Development patterns feeding into other project components

Participants at work in the development pattern workshops

Final workshop proposal for one of the development patterns (Neighbourhood TOD)

Calibrating development patterns

An introduction to the development pattern workshops

What is Plan It Calgary?

Plan It Calgary is a project undertaken by the City of Calgary to develop a long-term Integrated Land Use and Mobility Plan that achieves the eleven sustainability principles adopted by Council. The project consists of multiple components, developed by the City project team together with the Design Centre for Sustainability. Key amongst these components are the creation of city-wide scenarios, a detailed exploration of development patterns and case studies, and a synthesis back at a city-wide scale (Big Map). The components of this *whole-part-whole* process are illustrated in the image above (top left).

What are development patterns?

Development patterns are assemblies of urban elements - parcel and building types, local streets, and open space - that can be replicated throughout a city. A city's urban fabric consists of the combination of many different development patterns. The urban elements that make up development patterns are arranged according to recurring mixes and proportions of land uses. Development patterns are theoretical in the sense that they are not site specific, but hold essential attributes that can be associated to similar areas across the city. For instance, recent single family neighbourhoods in Calgary often share similar characteristics, and could be considered an existing development pattern.

Why are we using development patterns?

Development Patterns are key within the project's methodology as they provide the data that supports the other Plan It Calgary project components. Many different development patterns combine to create a city's urban fabric. The array and level of data embedded within development patterns is greater than in conventional land use planning, making development patterns a useful short and long-term planning tool. This data ranges from jobs and population figures to physical information about land use mix, housing types, densities, and infrastructure. This information can be used to help inform future policy, in the form of pattern-specific design rules that can easily integrate into policy documents. **By providing a link between the people and jobs density required for a desired level of transit, the built forms that make such densities possible, and the resulting land use mix, development patterns create the necessary bridge between land use and transportation, towards the creation of an Integrated Land Use and Mobility Plan.**

Above: Development patterns are key in the project methodology as they feed into other project components. The six collaborative multi-stakeholder workshops refined the patterns for a Calgary-specific context. Each team created a physical representation of how that pattern would look in a Calgary specific context.

How do we create development patterns?

Development patterns are initially created according to prototypical urban conditions, based on recurring urban elements and mixes and proportions of land uses. The assumptions underlying development patterns are then tested and refined through collaborative multi-stakeholder workshops. In the Plan It Calgary development pattern workshops, the project team and invited stakeholders refined the development patterns within a Calgary-specific physical context. The major outcomes of the six workshops were the confirmation of population and employment assumptions, a visual representation of the pattern on the ground, and answers to key questions regarding land use mix, physical appearance, green infrastructure, phasing, replicability, and resiliency of each pattern.

plan it calgary
integrate · grow · sustain

Design Centre for Sustainability
School of Architecture + Landscape Architecture
THE UNIVERSITY OF BRITISH COLUMBIA

THE CITY OF CALGARY

Calibrating development patterns
Scope of workshops

The objective of the workshops was to test the feasibility of key development patterns in a Calgary-specific context. Workshops considered land use, built form, and jobs and population assumptions underlying each pattern.

In order to satisfy jobs and population targets to support threshold requirements for an enhanced level of transit (i.e. threshold for areas with basic transit to become areas where high capacity transit is viable), workshop teams collectively came up with a spatial allocation of built forms (parcel and building types), and, consequently, of land uses. For each pattern, workshop teams provided a set of design strategies applicable to similar sites across the city, which relate to key questions regarding people and jobs, land use mix, physical appearance, green infrastructure, phasing, replicability, and resiliency of each pattern.

Through this process, six of the development patterns used to date in the Plan It Calgary project were refined: Major Transit Oriented Development (TOD) (infill), Neighbourhood Transit Oriented Development (TOD) (greenfield), Medium Density Infill, Industrial Infill, Transit Corridor, and Greenfill. The project team has identified these patterns as key to developing an Integrated Land Use and Mobility Plan that conforms with the eleven sustainability principles adopted by Council.

? land use mix
? green infrastructure
? replicability
? jobs & people
? physical form
? phasing
? resiliency
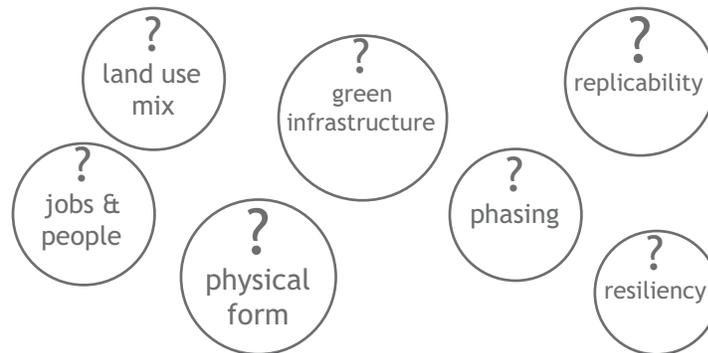
Lessons learned

1 people and jobs

By meeting and exceeding the population and employment targets, the workshops have generally confirmed the assumptions about the population and employment capacity of the six development patterns explored. Confirming the assumption on people and jobs is important because it enables to improve transit and provides for other sustainability goals dependent on these numbers.

