

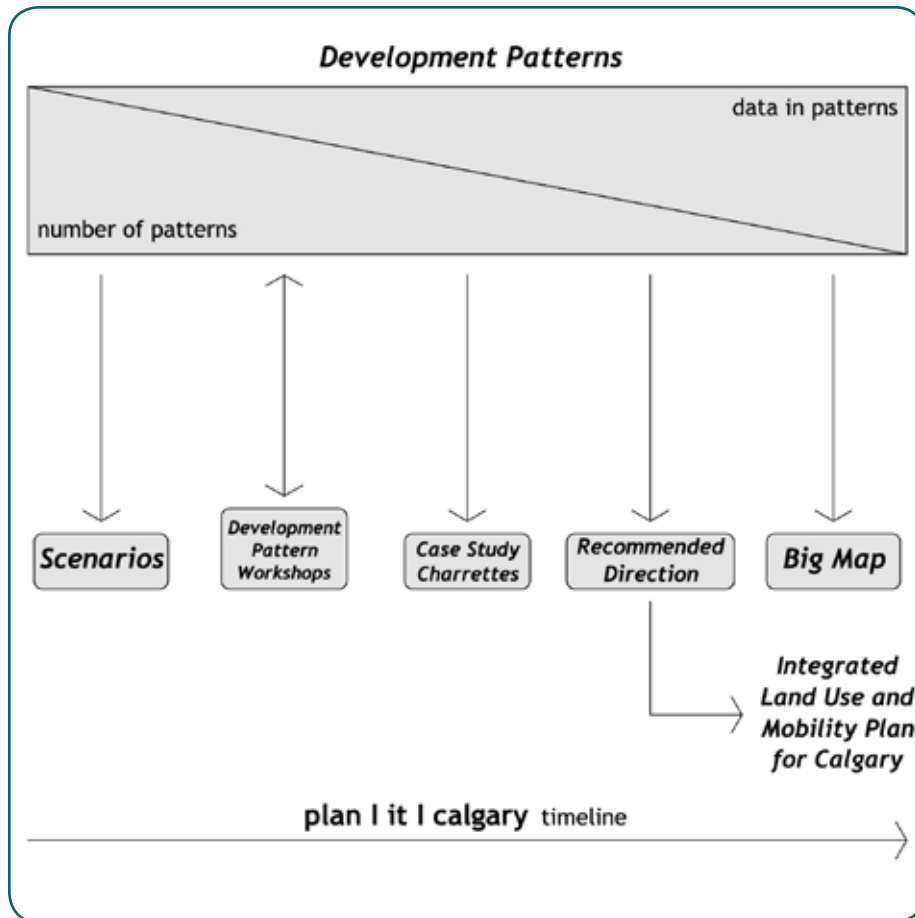
MEDIUM DENSITY INFILL

Design Brief

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INTRODUCTION



Development patterns provide the data that supports the other project components. The amount of data provided increases as the project evolves. Through these workshops we will explore, test, and refine the development patterns. The refined patterns will be inputs into the next stages of the project.

The objective of the **Development Pattern Workshops** is to test and refine six of the over fifty* development patterns used to date in the **plan | it | calgary** project:

- Major Transit Oriented Development (TOD) (Infill)
- Neighbourhood Transit Oriented Development (TOD) (Greenfield)
- Medium Density Infill
- Industrial Infill
- Transit Corridor
- Greenfill

The project team has identified these six development patterns as key to informing an integrated land use and transportation plan that achieves the sustainability principles approved by Council - the ultimate goal of the **plan | it | calgary** project. Through these workshops, the project team and invited stakeholders will truth the patterns within the Calgary physical context, testing jobs and population assumptions, and creating a visual representation of each pattern on the ground.

We will accomplish this task by exploring the implications of applying each pattern to a representative site abstracted from an existing physical location within Calgary. Workshop outcomes are not intended to be site-specific solutions for the source locations. Workshop outcomes will be six physical development patterns - with more rigorous jobs and population assumptions - that can be applied to similar sites throughout Calgary.

The resultant more robust, Calgary-specific development patterns will be inputs into the next stages of the project. They will also help inform future development proposals and policy by assisting City Staff to set expectations for new and infill developments similar to the development patterns explored.

* This number includes variations in some of the patterns that were specifically developed for the different scenarios. The full set of development patterns is not intended to be applied at once; only selected groups of patterns were applied to the scenarios.

BACKGROUND

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. As part of the project terms of reference, Council adopted a set of Sustainability Principles for land use and transportation that are drawn from imagineCALGARY, SMART growth, and current City policy.

What are the Sustainability Principles that drive plan|it|calgary?

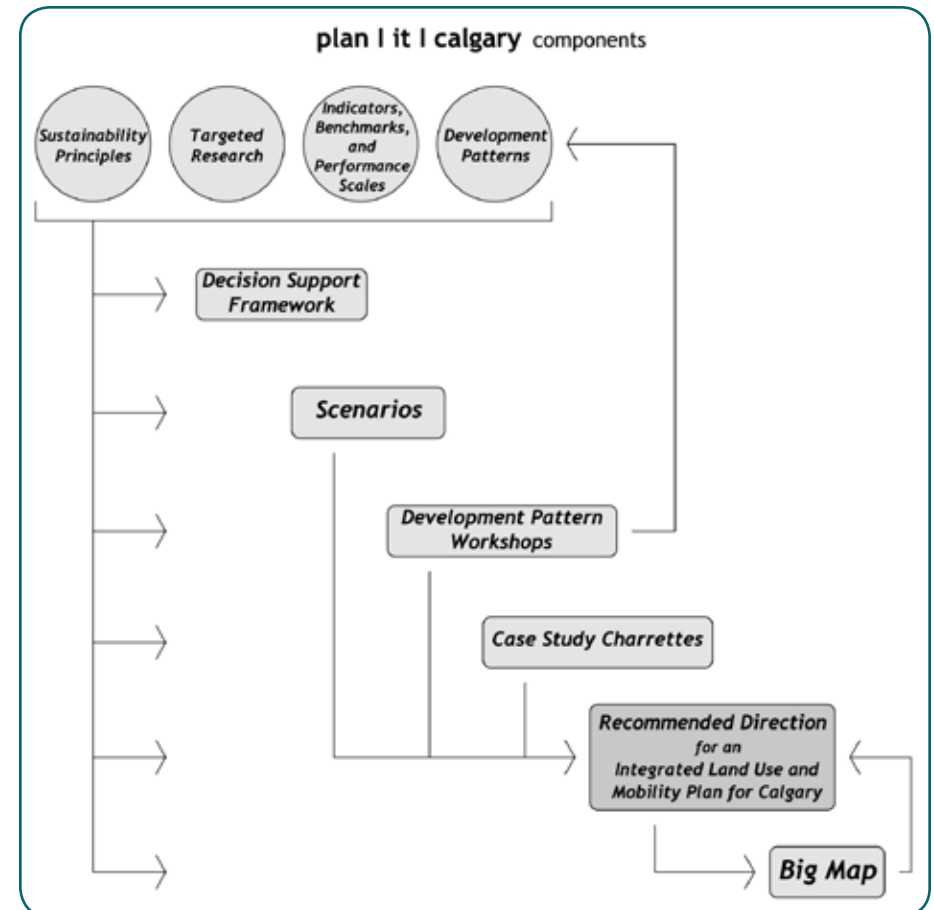
The Sustainability Principles approved by Council on January 2007 to guide the generation of a Calgary Land Use and Mobility Plan are:

