Post-Oil +15

Designing an "Urban Campus" in Downtown Calgary

by
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AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by examiners.

I understand that my thesis may be made electronically available to the public.

ABSTRACT

Calgary, Alberta is a city that is economically dependent on the petroleum industry. The inevitable boom and bust cycle surrounding the petroleum industry frequently disrupts Calgary's socioeconomic health. Since the most recent downturn in 2014 caused by a drop in oil prices, the downtown region has suffered from a decline of buildings, jobs, and population. As the administrative centre of the petroleum industry, the city core has been depleted of activity both in the public realm and in private office towers.

The desolate state of downtown Calgary is not merely the result of the instability of the oil market, but is also due to the lack of success of the "+15 system" in creating a cohesive urban centre. The +15 system, a network of walkways which connect office towers through a series of elevated bridges, removes the pedestrian from the streets and renders the public realm inactive.

The question of economic sustainability and urban renewal has challenged the policies of Albertan politicians, with many advocating strengthening alternative industries outside of oil and gas. As a response to this potentially diverse future economy, this thesis explores how the modern university can actively engage in the process of industry diversification by creating spaces that connect academic, social and economic activity. By transforming the +15 system from an isolated path into an "urban campus", this proposal aims to activate and connect the horizontal public and vertical private realms.

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INTRODUCTION

Post-Oil +15 is a thesis that explores the potential for existing pedestrian networks to transform the social, architectural, and economic landscape of downtown Calgary. The design proposition is influenced by the collapse in oil prices in 2014 and responds to the problematic context of a city centre where a single industry dominates the entire economy. While Calgary has established a reputation as the leader of oil and gas in Canada, one of the downfalls is that the saturated petroleum market has produced both a society that is overly dependent on this lucrative yet unstable industry and a downtown region that is devoid of cultural vibrancy and diversity. The objective of this thesis is not to offer a solution that resolves Calgary's economic issues, but rather to address the latent urban problems that have emerged because of the recent economic crisis. In the proposal, the singular economic and urban function of downtown Calgary is reversed by establishing a new academic institution inside Calgary's extensive walkway system. By implementing a university inside this elaborate urban infrastructure, it has to potential to revitalize deteriorating urban spaces and encourage new types of users to enter the city.

Chapter one explores the relationship between Calgary's economic history and urban identity in both spatial and non-spatial terms, first by examining how the economy has influenced the form of the urban fabric, and secondly by understanding the way citizens and politicians perceive the city during different stages of the economic cycle. The thesis supports the current social and political discourse concerning the urgent need to diversify industries in order to undercut the pressures of an instable oil and gas market. Political platforms and government strategy plans are examined in this chapter to support the framework of the design proposal.

The second chapter establishes the site for the design — an indoor walkway system in the city centre, also known as the +15. As a prominent architectural element in the city, the +15 has a strong influence on the spatial organization and overall development of downtown Calgary. This section includes research on the evolving ideologies associated with grade-separated, enclosed walkway systems and a critical analysis of the +15's current conditions, leading to the argument that this type of pedestrian network is contributing to the depleted vibrancy of the downtown core.

As a vehicle to reinvent the identity of downtown Calgary, the thesis advocates for a new university to be built inside the +15. The third chapter examines the viability of universities as suitable catalysts for revitalizing the city by assessing their contemporary roles as social and economic developers and studying current university typologies, such as innovation spaces and learning centres, that demonstrate the increasing integration of pedagogy with communities and industries.

The final chapter is a design proposal that combines previous research on the political discourse concerning industry diversification, critiques of analogous pedestrian networks, and the benefits of healthy university and industry relationships. The proposal is separated into two phases: in the first phase, a university is constructed as an autonomous building, which acts as an "anchor" institution, and the building design follows a set of architectural principles that align with core values in contemporary pedagogical practices. The second phase deploys these architectural principles inside the spaces of the +15, creating an indoor campus that is distributed across the entire downtown region and integrated seamlessly with existing spaces in the public realm. The chapter concludes with a vision of downtown Calgary as a diverse community with academic, businesses, and community members occupying common spaces within the university grounds.



Fig. 01 *Aerial view of Calgary skyline*



INDUSTRY AND IMAGE

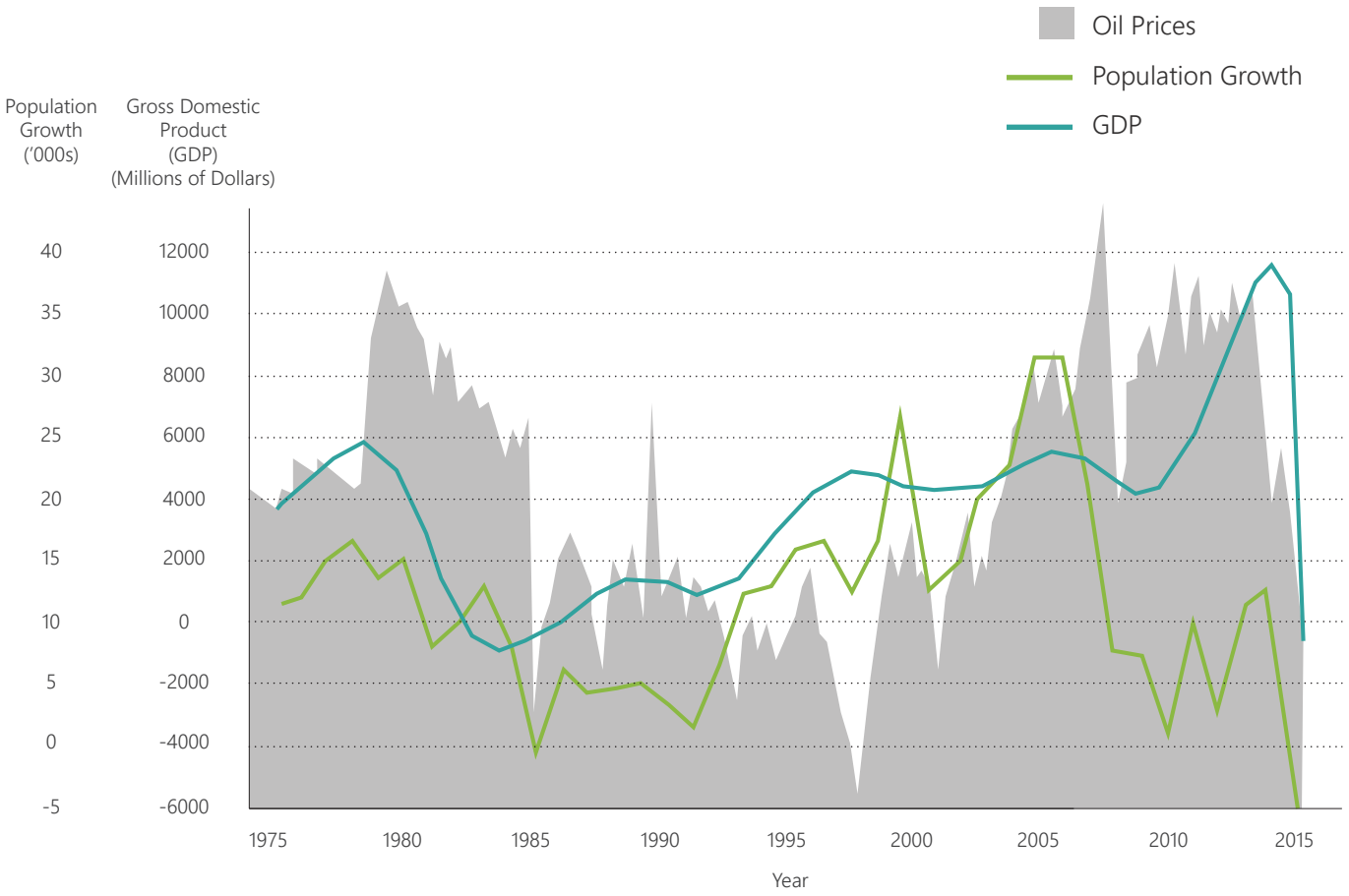


Fig. 02 Boom-bust cycle in Calgary

THE FUTURE OF CALGARY'S INDUSTRIES

Calgary is the fulcrum of the petroleum industry in Canada. The city's concentration of oil and gas businesses has generously contributed to its wealth and reputation as the national industry leader. Even though the monopolization of Calgary's economy by the oil and gas sector has been decreasing, the industry remains the single greatest contributor to the city's gross domestic product.[1] Although the energy market continues to provide benefits to the city, the reliance on this single sector is problematic because it frequently destabilizes the economy.

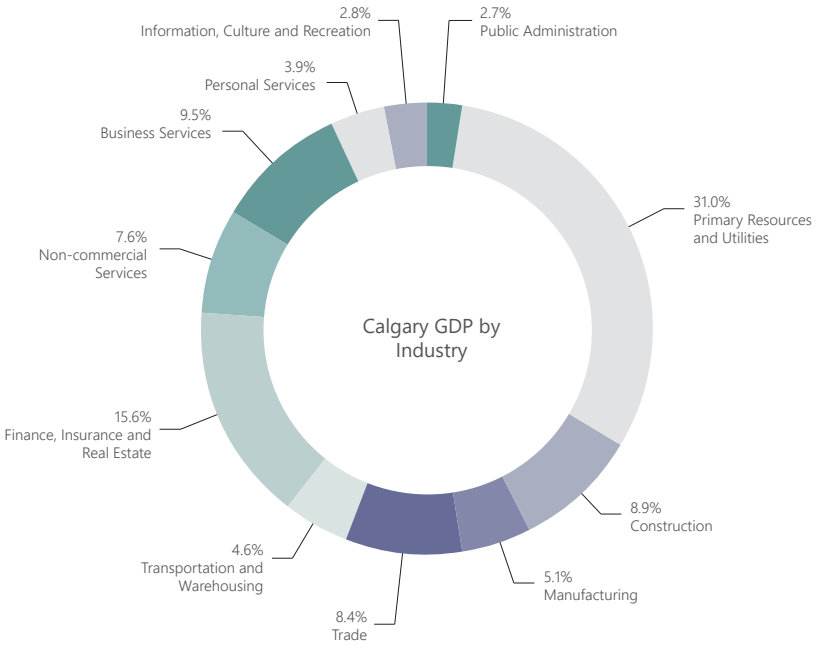


Fig. 03 Calgary GDP by industry

1 Why Calgary? our Economy in Depth. Calgary Economic Development, 2016.



Fig. 04 Natural gas plant in southern Alberta

The lack of economic resilience is an ongoing problem recognized by many businesses, as well as government and community members. Government entities, such as The Alberta Government and Calgary Economic Development, are working with community members to plan the future direction of Calgary's economy. In recently published articles and economic strategy plans, authorities have indicated that the diversification in Calgary's industry base is necessary to build new market opportunities since continuing to reinvest in oil and gas is simply not enough. One of the strong indications that Calgary is moving towards this goal is that the government of Alberta has invested twenty-five million dollars over the next two years into three categories that it considers to be top priority: entrepreneurs in small to medium sized firms, opportunities in food-processing, and attracting new major businesses into the province.[2] While in the past, efforts have been placed on the expansion into the energy industry, the new direction for the economic plan points to the expansion of alternative sectors.

Agriculture is an industry that has been around for the last century, at one point being the key component in shaping Calgary's local economy. Prior to the domination of the energy market, Calgary was a central competitor in agriculture and transportation of ranching goods.[3] Currently, there is a resurgence in demand for agricultural services with the world population projected to continue increasing over the next decade.[4] The industry is undergoing a period of significant transformation and increased investment in research and development projects. By finding new methods of farming, creating new kinds of machinery, and improving crop types, this not only increases productivity, but places Calgary as the potential global leader in agricultural business.

2 "Growing a Diversified Economy," Alberta Government, accessed December 6, 2017, https://www.alberta.ca/diversifying-economy.aspx
3 Richard Baine, *Calgary: An Urban Study*. Toronto: Clarke, Irwin, 1973, 17.
4 Agri-Business Research and Development: An Opportunity and a Necessity. Calgary Chamber, 2015, 9.



Fig. 05 *Wind farm in southern Alberta*



Fig. 06 *Canola fields in Alberta*

The recent declaration of Alberta's target of thirty percent renewable energy generation by 2030 has also placed renewable energy at the forefront of economic attention. Supporting this claim, the Government of Alberta is planning to phase out 6,300 megawatts of coal-fire electricity and increase spending on initiatives related to green building and transportation, energy storage, and renewable power generation. Calgary has also been suggested as the site for a commercial centre in renewable energy because of the years of experience with managing human and financial resources in the petroleum energy sector.[5]

The sectors in which Calgary is placing its investments and resources are not limited to the two industries described. Only a few examples have been mentioned to demonstrate that Calgary's economy is in the midst of change. With increasing local and global demand, Calgary needs greater access to capital, research, and human resources in order to successfully cultivate some of its alternative sectors. However, Calgary's prime real estate and working population are currently devoted to serving the petroleum industry. In order to successfully diversify the economy, Calgary must rethink its strategies by making resources more readily available and continuing to push the boundaries of innovation.

5 "Calgary Growing Quickly as Canada's Next Green Energy Hub," last modified Mar 9, 2017, accessed December 6, 2017, http://www.calgaryeconomicdevelopment.com/newsroom/calgary-growing-quickly-as-canadas-next-green-energy-hub/

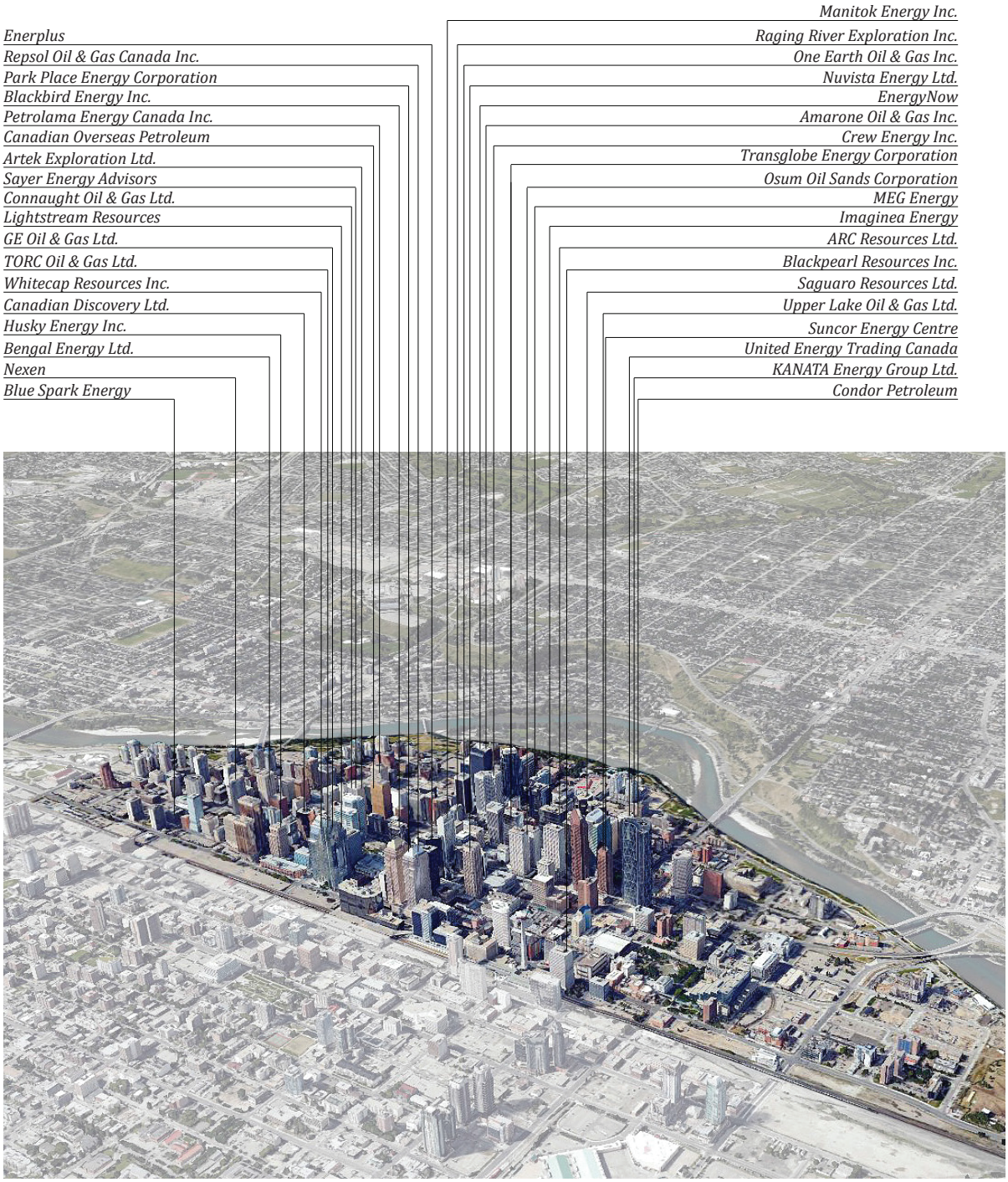


Fig. 07 Over 2,400 oil and gas companies are located in Calgary

IMAGE OF DOWNTOWN CALGARY

In February 1947, the discovery of crude oil near Leduc, Alberta prompted an expansion of petroleum development across western Canada. In the process, Calgary acquired the role as a major administrative centre for oil and gas, establishing its downtown as a district for the establishment financial and technological companies that would support the industry's growth. To further solidify Calgary's new status as the "oil capital of Canada", office towers designed for energy enterprises began to emerge across the downtown core.[6] Since then, Calgary has continued with the same pattern of land development and segregated the downtown district for commercial use. While there exist several areas used for residential, recreational, and institutional activity, they are allocated to the margins of downtown.

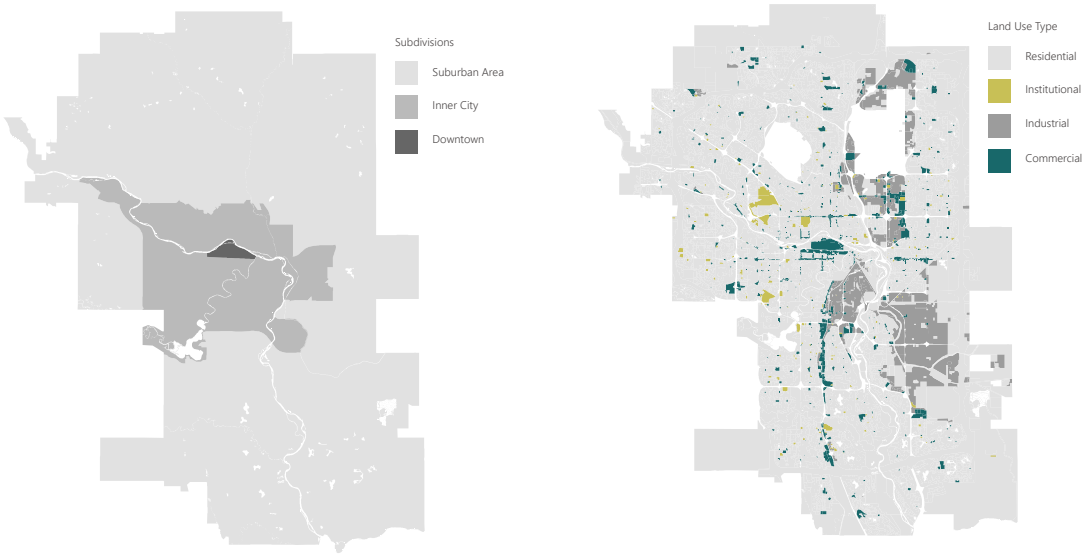


Fig. 08 *Map of land subdivision and land use type*

6 Beverly Sandalack, *The Calgary Project: Urban Form/Urban Life*, ed. Andrei Nicolai, Calgary: University of Calgary Press, 2006, 105.

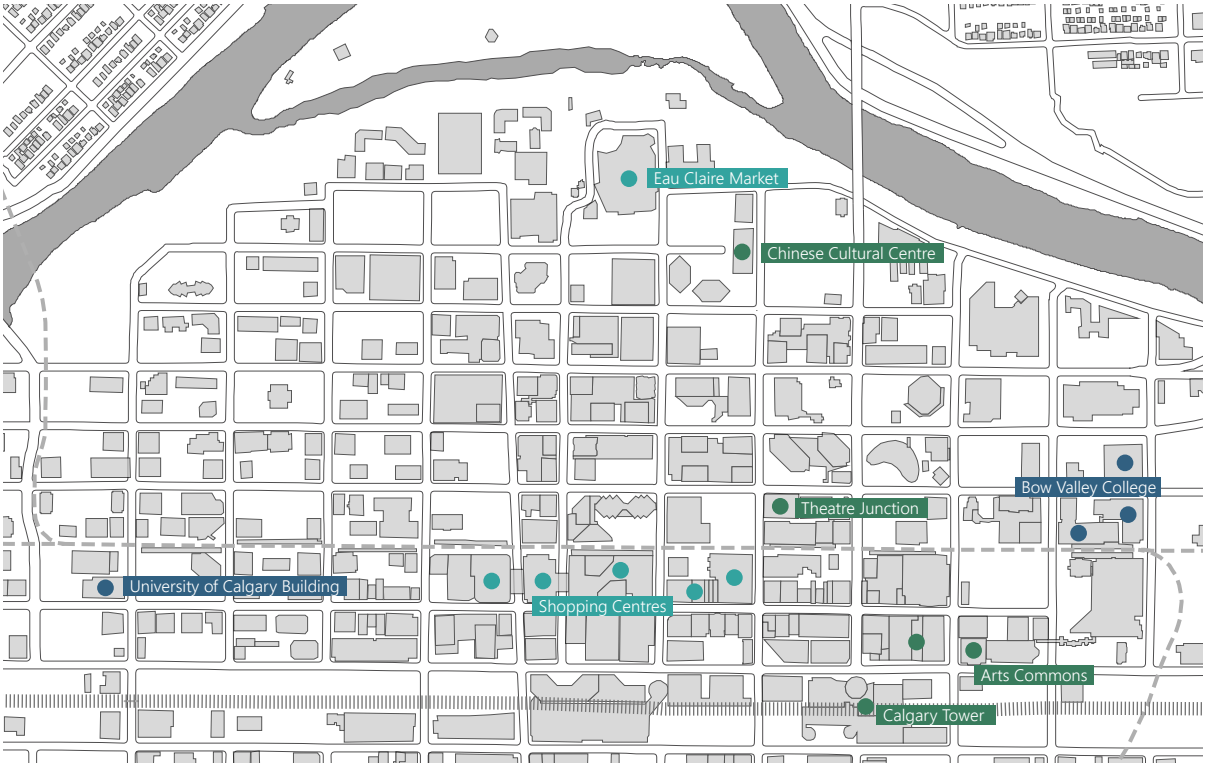


Fig. 09 Recreational and educational buildings



Fig. 10 Rocky Mountains

The absence of mixed-use activity in the downtown core has affected the way citizens and visitors perceive the city. Calgary's downtown core is not well suited for tourism because many of its retail spaces and public amenities cater solely to the working demographic.[7] Despite the large amount of tourists Calgary receives every year, the majority of people who visit do so for the purpose of visiting family and friends, viewing the natural landscapes, and participating in outdoor recreational activities—and seldom to explore the sights that the city has to offer.[8] The most recent oil crisis has made it even more apparent that there is a shortage of mixed-use spaces to support a diverse group of citizens. The downsizing or foreclosure of commercial businesses has decreased the number of people spending time in downtown. The declining number of workers, which make up the daily downtown population, is impacting the vitality of Calgary.