2 land use mix

All six patterns contain a diversified land use mix that includes at least five of the seven proposed land uses. The infill conditions explored the potential to intensify and diversify the existing land use mix. In some cases, the workshop pattern land use mix varies from the proposed one. Generally, workshop participants preferred to increase density in some areas above what was proposed, in order to preserve more single-family housing stock. The workshops illustrated that single-family homes could be maintained even while meeting overall higher density targets.

3 physical appearance

Participants used "game pieces" of building types and parcels (included in the case book, in the workshop design brief) to test different design scenarios and understand the implications of built form in the population and employment capacity of each pattern. Each team developed a plan and a series of physical design strategies to describe how each pattern would look in a Calgary-specific context. Patterns tended to create neighbourhood centres, increase public space, and preserve more detached single family housing than expected.
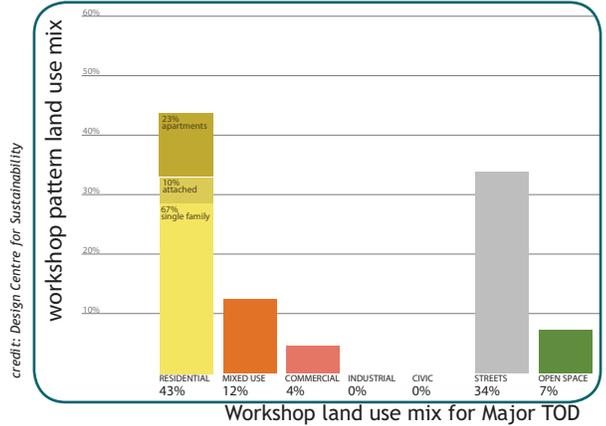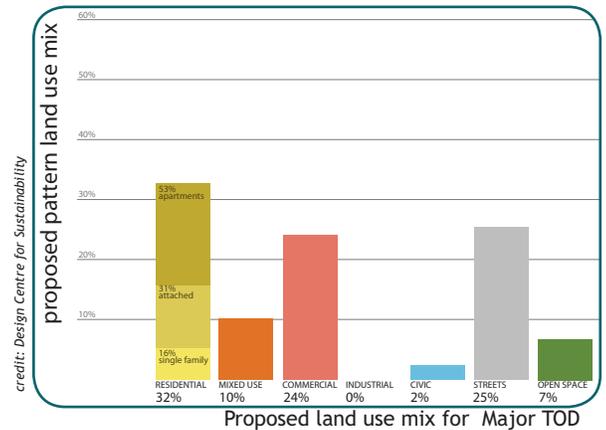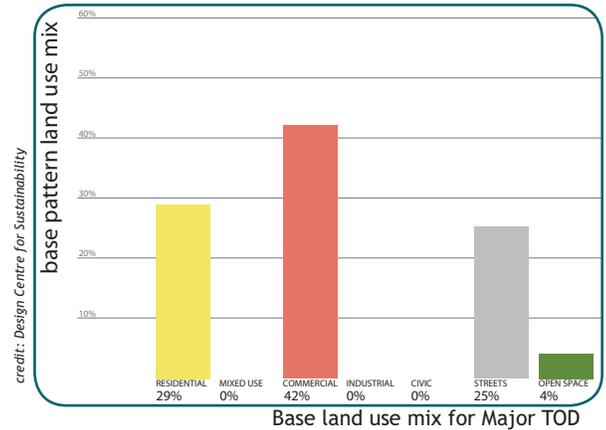
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The 11 sustainability principles

approved by Council on January 2007 to guide the generation of a Calgary Land Use and Mobility Plan are:

1. **Create** a range of housing opportunities and choices
2. **Create** walkable environments
3. **Foster** distinctive, attractive communities with a strong sense of place
4. **Provide** a variety of transportation options
5. **Preserve** open space, agricultural land, natural beauty, and critical environmental areas
6. **Mix** land uses
7. Strategically **direct and manage** redevelopment opportunities within existing areas
8. **Support** compact development
9. **Connect** people, goods and services locally, regionally, and globally
10. **Provide** transportation services in a safe, effective, affordable, and efficient manner that ensures reasonable accessibility to all areas of the city for all citizens
11. **Utilize** green infrastructure and buildings

Right:
The bargraphs represent pattern land use mixes and embedded built forms for current conditions (Base), early assumptions (Proposed), and final workshop outputs. The lower plan illustrates the spatial allocation of the workshop built forms and land use mix, as developed by participants.

credit: Design Centre for Sustainability

Base land use mix for Major TOD

RESIDENTIAL 29% | MIXED USE 0% | COMMERCIAL 42% | INDUSTRIAL 0% | CIVIC 0% | STREETS 25% | OPEN SPACE 4%

credit: Design Centre for Sustainability

53% apartments
31% attached
16% single family

Proposed land use mix for Major TOD

RESIDENTIAL 32% | MIXED USE 10% | COMMERCIAL 24% | INDUSTRIAL 0% | CIVIC 2% | STREETS 25% | OPEN SPACE 7%

green infrastructure

All six development patterns proposed design strategies related to green infrastructure and low-impact development practices, including stormwater management, green roofs, and building forms that permit light penetration and natural ventilation. The allocation of green open space was often higher than expected, as well as a desire to change the character of streets (i.e. more right-of-way dedicated to green, and less to cars).