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

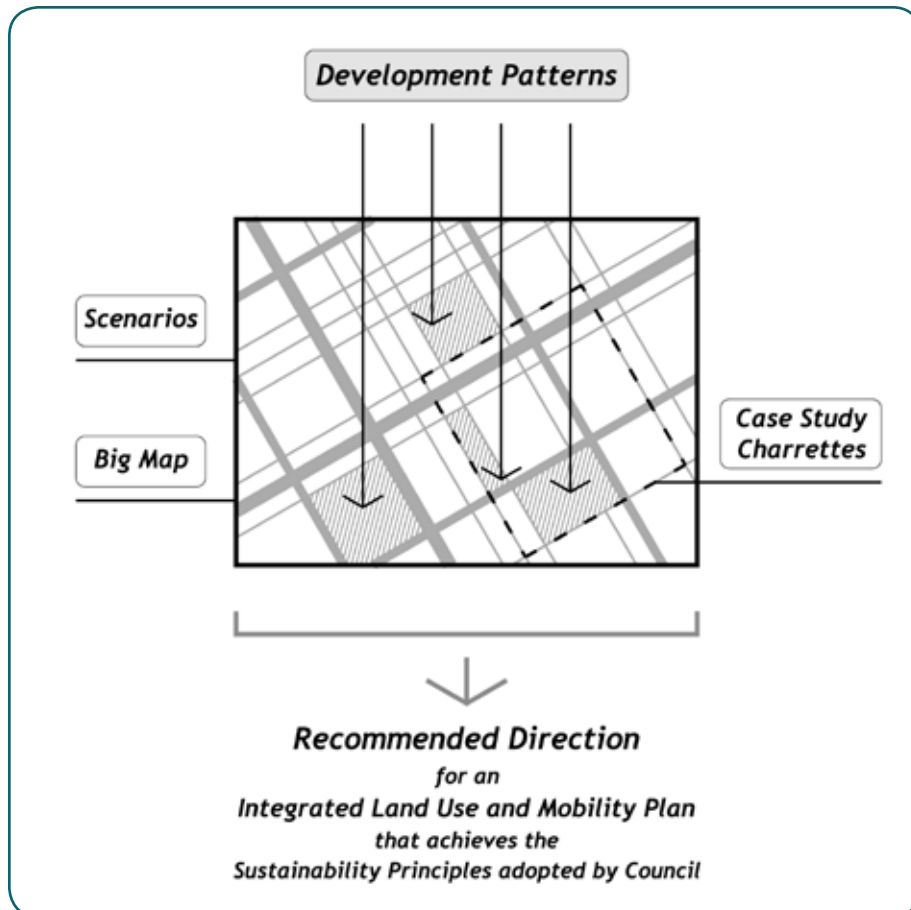
What are the project components in plan|it|calgary?

plan|it|calgary consists of multiple components. To date, the project team - together with the Design Centre for Sustainability* - has focussed on generating Scenarios to explore the possible implications of spatially applying the Sustainability Principles to the City. Other project components support this work, including" targeted research; sustainability performance indicators, benchmarks, and targets; and, development patterns. Outputs from all components, including the Development Pattern Workshops and future tasks (Case Study Charrettes and Big Map) will inform the generation of a Calgary long-term Integrated Land Use and Mobility Plan.

* The Design Centre for Sustainability (DCS) is located in the School of Architecture and Landscape Architecture at the University of British Columbia. It is an academic leader in applying sustainability concepts to the development of land, cities, and community.



The plan|it|calgary project consists of multiple components that support one another. In the Development Pattern workshops we will refine the project toolkit for the next stages of the project. The outputs of plan|it|calgary together with the outputs from previous sustainability-related City initiatives will inform a Recommended Direction for an Integrated Land Use and Mobility Plan for Calgary.



Development patterns are assemblies of urban elements - parcel and building types, local streets, and open space - that can be replicated throughout a city. Many different development patterns combine to create a city's urban fabric. They provide detailed data about population, jobs, land uses, transportation, and urban form. This makes development patterns a useful tool for developing an Integrated Land Use and Mobility Plan that achieves the Sustainability Principles approved by Council in January 2007.

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. 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?

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 mix, densities and FARs. It is used to help inform future policy, in the form of pattern-specific design rules that can easily integrate into policy documents.

What role do development patterns play in plan | it | calgary?

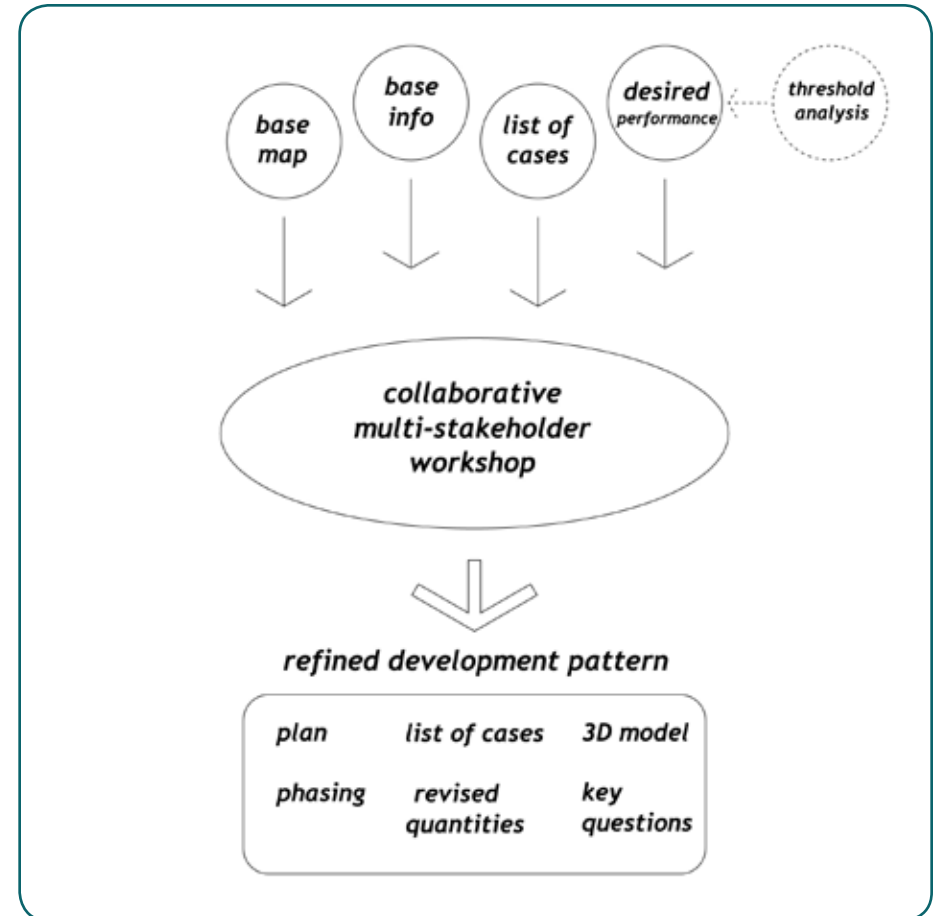
Development patterns provide the data that supports the other plan | it | calgary project components. Throughout the evolution of the project the amount of data provided by the patterns has increased as the number of patterns has been delimited. In the early stages of plan | it | calgary there were a greater number of patterns with limited associated data. The patterns were allocated across the city to create Scenarios representing potential development futures for Calgary. The performance of these was measured against performance indicators. The Case Study charrettes will use the refined version of the patterns resulting from these workshops and will apply them to specific sites and neighbourhoods in Calgary. Development patterns will inform the Recommended Direction. Only after Council approves the Recommended Direction, the patterns will be again introduced as an input to Big Map - when the time comes to apply the refined patterns at a city-wide scale. Development patterns are therefore embedded in the outputs of plan | it | calgary. These outputs will inform the generation of an Integrated Land Use and Mobility Plan for Calgary.

WORKSHOP INSTRUCTIONS

The objective of this workshop is to test the feasibility of the land use and case mix, and resulting jobs and population assumptions underlying a single development pattern. The challenge is to collectively come up with a spatial allocation of land uses and cases (parcel and building types) that satisfy jobs and population targets for a Calgary specific version of this development pattern. These targets conform to transit threshold requirements for the city as a whole.