7 Evan Duggan, "High Office Vacancy Hits Calgary's Downtown Retail Market," *Property Biz*, Canada, June, 27, 2017, https://renx.ca/calgary-high-office-vacancy-hurts-retail-barclay-street/

8 Tourism in Calgary and Area Tourism Region 2014: A Summary of 2014 Visitor Numbers, Expenditures and Characteristics. Alberta Government, 2016, 8.

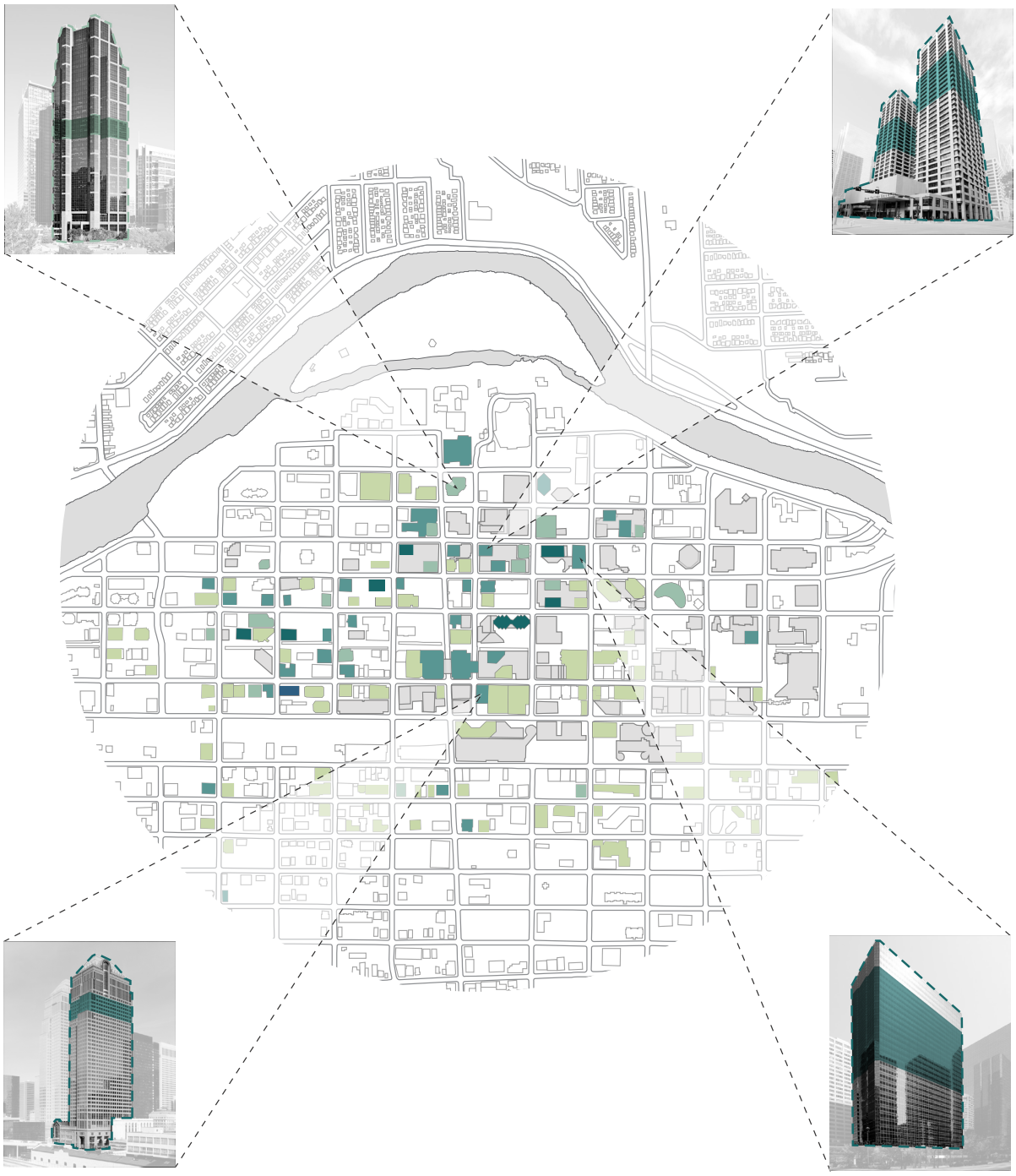


Fig. 11 Commercial vacancy map

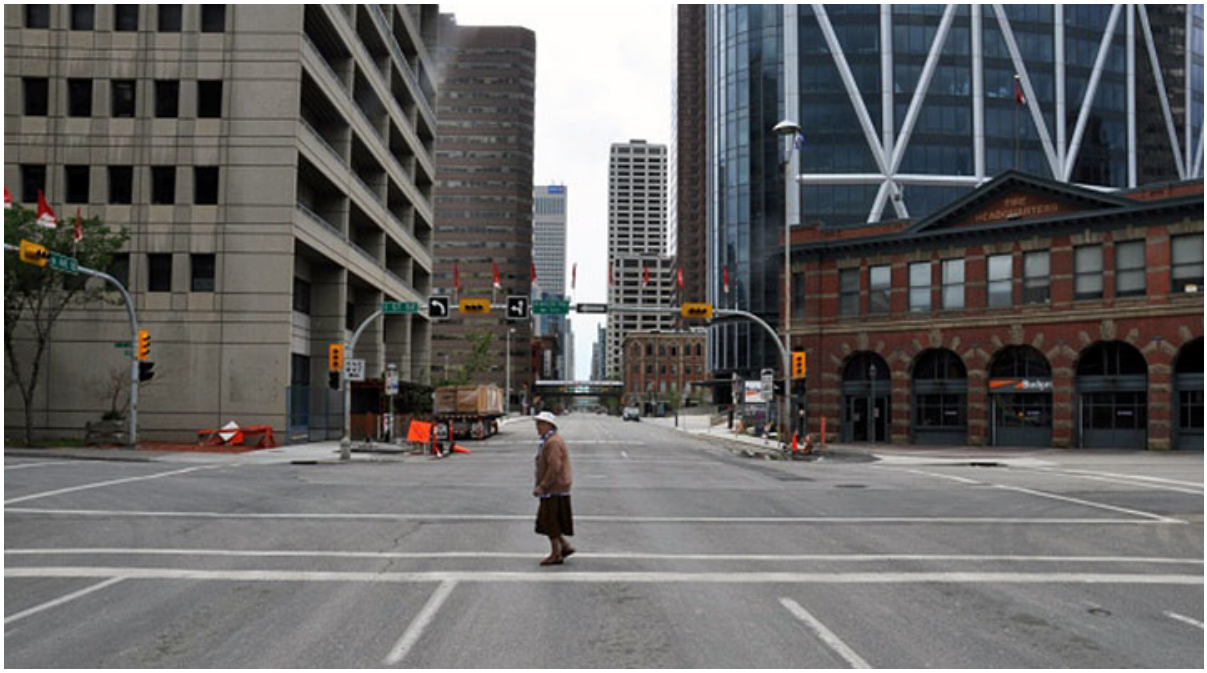


Fig. 12 Empty downtown streets

With uncertainty about the immediate future or the return of employment in the energy sector, government and building developers have started to look into alternative solutions to fix vacancy problems instead of awaiting the return of oil and gas businesses. The vacancy rate, currently sitting at twenty-seven percent, is projected to continue rising, and the new construction projects nearing completion will only further increase the challenges facing the city.[9] Proposals to repurpose offices into residential buildings and to attract new company headquarters to Calgary are under consideration.[10] [11] While the fate of the empty offices remains undecided, the absence of activity in the tower floors above and in the public levels below continues to tarnish the reputation of the city.

9 "Vacant Skyscrapers are an 'Albatross' that Canada's Oil Capital can't Shake Off Too Soon," Financial Post, last modified June 22, accessed December 6, 2017, http://business.financialpost.com/real-estate/property-post/vacant-skyscrapers-are-an-albatross-that-canadas-oil-capital-cant-shake-off-too-soon

10 Ibid.

11 "Calgary Landlords Converting Office Spaces for Residential Use," The Globe and Mail, last modified August 18, 2017, accessed December 6, 2017, https://www.theglobeandmail.com/real-estate/calgary-and-edmonton/calgary-landlords-converting-office-spaces-for-residential-use/article36029264/



Fig. 13 +15 overpass interior



+15 SYSTEM



Fig. 14 +15 overpass above streets



Fig. 15 +15 overpass above train line

CONTEXT

The +15 is a skywalk system intrinsically woven into the architecture of downtown Calgary. The system weaves through office towers, offering an analogous path of travel and protection from harsh winter climates for the public. As suggested by the name +15, the system is located approximately fifteen feet above ground, aligning with the second level of buildings. In 1970, the first +15 passageway was implemented, joining Calgary Inn to an adjacent office building. Now over a half-century later, the system contains 14km of walkways that connects over sixty buildings.[12] At street level, a small portion of the +15 can be seen, marked by the presence of steel truss bridges that connect office towers together, but the majority of the walkway system is ambiguous and concealed within the interior of buildings.

12 *Calgary's Plus 15 Network*. The City of Calgary. http://www.calgary.ca/Transportation/Roads/Pages/Road-Maintenance/Bridge-rehabilitation/plus15Skywalk.aspx#-funfacts

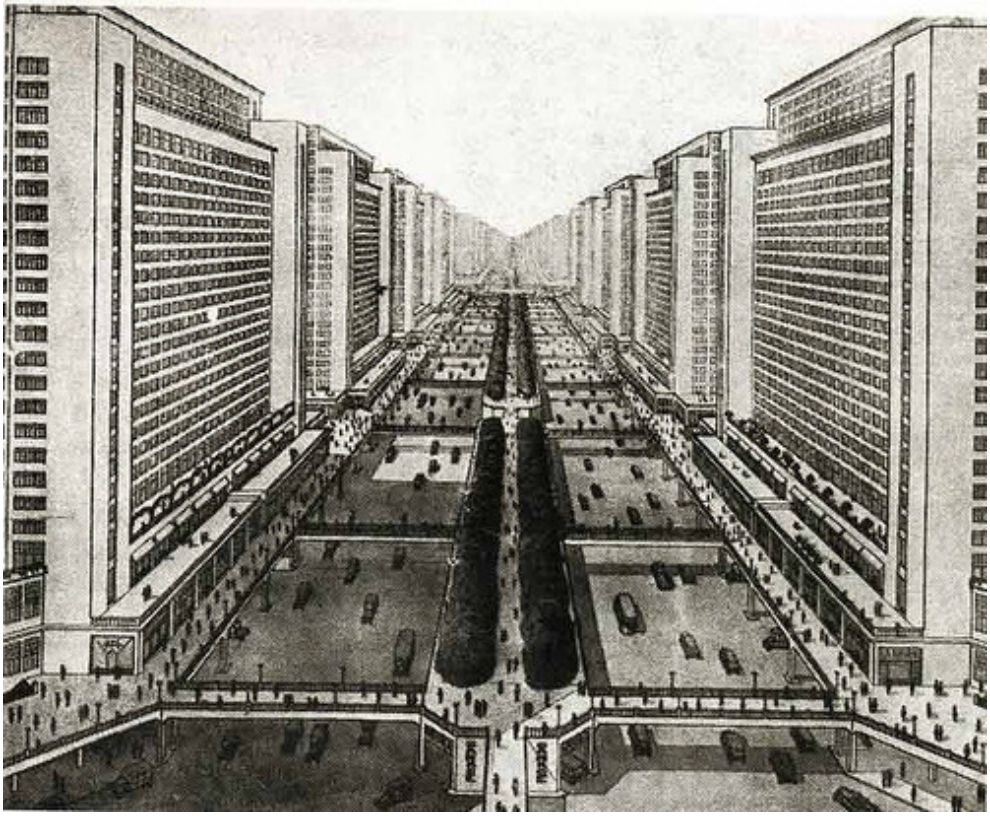


Fig. 16 The Ville Radieuse, c.1924

ORIGIN OF MULTILEVEL SYSTEMS

The +15 project was developed in the late twentieth century, almost congruently with other multi-level systems in Canada, such as the PATH in Toronto and RÉSO in Montreal. Although this concept of analogous pedestrian walkways appeared as though it emerged overnight, its origins can be credited to ideas from notable architects in the *Congrès internationaux d'architecture modern* (CIAM). CIAM was a European organization founded in the first half of the twentieth century that assembled architects with shared interests in modernist ideals of architecture and urbanism.[13] Le Corbusier, one of the founding architects of CIAM, began the movement of pedestrianized city centres in his early proposals, which imagined a rationalized city comprised of linear forms coupled with meandering elevated pathways. The Ville Radieuse, one example of his unrealized projects, envisioned a district of skyscrapers arranged along a Cartesian grid where the automobile and the pedestrian existed on separate planes. The project was largely motivated by the desire to better the lifestyle of individuals in the post-war era, attempting to resolve issues of living, traffic, noise, public space, and transportation.[14]

Although Le Corbusier's propositions were highly provocative, they were heavily criticized for their lack of consideration of the architectural experience at human scale. Team 10, a subgroup within CIAM, challenged Le Corbusier's approach to urban renewal by proposing a more respectful redevelopment of the city. Rather than the deterministic and standardized methods of Le Corbusier, Team 10 suggested a format that was process-driven and sensitive to the interests of its users and developers. Deemed the "non-plan" approach, their proposal involved informal spaces for social interaction, defined as urban

13 Trevor Boddy, "Underground and Overhead: Building the Analogous City". Michael Sorkin, New York: Hill and Wang, 133.

14 William JR Curtis, *Le Corbusier: Ideas and Forms.* London: Phaidon Press, 1986, 118-119.

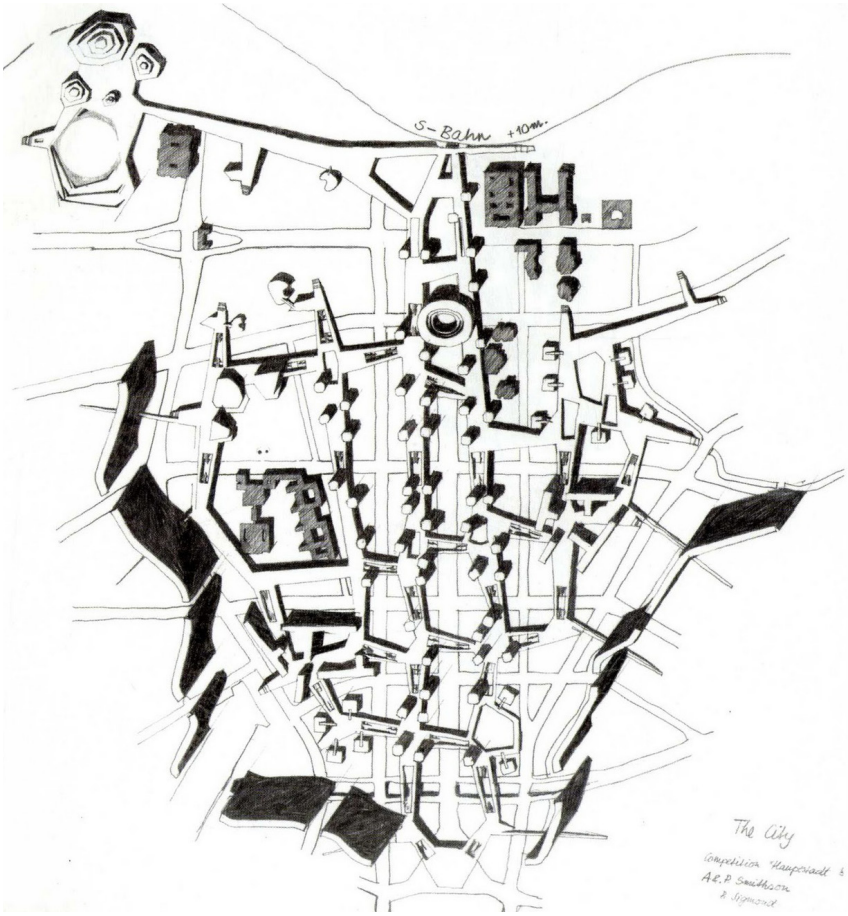


Fig. 17 Hauptstadt network of elevated volumes and spaces, c.1958

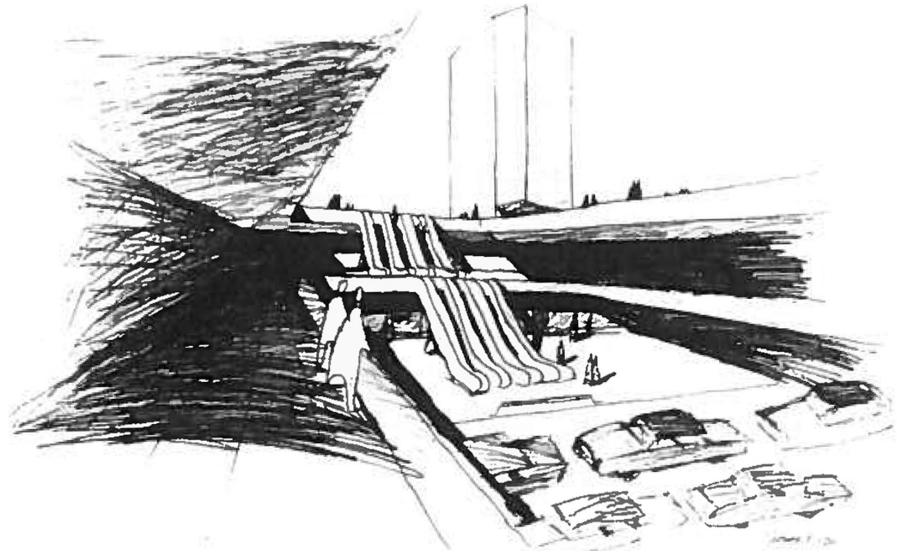


Fig. 18 Hauptstadt escalators giving access to upper-level pedestrian network, c.1958

"clusters", coupled with elevated pedestrian networks that would be developed incrementally and organically.[15] Unlike the utopias imagined by early modernists that sought to build from a state of tabula rasa, the non-plan was a continual process of revising existing city plans. The Berlin Hauptstadt proposal, an unbuilt scheme developed by Alison and Peter Smithson exemplified the new ethos of Team 10. In the proposal to redevelop the city centre for Berlin, the Smithsons focused on ensuring the continuity of urban fabric, connectivity of different programs, and movement across the city.[16] They recognized the importance of historical preservation and achieving the harmony between traditional and contemporary architecture. Despite Team 10's rejection of rationalistic methods of organization in favour of process-oriented concepts, the developmental freedom that the non-plan offered raised a larger urban issue related to movement in public space and the coherence of city development. Because the non-plan was designed at the small scale, built across longer periods of time, and involved multiple participants, the ability to control the outcome of the system proved to be difficult and threatened the legibility of the city.[17]

It is evident through the debates within CIAM that there remains many issues unresolved regarding multi-level systems. The compromised pedestrian experience and coherency of city development seem to undermine the value of multi-level systems altogether. Even by the disbandment of CIAM in 1959, many of the pedestrian network propositions were still not built and they were never proven to be better than conventional urban planning practices. Despite the unrealized nature of the works, the core ideologies managed to transcend continental borders and influence numerous American architects in the later years.

15 Jennifer Yoos and Vincent James, *Parallel Cities: The Multilevel Metropolis.* Walker Art Center, 2016, 78-80.
16 Marco Vidotto, *Alison + Peter Smithson*. Barcelona: Editorial Gustavo Gili, 1997, 64.
17 Jennifer Yoos and Vincent James, 87.