5 phasing, replicability, and resiliency

The teams generally identified gradual incremental intensification as a way to phase development over time to achieve the sustainability principles. Workshop teams developed a series of physical design strategies that can be replicated in similar sites across the City. Flexibility was identified as key element of the patterns' resiliency.

credit: Design Centre for Sustainability

23% apartments
10% attached
67% single family

Workshop land use mix for Major TOD

RESIDENTIAL 43% | MIXED USE 12% | COMMERCIAL 4% | INDUSTRIAL 0% | CIVIC 0% | STREETS 34% | OPEN SPACE 7%

credit: Design Centre for Sustainability

Major TOD workshop plan

Calibrating development patterns
Workshop process

Workshop inputs

In order for the workshop teams to address the particular challenges of each pattern, participants were provided with the following inputs: a **design brief** containing instructions for the workshop, desired population and employment numbers, background information on the process, relevant information to aid in the discussion, and a checklist of deliverables; **land use distribution** for existing and proposed conditions; a **base map** derived from a representative physical location within Calgary; a **list of cases** (parcel and building types), and their associated numbers (density, number of dwelling units, people, jobs, storeys, and commercial storeys); and, a **desired performance** (target) of population and jobs for each development pattern in conformance with transit threshold requirements.

Collaborative multi-stakeholder workshop

Each workshop team consisted of members of the City Plan It Calgary team, designers and facilitators from the Design Centre for Sustainability, invited City and stakeholder knowledge stewards, and local design professionals. Knowledge stewards included representatives from Parks, Transportation, Planning, School Board, Urban Forestry, and Economics.

In order to achieve the desired population and jobs performance for each pattern, workshop teams selected and applied cases to a base map derived from a representative physical location within Calgary. Cases include parcel and building types and, to a lesser extent, street types. To facilitate decision making, cases were represented as "game pieces" drawn to scale that could be moved around to test different design scenarios.

*Below:
Workshop participants were provided with a series of inputs to help inform decision-making. Through a collaborative multi-stakeholder process, participants discussed, selected, and applied cases to produce a visual representation of the pattern on the ground.*

Workshop outputs

At the end of the workshop, teams had produced the following outputs:a **plan** of the development pattern; a set of physical **design strategies** for applying the development pattern in Calgary; a **list of cases** used in the pattern; a description of **any new cases** or added case information used in the pattern; **Diagrams** and/or **3D sketches** of how the pattern would look; a description of the **phasing** required for the development pattern; revised **population and employment** numbers for the pattern; and, **answers** to the development pattern **key questions** regarding land use mix, physical appearance, green infrastructure, phasing, replicability, and resiliency of each pattern.
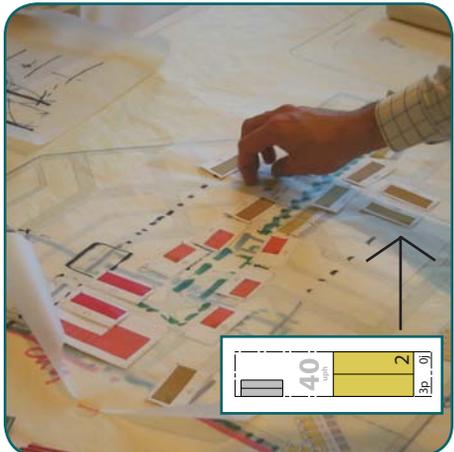

credit: Design Centre for Sustainability
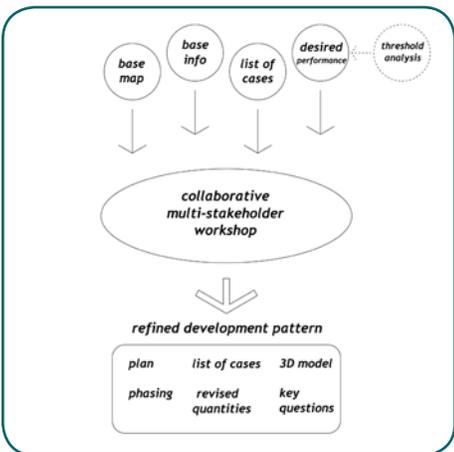
Workshop inputs, process, and outputs

Participants in discussion

Participants using the pieces from the case book