

credit: Design Centre for Sustainability

Commercial and civic cores linked by a central green spine

Neighbourhood TOD (greenfield)

Development pattern workshop

Description

The Neighbourhood Transit Oriented Development (TOD) pattern is a new type of greenfield development for Calgary, with a density form and land use mix that supports transit and walkability. The pattern is bounded at one edge by an urban boulevard. The proposed Neighbourhood TOD achieves housing and employment capacities that are higher than Calgary's conventional greenfield development of low and medium density residential. This pattern supports the 11 sustainability principles, particularly:

- Principle 2: *Create walkable environments;*
- Principle 3: *Foster distinctive, attractive communities with a strong sense of place; and,*
- Principle 6: *Mix land uses*

Challenges

The workshop addressed two challenges:

- To accommodate 90 people/ha and 50 jobs/ha, which translates to 2600 people and 1500 jobs in a 30-hectare greenfield site. With 140 jobs and people per hectare (90 people/ha plus 50 jobs/ha), the proposed Neighbourhood TOD (Greenfield) is within the threshold to support high capacity transit service (100 to 150 people and jobs/ha).
- To provide a diversified land use mix with an interconnected street network, ensuring walkability within the neighbourhood.

Summary & conclusions

The Neighbourhood TOD team redesigned the proposed street network to result in a more connected, grid-like pattern. A central green spine, as well as a well-defined "core" of mixed-use and commercial uses anchors the pattern and concentrates the density. A pedestrian-oriented street mirrors the main thoroughfare and links each node. The entire pattern is within a 10-minute walking distance (800m) of the transit stop, resulting in a walkable, vibrant new community with frequent connections to the larger city network. This pattern identified a need for highly connected, grid based street patterns in new greenfield developments. Using this street pattern provided the basis to create a vibrant core and a walkable, transit oriented community.

Above:

A Neighbourhood TOD (greenfield) is a new type of greenfield development with a density and mix of land uses that supports transit and walkability.

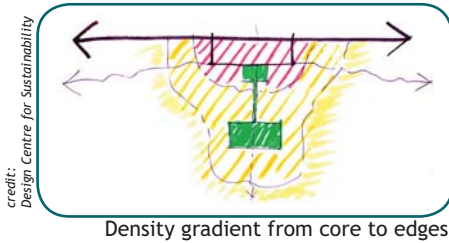
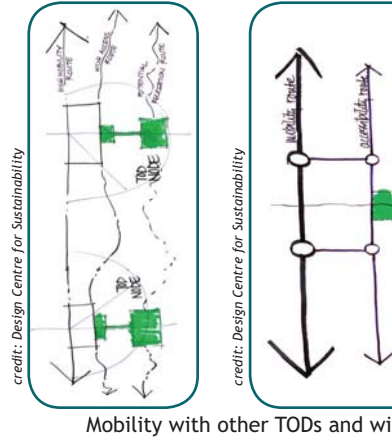
The workshop team redesigned the street network and introduced commercial and civic cores, and a central green spine.

Neighbourhood TOD (greenfield) Design strategies

The workshop team addressed the challenge of developing the ideal Neighbourhood TOD pattern in a greenfield context. The team identified a more grid-like pattern of nodes than typical of suburban neighbourhoods, with a shopping high street and dual connections to the urban boulevard. A central green spine connects the mixed-use and commercial core with a parallel park and recreation route.

