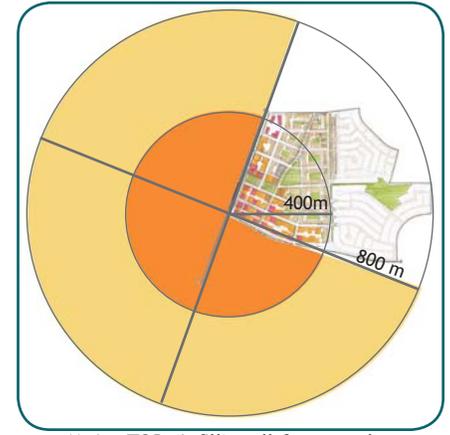


Base map - one quadrant



Major TOD (Infill) - one quadrant



Major TOD (Infill) - all four quadrants

Major TOD (infill)

Development pattern workshop

Description

The Major Transit Oriented Development (TOD) pattern is a large scale, mixed use activity centre that encompasses an 800m radius (10 minute walk) around a major transit station. Major TODs are places where people can live, work, shop, and play. Successful TODs incorporate an attractive, walkable street network, and a mix of land uses and transit facilities that integrate with the neighbourhood form and function.

This workshop examined the implications of applying the Major TOD pattern to existing urban areas within Calgary. A Major TOD as an infill strategy intensifies existing underused land (e.g. big box shopping malls) located within 800m of a high capacity transit stop. 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;*
- Principle 6: *Mix land uses;* and,
- Principle 7: *Strategically direct and manage redevelopment opportunities within existing areas.*

While the pattern does not currently exist in Calgary, Brentwood and Shawnessy Ctrain Stations are potential locations for Major TODs in Calgary.

Challenges

The workshop addressed two challenges:

- To accommodate 130 people/ha and 135 jobs/ha, which translates to 34,000 people and 36,000 jobs in a total area of 262 hectares. With such densities, the pattern would be within the threshold to support high capacity transit.
- To transform an existing single use, large parcel urban area to a significantly diversified land use mix with an interconnected street network.

Summary & conclusions

The Major TOD workshop illustrates that the distribution of density throughout the pattern may vary significantly, particularly in infill situations where select areas may be needed to be preserved. In the infill condition explored, a greater intensification at the centre of the TOD means adjacent residential neighbourhoods can remain. As a result, the area within 400m of the transit station accommodated most of the new population and jobs required to meet the targets, while the established lower density residential neighbourhood remained almost intact. The workshop explored one quadrant of a Major TOD, assuming the answers obtained would conceptually be applicable to the remaining quadrants.

Above:
A Major TOD encompasses an 800m radius (10 minute walk) around a major transit stop. This workshop explored how one quadrant of a Major TOD might develop in an existing urban area, assuming the lessons learned can be conceptually applied to the remaining quadrants.

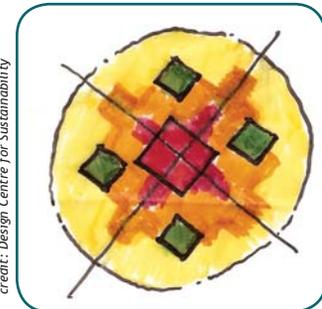
The workshop team met the population and employment targets by concentrating redevelopment within 400m of the transit station and maintaining the adjacent established communities.

Major TOD (infill) Design strategies

The workshop team explored one quadrant of the Major TOD, assuming that the resulting design strategies are applicable to the rest of the TOD, as well as to other similar infill situations throughout Calgary. The workshop team met the job and population targets by concentrating infill in the area within 400m of the transit stop and preserving the adjacent established lower density residential neighbourhood. The workshop team developed design strategies to integrate the existing and emerging communities, create an attractive and flexible urban fabric, phase redevelopment over time, and incorporate green infrastructure.

1 Population and jobs close to transit

- Provide a **density gradient** from highest density at the centre of the TOD to lower density in the surrounding communities, to ensure the majority of the new population and jobs are close to high capacity transit.
- Create a **district hub** (red square) with more *work* than *live* at the centre of the TOD and a **neighbourhood hub** (green squares) with more *live* than *work* inside each of the four quadrants, so all include *live* and *work* uses.