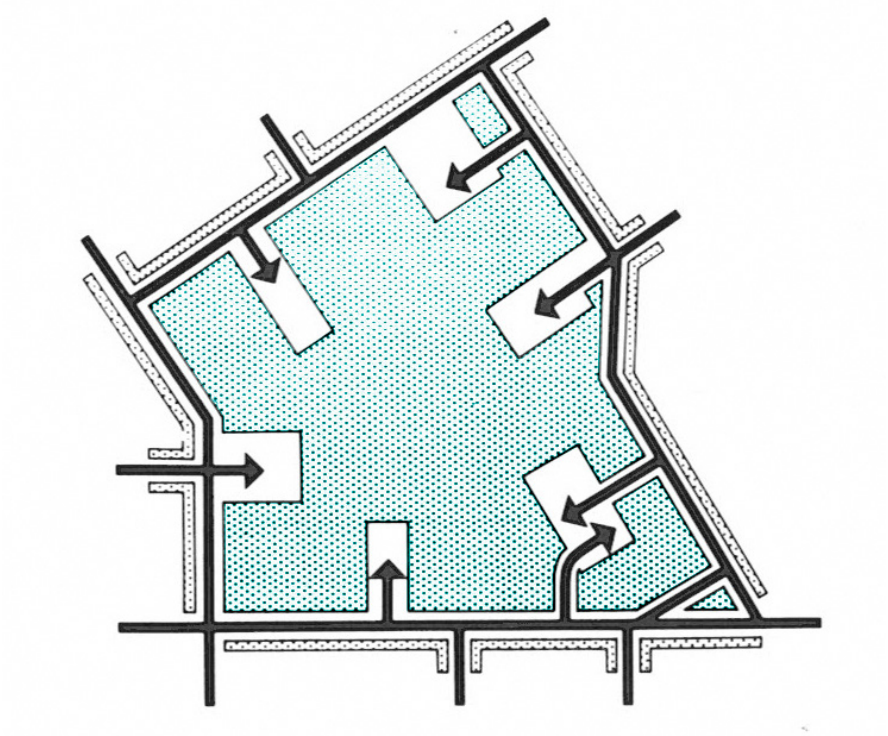


Fig. 19 *Bird's-eye view of Victor Gruen's Fort Worth Texas proposal , c. 1956*



Fig. 20 *Drawing of Victor Gruen's Fort Worth Texas Proposal, c. 1956*

MULTI-LEVEL SYSTEMS IN AMERICA

The first architect to champion the idea of multi-level systems in North America was Victor Gruen, who continued to develop the ideas from CIAM in his own projects. The father of the American shopping mall, Gruen invented new urban typologies to organize pedestrian spaces and retail environments that engaged in civic life. In 1956, his proposal for Fortworth, Texas envisioned the revival of the city centre by reconstructing a retail core that gave priority to pedestrians. A loop road containing parking garages and bus terminals was created around the downtown region to restrict automobiles from gaining access into the core. Devices such as pedestrian bridges, plazas, and arcades were also introduced to assist with the incremental reordering of the city into a central pedestrian plaza for shopping.[18] For Gruen, the main objective was to create a downtown magnet flooded with a variety of activities and people on the streets as well as inside of buildings. This fundamental aspect was overlooked by other architects who only imitated Gruen's traffic principles, which centred around separating pedestrian and automobile activity.

The first elevated walkways, built in Twin Cities St. Paul and Minneapolis in 1962, exemplified the weak interpretation of Gruen's concepts, by relegating the pedestrian to an analogous pathway removed from vehicles. As the plan developed further, the project also emphasized protecting the public from the cities' harsh winter climates by transforming the walkways into a completely enclosed system.[19] While there were feeble attempts to recreate the social, recreational and commercial character of successful shopping districts that Gruen advocated, overtime, the multilevel systems developed according to capitalist agendas and only implemented spaces that would generate extra profit for building owners. Numerous other cities used St. Paul and

18 Victor Gruen, "Centers for the Urban Environment," 1973, 192-3.
19 Trevor Boddy, 136.

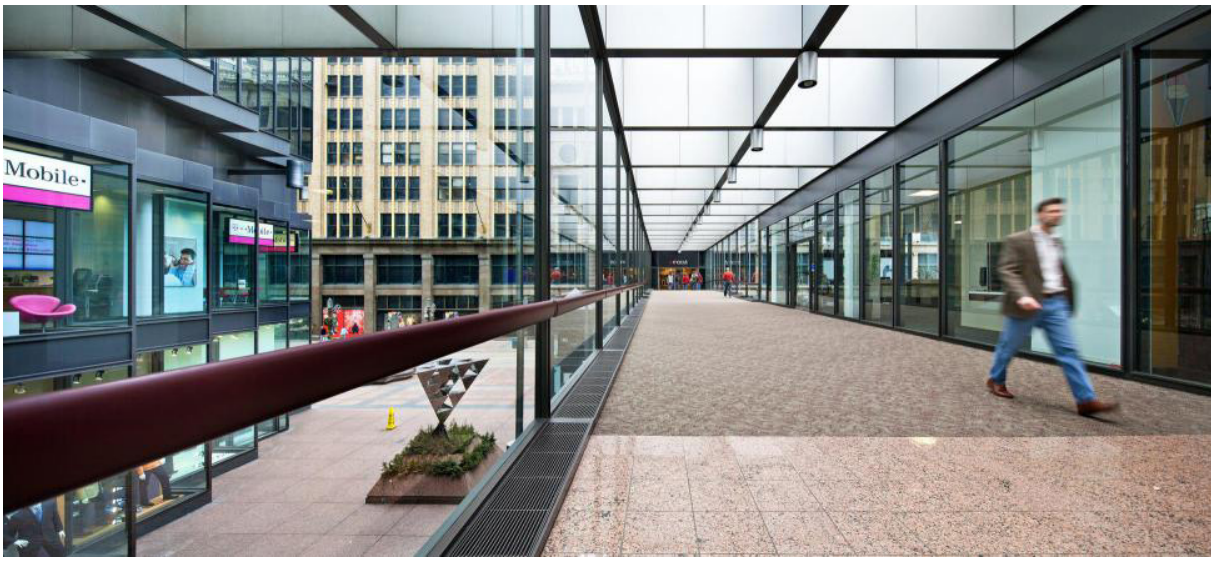


Fig. 21 Minneapolis skyway system

Minneapolis' elevated walkways as a formula for creating their own pedestrian system.[20] However, St. Paul and Minneapolis had already drifted so far away from Gruen's original concepts that the subsequent multilevel systems, too, were mere reductions of Gruen's ideas.

20 Trevor Boddy, 137.

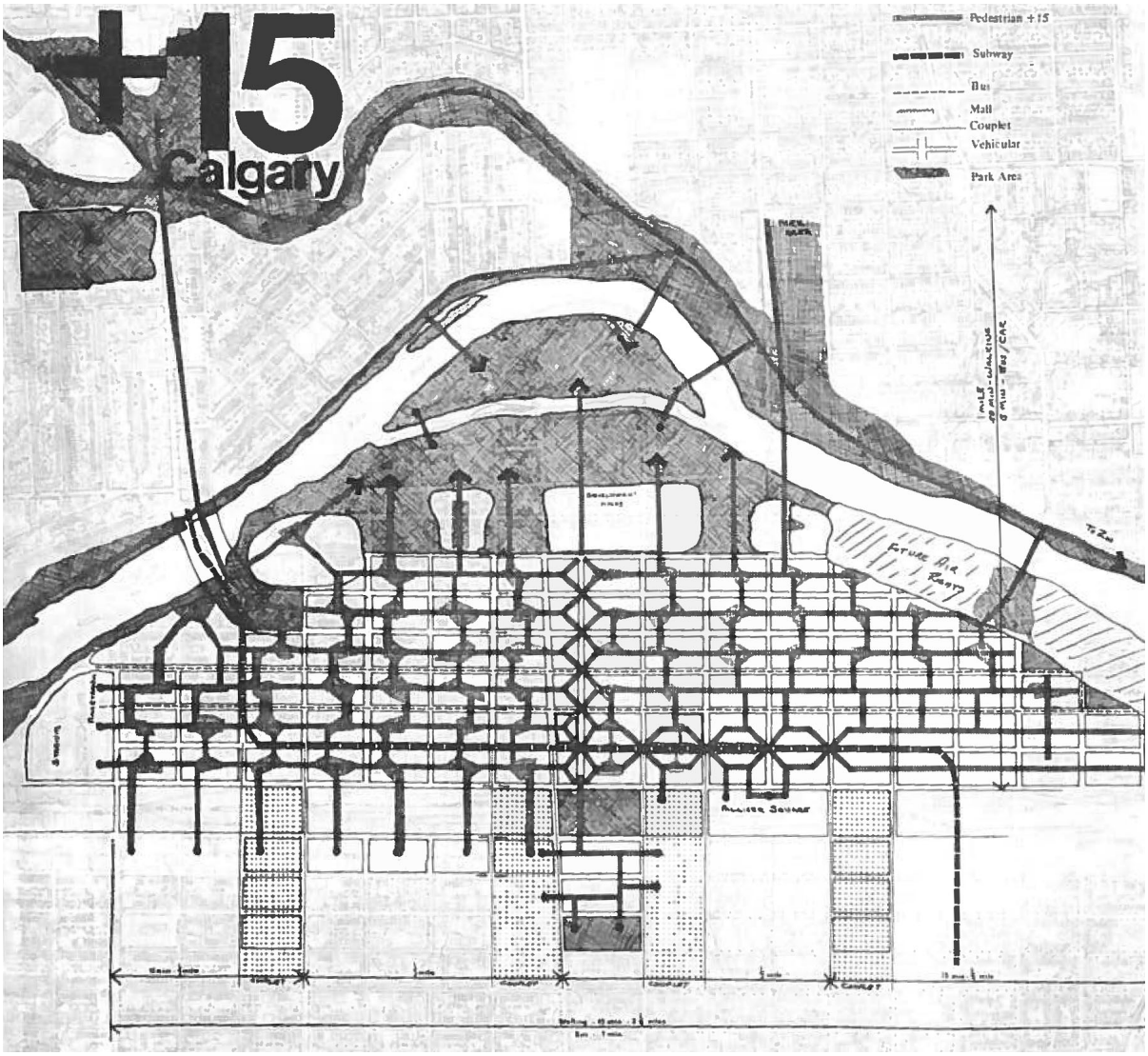


Fig. 22 Original +15 plan original, c. 1966

CONCEPTS AND CRITICISMS

The +15 was initially built as part of a municipal initiative to renew Calgary's urban realm. Due to the rising popularity in suburban living, the formation of urban sprawl meant that more people were using cars to travel around the city. Canadian architect Harold Hanen observed that the increasing number of automobiles on the streets of downtown was endangering the safety of pedestrians, and like many other architects before him, he devised the +15 as a way to reclaim safe spaces for people to walk.[21] Hanen also saw the potential in the +15 to initiate cohesion for the future development of Calgary. As the new urban streetscape, the +15 would create opportunities of access into different buildings connected to the system, and would be filled with gardens, retail, and service spaces similar to what one would find along an outdoor promenade.[22]

Despite Hanen's grand visions for Calgary, his concepts were not without weaknesses. His original documents show the +15 as a system of organized pathways arranged on a grid, forming building connections that were clear and logical but also sterile and devoid of intimacy at the human scale, similar to the earlier projects by Le Corbusier. While Hanen's sketches depicted the overpasses as unique structures that could enhance the urban fabric by embodying different forms and materials to give each one a distinct visual character, his ambition for exactness and rigidity were at odds with his desire to create a public realm that encompasses variety and flexibility. In addition, his focus on building upwards ignored how the +15 would impact the streets. Regardless of how Hanen's concept of the +15 is perceived today, the +15 that exists currently does not bear much resemblance to Hanen's original plan. When the +15 began construction, the

21 *Calgary's Plus 15 Network*. The City of Calgary. http://www.calgary.ca/Transportation/Roads/Pages/Road-Maintenance/Bridge-rehabilitation/plus15Skywalk.aspx#-funfacts

22 Beverly Sandalack, *The Calgary Project: Urban Form/Urban Life*, ed. Andrei Nicolai, Calgary: University of Calgary Press, 2006, 112.

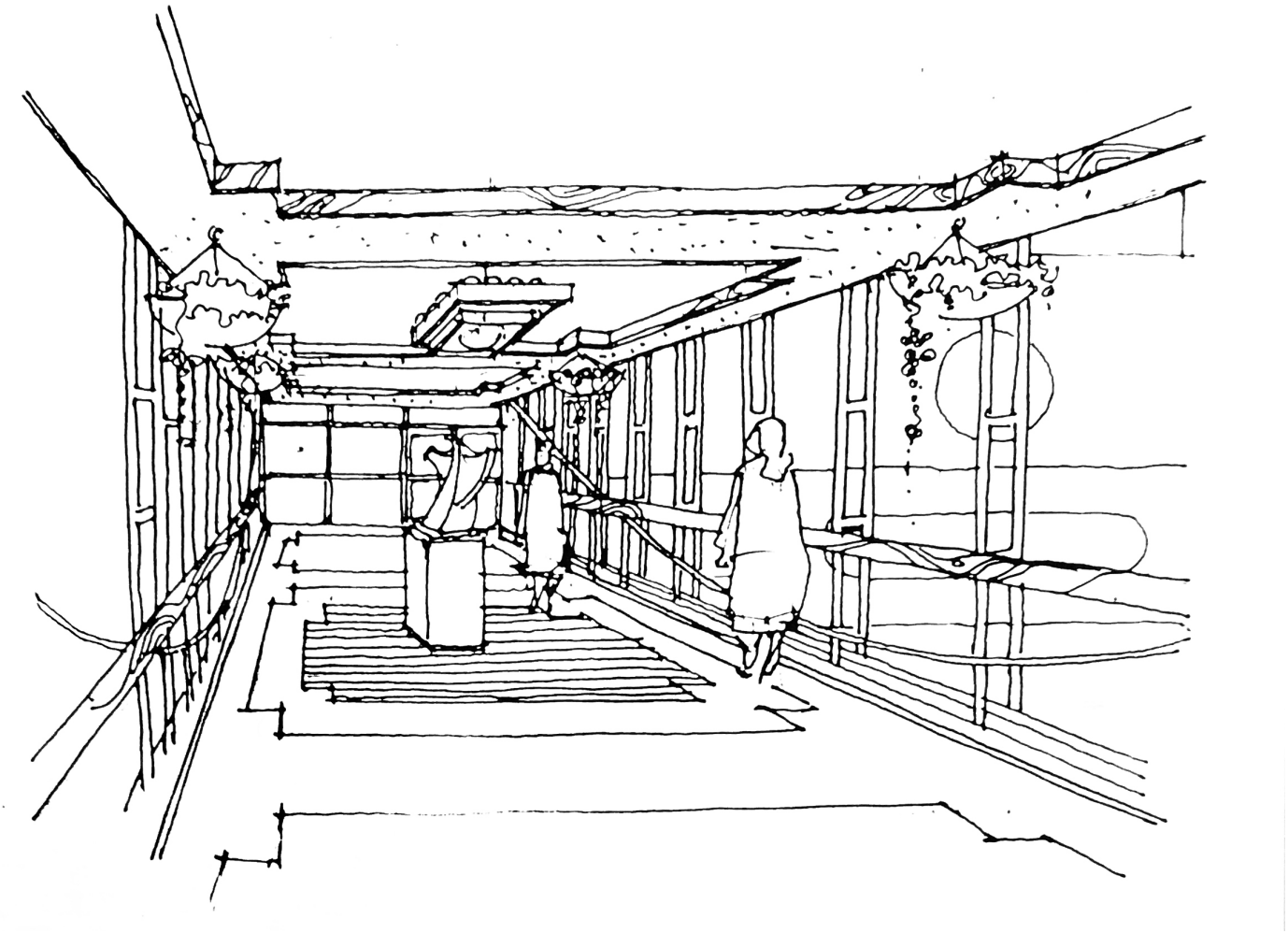


Fig. 23 Original sketch of interior of +15

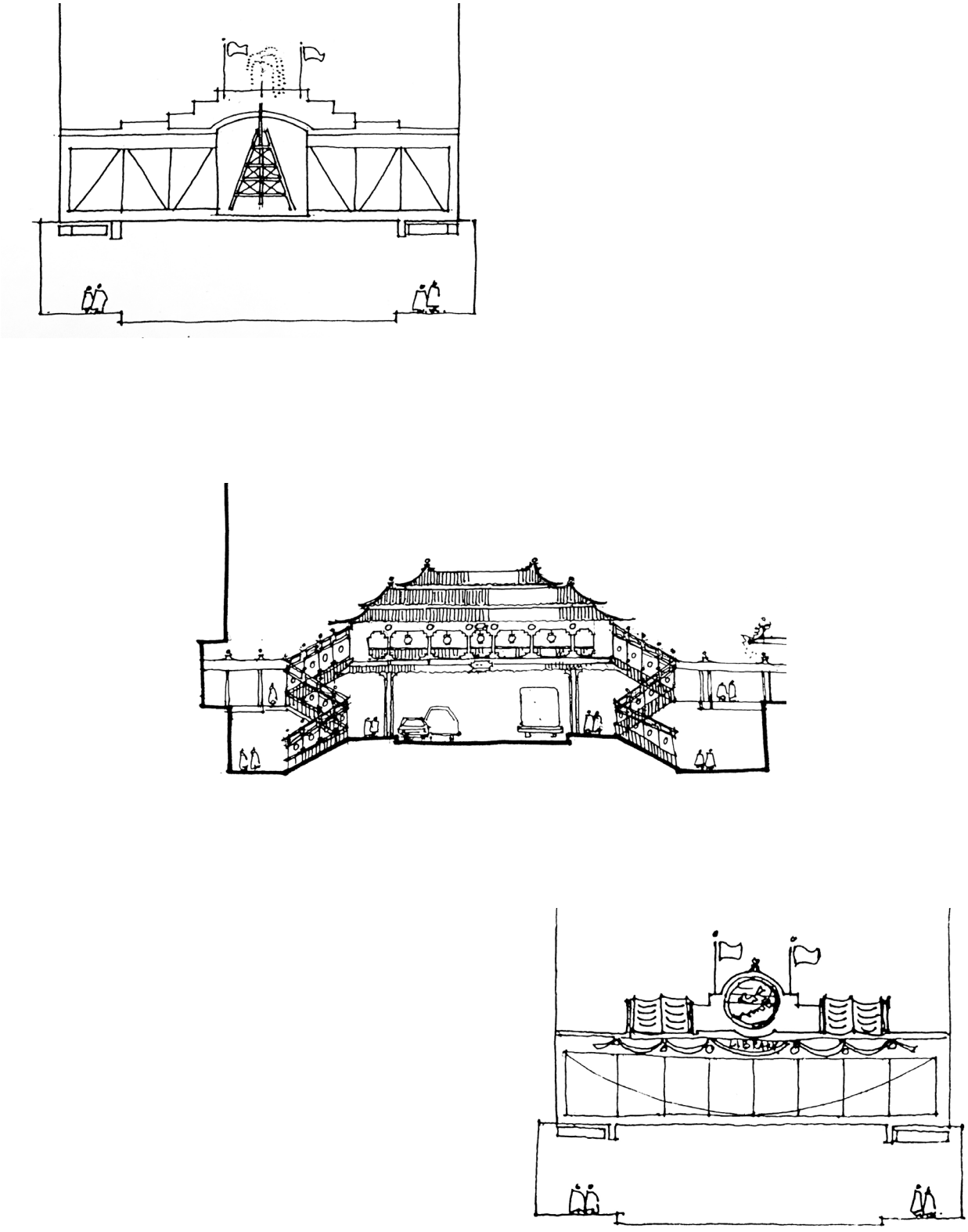


Fig. 24 Original sketches of various +15 elevations

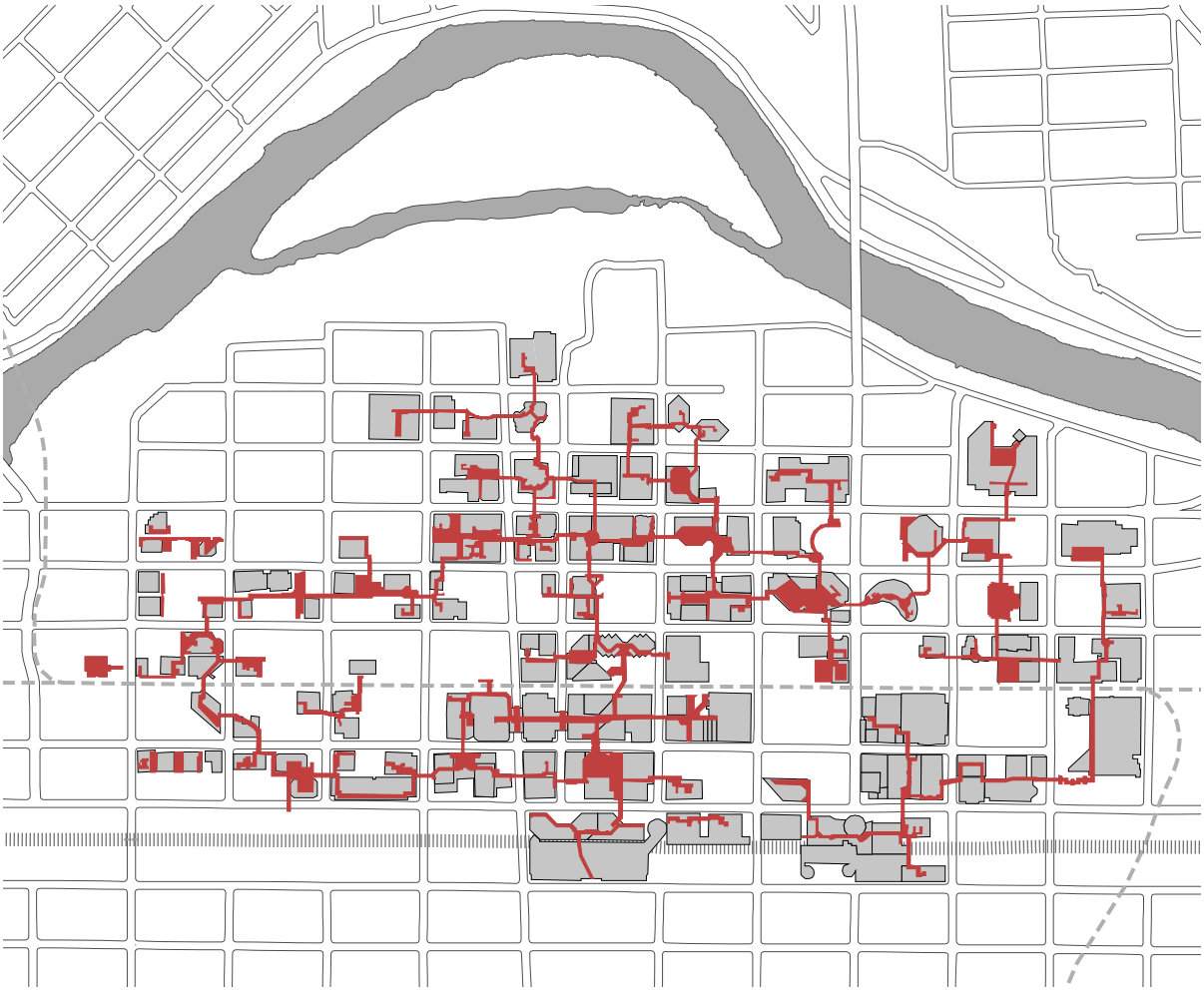


Fig. 25 +15 map

network started to resemble many of the walkway systems in North America that emphasized profit and deemphasized the architectural experience or the opportunity to use the pedestrian system as an urban planning tool.