The workshop team will apply cases to a base map derived from a representative physical location within Calgary to achieve the desired population and jobs performance for this pattern. Cases include parcel and building types and, to a lesser extent, street types. The Case Book (included in the 'Working Material' section) describes the available cases. Workshop materials include additional information on existing land use locations and quantities to provide context where necessary for decision making.

The workshop team must collectively produce a plan and physical massing (i.e. perspectives, 3D model) of the refined development pattern, plus additional diagrams and sketches that describe the massing and functioning of the refined development pattern. The workshop team must describe any proposed additional cases, and answer specific questions posed within the design brief on the revised population, jobs, and land use quantities, phasing, resiliency, replicability, and green infrastructure of the pattern.



The workshop will be a collaborative multi-stakeholder process. The workshop team will take the inputs provided by the plan|it|calgary team to collectively explore, test, and refine this particular development pattern.

WORKSHOP INPUTS

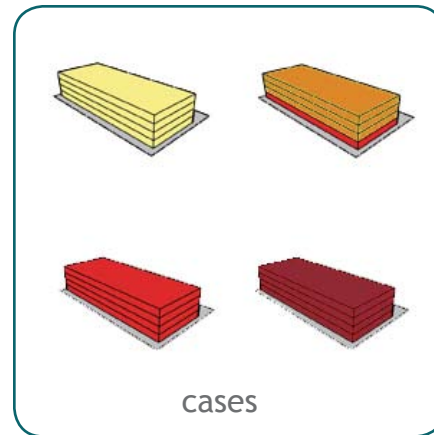
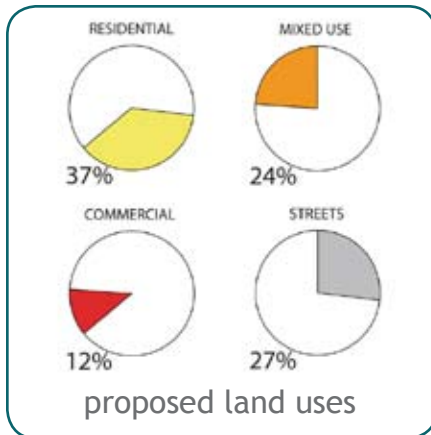
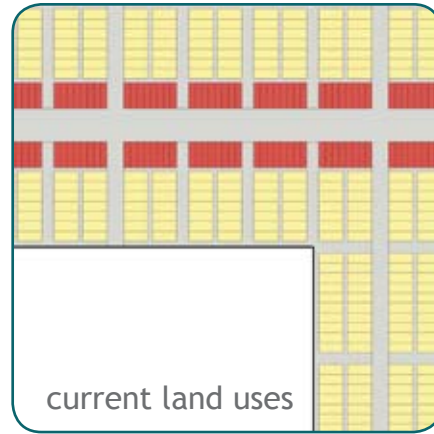
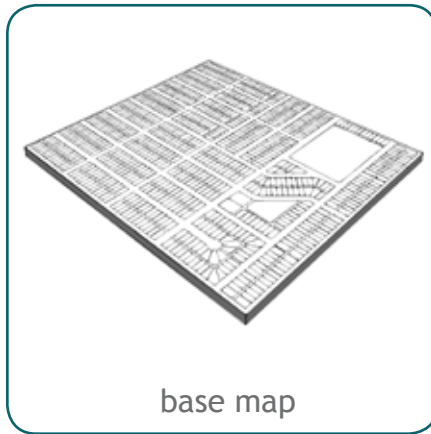
The following are the inputs you will be provided in this workshop:

- **Base map** derived from a representative physical location within Calgary
- **Base information on current and proposed land uses**
- **List of Cases** for the development patterns (compiled in the Case Book, included in the 'Working Material' section)
- **Desired Performance** of population and jobs for this development pattern that conforms with transit threshold requirements

WORKSHOP OUTPUTS

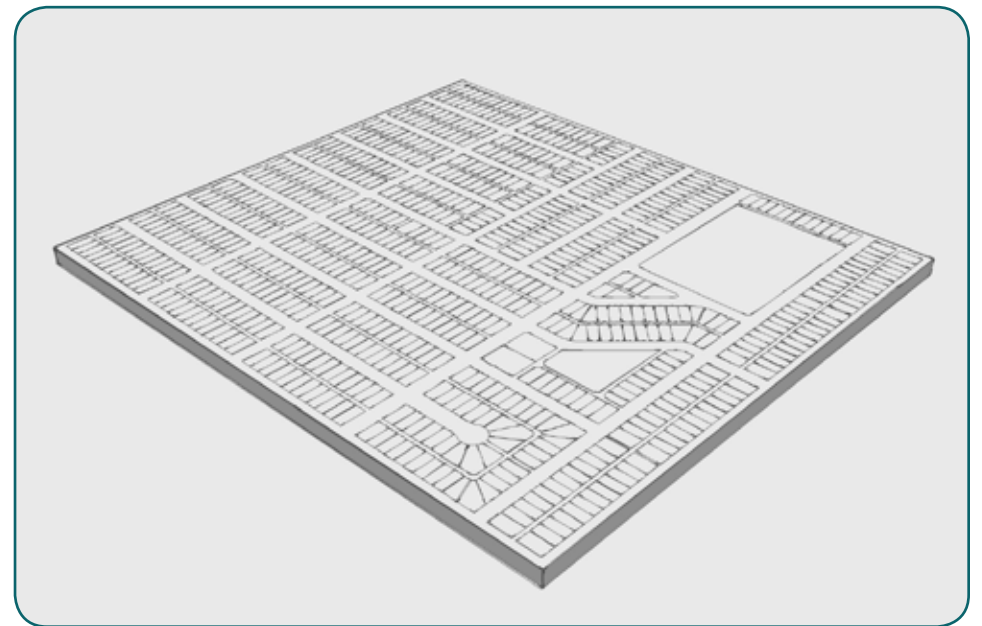
The workshop will result in a set of design rules and guidelines for the refined development pattern. The deliverables include:

- **Plan** of the development pattern
- **Physical design principles** for applying the development pattern in Calgary
- **List of cases** used in the development pattern
- Description of any **new cases** or **added case information**
- **3D visualization** of how the development pattern would look (sketches and perspectives of relevant areas)
- Description of the **phasing** required for this development pattern
- **Revised quantities** for this development pattern
- Answers to the development pattern **key questions** (*Report Back Worksheet*)



The workshop inputs consist of a base map of this pattern, base information on current and proposed land uses, a list of cases (compiled in the Case Book), and a desired performance of population and jobs for this particular development pattern.

MEDIUM DENSITY INFILL WORKING MATERIAL



MEDIUM DENSITY INFILL DESCRIPTION

What is a Medium Density Infill development pattern?

The **Medium Density Infill** development pattern doubles the population and jobs in existing low density residential neighbourhoods. The target areas for this type of intensification are those where there is a need for growth (e.g. areas close to City Centre). By intensifying population within existing neighbourhoods in the city, this pattern significantly supports Sustainability Principle 8: *Support compact development*; and, 7: *Strategically direct and manage redevelopment opportunities within existing areas*.

The proposed **Medium Density Infill** development pattern assumes a housing and employment capacity that differentiates it from other patterns. It is important to note that this pattern is different than the Medium Density Residential development pattern. The **Medium Density Infill** pattern applies to low density residential neighbourhoods, maintaining their character and basic physical appearance, while at the same time doubling their population and employment capacity.