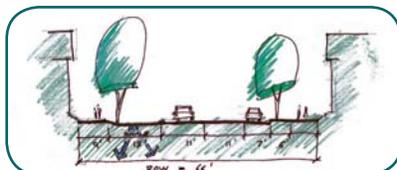


credit: Design Centre for Sustainability

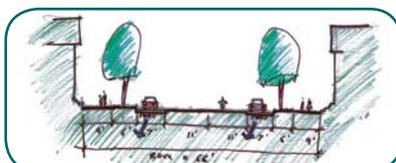
Density gradient with district (red) and neighbourhood (green) hubs

6 Green streets and diverse open spaces

- Create a **network of open spaces** of different type, size, and character to connect the transit hub with the adjacent communities. Include an urban plaza close to the station, and other open spaces such as a park, and smaller semi-private parks.
- Design a comprehensive green infrastructure plan that includes neighbourhood streets with permeable on-street parking and green streets with 4m-wide swales that direct storm water to open spaces performing retention and infiltration.

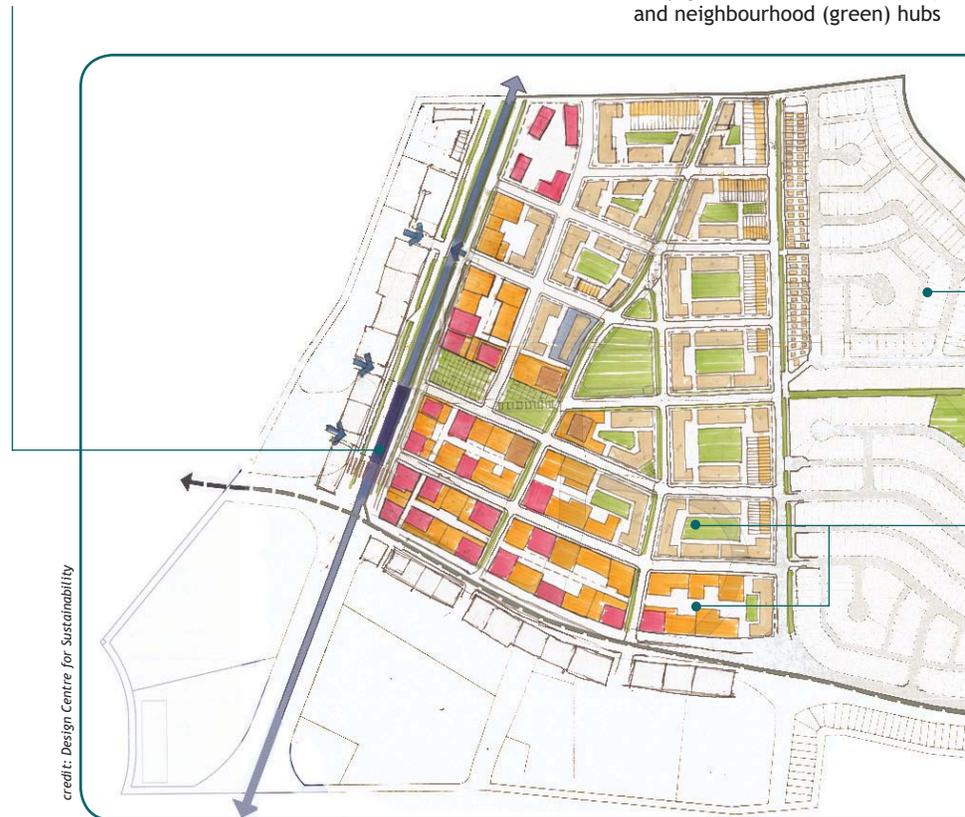


Green street with 4m swale



credit: Design Centre for Sustainability

Neighbourhood street with permeable parking



credit: Design Centre for Sustainability

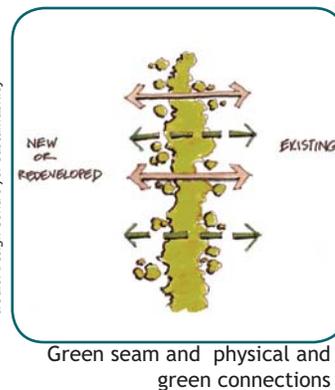
Plan of one

5 Phased redevelopment

- Plan for **phased redevelopment** when defining the new street **rebuild the grid** at the centre of the TOD first, where there is in the short term, and **integrate the grid** with existing major property lines in areas further away from the centre that will value in the long term.