In the beginning, participating in the +15 project was optional for developers who could build an overpass in exchange for increased building area and tax credits. A new law was implemented in mid-1970 that made the overpass a mandatory part of new office development and eventually shifted the course of how the +15 system was built. Concurrently, the oil boom spurred tremendous growth in commercial tower construction, but many developers were focused on efficiency and disregarded the overall planning intentions of the +15.[23] As a result, the building interiors became fragmented and circulation paths unclear, ultimately discouraging the public from using the walkway system as an alternate network to the sidewalk.

The intention of the +15 was to be a public network that virtually anyone could access throughout the day and night, but several factors related to control, accessibility, signage, and function contributed to its transformation into a quasi-public realm. In 1984, a +15 policy guidebook was created by the City of Calgary's planning and building department that attempted to clarify the responsibilities of security, maintenance and operation between the City and adjacent property owners.[24] In the document, it established that high-level tasks involving the coordination of the +15 development and the distribution of funds would be carried out by the planning coordinator from the City of Calgary, while the design and maintenance of the +15 system components would be assumed by the building owners. Policing responsibilities, on the other hand, was equally divided between the public police department and private security guards, where they were

23 Trevor Boddy, 142.

24 *+15 Policy.* Planning and Building Department, Development, Land Use & Downtown Division. City of Calgary, 1984.



Fig. 26 Minimal signage outside entrances



Fig. 27 Lobby space



Fig. 28 *Individually set hours of operation*



Fig. 29 *Interior corridors*

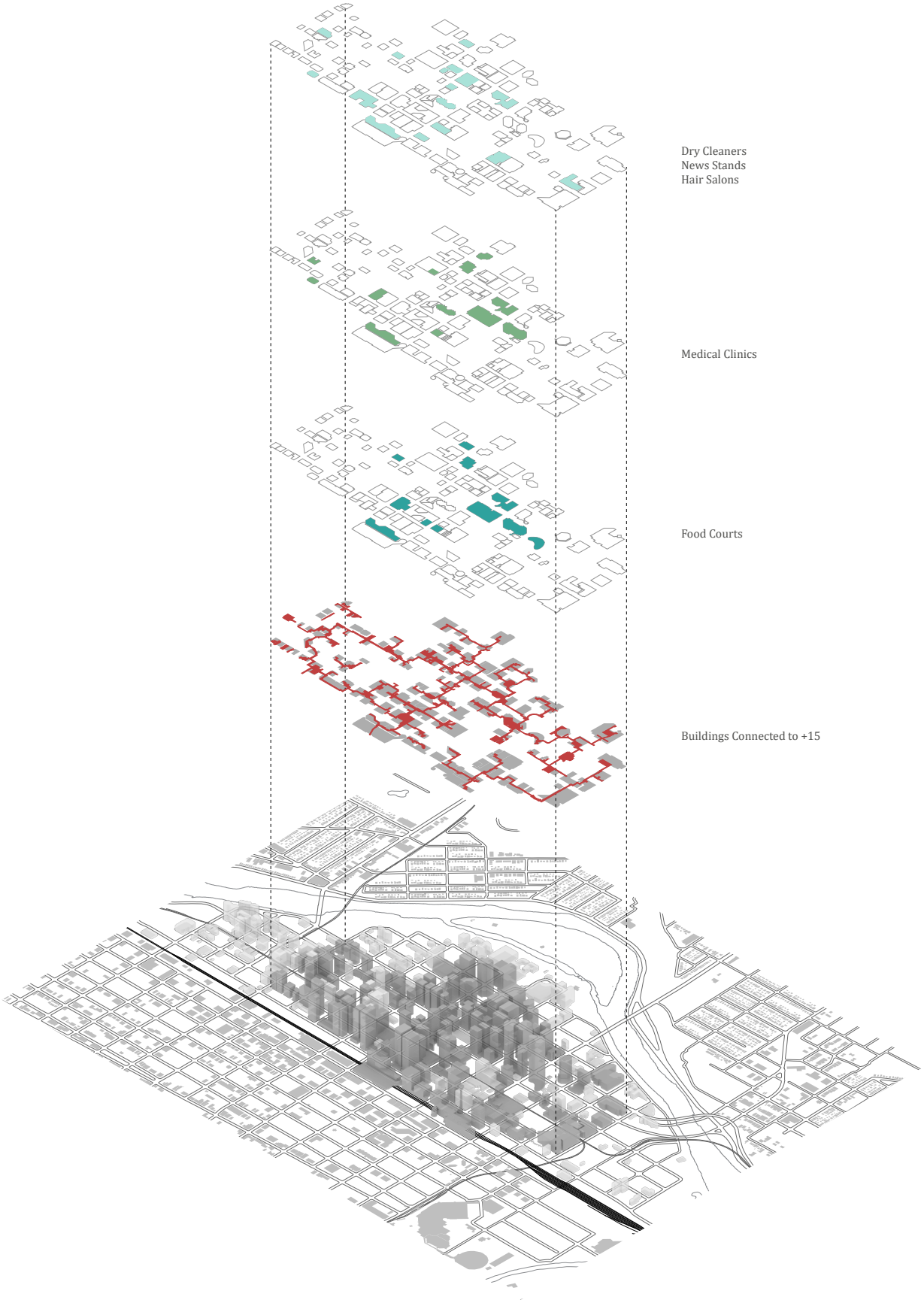


Fig. 30 Categories of spaces inside the +15

assigned to patrol the public areas of the +15 and the private properties abutting the walkways, respectively. Despite the joint partnership of the +15 between the public and private sector, there is a perception of the +15 system as mostly private territory. One of the main challenges facing the +15 is a lack of clear indication on how the walkways are accessed. The entry points into the pedestrian network are through lobbies of office buildings, which most people perceive as private property because of internal security patrols who surveil the space.[25] In addition, there are often minimal or no signage outside of entrances to direct people into lobby spaces. With the private ownership of office towers, building owners do little to encourage visitors to enter and have imposed hours that limit the access into the +15, no longer leaving the system open for all-day use.[26]

Once inside the +15, the everyday pedestrian will find themselves with very limited retail and amenity options. There is an apparent class divide in the +15, favouring the white-collared worker and excluding other user groups. A rotation of fast-food courts, coffee shops, medical clinics, and lottery kiosks have generated homogenous interior spaces that only the downtown office worker would occasionally frequent during their lunchtime or coffee breaks.[27] Not only does this reduce the chances for retailers to maximize their profit throughout the day, they are also charged premium prices for rent.[28] This model of operation reduces efficiency, profitability, and efficacy, and greatly diminishes the potential for the public network to thrive.

25 Beverly Sandalack, 110.
26 Ibid
27 Barry Maitland, *Hidden Cities: The Irresistible Rise of the North American Interior City*. Butterworth-Heinemann Ltd., 1992, 166.
28 *Calgary Retail Market Overview.* Avison Young, 2014.



Fig. 31 Retail establishment inside +15



Fig. 32 *+15 Food court during non-peak hours*

With the downtown region conceived as a business district, it is challenging to increase the diversity of user types and to drive up demand for other kinds of programmatic functions inside the +15. Jane Jacobs, in her book *the Life and Death of Great American Cities*, emphasizes the importance of combining primary functions in order to create lively secondary diversity that serves the people the primary uses attract.[29] Primary functions anchor people to specific places, and the greater the number of primary functions combined in one district, the more vibrant a district becomes. The mixing of functions generates economically stimulating environments due to more people sharing the same pathways at different times, facilities being used more frequently, and diverse types of services and amenities being created[30] Downtown Calgary, aside from being a place of work, is currently lacking other primary functions, which explains why there is an imbalance of people using the +15. The imbalanced distribution of people is particularly noticeable during the evenings and weekends when employees have left work and the streets have become devoid of cars and the +15 absent of pedestrians.

While it may seem like the problems of the +15 exist merely on the upper levels, issues extend to the ground plane as well. When the project first started, pedestrian activity was already sparse on the streets of Calgary, but once the +15 was established and split pedestrian activity across two separate levels, it furthered the deterioration of public life on the streets. The advantage of the +15 being built as an enclosed system is that it permits people to do their shopping and dining indoors. Meanwhile, retail spaces at grade, aside from having to compete with retailers on the second level, also have to endure the problems with the +15 overpasses casting heavy shadows onto the streets, creating wind tunnels and blocking views of the Rocky Mountains.[31] In addition, the barren plazas adjacent to office buildings create distance between the

29 Jane Jacobs, *The Death and Life of Great American Cities*. Vintage, 1992, 162.
30 Jane Jacobs, 163-4.
31 Trevor Boddy, 142.



Fig. 33 Outdoor plaza in front of office building

storefront and sidewalk, discouraging people from approaching the building.[32]

The extensiveness of the +15 indicates that it is here to stay as an integral part of Calgary's urban infrastructure. But underlying issues remain overlooked and unresolved despite the system continuing to grow each year. There are opportunities to invest in new strategies that improve how the +15 functions and to enrich the culture of the city, especially in a time when Calgary is experiencing significant changes.

32 John Alley, "Plus 15 - is it really Killing Street Level Retail?" *Chinook Arch*. v. 2, no. 1, 986.



Fig. 34 The New Mechanics Hall, Lausanne, Switzerland



HIGHER EDUCATION DESIGN



Fig. 35 Academic Village, University of Virginia

FUTURE ROLE OF THE UNIVERSITY

Higher education is valued in our modern knowledge society, which places economic value on the creation and distribution of information.[33] Contemporary universities campuses are increasingly blurring the boundaries of the school and the city to increase access to knowledge for students, industry partners, and community members.[34] This evolving mission has impacted the way university campuses are being designed. There is a shift from building campuses on their own isolated properties to developing campuses that are integrated with the existing urban fabric.

The traditional campus typology emphasized insularity, deriving its core ideas from monastic design. The University of Virginia was the first campus built in North America in 1819 and is described as an "academic village" because the school was established as its own community in the hinterlands of Charlottesville.[35] The academic village was inward-looking and contained an impermeable boundary that used gates and watch towers to monitor their students. However, schools are now gradually dissolving the divide between the city and university and are more inclusive of people outside of their immediate neighbourhoods.[36]

Today, the new campus typology reflects this paradigm shift; an increasing number of universities are located inside of urban centres. University buildings are dispersed across the urban fabric and surrounded by businesses, residences, and urban amenities that make learning environments more engaging. As higher education institutions are facing more pressure to provide

33 Daniel Bell, *The Coming of Post-Industrial Society*. New York: Basic Books, 1976.

34 Janne Corneil and Philip Parsons, "The Contribution of Campus Design to the Knowledge Society: An International Perspective," *Campus and the City: Urban Design for the Knowledge Society*. gta Verlag, 2007, 115.

35 Richard G. Wilson, Joseph M. Lasala and Patricia C. Sherwood, *Thomas Jefferson's Academical Village: The Creation of an Architectural Masterpiece*. Charlottesville: University of Virginia, 2009.

36 Rifca Hashimshony and Jacov Haina, "Designing the University of the Future," *Planning for Higher Education* v. 34, no. 2, 2006, 9.



Fig. 36 Chicago Loop University map

quality education, world class research, and compete for students, the location of the university is critical for access to greater funds and resources. One way to tap into these resources is to partner with private sectors, with which they can share skills, technology, and resources to not only save space but also reduce costs.[37] The growth of public-private partnerships (P3) in recent years has helped universities build more efficient and flexible buildings, and become more attractive to prospective students.[38] The synchronized goals in the P3 model propels the development of resources and capacity to address public needs by making it easier for students to seek career and cultural experiences and for businesses to find talent and innovative research opportunities.

The mission of the university encompasses the nurturing of a highly skilled workforce but also includes enhancing the image of its surrounding neighbourhoods. The Loop University in Chicago demonstrates how numerous institutions collectively remediated declining buildings and enabled the Chicago region to participate in the global economy with the work that is produced on campus grounds. With over twenty university and colleges in the Loop University, Chicago's economy has profited immensely through the integration of the university across the city; the university has created thousands of new jobs, increased residential areas for students, and commenced innovative construction projects.[39]

The universities have assisted with revitalizing downtown Chicago's neighborhood; the Loop University in Chicago has inadvertently become a place for tourism, with tourists coming to downtown Chicago for the architecture, exhibition spaces and sporting events. While tourism is not necessarily part of the agenda in the university planning process, often the success of their ability to attract visitors is an indication of urban health.[40]

37 "7 Keys to Success." NCPPP. Accessed 12/12, 2017. https://www.ncppp.org/ppp-basics/7-keys/

38 *Public-Private Partnerships in Higher Education: what is Right for Your Institution?* Parthenon EY education practice, 2017.

39 Sharon Haar, 179.

40 Sharon Haar, 153.



Fig. 37 Students occupying Loop U streets



Fig. 38 Buildings in the Loop U

Inarguably, the Loop University has brought diversity and vitality into the city of Chicago by animating the streets with commercial and cultural activity. However, the dispersion of buildings across multiple city blocks has also rendered a campus that is incoherent and lacking in a strong urban identity. Sharon Haar, the associate professor of architecture at the University of Illinois, notes that there is a weakened sense of place resulting from the absence of a main building that anchors the individual campus projects together.[41] She posits that the success of the campus model must be accompanied by a new campus centre located centrally among these new buildings, creating a concentrated hub of activity. The exterior should also be clearly defined, through the use of signage, furniture, and installations to unite campus districts together.

The role of the university is now extending beyond education: cities are employing universities as social and economic developers. With universities becoming more cutting edge in the work that they produce, the quality of their spaces is also evolving to reflect their new mission.

41 Sharon Haar, 179.

NEW SPATIAL TYPOLOGIES

Universities are expanding into online research and distance learning as the advancements in technology are simplifying the means for students to access digital resources.[42] Despite the rapid growth of Internet applications, the appeal of the physical university is not lost — the ability to interact face-to-face with peers in an informal setting is an important aspect of education that students are not able to receive in a virtual setting. While virtual education allows the convenience to learn from a remote location, the physical campus emphasizes the notion of community, which is essential to a student's university life experience.

There is currently a lack of theory to explain how the quality of physical spaces affect learning.[43] However, Ian Taylor, in his book *Future Campus*, uses educational theory to inform the design decisions of contemporary universities. In contemporary educational theory, three primary principles are identified that influence the development of physical learning spaces: dialogue, visualization, and collaborative learning.[44] Spaces that can facilitate conversations between faculty and students, reinforce student learning through visual experiences, and maximize the opportunity for peer to peer work are conditions that are seen as key to a university's success.

From this educational theory model, Taylor proposes four categories of spaces that encompass the different principles of learning: specialist, teaching, collaborative, and personal.[45]

42 Rifca Hashimshony and Jacov Haina, 9.
43 David Radcliffe et al., *Learning Spaces in Higher Education: Positive Outcomes by Design*. Brisbane: The University of Queensland, 2008, 13.
44 Ian Taylor, *Future Campus: Design Quality in University Buildings*. Newcastle: Riba Publishing, 2016, 27.
45 Ian Taylor, 32.

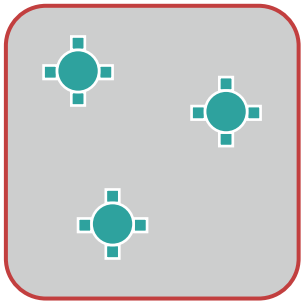
Specialist:
The specialist space is designed for one specific function. Due to its prescribed use, this room type is often inflexible.
Example:
research laboratory, lecture hall



Teaching:
The teaching space is a room for exchanging ideas between the teacher and learner. Layout of the space is flexible to accommodate various teaching formats.
Example:
classroom, seminar room



Collaborative:
The collaborative space is an informal space for peer to peer learning and receiving support from teachers and tutors. The layout of this room type can vary from small-sized rooms to large open areas.
Example:
open workspace, learning support office



Personal:
The personal space is a space for independent study and reflection. They can exist as small hubs or open spaces delineated by specialty furniture that provide privacy.
Example:
study room, workstation

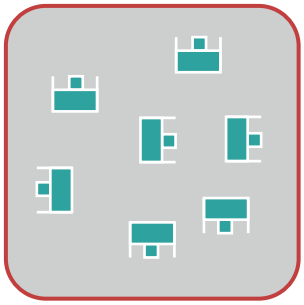


Fig. 39 Categories of learning spaces



Fig. 40 Ryerson Student Learning Centre

Providing a balance and variety of space types is essential to reflect the different kinds of work produced at the university. As the world is continually evolving, university spaces need to be forward-thinking and flexible in their ability to accommodate new methods of teaching and research. While some traditional types of learning spaces remain pertinent within the university campus, such as lecture halls and faculty workspaces, the "spaces between" where learning takes place, including hallways, meeting rooms and student lounges, are equally integral to education.[46] In response to the changing demand for more collaborative and informal spaces that foster spontaneous encounters and experimentation of ideas, new academic building typologies have emerged over the last decade, including innovation centres and learning hubs.

46 *Student Union Trends + Projects*. Perkins+Will.

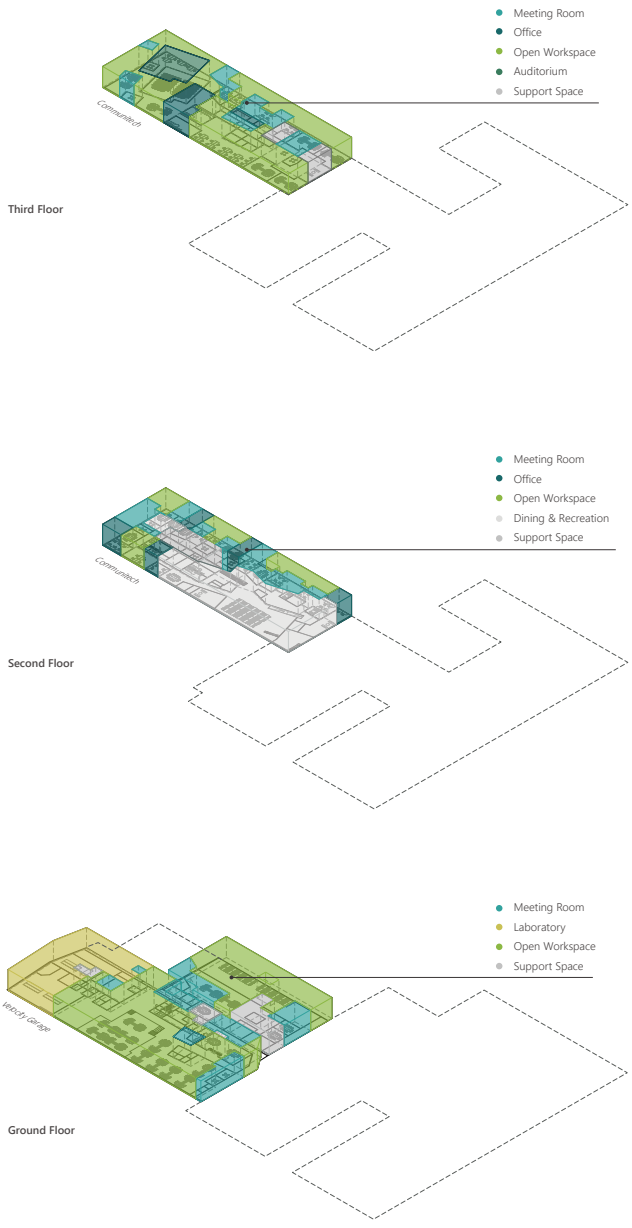


Fig. 41 Programmatic diagram, Communitech and Velocity

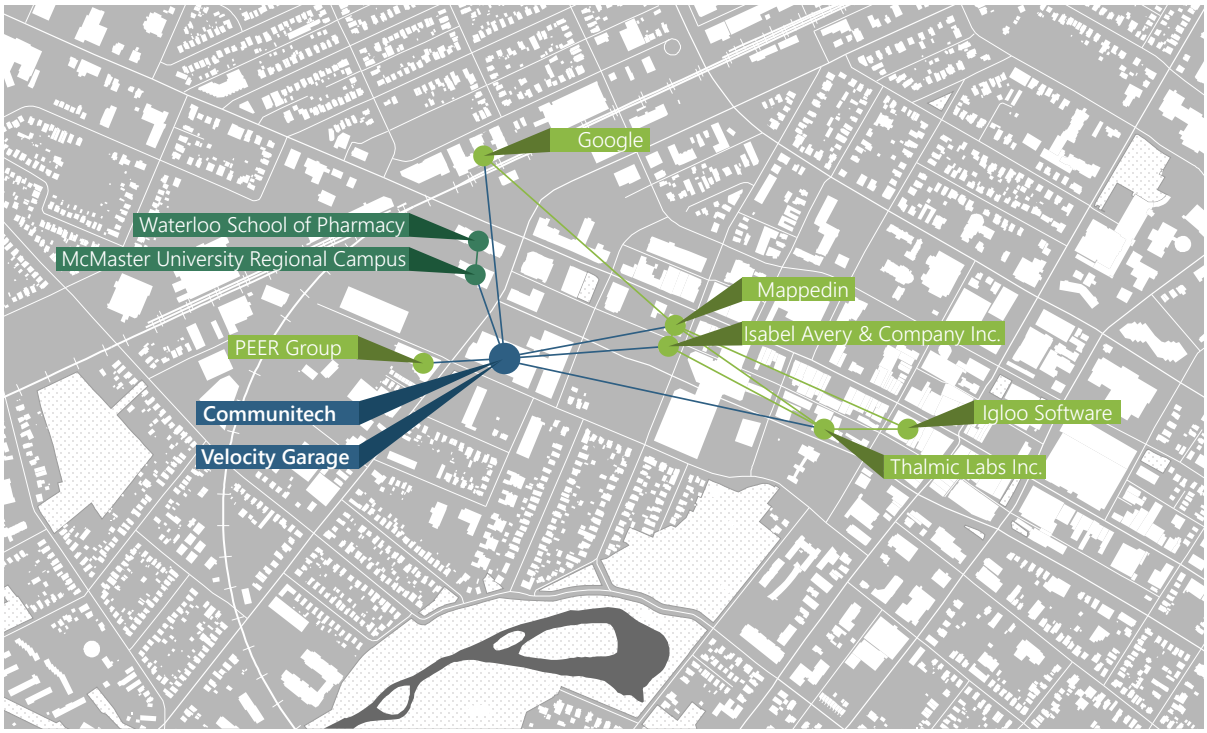


Fig. 42 Community networks, Communitech and Velocity

Innovation centres, which include co-working spaces, research institutes, incubators, and accelerators, have expanded across the globe.[47] In the innovation centre, the university typically partners with private companies or the government to provide a space where people from separate professions and disciplines can more easily converge. For example, Communitech and Velocity are conjoining incubator spaces, operated by the Waterloo Regional Tech Community and the University of Waterloo, to grant entrepreneurs and students access to tools, space, and networking opportunities for their start-up businesses.[48] [49] This particular innovation centre is situated in a prime location surrounded by university buildings and technology companies, and plays an important role in contributing to the local economy by encouraging innovation and collaboration with industry partners.