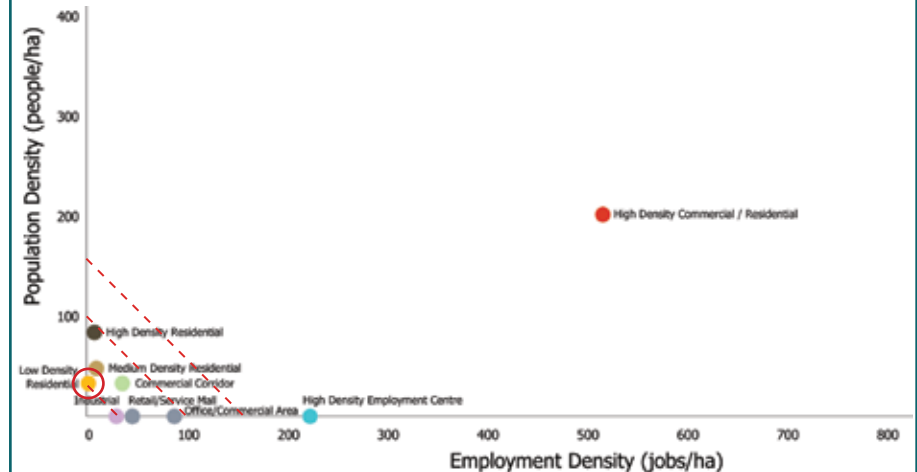
What is the desired performance for a Medium Density Infill development pattern in terms of population and employment capacity?

With 65 people per hectare, a **Medium Density Infill** pattern accommodates twice the population than current low density residential neighbourhoods (33 people/ha). The employment capacity is also twice as the current (from 1 job/ha to 2 jobs/ha), but is still minor when compared to population.

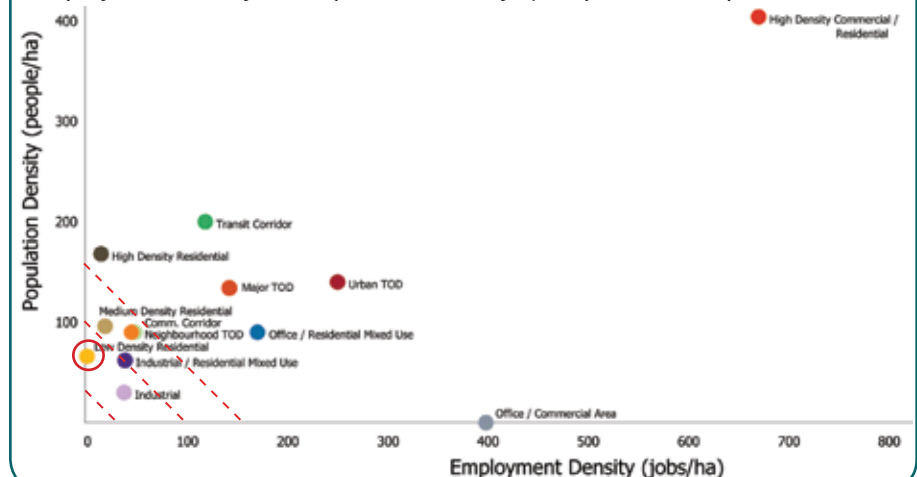
What is the desired performance for an Medium Density Infill development pattern in terms of transit capacity and viability?

Current low density residential neighbourhoods in Calgary are just on the threshold for basic transit service (35 people and jobs per hectare). While not enough to support high capacity transit, the intensified neighbourhoods resulting from **Medium Density Infill** will consolidate existing areas to support basic bus service. Basic service may consist of a feeder bus service to the nearest CTrain station or mainline bus route.

Employment Density and Population Density of Existing Development Patterns



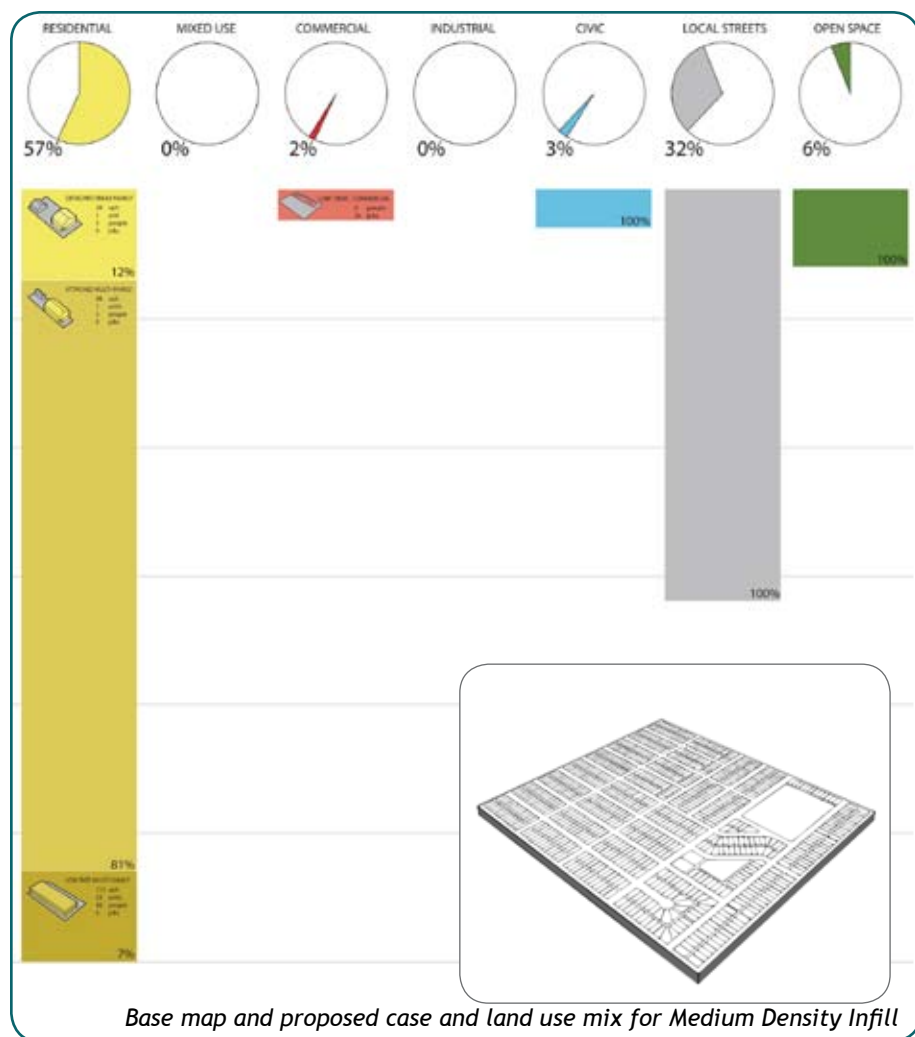
Employment Density and Population Density of Proposed Development Patterns



Each of the existing and proposed development patterns has particular population and employment densities. The dashed red lines represent the thresholds to support different types of transit: minimum 35 people/jobs per hectare for basic bus service and minimum 100-150 people/jobs per hectare for high capacity transit service (streetcars, busways, light rail transit, commuter rail).

Design Centre for Sustainability

MEDIUM DENSITY INFILL DESCRIPTION



What are the land uses and cases that make up the proposed Medium Density Infill development pattern?

The proposed **Medium Density Infill** development pattern is primarily residential (57%), but also includes four other land uses: 2% commercial, 3% civic, 32% local streets, and 6% open space. The proposed pattern includes a variety of residential building and parcel types, such as detached single family, attached multi-family, and low rise multi-family.

In the exploration of the **Medium Density Infill** the team may choose to introduce new cases, and/or modify the proposed case and land use mix. The Case Book includes alternate case options, and the team may also generate new cases. For the latter, the team must provide a description and housing and employment data.

Although beyond the development pattern boundary, the base map includes a major arterial as reference to provide context for decision making.