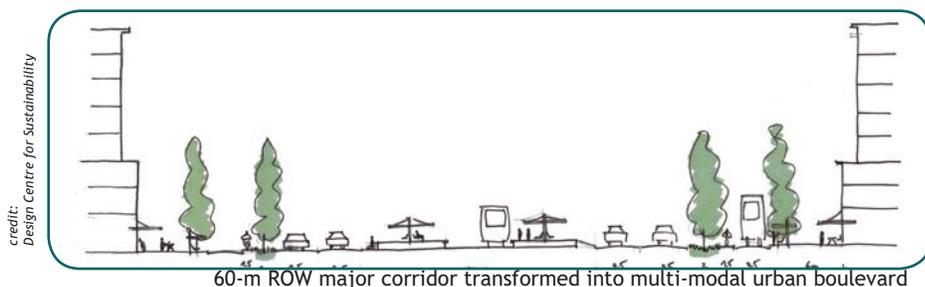
2 Bonds and links with the surrounding community

- Create **green seams** to transition between the redeveloped area at the centre of the TOD and the adjacent lower density residential areas.
- Provide **physical connections** (e.g. streets, pedestrian paths) to enhance accessibility between the existing community and the services, transit, and open spaces available in the redeveloped area.
- Provide **green connections** between new and existing public open spaces to bring together the emerging and existing communities.



3 Attractive streets and urban boulevards

- **Tame the street** by transforming the existing 60m ROW major corridor, unfriendly for pedestrians to cross, into a multi-modal urban boulevard with green medians that effectively shorten crossing distances.
- **Rebuild the grid** over the larger parcels to create more connections and route options. This means improved accessibility for all modes, and decreases congestion by spreading the traffic demand over a greater number of streets.
- Promote **active street walls** with street-front retail, provide on-street parking, and locate any surface parking at the rear of buildings.



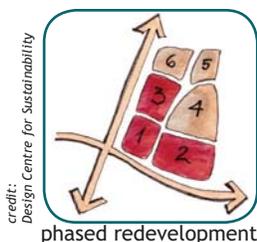
4 Flexible blocks

- Retrofit the street network to create **resilient blocks** with dimensions that accommodate multiple uses and activities, while ensuring walkability within the neighbourhood, such as block dimensions of 85x150m (Calgary) and 100x200m (Vancouver).
- Within each block, provide lanes and some **smaller parcels** to accommodate a variety of building types and semi private open spaces.
- Encourage **horizontal or vertical mixed use** within the same block around major intersections.
- Create opportunities for different uses that can accommodate **shared parking** (e.g. a movie theatre with a high parking demand in the evening can accommodate commuter park & ride during the day)
- Retain some level of auto service in blocks in the areas further away from the TOD centre and adjacent to the major corridor. Ensure these blocks can be easily retrofitted over time.

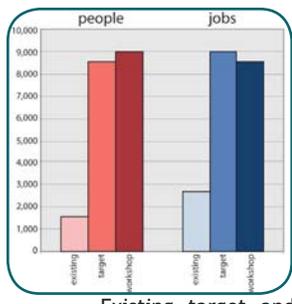


quadrant of a Major TOD

network:
more value
roads and
acquire



Major TOD (infill) Key questions & findings



Existing, target, and workshop population & jobs

How many people and jobs can a Major TOD hold?

The quadrant of the Major TOD explored accommodates 7,400 new people and 5,800 new jobs in a 65-hectare infill site. This translates to a total population of 9,000 and 8,500 jobs, meeting the population and employment targets. Resulting densities are 130 people/ha and 135 jobs/ha, and are applicable to the remaining quadrants of the TOD.

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

A good distribution of land uses within a Major TOD will foster future job opportunities for the city. For this purpose, the team proposed a district hub at the centre of the TOD and a neighbourhood hub inside each of the four quadrants, all including *live* and *work* uses (Design strategy 1). The team agreed on the immense capacity of TODs to integrate land use and transportation in a way which serves both the neighbourhood and the region: while major arterial roads form the central transportation corridors, they can also provide a mixed-use pedestrian friendly environment that supports a range of community needs and multiple modes of transportation (Design strategy 3). The land use mix diversity index is 0.73.