47 Julie Wagner and Dan Watch, *Innovation Spaces: The New Design of Work*. Brookings, 2017, 4.

48 "About the Velocity Program," Velocity, accessed December 12, 2017, http://velocity.uwaterloo.ca/about-us/

49 "About Communitech," Communitech, accessed December 12, 2017, https://www.communitech.ca/who-we-are/

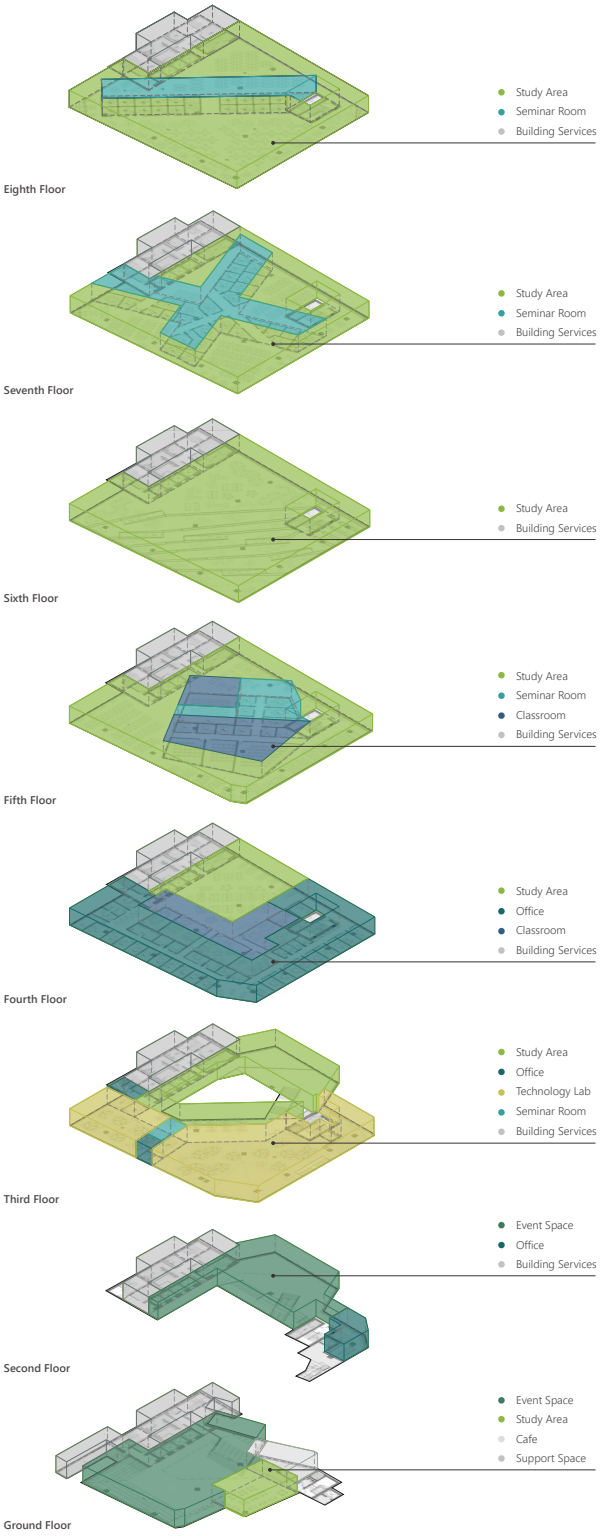


Fig. 43 *Programmatic diagram, Ryerson Learning Centre*

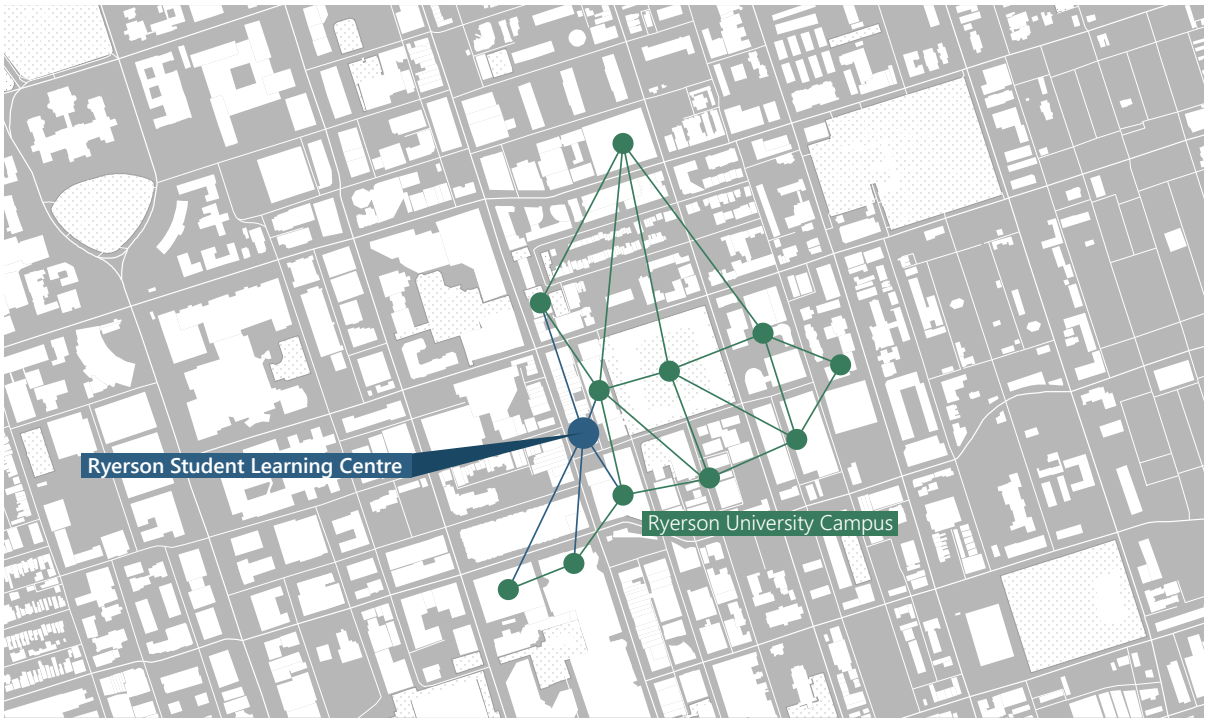


Fig. 44 *Community networks, Ryerson Learning Centre*

The learning hub is another recent model of university design. This type of learning space is more social in nature and is where students go to receive support services for research and technology.[50] The centre offers a variety of spaces, from large-scale learning commons to small scale areas for personal study. The Ryerson Student Learning Centre is an example of this building typology, where space is provided for students to study, collaborate, and invent.[51] The eight-storey building is situated near other campus buildings, offering a place to study after school or in between classes.

50 Ian Taylor, 42.
51 "Ryerson Student Learning Centre," accessed December 12, 2017, http://slc.blog.ryerson.ca/

The new types of buildings and learning spaces reinforce the educational importance of in-person contact with peers and the need for physical university campuses. Although the discussion about physical spaces has centred around its power to influence learning and innovation, the physical appearance is equally important in establishing the reputation of the university.

The appearance of the academic institution is important for not only its physical appeal but also because it contributes to the university's reputation. The way the campus is physically presented to the public can influence how the public perceives the university as an establishment.[52] Its façade is one way the university can communicate their aspirations and visions to the outside world. As leaders of innovation, universities are integrating sustainability concepts and demonstrating them through the use of new materials, systems and display technologies.[53] For example, the Roy and Diana Vagelos Education Center by architecture firm, Diller Scofidio + Renfro, is a university project aimed to create a visual landmark at the northern end of Columbia University's medical campus. The fully glazed tower showcases the advanced technological classrooms and collaboration spaces that reflect the modern practice and education of medicine through a winding 'study cascade' linking the fourteen storeys of learning spaces.[54] The building also integrates a range of sustainable features, including ceramic fritted glass to diffuse sunlight and efficient mechanical systems to optimize energy and water consumption, which coincides with the university's mission to provide world-class education and learning environments for students.[55]

52 Ian Taylor, 28.

53 Gerhard Schmitt, "Three Conditions for Successful Campus Planning," *Campus and the City: Urban Design for the Knowledge Society*. gta Verlag, 2007, 32.

54 Julie Baumgardner. *DS+R creates a light-filled Medical Center for Columbia University*. Wallpaper*, 2016. https://www.wallpaper.com/architecture/diller-scofidio-renfro-completes-ny-columbia-university-medical-centre

55 "Roy and Diana Vagelos Education Center". Columbia University Medical Center. Accessed 12/12,2017. https://www.cumc.columbia.edu/facilities-management/capital-projects/our-projects/roy-and-diana-vagelos-education-center



Fig. 45 *Roy and Diana Vagelos Education Center*

The university has transformed from an inwardly-focused enterprise to an institution with broad access to knowledge and innovation. The changing nature of the university has affected the way institutions are practicing education and designing their spaces, with greater focus on collaboration and the exchange of knowledge across disciplines. As leaders of learning and research, universities are playing a greater role in shaping their surrounding community and local economy.



DESIGN PROPOSAL

Fig. 46 +15 Overpass Design Intervention



DESIGN OBJECTIVES

The design proposal combines the previously discussed topics of Calgary's economic challenges, context of the +15, and research on the relationship of higher education institutions and economic development. The thesis operates under the speculation that Calgary's economy will continue to diversify and deemphasize the importance of the petroleum industry. The objective of the proposal is to facilitate the city's transition into a diversified economy by using the university as a medium to connect emerging industries with student talent, and to revitalize Calgary's declining urban landscape.

The proposition is presented as a series of tactics intended to be replicated across the district, which will change over time how a place works and is perceived. A new interdisciplinary university is proposed in the central core of Calgary, operating inside the established physical connections of the +15. The thesis looks at modern educational theory and university design trends to determine the types of teaching, research, and community spaces that complement these urban sites.

The first phase of design includes constructing a new university building. Taking lessons learned from the Chicago Loop University, the new build attempts to provide the campus with an anchor, which unifies and establishes a brand for the rest of the university. The second phase focuses on developing the university inside the +15, by extending the design principles and spatial typologies developed in phase one. A typological approach is taken by categorizing the building types in downtown and applying a specific set of tactics to each typology. In the end, the two phases are combined to produce a cohesive city campus.

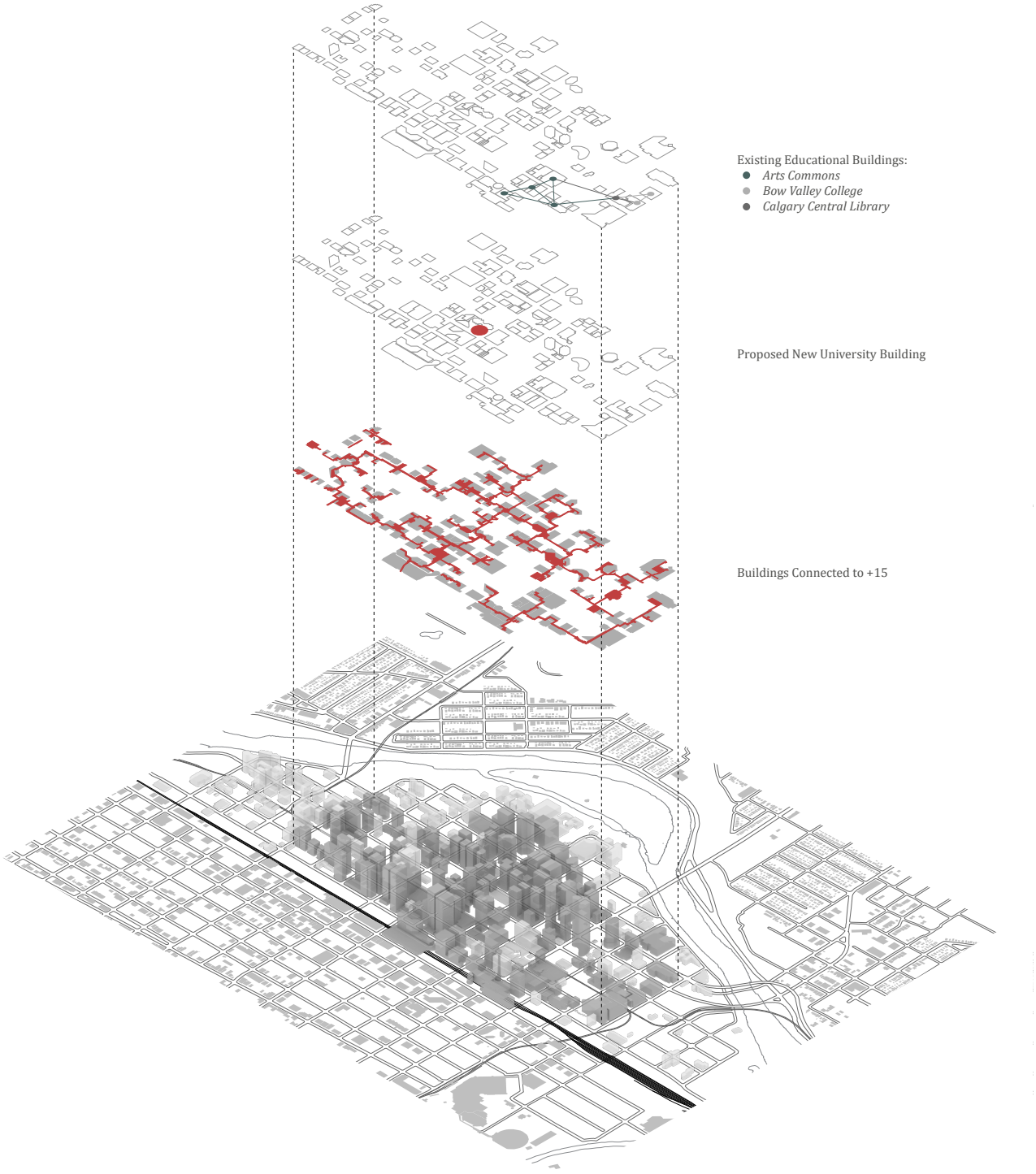


Fig. 47 *Anchor institution exploded axonometric*

PHASE 1: DESCRIPTION

The focus of phase one is to establish a clear physical presence of the university in the city. A new university building is created at the center of the +15 system and acts as an “anchor” institution. Although the new university building is currently not adjacent to the existing educational buildings that are connected to the walkway system, in phase two, the physical expansion of the university will incorporate the existing educational buildings in the rest of the campus.

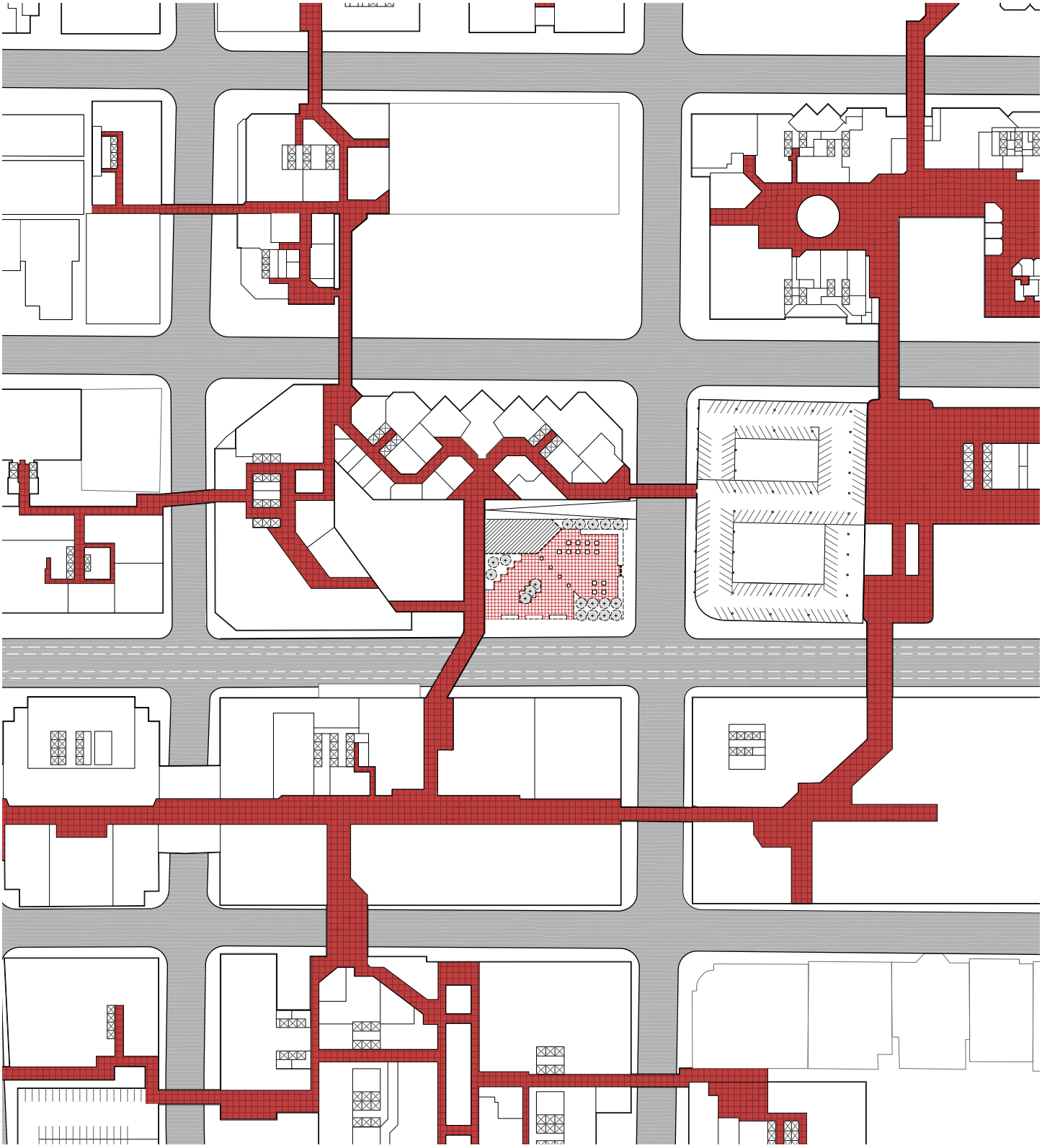


Fig. 48 Proposed Anchor Building Location

SITE - EXISTING

An outdoor plaza, located at the intersection of 7th Avenue SW and 2nd Street SW, is selected as the site for the new university building. Surrounded by office towers, a shopping center, and a parking garage, the site is a highly coveted piece of real estate in downtown. In the original planning scheme, a sixty-four storey office tower was intended to be placed on the site, but due to an economic downturn, the project was cancelled and an outdoor plaza was built in its place. [56]

56 *New Office Development: Calgary CBD and Beltline.* CBRE, 2013. http://www.cbre.ca/AssetLibrary/CalgaryOfficeDevelopment_Sep2013.pdf

The outdoor plaza is slated for demolition in the future for commercial development. In 2013, plans to reinstate office tower construction were once again postponed by another economic recession. The thesis takes advantage of the undeveloped plot of land and envisions a building for educational use rather than the intended commercial use.

In order to construct a university building on the site, full demolition of the outdoor plaza and partial demolition of the parking garage is required.