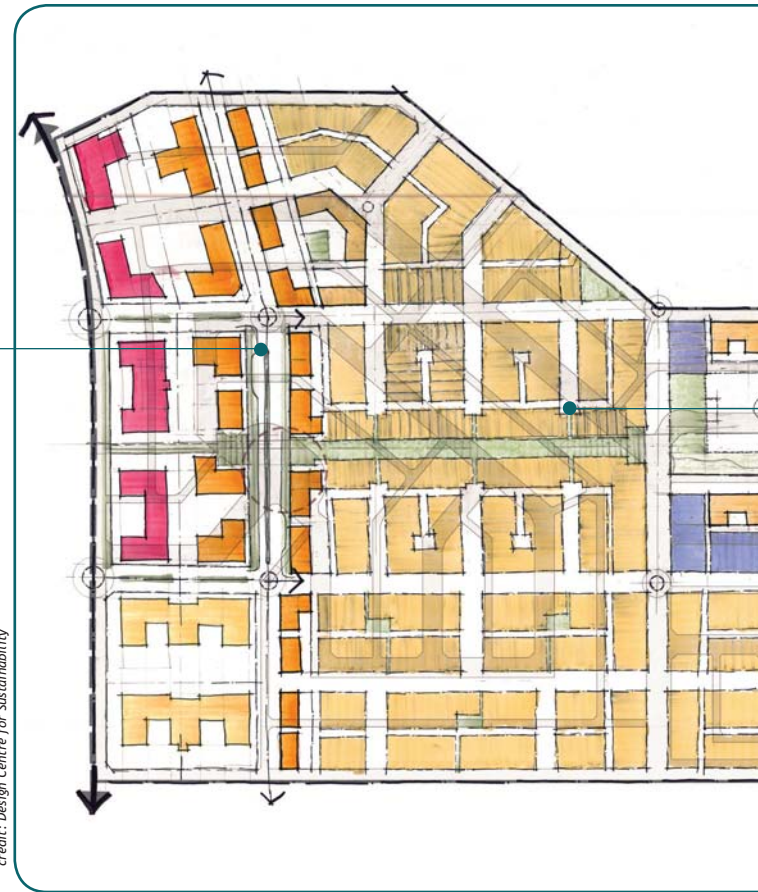
1 Hierarchy and mobility

- Establish a high mobility/high access **urban boulevard at the edge** of the TOD and a pedestrian high street that links neighbouring nodes.
- Connect the two parallel routes with a **couplet** that has roundabouts at all four intersections. This is the main transit hub for the node.
- Create a **fine-grained pedestrian network** with intersections every 60 metres.
- Emphasize **walkability** along and across the urban boulevard where it passes through the core. Make pedestrian crossings every 200 metres.



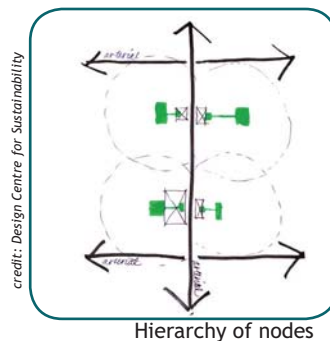
5 Central core

- Locate the **transit and employment core** at the edge, not the intersection of high mobility routes.
- Create a **density gradient** with more density and land use intensity at the core, transitioning to lower density at the edges.
- Locate regional and community-wide street-oriented commercial and office uses along uses along the **urban boulevard**.
- Locate neighbourhood commercial, office, and mixed-use retail along the **High Street**.
- Orient building facades to the street and create a **continuous street wall**.
- Phase density to **focus intensity in the core**: develop along the High Street between the couplets first; along the couplets second; and along the boulevard third.



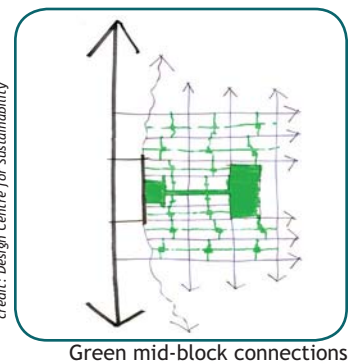
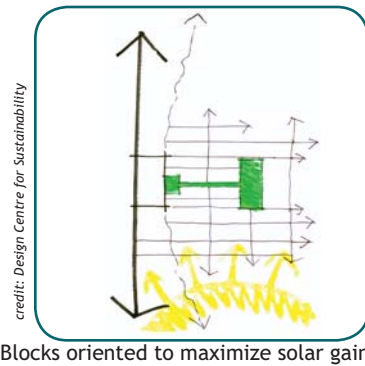
2 Hierarchy of nodes

- Locate the Neighbourhood TOD pattern across and along an urban boulevard to create a series of **nodes** that service multiple communities.
- Create a **hierarchy of nodes** in communities. The pattern represented here is the larger of these nodes.



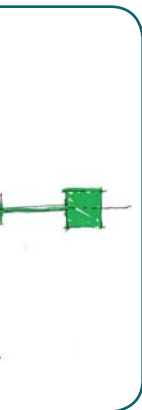
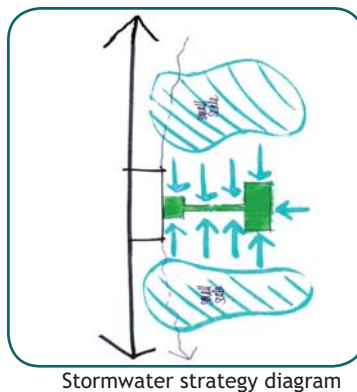
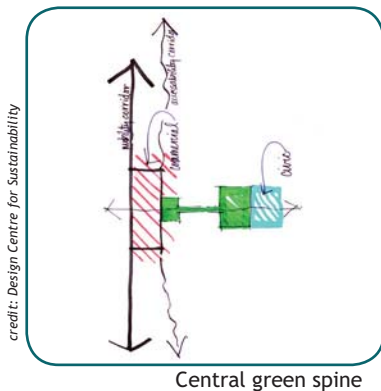
3 Interconnected grid of streets

- Establish a **regular grid** in and around the core, which can break down at the edges to blend with existing residential street patterns.
- Orient the long edges of blocks for **solar access**.
- Create **mid-block pedestrian connections** via green pathways.