DESIRED PERFORMANCE FOR PROPOSED MEDIUM DENSITY INFILL:

PATTERN AREA:	73.2 ha
POPULATION:	4,800 (65 people/ha)
EMPLOYMENT:	160 (2 jobs/ha)

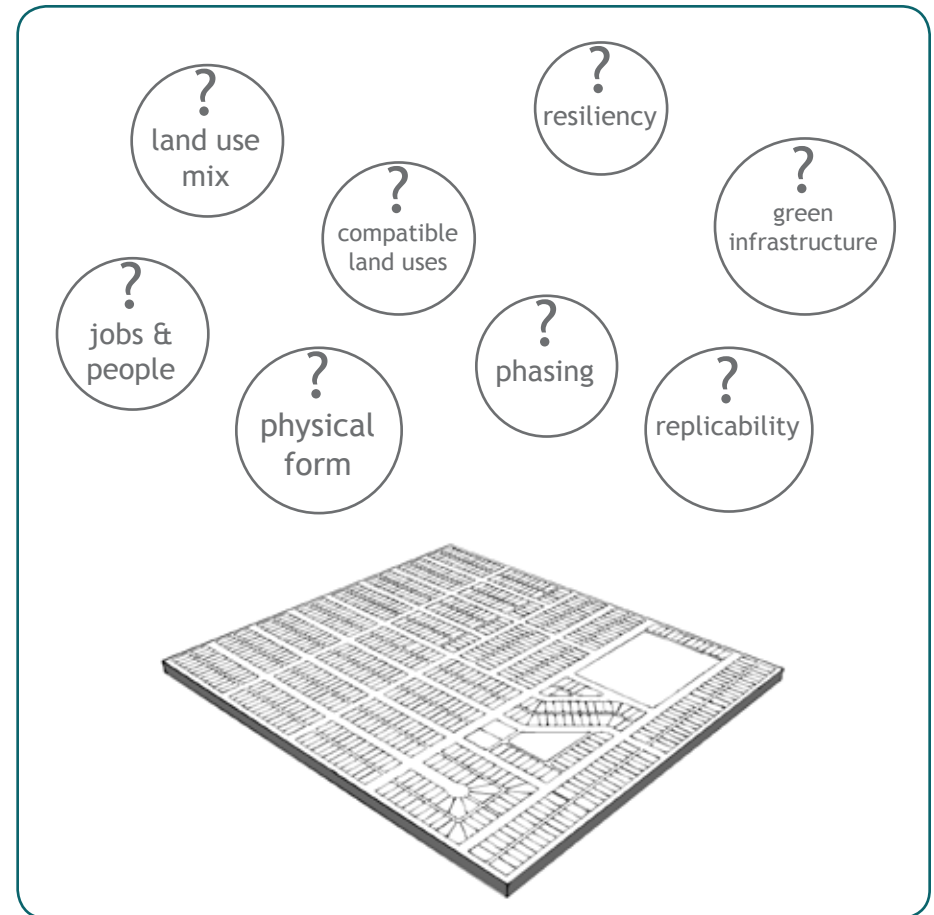
A series of cases (parcel and building types) make up the land uses. Each development pattern represents a particular allocation of land uses. Together, land use and case allocation determine the jobs and population performance of a pattern. This workshop will review and refine these allocation and performance assumptions. This may involve adding new cases and/or modifying the proposed case and land use mix.

Design Centre for Sustainability

MEDIUM DENSITY INFILL

KEY QUESTIONS

- **How many jobs and dwelling units can a Medium Density Infill hold?**
 - > Is it possible for a **Medium Density Infill** to double the population and jobs of an existing low density residential neighbourhood, while maintaining its basic character and physical appearance?
- **What is the appropriate land use mix for a Medium Density Infill?**
 - > What are the commercial, recreational, and other services required to meet the needs of the existing and emerging community and how do they integrate with the primary residential use?
- **What is the physical appearance of a Medium Density Infill?**
 - > What are the housing types and mix appropriate to double the population and maintain the basic character and identity of the neighbourhood, and how can these improve housing choice and affordability in the community?
 - > How can the existing neighbourhood be intensified in ways that it emphasizes public open space and civic buildings as gathering places, to enhance the sense of community?
 - > How can the design of public spaces contribute to the identity of smaller individual areas within the existing neighbourhood?
- **What is the green infrastructure within a Medium Density Infill?**
 - > What design strategies for green infrastructure and low-impact development practices can contribute to the health, maintenance, and function of the existing neighbourhood?
- **What are other compatible land uses within a Medium Density Infill?**
- **What is the phasing for a Medium Density Infill?**
 - > What are the challenges and key focus needs for policy development and implementation strategies?
- **What is the replicability of a Medium Density Infill?**
- **What is the resiliency of a Medium Density Infill?**



It is up to the workshop team to explore and test the previous assumptions related to population and jobs in the Medium Density Infill development pattern and at the same time come up with new data about its land use mix, urban form, phasing, resiliency, replicability, and green infrastructure.

MEDIUM DENSITY INFILL DESIGN STRATEGIES & BEST PRACTICES

photo credit: Design Centre for Sustainability



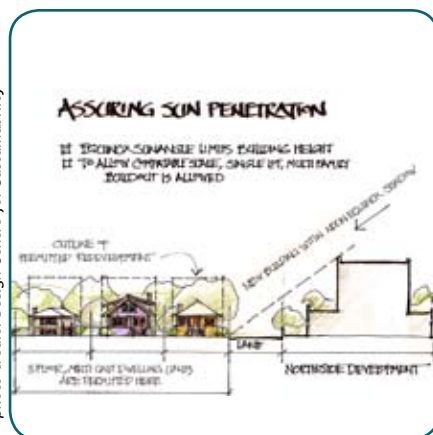
photo credit: Design Centre for Sustainability



photo credit: Jon Lauren



photo credit: Design Centre for Sustainability



The Medium Density Infill development pattern intensifies existing low density residential neighbourhoods, while at the same time maintaining their character and basic physical appearance. Above are different examples of infill in low density residential neighbourhoods: (clockwise from top, left) incremental infill through coach houses and duplexes; a fourplex (Vancouver, BC); study of height, scale, and outline of permitted development to allow for sun penetration; and, on-street retail with residential units above (Denman Street, Vancouver, BC).

Design Strategies

- Provide opportunities for **incremental infill** within **buildings** (e.g. basement suites, duplexes, triplexes) and within **parcels** (e.g. garden suites, suites above garages) to gradually intensify the neighbourhood.
- Where appropriate, introduce **multi family housing** with heights and forms compatible with the surrounding single family house context.
- Create opportunities to introduce small scale **commercial use** within existing single family houses (e.g. a neighbourhood corner store).
- Orient new buildings to allow for **pocket parks** and public space openings for community gathering.
- Retrofit **alleys** to: become attractive **gathering places** for neighbours; accommodate new accessibility and parking demands; and, perform ecological functions (e.g. stormwater infiltration, community gardens).
- Create a **green infrastructure network** featuring trees and boulevards; stormwater management - turning **grey streets into green ones**; and, green roofs and greywater recycling in new buildings.

Calgary Policy on Secondary Suites

On July 25, 2005, Council approved the direction to integrate secondary suites within the Low Density Residential Framework. The Land Use Bylaw Review process had previously identified secondary suites as a form of housing that needs to be recognized, and as a way to broaden the range of housing options and to address the issue of affordable housing.

In Calgary, a **Secondary Suite** is defined as an additional dwelling unit (bedroom, bathroom, kitchen) that exists in conjunction with a principal dwelling such as a single detached dwelling. Most secondary suites in Calgary occur in the form of basement suites within a single detached dwelling. Although the basement suite is the most common form, other forms of secondary suites have been developed in Calgary. These include: above a rear detached garage; above the main floor of a single detached dwelling; attached at-grade to a single detached dwelling (similar to a semi detached dwelling, side by side); and, detached (Stand Alone) from the principal dwelling (detached garden suite). *Source: City of Calgary*

MEDIUM DENSITY INFILL

DESIGN STRATEGIES & BEST PRACTICES

Mole Hill, Vancouver, BC

Mole Hill is a recent example of residential infill in heritage buildings. The project consisted of the renovation of 27 heritage homes into 170 units of non-market housing. Dwelling types include studios and 1, 2, and 3 bedroom units. The alley was transformed into a mid-block greenway with community gardens and gathering spaces. A small park open to the public has water features that use stormwater. Sustainable practices underway include use of geothermal energy and a CAN-partnership to reduce vehicle ownership. As part of this initiative, there is storage for bicycles, and parking stalls in the alley were reduced from 100 to 28.

