (Jobs/Ha gross) = 50 Population density (Pop/Ha gross) = 300

Minimum Land Allocation (Percentage): Parks: 10% Civic: 5%

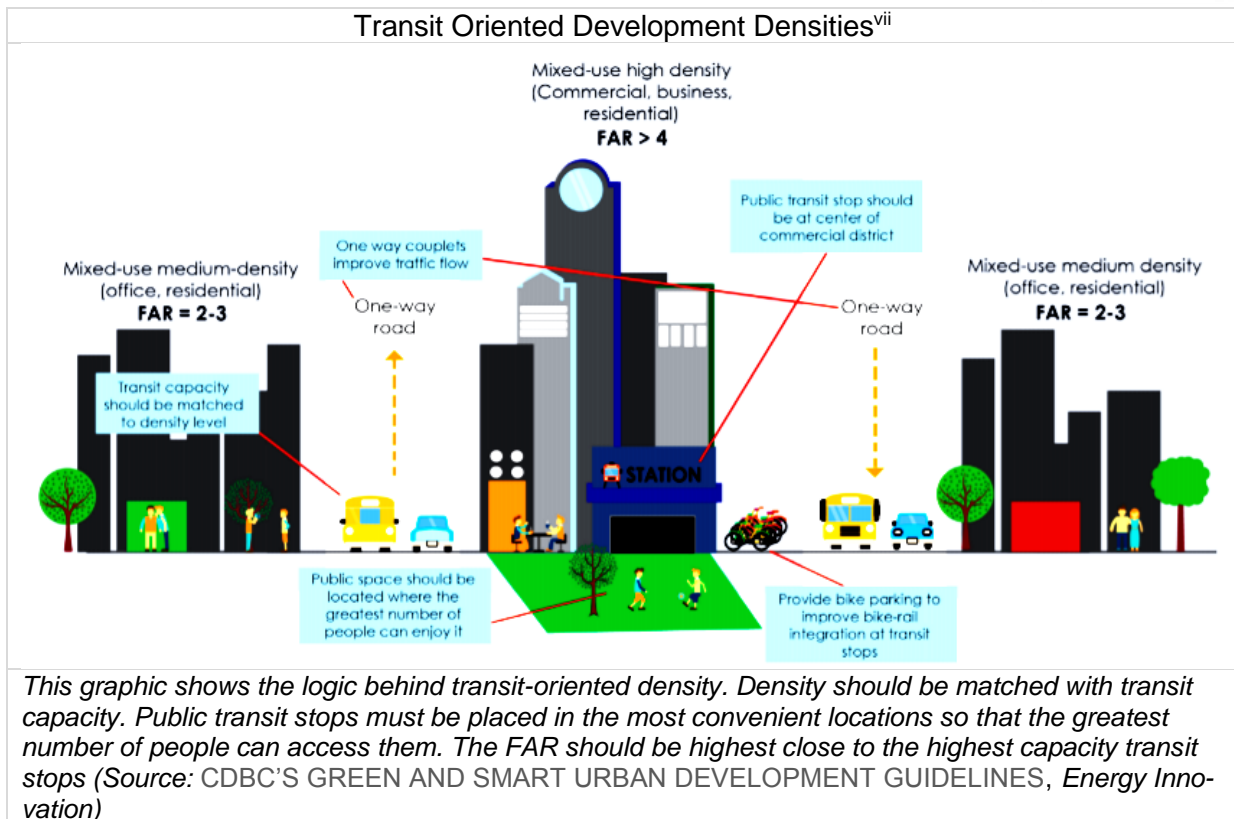
Typical massing - Town Center



The 3-V approach: PLACE VALUE, NODE VALUE AND MARKET POTENTIAL VALUE^{vi}

A new World Bank Report allows decision makers to better understand the linkages between connectivity, accessibility, place quality, and market potential values around a given station. Cities can then identify the type of development for which they are best-suited. The 3V Framework is applicable to large cities with extensive networks, and also smaller cities with only a few mass transit lines or a bus rapid transit system.

Where, when, and how to implement TOD: the 3V Framework. TOD principles cannot be applied uniformly across an entire city or transit network, since densities of jobs and people vary widely across the urban space. In fact, experience has shown that only about 15% of transit stations and their surrounding area can support very high density development.