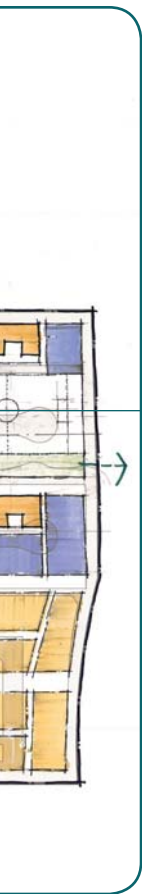


4 Central green spine

- Create a **central green spine** anchored at either end by commercial and civic uses. Locate more urban open space at the core end, and more recreational space at the residential end.
- **Cluster residential density** around the spine and transition to lower density towards edges.
- Use the spine as a centralized **stormwater management system** for the node, with decentralized, smaller scale solutions in outlying areas.

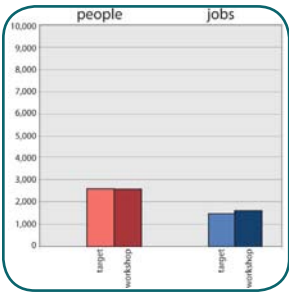


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Neighbourhood TOD (greenfield) Key questions & findings



Existing, target, and workshop population & jobs

Above:
The workshop team accommodated over 2500 people and 1600 jobs in a 30-ha greenfield site, meeting the population and employment targets to support high capacity transit service.

How many people and jobs can a Neighbourhood TOD hold?

The Neighbourhood TOD accommodates over 2,500 people and 1,600 jobs in a 30-hectare greenfield site, slightly below the population target (1%) and exceeding the employment target by 6%. This translates to densities of 87 people/ha and 55 jobs/ha.

What is the appropriate land use mix for a Neighbourhood TOD?

Workshop participants proposed an increase in residential and mixed-use area, and a decrease in open space from the expected land use mix (part of the assumptions previous to the workshop). Commercial, office, and mixed-use is focused in the core and along the urban boulevard (Design strategy 5). The plan also contains “flex” blocks adjacent to the urban boulevard, which could incorporate light industrial or highway commercial type development in the interim stages of development. The land use mix diversity index for the resulting Neighbourhood TOD (greenfield) pattern is 0.81.

What is the physical appearance of a Neighbourhood TOD?

A central urban core (Design strategy 5) connected to a green spine (Design strategy 4) are the principle organizing features of this pattern. The core consists of commercial and mixed-use buildings of three storeys, at the edge of an urban boulevard, which accommodates the transit connections. A parallel pedestrian-oriented street accommodates pedestrians and bikes (Design strategy 1). Rowhouses cluster along the central green spine, which is anchored by a civic complex at one end and the urban core at the other. Housing types include 5-storey apartments, 3-storey rowhouses, tandem duplexes, and narrow-lot single family homes. The blocks have green pedestrian paths which provide greater pedestrian connectivity.

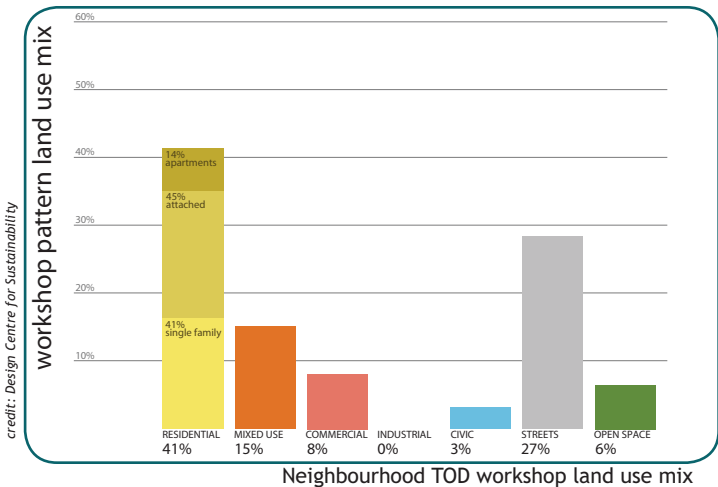
What is the green infrastructure within a Neighbourhood TOD?

The green spine serves as a centralized stormwater management system for the node, while more decentralized solutions (2-3 lot communal stormwater gardens etc.) exist in surrounding areas (Design strategy 4). Solutions such as green roofs and walls are also applicable throughout the community.

What is the phasing, replicability, and resiliency of a Neighbourhood TOD?

A transit oriented development must meet the suggested population and employment through all stages of development to achieve commercial viability and sustainability. It must also be supported by a policy of locating businesses and commercial uses in these areas rather than business parks. “Flex” blocks along the arterial allow land use to adapt to context over time and in different areas. The street grid can break down at the edges to mesh with other street patterns and natural features. Block depths can change in response to context. These features, together with a mix of housing types and flexible office spaces, contribute to a pattern that is both replicable and resilient.

Right:
As this pattern occurs in a greenfield context, there is no current existing land use. The diverse land use mix resulting from the workshop supports a complete, walkable, and transit oriented community. The land use mix diversity index is 0.81.



Neighbourhood TOD workshop land use mix