Cambridge Cohousing, Cambridge, MA

Cambridge Cohousing is an infill residential project of 41 dwelling units on a narrow 0.6 ha-site (1.5 acres). The project provides numerous housing types ranging from 3 storey townhouses to 1, 2, and 3 bedroom units. It also includes communal facilities, such as childcare and recreational facilities, a library, and shared gardens. The project uses a district heating/cooling system and water-efficient utilities (e.g. toilets, dishwashers, and washing machines). In 1998, Cambridge Cohousing was awarded by the AIA/COTE Top Ten Green Projects and by the Green Building Challenge. Cambridge Cohousing is part of the U.S. Department of Energy's Building America program.

Infill Design Project, Portland, OR

Portland's Infill Design project aims to improve the design of multidwelling and rowhouse development. The project brings together a diversity of community stakeholders to find solutions to a wide range of design-related issues. The range of priorities being considered includes: accommodating greater density while respecting desired neighbourhood character; encouraging quality design while facilitating affordable housing; providing for automobile parking while contributing to pedestrian-friendly street frontages; meeting density goals while providing usable open space; minimizing impervious surfaces while ensuring durable vehicle areas; and, allowing the new while respecting the old. An emphasis of the project is on finding ways of encouraging desirable development, rather than simply regulating against bad design.



photo credit: Elisa Campbell



photo credit: Dave Hohenschau



photo credit: Sharon Hamer

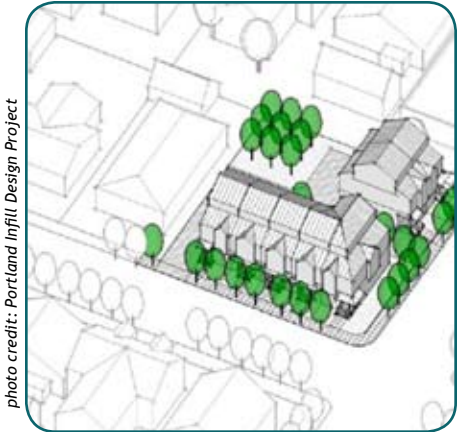
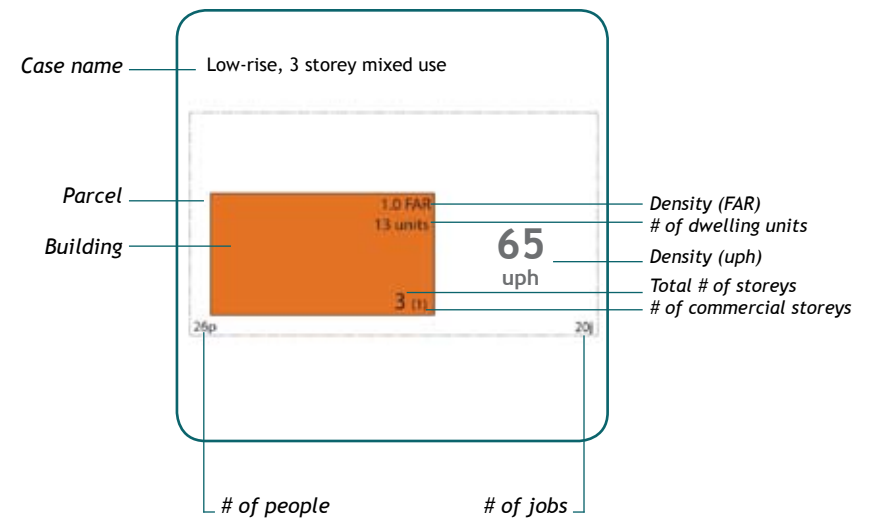
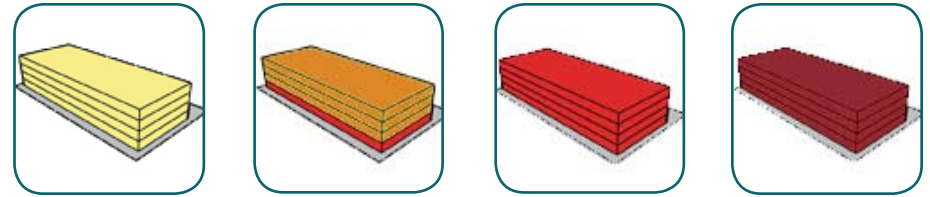


photo credit: Portland Infill Design Project

(Top, left and right) Mole Hill in Vancouver, BC, consists of the renovation of 27 heritage homes into 170 non-market housing units. The alley has been transformed into a mid-block greenway with community gardens and gathering spaces. (Bottom, left) Cambridge Cohousing, in Massachusetts, features 41 units of various types, communal facilities, and several environmentally sustainable practices. (Bottom, right) The Portland Infill Design Project offers numerous design solutions to accommodate density while respecting desired neighbourhood character.

DEVELOPMENT PATTERN CASE BOOK

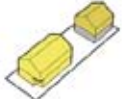











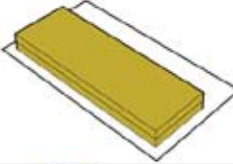


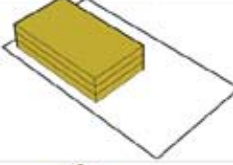


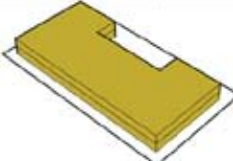




DEVELOPMENT PATTERN CASE BOOK

GROUND-ORIENTED RESIDENTIAL

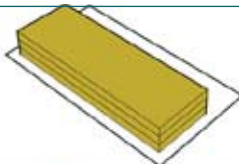


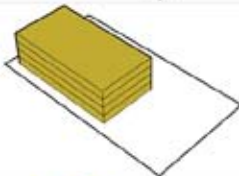


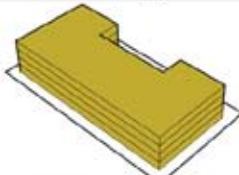


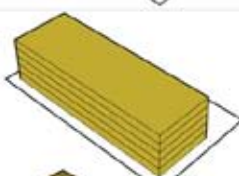
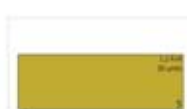

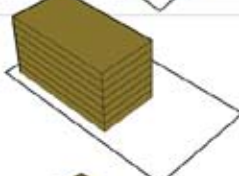


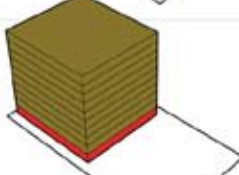


TYPE	NET DENSITY	FORM			UNITS	PEOPLE	JOBS	DESCRIPTION
SINGLE FAMILY FRONT GARAGE	20 ^{uph} (8 upa)				1 unit	3 people	0 jobs	Single family detached house on standard 15m wide parcel. Front access garage. Assumed unit size 180 m ² . Assumed population density 3 persons per unit.
SINGLE FAMILY REAR GARAGE	20 ^{uph} (8 upa)				1 unit	3 people	0 jobs	Single family detached house on standard 15m wide parcel. Rear access garage. Assumed unit size 180 m ² . Assumed population density 3 persons per unit.
SINGLE FAMILY NARROW LOT	30 ^{uph} (12 upa)				1 unit	3 people	0 jobs	Single family detached house on narrow 10m wide parcel. Rear access garage. Assumed unit size 165 m ² . Assumed population density 3 persons per unit.
SINGLE FAMILY REAR GARAGE AND ACCESSORY UNIT	40 ^{uph} (16 upa)				2 units	5 people	0 jobs	Single family detached house on standard 15m wide parcel. Rear access garage with accessory unit. Assumed unit size 180 m ² with 60 m ² accessory unit. Assumed population densities of 3 persons per unit and 2 persons per accessory unit.
SIDE BY SIDE DUPLEX	40 ^{uph} (16 upa)				2 units	6 people	0 jobs	2 unit duplex, attached side by side on standard 15m wide parcel. Rear access garage. Assumed unit size 150 m ² . Assumed population density 3 persons per unit.
7.5M ROWHOUSE	40 ^{uph} (16 upa)				1 unit	3 people	0 jobs	Attached rowhouse on 7.5m wide parcel. Rear access garage. Assumed unit size 125 m ² . Assumed population density 3 persons per unit.
6.4M ROWHOUSE	50 ^{uph} (20 upa)				1 unit	3 people	0 jobs	Attached rowhouse on 6.4m wide parcel. Rear access garage. Assumed unit size 110 m ² . Assumed population density 3 persons per unit.