1 +15 overpass
2 Light Rail Transit Station
3 Parking garage (demolish)
4 Garden plaza (demolish)

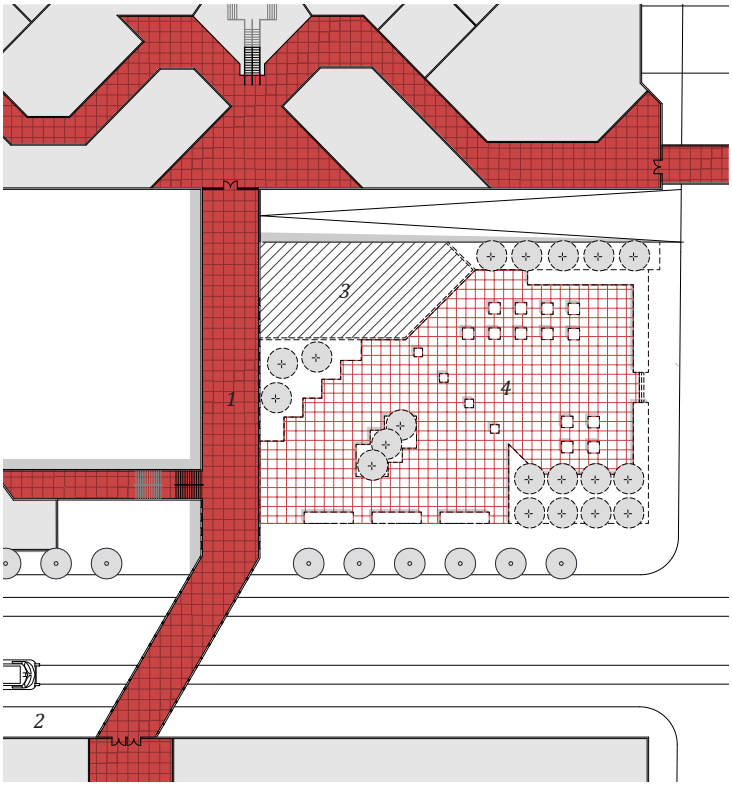


Fig. 49 Site demolition plan

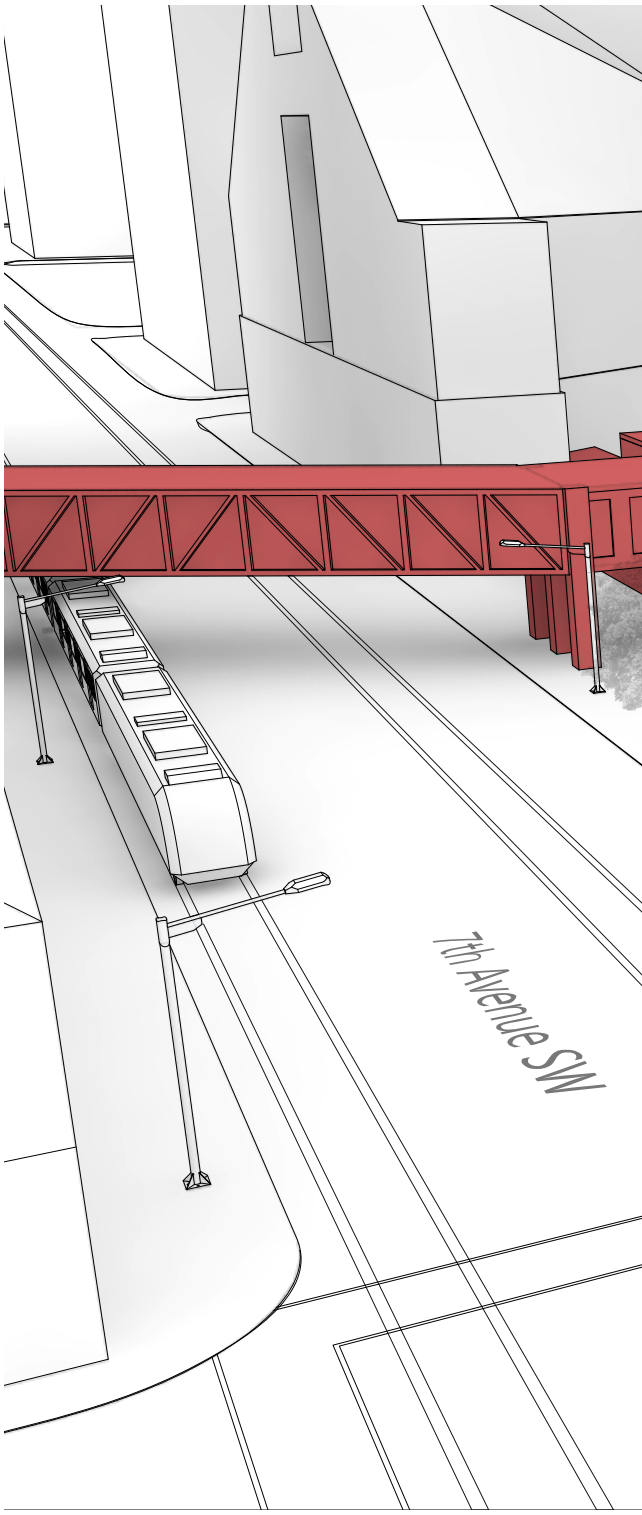
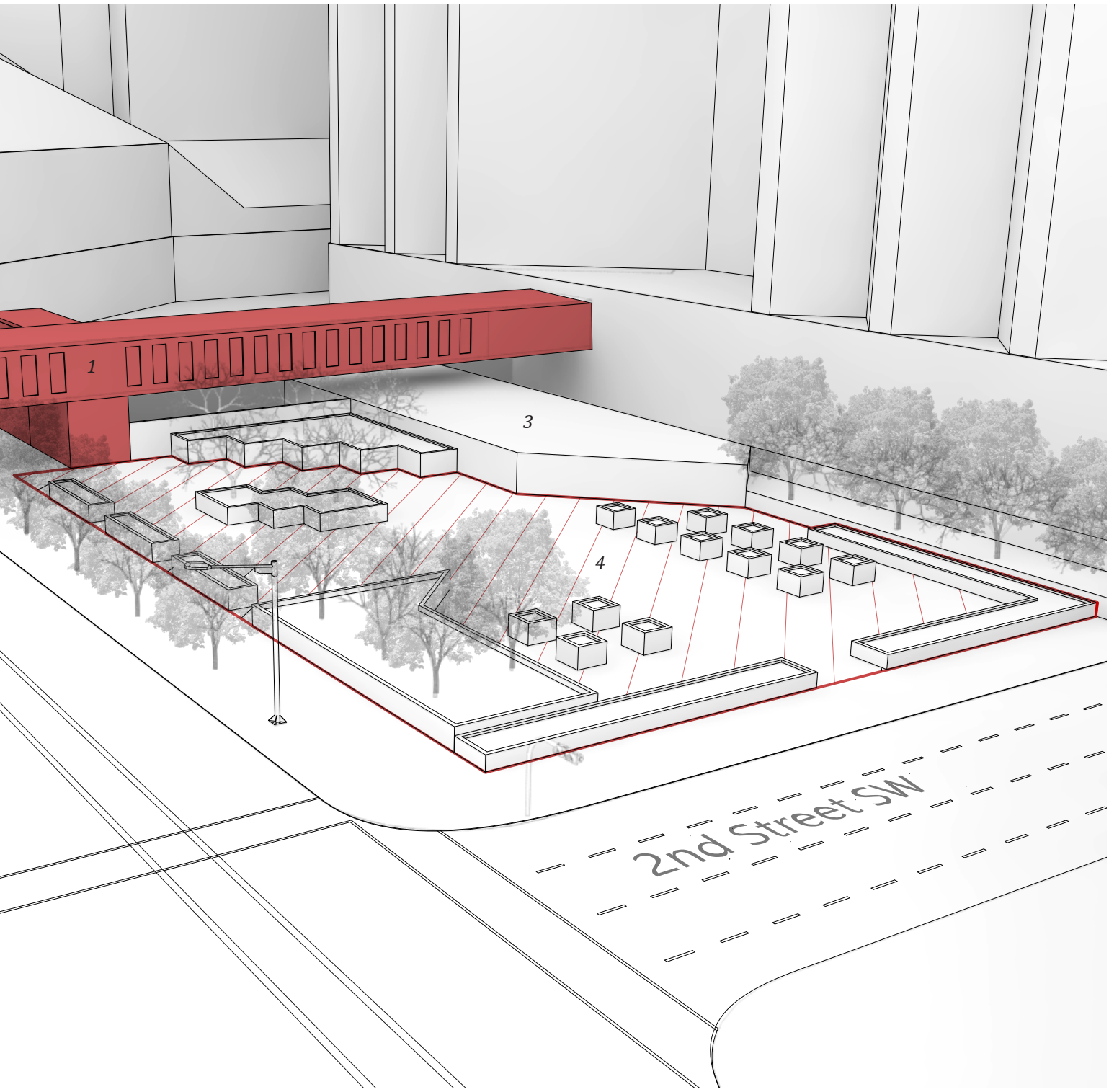
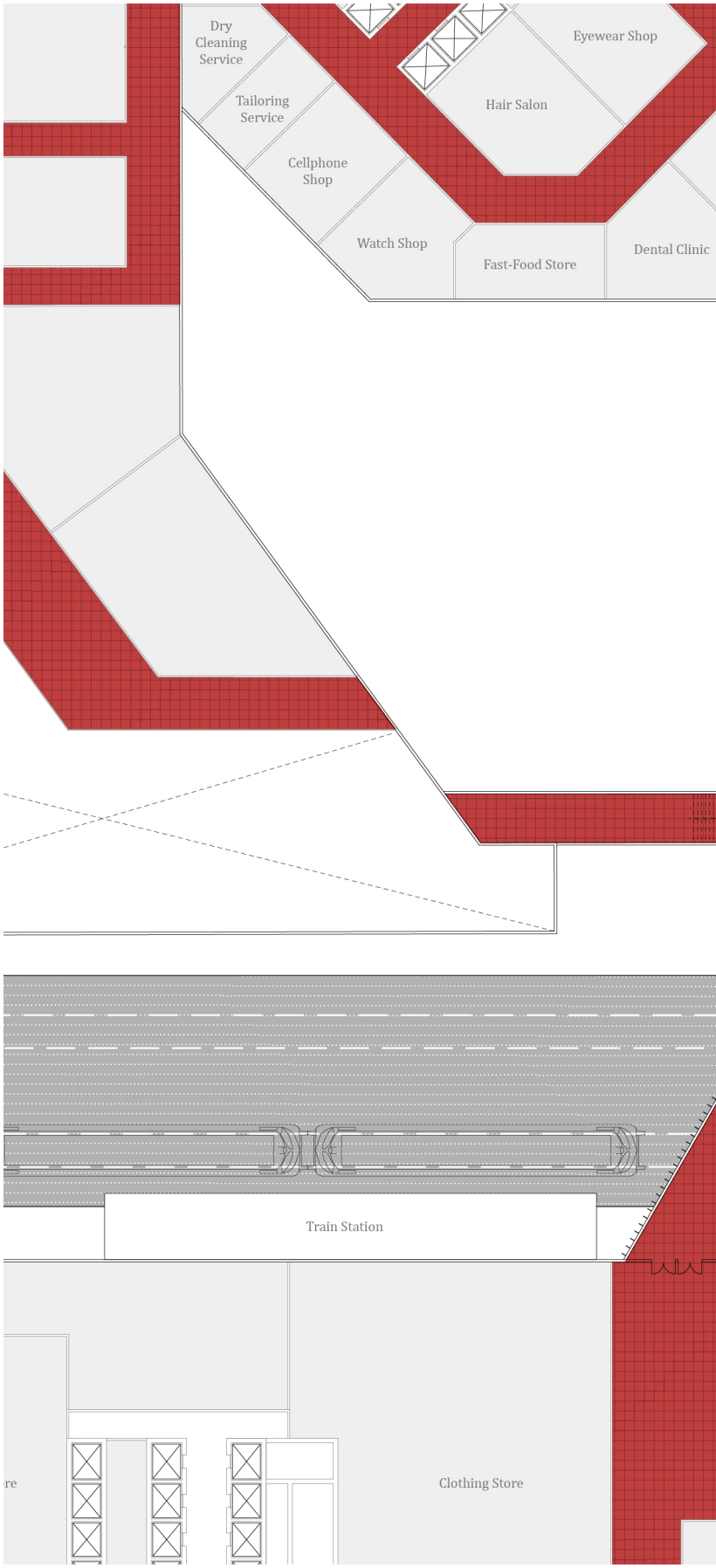


Fig. 50 Site demolition perspective


1
3
4
2nd Street SW

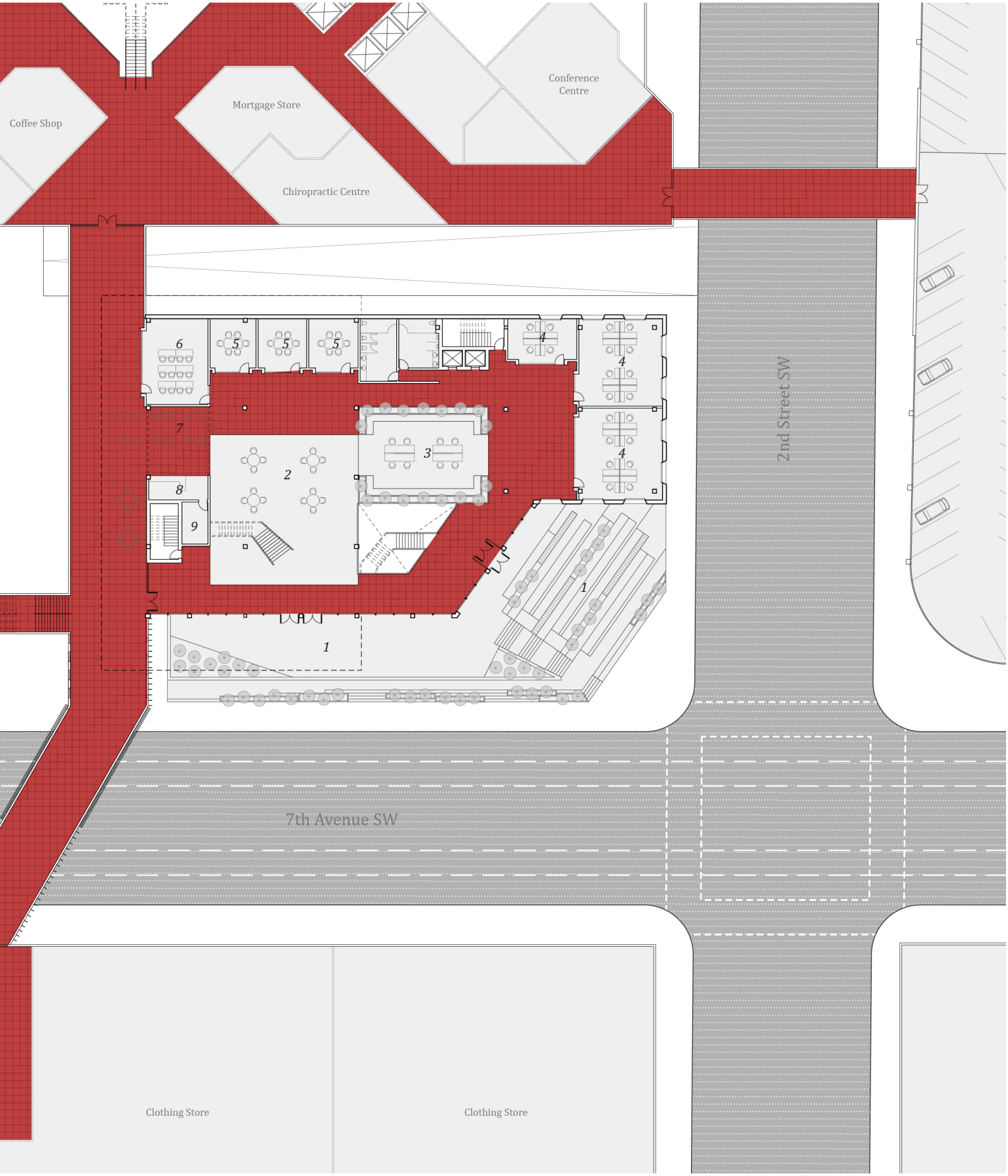
SITE - PROPOSED

The proposed plan preserves the shared underground parking garage and the +15 overpass. The second floor serves as the main floor where students and visitors enter. The entrance, located on the southeast street corner, is emphasized by an outdoor plaza containing a staircase and a series of ramps. The main level is intended to create informal spaces of collaboration and a direct passage into the rest of the +15 network. Comprised of a mixture of shared workspaces for the public, students, and businesses to use, as well as ample room for circulation, the main goal is to foster an environment where unplanned encounters and activities can take place.



1 Entry Plaza
2 Open Study Area
3 Open Work Area
4 Collaborative Work Room
5 Study Room
6 Seminar Room
7 Café Seating
8 Café
9 Storage

Fig. 51 Proposed 2nd Floor (+15 Level)


Coffee Shop
Mortgage Store
Chiropractic Centre
Conference Centre
2nd Street SW
7th Avenue SW
Clothing Store
Clothing Store
1
2
3
4
5
6
7
8
9

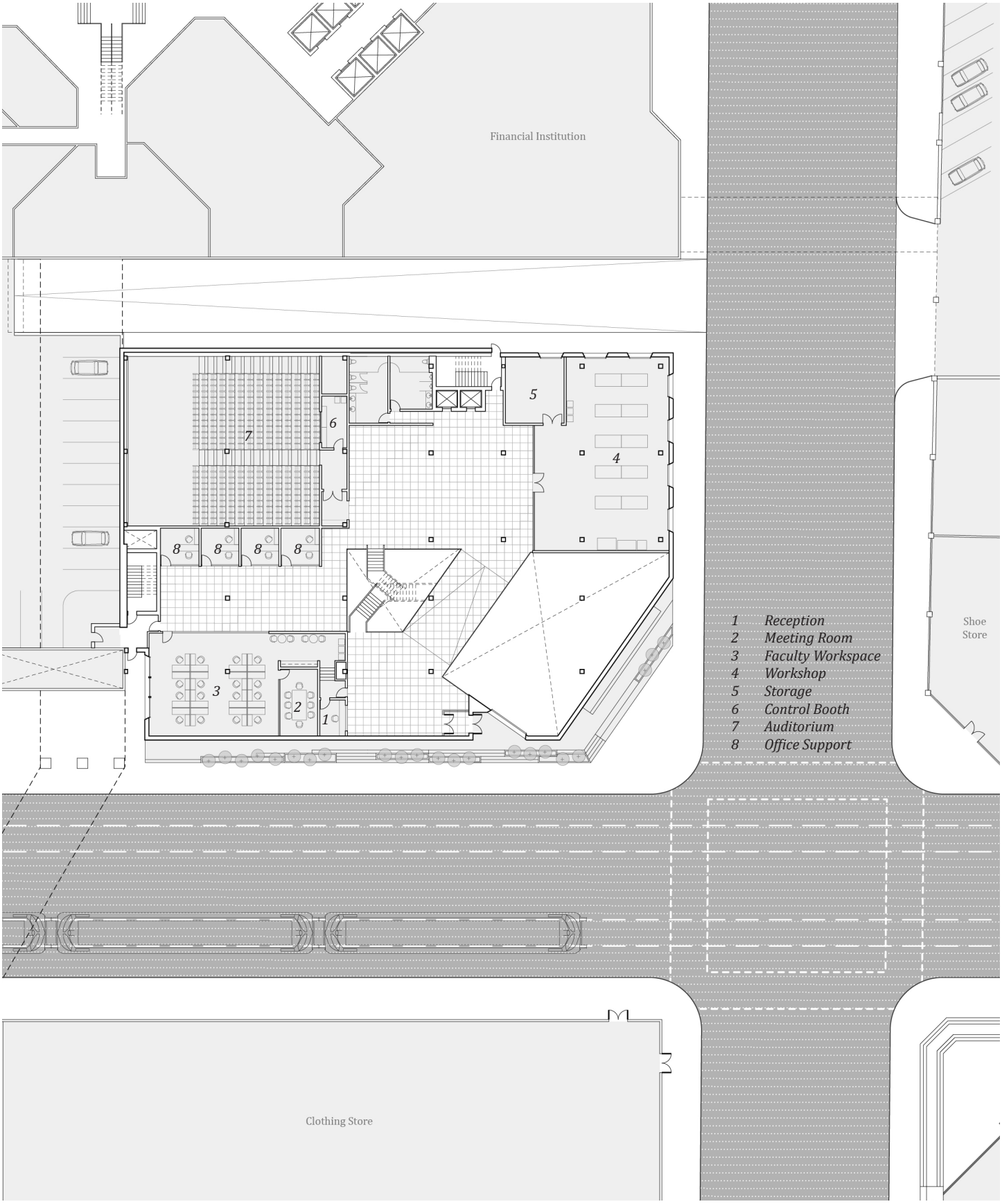


Fig. 52 Proposed Ground Floor

PROGRAM

The academic institution is proposed as the new technical university in Calgary, specializing in the fields of agriculture and renewable energy, which are two of Calgary's growing industries. A mix of traditional academic spaces, such as classrooms and auditoriums, are provided for more general types of learning, while specialty spaces, such as research laboratories, rooftop farms, technology exhibits, are tailored to the specific areas of study. Specialized ventilation systems and utilities are also featured in the building to support activities in both dry and wet laboratories.

The two fields that are selected as a starting point for the establishment of the new university building are chosen based on projected growing industries. The future expansion of the university campus, outlined in phase two, is set up to be developed incrementally over time. This approach is taken because it allows flexibility in developing physical spaces and new curriculums that best respond to future development of the economy and community.

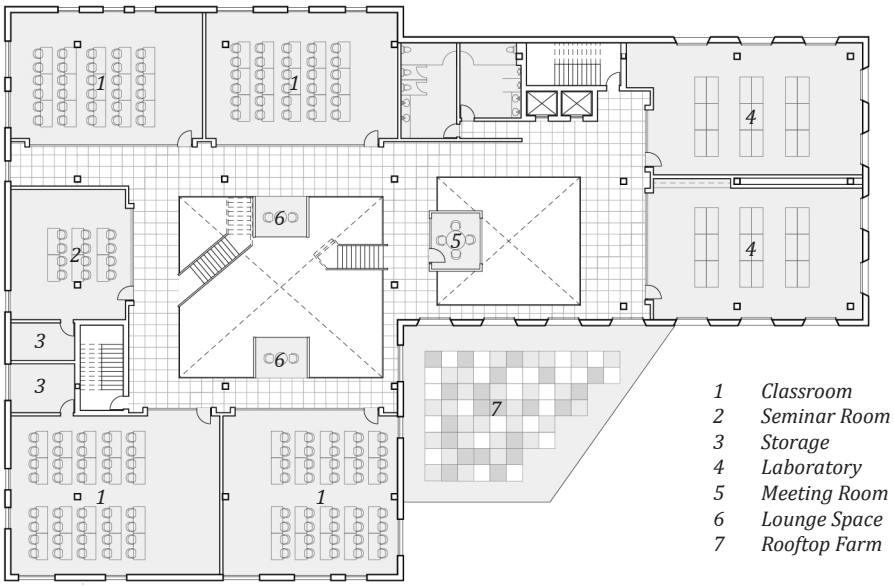


Fig. 53 Proposed Upper Floor

FORM & MATERIAL

The form of the building is important in communicating the more intangible missions of the university. In the design proposal, the university building is designed with three primary user groups in mind: academics, industry partners, and community members. The building uses juxtaposing forms and materials to visually represent the different user groups. Each of these participants is vital to the success of an academic institution that is embedded into the urban fabric of the city.