To make informed decisions about TOD, research institutions and governments have developed a variety of methodologies that can help identify which station areas are good candidates for TOD, determine what level of density the area around a given station can absorb, and figure out what kind of development mix makes sense in a particular area, looking to strike the right balance between jobs, housing, and other amenities.

Building on these approaches, the report proposes a new framework for guiding TOD plans, by simultaneously assessing the “three values” (3V) of transit stations and surrounding areas:

- The **node value** describes the importance of a station in the public transit network based on passenger traffic, connections with other transport modes, and centrality within the network.
- The **place value** reflects the quality and attractiveness of the area around the station. Factors include the diversity of land use; the availability of essential services such as schools and healthcare; the proportion of everyday amenities that can be accessed by walking or cycling; pedestrian accessibility and also the size of urban blocks around the station.
- The **market potential value** refers to the unrealized market value of station areas. It is measured by looking at the major variables that can influence the demand for land (current and future number of jobs in the vicinity of the station, number of jobs accessible by transit within 30 minutes, current and future housing densities) as well as the supply (amount of developable land, possible changes in zoning policy, market vibrancy, etc.).

The report presents an approach to identify and address potential imbalances between node, place and market potential values to create new economic opportunities—for example, by improving the urban environment around a major transit hub, or by improving public transit service to a booming area. The tool provides a common framework of assessment for

urban, transport, and economic planners, thereby facilitating conversations needed for better economic, land use, and transport integration. ^{viii}

Recommended Case study:

Seoul Zoning Regulations encourage High-Density Development around major public transportation nodes. ^{ix}

Sources:

ⁱ <https://image.slidesharecdn.com/Igtoduttipecmay2009-100318135820-phpapp01/95/Ig-tod-uttipec-may2009-21-728.jpg?cb=1268922934>

ⁱⁱ Curitiba Mass Transit nodes:

https://www.google.com/search?tbm=isch&source=hp&biw=1024&bih=495&ei=0GJXW7LsIaORmwXf1qPABA&q=Curitiba+transit+nodes&oq=Curitiba+transit+nodes&gs_l=img.3...576.8302.0.9805.23.17.0.6.2.0.233.2048.2j13j1.16.0...0...1ac.1.64.img..1.17.1928.0..0j0i30k1j0i8i30k1j0i24k1.0.1OdR-EYeaTI#imgrc=Ve0KPpiA2tQchM

ⁱⁱⁱ Transforming the Urban Space Through Transit-Oriented Development: The 3V Approach

<http://www.worldbank.org/en/topic/transport/publication/transforming-the-urban-space-through-transit-oriented-development-the-3v-approach>

^{iv} Source: <https://www.calthorpe.com/sites/default/files/China%20Design%20Manual%20Pamphlet.pdf>

^v Source: Climate Works Foundation. *Low Carbon Cities – Principles and Practices for China’s Next Generation of Growth*. The China Sustainable Energy Program. p. 18. www.calthorpe.com/files/China_Design_Manual_Pamphlet.pdf

^{vi} <https://www.slideshare.net/EMBARQNetwork/transforming-the-urban-space-through-tod-the-3v-approach>

^{vii} Source: <http://energyinnovation.org/wp-content/uploads/2015/12/12-Green-Guidelines.pdf>

^{viii} Salat, S. and Ollivier, G. 2017. *Transforming the Urban Space through Transit-Oriented Development: The 3V Approach*. World Bank, Washington, DC. <https://openknowledge.worldbank.org/handle/10986/26405>

^{ix} Source: UN-Habitat. 2012. *Economic Foundations for Sustainable Urbanization: A Study on Three-Pronged Approach: Planned City Extensions, Legal Framework, and Municipal Finance*. Nairobi. p. 29. <http://unhabitat.org/books/economic-foundations-for-sustainable-urbanization-a-study-on-three-pronged-approach-planned-city-extensions-legal-framework-and-municipal-finance/>

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World Resources Institute (WRI) – Ross Centre for Sustainable Cities. 2016. *TOD Guide for Urban Communities*. Embarq. http://www.wrirosscities.org/sites/default/files/TOD_Guide_Urban_Communities_English_EMBARQ.pdf