DEVELOPMENT PATTERN CASE BOOK

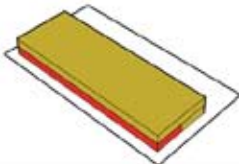


	TYPE	NET DENSITY	FORM		UNITS	PEOPLE	JOBS	DESCRIPTION
GROUND-ORIENTED RESIDENTIAL	SINGLE FAMILY NARROW LOT AND ACCESSORY UNIT	60 ^{uph} (24 upa)	  		2 ^{units}	5 ^{people}	0 ^{jobs}	Single family detached house on narrow 10m wide parcel. Rear access garage with accessory unit. Assumed unit size 165 m ² with 60 m ² accessory unit. Assumed population densities of 3 persons per unit and 2 persons per accessory unit.
	TANDEM DUPLEX	60 ^{uph} (24 upa)	  		2 ^{units}	6 ^{people}	0 ^{jobs}	2 unit duplex attached front to back on narrow 10m wide parcel. Rear access garage. Assumed unit size 121 m ² . Assumed population density 3 persons per unit.
	5M ROW-HOUSE	60 ^{uph} (24 upa)	  		1 ^{unit}	3 ^{people}	0 ^{jobs}	Attached rowhouse on 5m wide parcel. Rear access garage. Assumed unit size 135 m ² . Assumed population density 3 persons per unit.
	4.3M ROWHOUSE	70 ^{uph} (28 upa)	  		1 ^{unit}	3 ^{people}	0 ^{jobs}	Attached rowhouse on 4.3m wide parcel. Rear access garage. Assumed unit size 115 m ² . Assumed population density 3 persons per unit.
STACKED RESIDENTIAL	LOW-RISE, 2 STOREY STACKED APARTMENTS	80 ^{uph} (32 upa)	  		16 ^{units}	32 ^{people}	0 ^{jobs}	Low-rise stacked apartments at 0.9 FAR . Greater parcel coverage. 2 stories. Assumed unit size 90 m ² . Assumed population density 2 persons per unit.
	LOW-RISE, 3 STOREY STACKED APARTMENTS	80 ^{uph} (32 upa)	  		16 ^{units}	32 ^{people}	0 ^{jobs}	Low-rise stacked apartments at 0.9 FAR . Reduced parcel coverage. 3 stories. Assumed unit size 90 m ² . Assumed population density 2 persons per unit.
	LOW-RISE, 2 STOREY STACKED APARTMENTS	115 ^{uph} (46 upa)	  		23 ^{units}	46 ^{people}	0 ^{jobs}	Low-rise stacked apartments at 1.3 FAR . Greater parcel coverage. 2 stories. Assumed unit size 90 m ² . Assumed population density 2 persons per unit.

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STACKED RESIDENTIAL

TYPE	NET DENSITY	FORM			UNITS	PEOPLE	JOBS	DESCRIPTION
LOW-RISE, 3 STOREY STACKED APARTMENTS	115 uph (45 upa)				23 units	46 people	0 jobs	Low-rise stacked apartments at 1.3 FAR . Greater parcel coverage. 3 stories. Assumed unit size 90 m ² . Assumed population density 2 persons per unit.
LOW-RISE, 4 STOREY STACKED APARTMENTS	115 uph (45 upa)				23 units	46 people	0 jobs	Low-rise stacked apartments at 1.3 FAR . Reduced parcel coverage. 4 stories. Assumed unit size 90 m ² . Assumed population density 2 persons per unit.
LOW-RISE, 4 STOREY STACKED APARTMENTS	195 uph (79 upa)				39 units	78 people	0 jobs	Low-rise stacked apartments at 2.2 FAR . Greater parcel coverage. 4 stories. Assumed unit size 90 m ² . Assumed population density 2 persons per unit.
LOW-RISE, 5-STOREY STACKED APARTMENTS	195 uph (79 upa)				39 units	78 people	0 jobs	Low-rise stacked apartments at 2.2 FAR . Greater parcel coverage. 5 stories. Assumed unit size 90 m ² . Assumed population density 2 persons per unit.
MID-RISE, 7 STOREY STACKED APARTMENTS	195 uph (79 upa)				39 units	78 people	0 jobs	Mid-rise stacked apartments at 2.2 FAR . Reduced parcel coverage. 7 stories. Assumed unit size 90 m ² . Assumed population density 2 persons per unit.
MID-RISE RESIDENTIAL TOWER	330 uph (134 upa)				65 units	130 people	30 jobs	Mid-rise residential tower at 3.9 FAR . Some commercial at base. 10 stories. Assumed employment densities of 20 m ² per employee (50%) and 23 m ² per employee (50%). Assumed unit size 90 m ² . Assumed population density 2 persons per unit.

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TYPE	NET DENSITY	FORM		UNITS	PEOPLE	JOBS	DESCRIPTION	
HIGH-RISE RESIDENTIAL TOWER	670 _{uph} (271 upa)				130 _{units}	260 _{people}	60 _{jobs}	High-rise residential tower at 8.0 FAR . Commercial at base. 20 stories. Assumed employment densities of 20 m ² per employee (50%) and 23 m ² per employee (50%). Assumed unit size 90 m ² . Assumed population density 2 persons per unit.
LOW-RISE, 2 STOREY MIXED USE	65 _{uph} (26 upa)				13 _{units}	26 _{people}	20 _{jobs}	Low-rise mixed use at 1.0 FAR . Street-oriented commercial space with apartments above. 2 stories. Assumed employment densities of 20 m ² per employee (50%) and 23 m ² per employee (50%). Assumed unit size 90 m ² . Assumed population density 2 persons per unit.
LOW-RISE, 3 STOREY MIXED USE	65 _{uph} (26 upa)				13 _{units}	26 _{people}	20 _{jobs}	Low-rise mixed use at 1.0 FAR . Street-oriented commercial space with stacked apartments above. 3 stories. Assumed employment densities of 20 m ² per employee (50%) and 23 m ² per employee (50%). Assumed unit size 90 m ² . Assumed population density 2 persons per unit.
LOW-RISE, 5 STOREY MIXED USE	160 _{uph} (65 upa)				35 _{units}	70 _{people}	36 _{jobs}	Low-rise mixed use at 2.0 FAR . Street-oriented commercial space with stacked apartments above. 5 stories. Assumed employment densities of 20 m ² per employee (50%) and 23 m ² per employee (50%). Assumed unit size 90 m ² . Assumed population density 2 persons per unit.
LOW-RISE, 5 STOREY MIXED USE	160 _{uph} (65 upa)				35 _{units}	70 _{people}	36 _{jobs}	Low-rise mixed use at 2.0 FAR . Street-oriented commercial space with stacked apartments above. Commercial space deepened for larger format retail or grocery. 5 stories. Assumed employment densities of 20 m ² per employee (50%) and 23 m ² per employee (50%). Assumed unit size 90 m ² . Assumed population density 2 persons per unit.