The institution also attempts to disrupt the rigid forms and hard textures of modern skyscrapers by using unexpected architectural forms and materials. Extrapolating the shapes of buildings around the site, the building adapts and creates a new architectural language that subverts the predictability of downtown development.

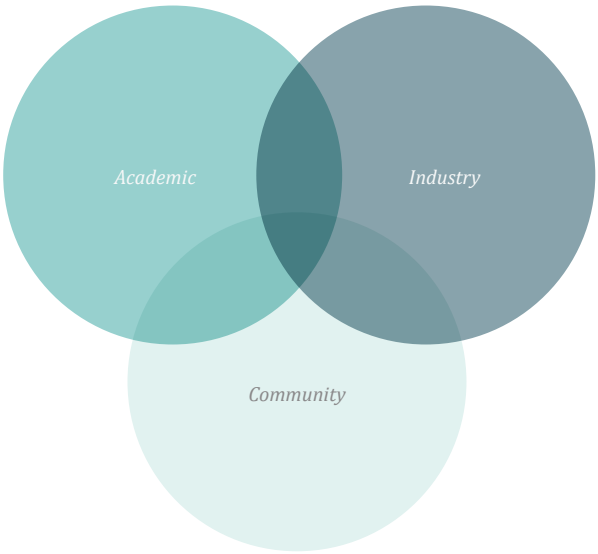


Fig. 54 Universities promote the collaboration between different user groups

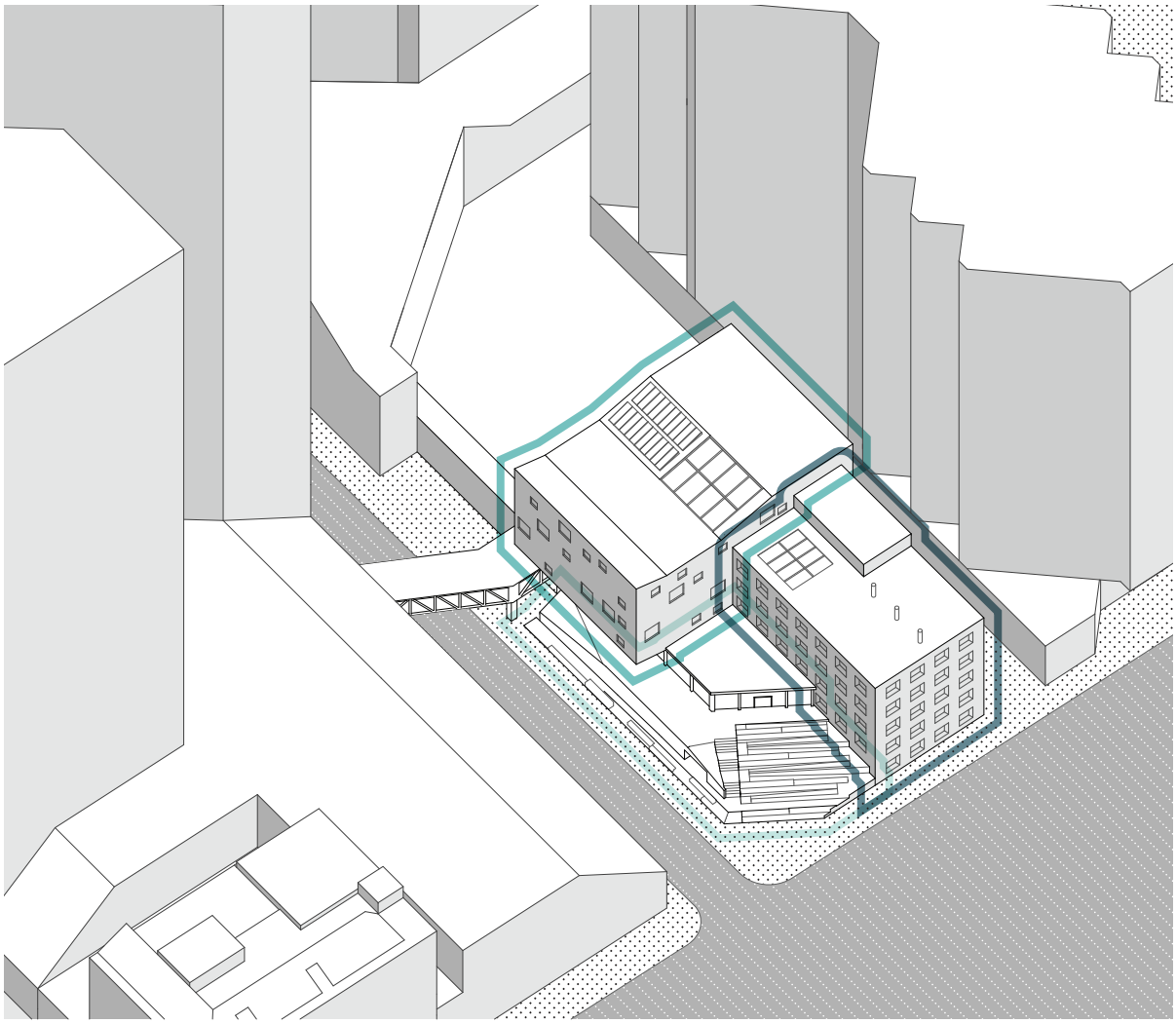


Fig. 55 Proposed Building Form



Fig. 56 Exterior of anchor institution



Modern universities are recognized as ambassadors of innovation and sustainability. Wood is selected as the primary building material to complement the university's mission of sustainability and to support local industries, like Alberta's growing forestry industry. The project features green energy strategies, like rainwater collection, solar harvesting, and skylight atriums to cut down on energy costs and to demonstrate best practice in architecture.



Fig. 57 *Section perspective of anchor institution*



amp *Rainwater Harvest* *Photovoltaic Panels* *Skylight*

1 *Mechanical Room*
2 *Faculty Workspace*
3 *Learning Support*
4 *Auditorium*
5 *Entry Plaza*
6 *Open Study Area*
7 *Café Seating*
8 *Study Room*
9 *Classroom*

DESIGN ELEMENTS

A series of design elements are developed based on trends in higher education described in previous chapters. These trends primarily focus on the importance of fostering innovation and creating collaborative settings for work and learning. The design elements presented in this section are the basis for developing the urban campus inside the +15.

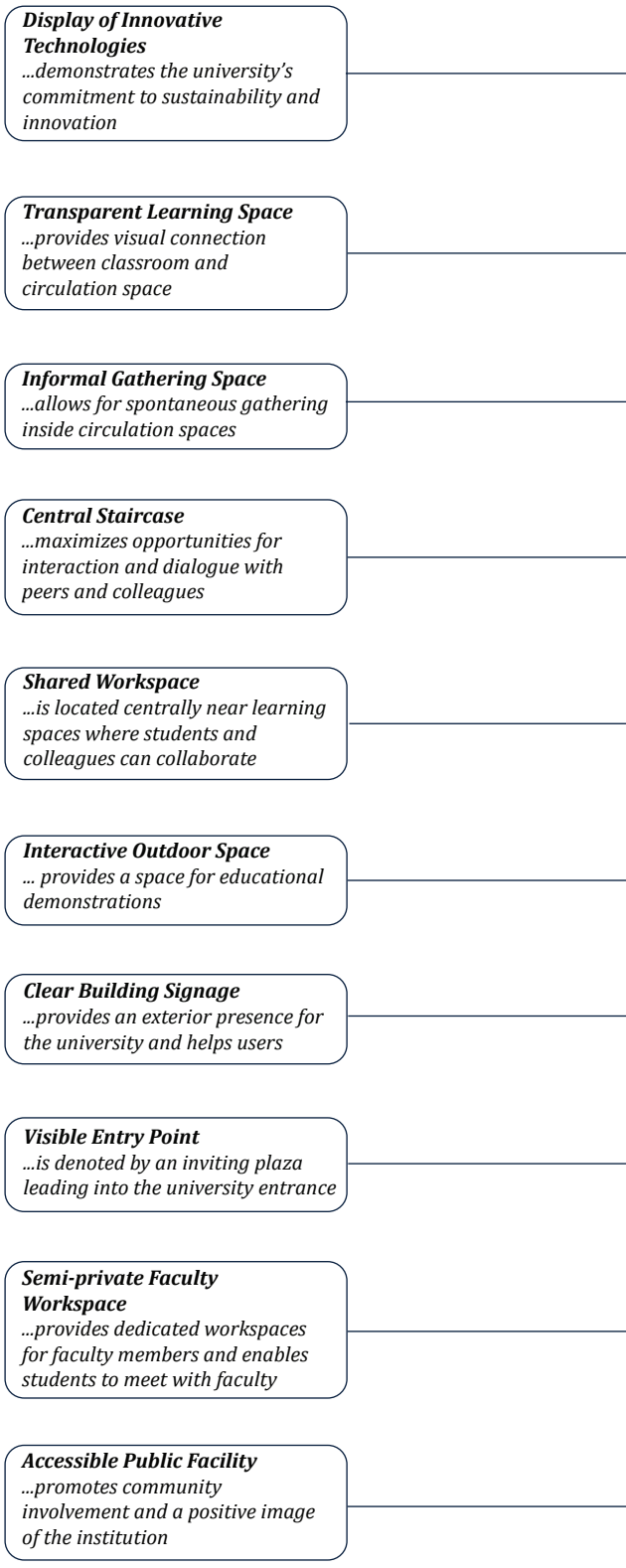


Fig. 58 Anchor institution design elements



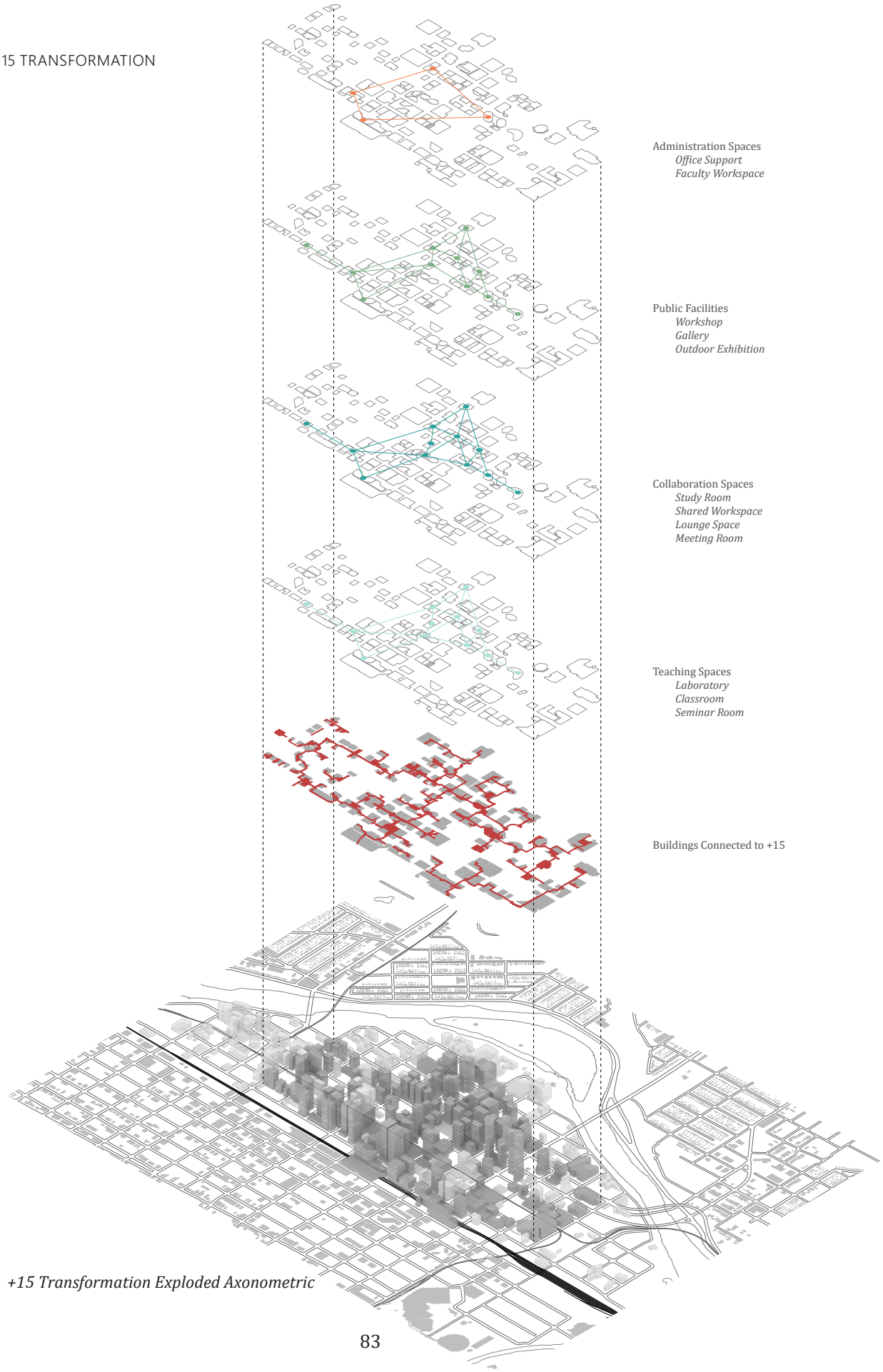
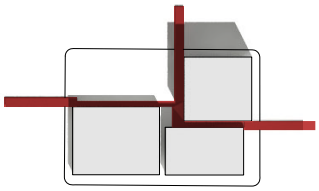


Fig. 59 +15 Transformation Exploded Axonometric

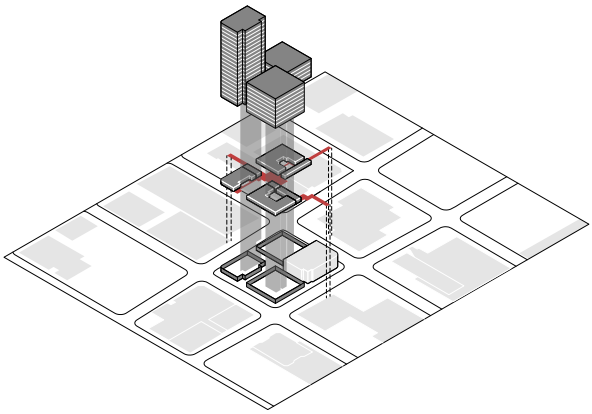
PHASE 2: DESCRIPTION

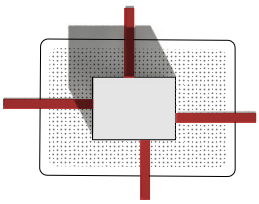
Entering into phase two of the design proposal, an urban campus is created inside the +15 system. New spaces for teaching, collaboration, community outreach, and work are built inside existing commercial spaces, and together these new types of spaces generate a complex network of mixed-use activity. In this phase of design, the network is formed over time and gradually expanded into new territories through constant negotiation between the university, building owners, and government bodies.

This thesis proposes that the university could leverage the existing public-private ownership of the +15 by working closely with the City of Calgary and building owners to establish effective regulations, seek funding for development and improve the quality of public spaces. There is currently a government fund allocated for constructing or improving elements of the +15 system, which is imagined to go towards the funding of this urban campus project as it aligns with many of the city's economic and urbanistic goals. Building owners would benefit from integrating the university into their buildings as they have guaranteed long-term tenants and are provided with building upgrades by the university, which increases their buildings' value and marketability. Ultimately, the strong collaboration between these various stakeholders is critical in order to create a viable and successful academic institution inside the +15.

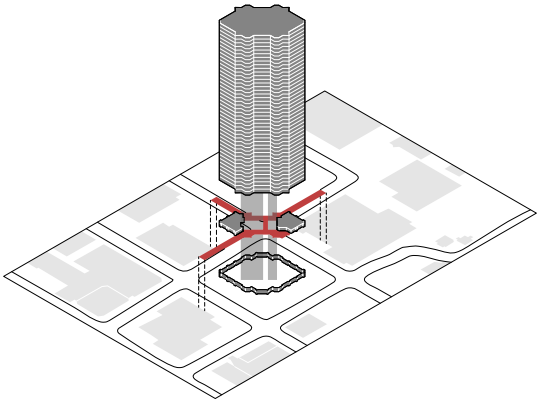


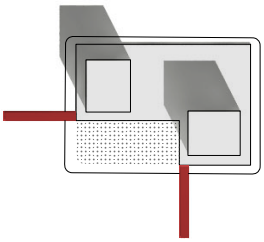
Multi-tower Block





Single Tower Block





Podium Tower Block

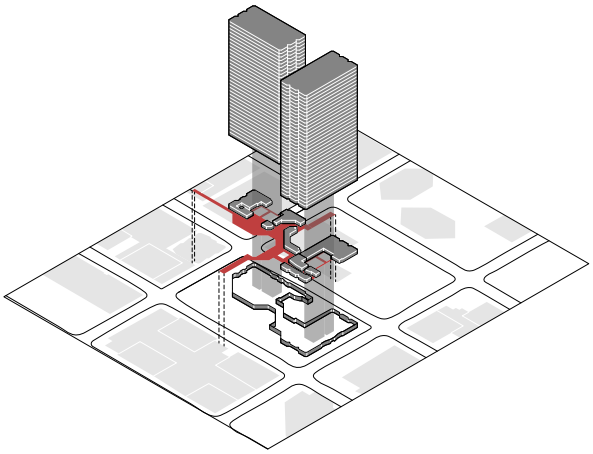


Fig. 60 Office Building Typologies

TOWER TYPOLOGY ANALYSIS

An analysis of existing office tower typologies is conducted to understand spatial properties of each building type. In the examination of these typologies, observations about their key building components are provided.

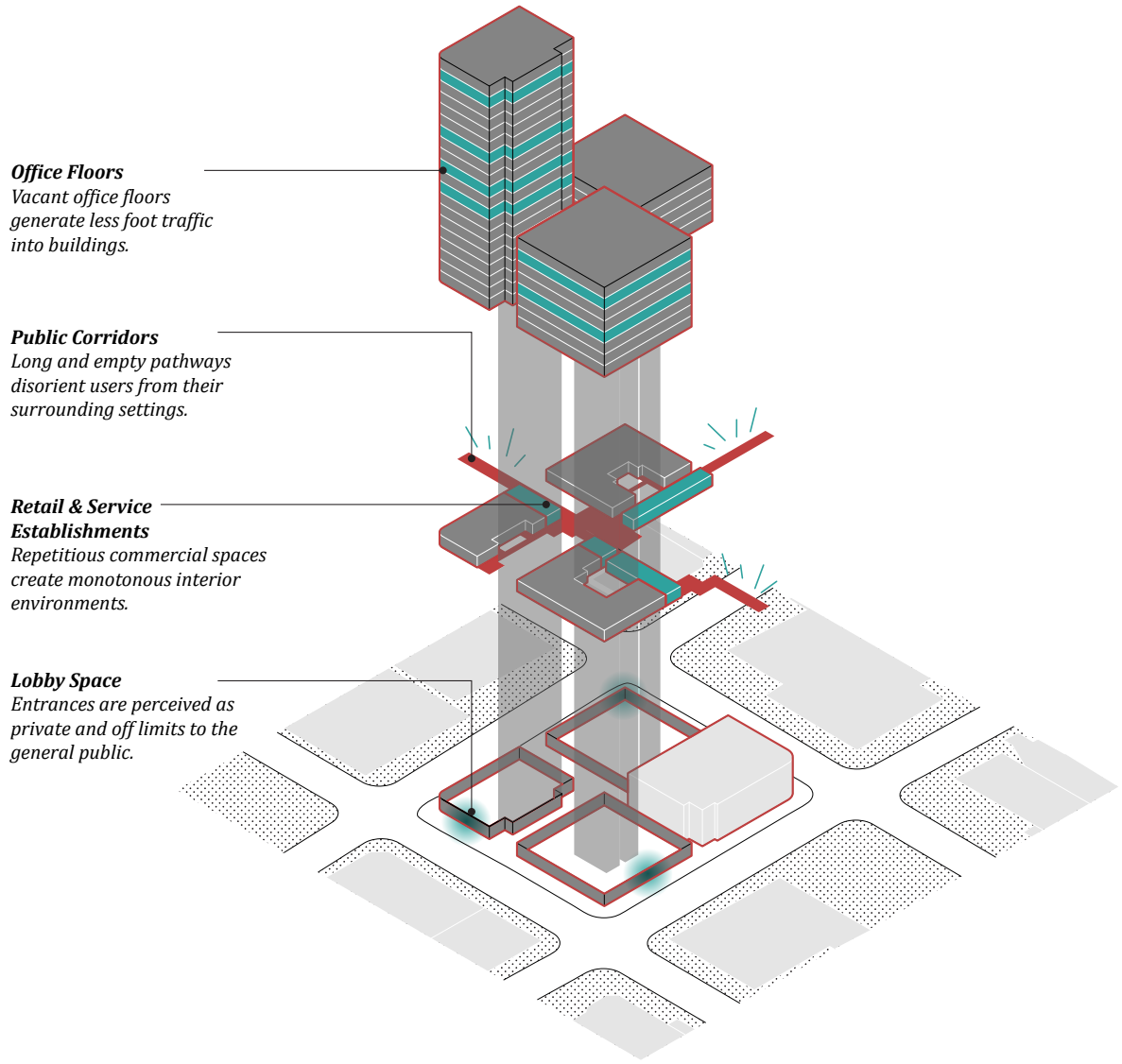


Fig. 61 *Multi-tower Block Typology Diagram*

MULTI-TOWER BLOCK TYPOLOGY

The multi-tower block typology contains multiple office towers within one city block. The towers are connected by corridors running along the edge of the buildings. Since office towers are grouped together, this typology is ideal for locating centralized learning spaces where the sharing of resources is beneficial. For example, organizing learning support centers, faculty offices and classrooms together maximizes the opportunity for faculty and students to convene.