What is the physical appearance of a Major TOD?

Density varies significantly throughout a Major TOD. In the infill condition, greater intensification at the centre of the TOD means adjacent lower density residential neighbourhoods can remain (Design strategy 1). Green seams serve as a transition between these residential areas and the redeveloped ones, connecting existing neighbourhoods with the services, transit, and open spaces in the redeveloped areas (Design strategy 2). The redeveloped areas become attractive, mixed-use, pedestrian friendly neighbourhoods, with a network of diverse open spaces, including a transit plaza, a park (at the neighbourhood hub), and smaller semi-private open spaces (Design strategies 3, 4, and 6).

Above:
The workshop team accommodated 8,500 jobs and 9,000 people in one 65-ha quadrant of the 262-ha Major TOD.

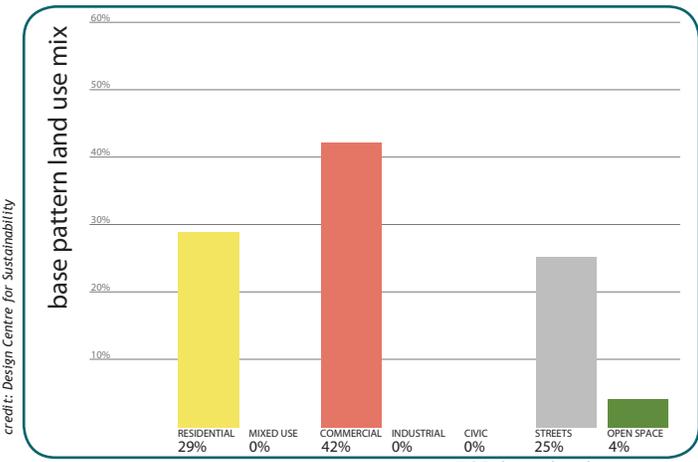
Below:
By using more compact built forms, the team met the population and employment targets, introduced residential, commercial, and open space uses to the single use commercial area, and, at the same time, maintained the adjacent single family area basically intact. The resulting land use mix diversity index is 0.73.

What is the green infrastructure within a Major TOD?

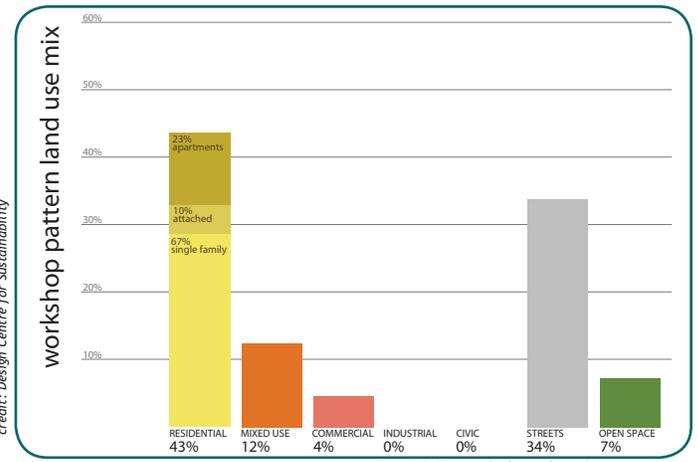
Green infrastructure is highly suitable for Major TODs given the extent of redevelopment both in terms of gross surface area and uptake by new residential and employment opportunities. Accommodating green infrastructure is envisioned in several principal domains: stormwater retention and infiltration, utilizing green streets and open spaces to perform these functions (Design strategy 6); centralized district heating; and, green building materials.

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

The team identified as a critical design strategy to plan for phased redevelopment when defining a new street network for infill conditions (Design strategy 5). The team developed various strategies that are applicable to Major TODs in Calgary in both infill and greenfield conditions, particularly the more aggressive concentration of density at the TOD centre (Design strategy 1). The team concluded that block dimension is key to allowing flexibility for different uses while ensuring walkability in the neighbourhood (Design strategy 4).



Major TOD base land use mix



Major TOD workshop land use mix