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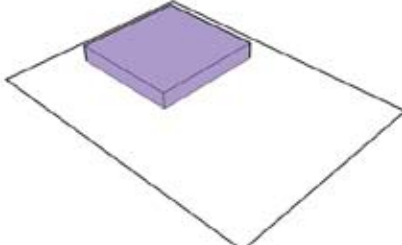


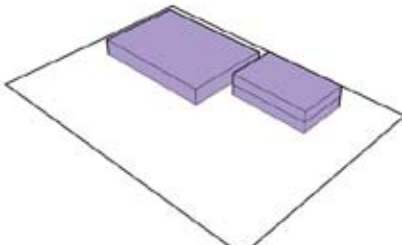


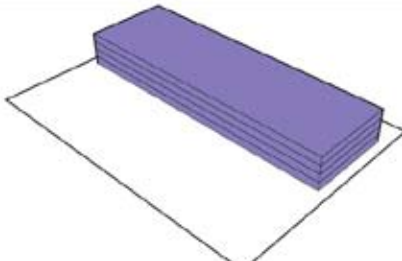


COMMERCIAL	TYPE	NET DENSITY	FORM			JOBS	DESCRIPTION
	1 STOREY COMMERCIAL STRIP RETAIL	0.2 FAR				76 jobs	Low density strip retail on large parcel at 0.2 FAR. 1 storey. Assumed employment densities of 20 m ² per employee (75%) and 23 m ² per employee (25%).
	1 STOREY COMMERCIAL GROCERY	0.3 FAR				85 jobs	Low density grocery and strip retail on large parcel at 0.3 FAR. 1 storey. Assumed employment densities of 40 m ² per employee (50%) and 23 m ² per employee (50%).
	2 STOREY COMMERCIAL	0.7 FAR				52 jobs	Medium density commercial at 0.7 FAR. 2 stories. Assumed employment densities of 20 m ² per employee (50%) and 23 m ² per employee (50%).
	3 STOREY COMMERCIAL	1.3 FAR				100 jobs	Medium density commercial at 1.3 FAR. Greater parcel coverage. 3 stories. Assumed employment densities of 20 m ² per employee (50%) and 23 m ² per employee (50%).
	4 STOREY COMMERCIAL	1.3 FAR				100 jobs	Medium density commercial at 1.3 FAR. Reduced parcel coverage. 4 stories. Assumed employment densities of 20 m ² per employee (50%) and 23 m ² per employee (50%).

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COMMERCIAL






TYPE	NET DENSITY	FORM			JOB	DESCRIPTION
5 STOREY COMMERCIAL	2.3 _{FAR}				170 _{jobs}	Medium density commercial at 2.3 FAR. Greater parcel coverage. 5 stories. Assumed employment density 23 m ² per employee.
7 STOREY COMMERCIAL	2.3 _{FAR}				170 _{jobs}	Medium density commercial at 2.3 FAR. Reduced parcel coverage. 7 stories. Assumed employment density 23 m ² per employee.
MID-RISE OFFICE TOWER	3.2 _{FAR}				225 _{jobs}	High density commercial tower at 3.2 FAR. 8 stories. Assumed employment density 23 m ² per employee.
HIGH RISE OFFICE TOWER	8.0 _{FAR}				560 _{jobs}	High density commercial tower at 8.0 FAR. 20 stories. Assumed employment density 23 m ² per employee.

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INDUSTRIAL	TYPE	NET DENSITY	FORM			JOB	DESCRIPTION
	1 STOREY LIGHT INDUSTRIAL	0.2 FAR				32 _{jobs}	Light industrial at 0.2 FAR, 1 storey. Assumed employment densities of 34 m ² per employee (50%) and 50 m ² per employee (50%).
	1-2 STOREY LIGHT INDUSTRIAL	0.3 FAR				50 _{jobs}	Light industrial at 0.3 FAR, 1 to 2 stories. Assumed employment densities of 34 m ² per employee (75%) and 50 m ² per employee (25%).
	BUSINESS INDUSTRIAL	1.5 FAR				375 _{jobs}	Business industrial at 1.5 FAR, 4 stories. Assumed employment density of 25 m ² per employee.

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ROAD TYPES: HIGH LEVEL ROADS

TYPE	RIGHT-OF-WAY	FORM	LANES	SPEED	DAILY TRAFFIC	DESCRIPTION
MINOR ARTERIAL	36 meters		4-6 lanes	50-70 kph	20,000-40,000 veh/d	<ul style="list-style-type: none"> • all modes • lower speed • medium volume • medium access corridor
URBAN BOULEVARD	40-60 meters		2-6 lanes	50-60 kph	20,000-45,000 veh/d	<ul style="list-style-type: none"> • all modes of transportation at high density • lower speed • urban corridor with complementary mixed land use
MAJOR ARTERIAL	50 meters		4-6 lanes	60-80 kph	30,000-60,000 veh/d	<ul style="list-style-type: none"> • auto, bus & truck traffic • higher speed • high volume, low access continuous cross town corridor
EXPRESSWAY	60-80 meters		4-8 lanes	70-90 kph	40,000-100,000 veh/d	<ul style="list-style-type: none"> • per Subdivision Design manual
PARKWAY	SITE SPECIFIC		2-4 lanes	50-60 kph	20,000-40,000 veh/d	<ul style="list-style-type: none"> • environmentally friendly modes at low density • lower speed • passive natural environment

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ROAD FEATURES

ROAD FEATURE			MINOR ARTERIAL	URBAN BOULEVARD	MAJOR ARTERIAL	EXPRESSWAY	PARKWAY
TRAVEL LANE				Lane widths vary from 3.5m to 3.7m * Widths could be reduced to 3.2m or 3.3m if lower speeds desired			
BUS/HOV LANE			*bus or bus priority	✓ *bus or bus only, HOV or street cars	✓ *bus or bus only or HOV	✓ *HOV	*bus
PARKING				✓ *site specific, parallel only			✓ *site specific
BIKE LANE			*wide curb lane	✓ *bike lane or wide curb lane	✓ *bike lane or wide curb lane		✓ *bike lane or wide curb lane
MEDIAN			✓	✓ *site specific	✓	✓	✓
BOULEVARD & SIDEWALK			✓	✓ *wide sidewalks	✓	✓ *some pathways, over passes	✓
MULTI-USE PATHWAY			✓ *site specific	✓ *site specific	✓ *site specific	✓ *site specific	✓ *site specific
STORMWATER INFILTRATION			✓ *site specific	✓ *site specific	✓ *site specific	✓ *site specific	✓ *site specific

WORKSHOP CHECKLIST

In order to effectively test and refine the development pattern explored in this workshop, the following deliverables must be completed:

- ☐ **Plan** of the development pattern
- ☐ **Physical design principles** for applying the development pattern in Calgary
- ☐ **List of cases** used in the development pattern
- ☐ Description of any **new cases** or **added case information**
- ☐ **3D visualization** of how the development pattern would look (sketches and perspectives of relevant areas)
- ☐ Description of the **phasing** required for this development pattern
- ☐ **Revised quantities** for this development pattern
- ☐ Answers to the development pattern **key questions** (*Report Back Worksheet*)

MEDIUM DENSITY INFILL KEY QUESTIONS (to be answered in *Report Back Worksheet*)

- **How many jobs and dwelling units can a Medium Density Infill hold?**
 - > Is it possible for a **Medium Density Infill** to double the population and jobs of an existing low density residential neighbourhood, while maintaining its basic character and physical appearance?
- **What is the appropriate land use mix for a Medium Density Infill?**
 - > What are the commercial, recreational, and other services required to meet the needs of the existing and emerging community and how do they integrate with the primary residential use?
- **What is the physical appearance of a Medium Density Infill?**
 - > What are the housing types and mix appropriate to double the population and maintain the basic character and identity of the neighbourhood, and how can these improve housing choice and affordability in the community?
 - > How can the existing neighbourhood be intensified in ways that it emphasizes public open space and civic buildings as gathering places, to enhance the sense of community?
 - > How can the design of public spaces contribute to the identity of smaller individual areas within the existing neighbourhood?
- **What is the green infrastructure within a Medium Density Infill?**
 - > What design strategies for green infrastructure and low-impact development practices can contribute to the health, maintenance, and function of the existing neighbourhood?
- **What are other compatible land uses within a Medium Density Infill?**
- **What is the phasing for a Medium Density Infill?**
 - > What are the challenges and key focus needs for policy development and implementation strategies?
- **What is the replicability of a Medium Density Infill?**
- **What is the resiliency of a Medium Density Infill?**