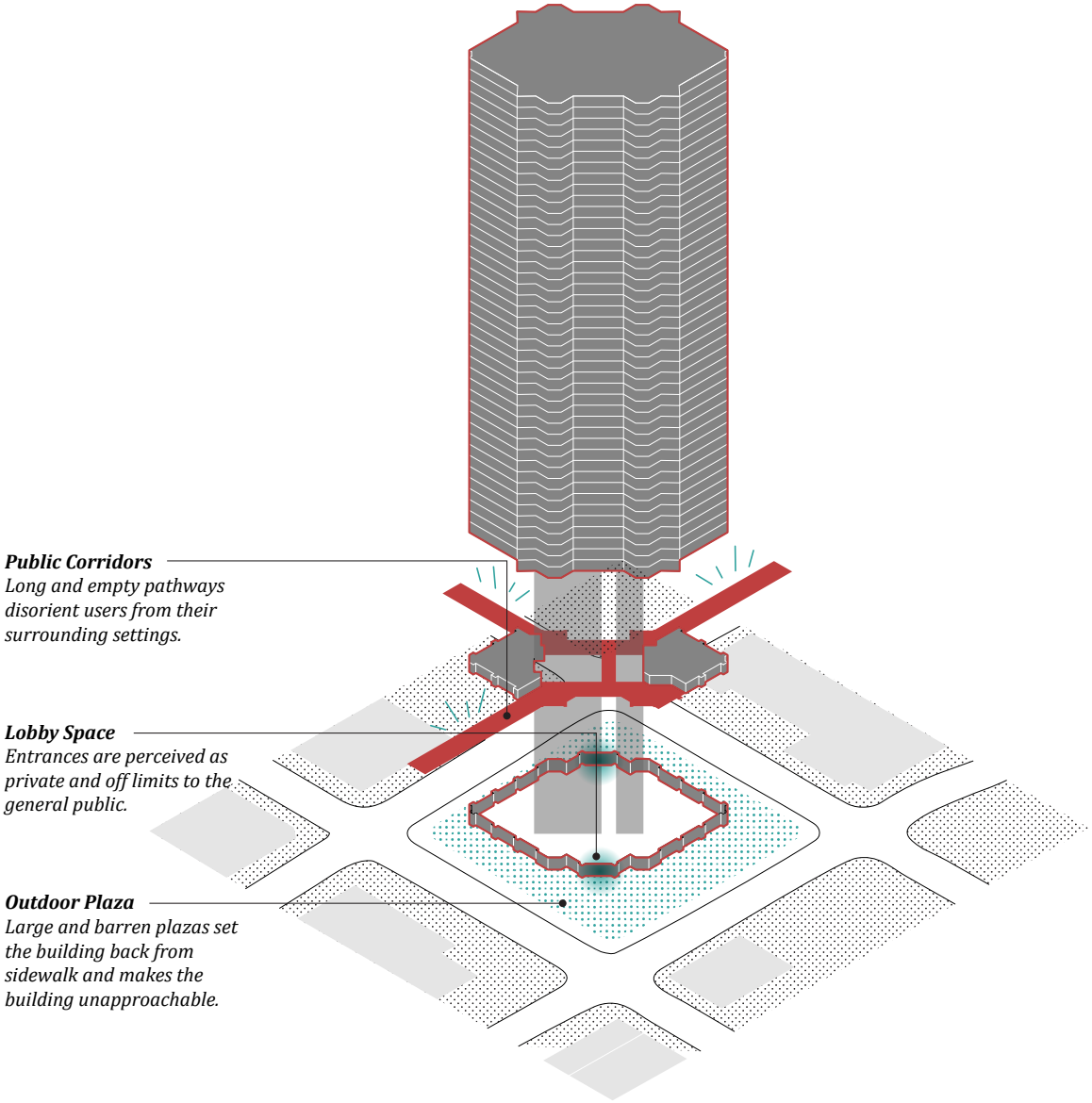


Fig. 62 Single Tower Block Typology Diagram

SINGLE TOWER BLOCK TYPOLOGY

In the single tower block typology, the office tower is surrounded by an outdoor plaza and occupies an entire city block. The building footprint is smaller due to the wide setback from the sidewalk. While interior spaces in the single tower are more compact, the large plaza is a fantastic location for outdoor educational activities and developing a new building addition.

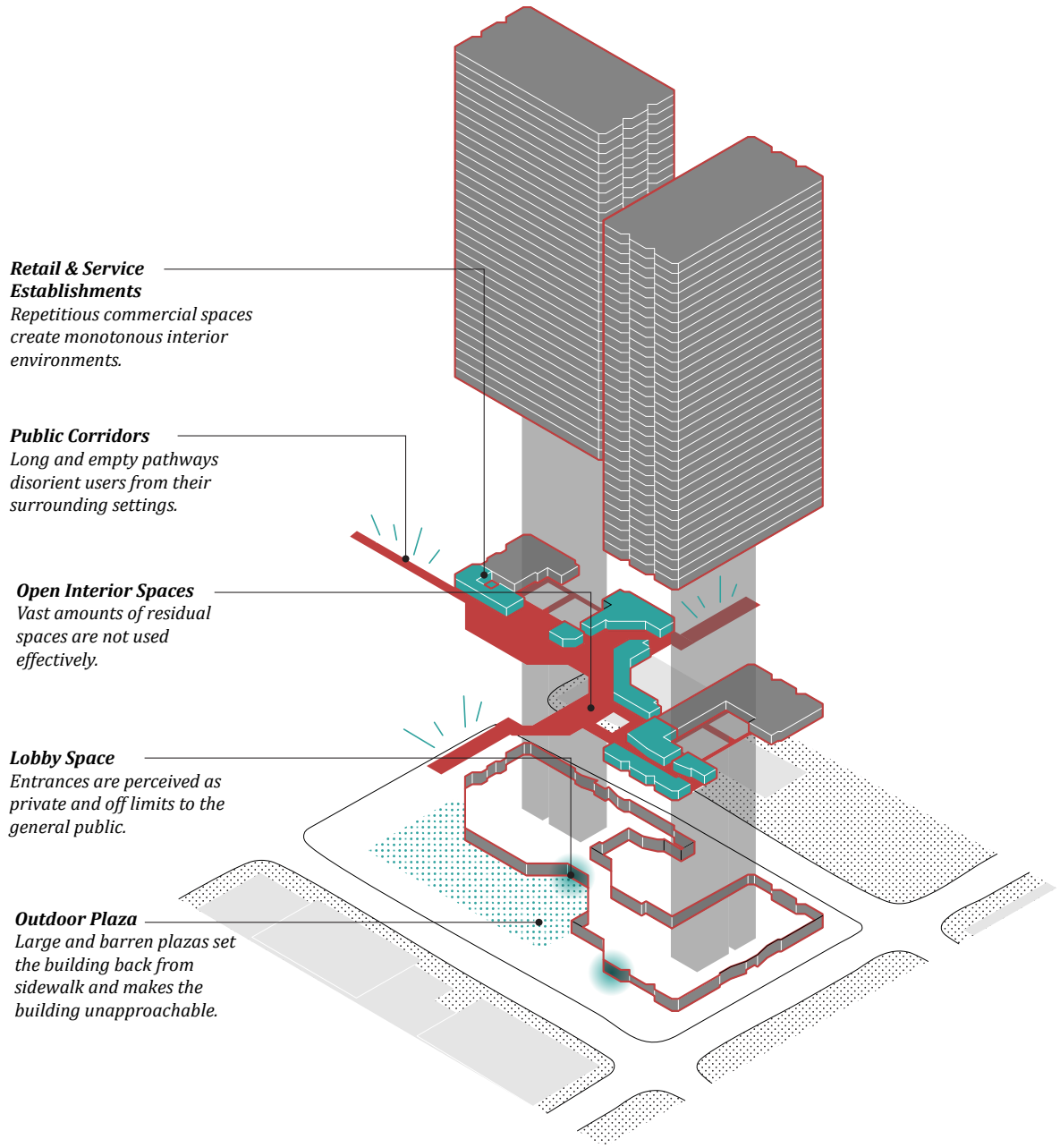
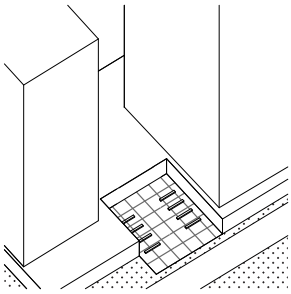


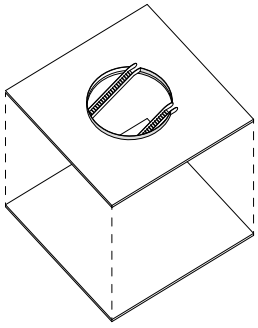
Fig. 63 Podium Tower Block Typology Diagram

PODIUM TOWER BLOCK TYPOLOGY

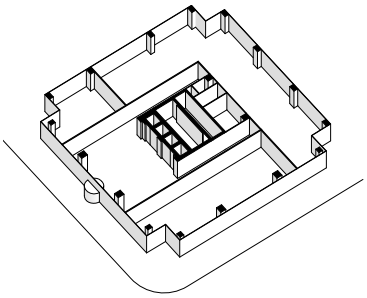
The podium tower typology consists of a wide base that covers the length of a city block and towers that sit above the base. The expansive interiors inside the podium levels serve as great locations for academic spaces that demand greater floor area, such as research labs or open workspaces.



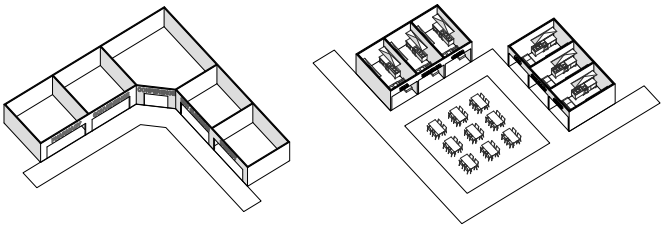
Outdoor Plaza



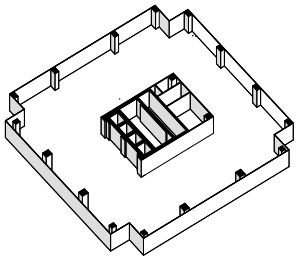
Open Interior Space



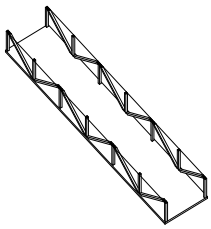
Lobby Space



Retail & Service Establishment



Office Floor



Public Corridor

Fig. 64 Building components

BUILDING COMPONENT ANALYSIS

In the following section, the building components identified earlier are examined in greater detail. The accompanying diagrams explain how design elements can be applied to each building component in order to create specific types of university environments. The purpose of this exercise is to create an index of spaces that collectively make up the university campus inside of the +15 system.

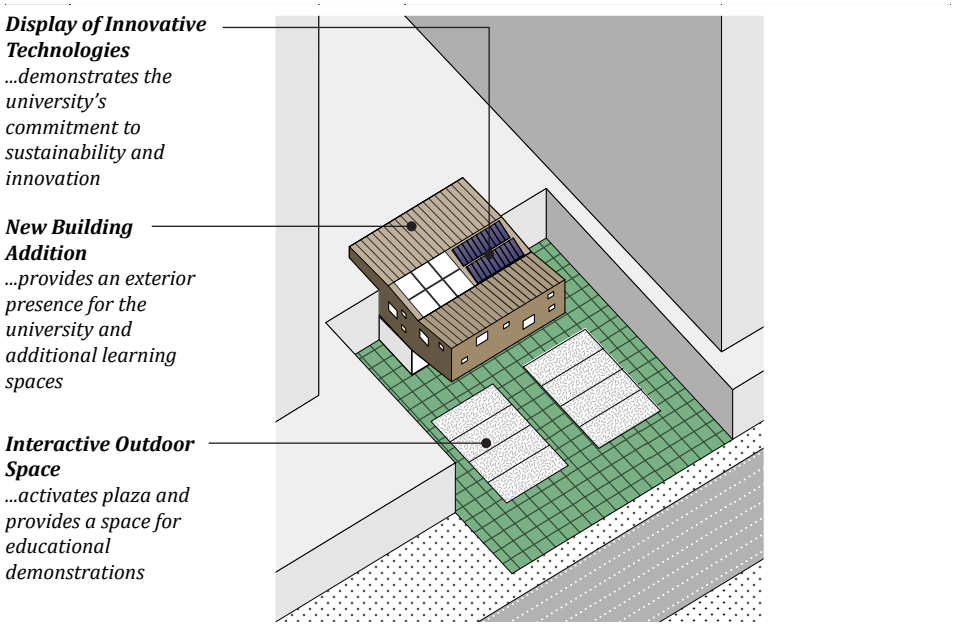


Fig. 65 Diagram of proposed outdoor plaza

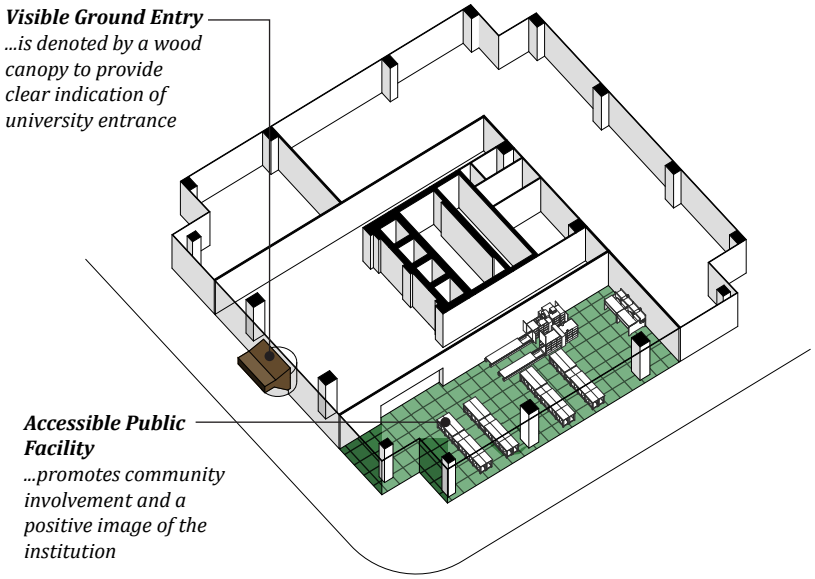


Fig. 66 Diagram of proposed lobby space

OUTDOOR PLAZA

The plaza is located between buildings or at a street intersection, containing limited outdoor furniture and treated with hard materials such as concrete or stone. Retail frontages stop abruptly at the facade instead of opening onto the plaza, setting the building far back from the sidewalk.

By developing a building addition that extends onto the plaza, a threshold is created that entices visitors to come inside. Implementing outdoor activities, such as experimental agriculture zones, introduces a new type of use into these barren exterior spaces and demonstrates the types of research and education produced by the academic institution.

LOBBY SPACE

The lobby serves as the entry point into offices floors above and into the +15 network. However, the presence of security guards and surveillance cameras gives the impression of the lobby as private territory, making it a challenge for the general public to enter the building.

The insertion of a canopy above entrances where the university is active inside the building and the implementation of public amenities along the building frontage provides an indication of where students, faculty, and the public should enter.

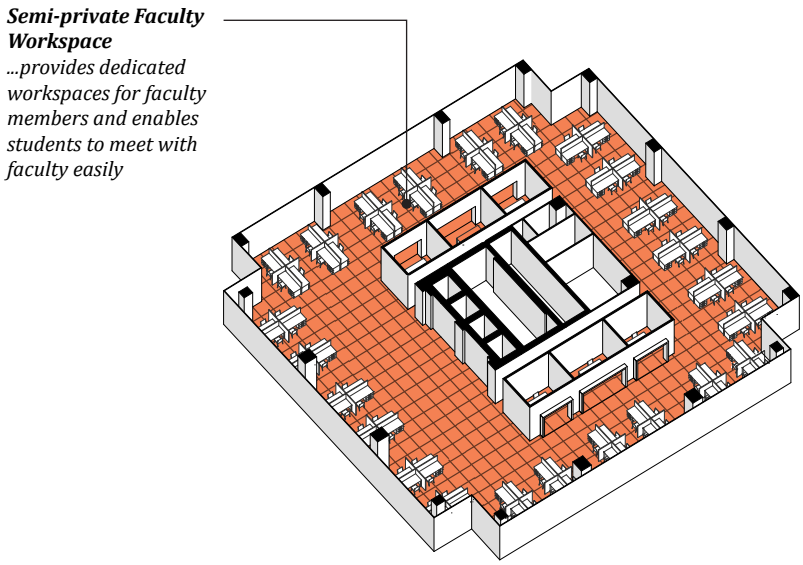


Fig. 67 Diagram of proposed office floor

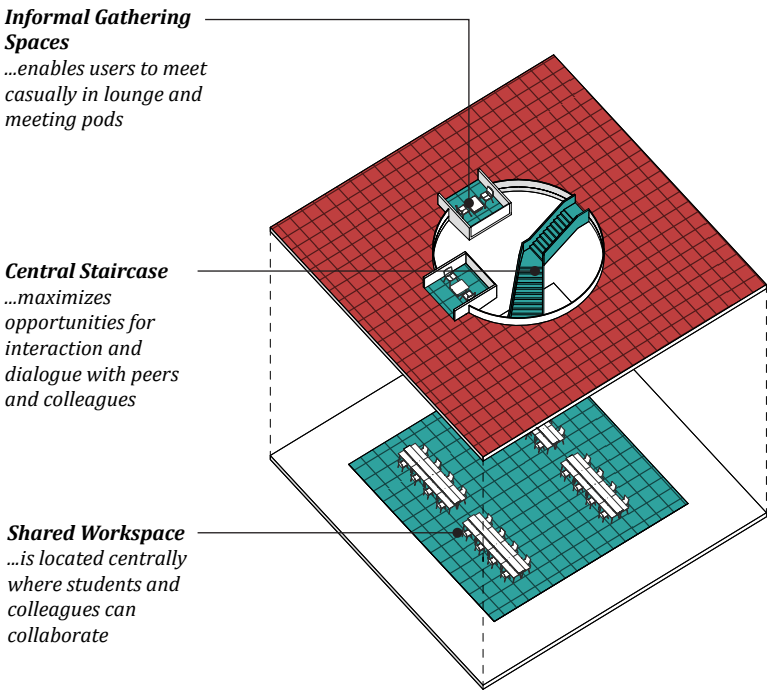


Fig. 68 Diagram of proposed open interior space

OFFICE FLOOR

Downtown Calgary currently has an abundance of office units available for lease or purchase because of the slow moving economy.

Due to the more private nature of the office floor, this type of space is most suited for private or administrative tasks.

OPEN INTERIOR SPACES

Floor openings are common features in open interior spaces to reduce barriers between floors, provide visual connection and increase natural light. However, spaces around and below the openings are treated as residual or circulation space that are devoid of activity and visual interest. Escalators also quicken the process of moving through floors but they minimize the opportunity for serendipitous encounters.

Introducing various types of spaces for collaboration, such as shared workspaces and meeting pods, and replacing the escalator with a central staircase can generate more traffic and visual interest in these intermediary spaces.

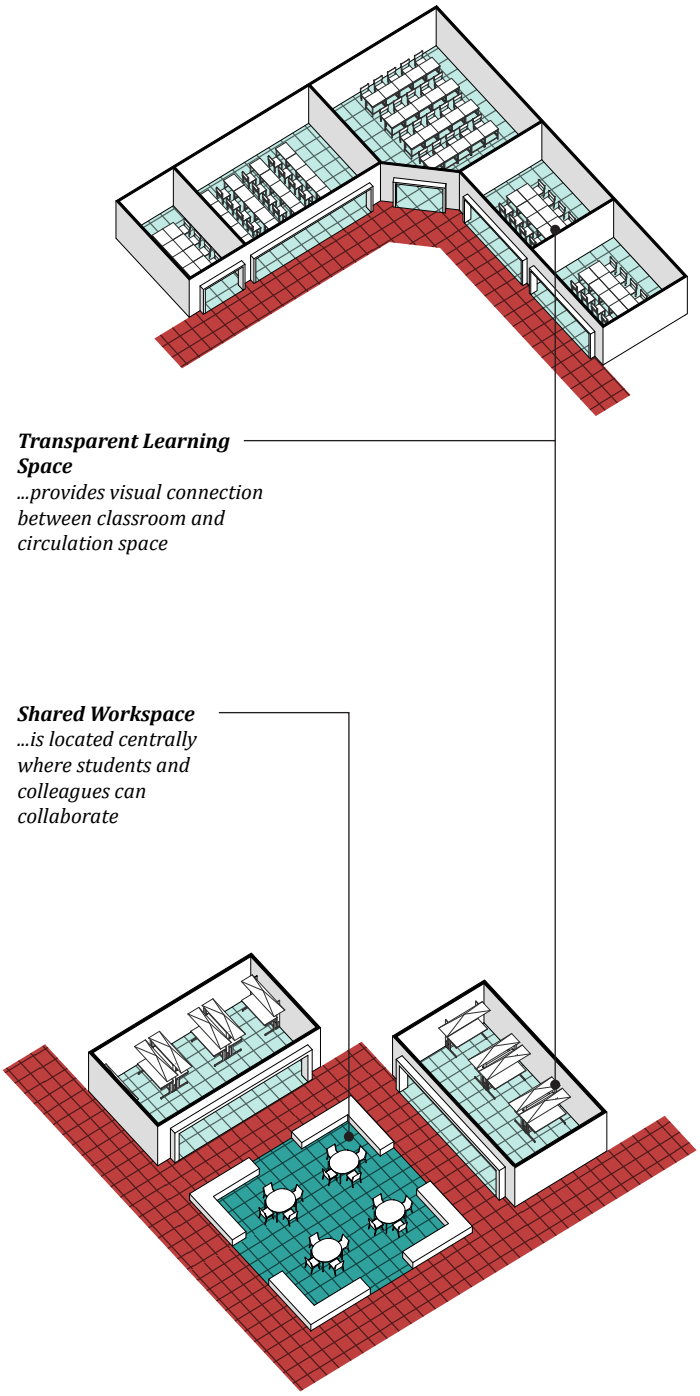


Fig. 69 Diagram of proposed retail & service establishments

RETAIL & SERVICE ESTABLISHMENTS

The +15 is oversaturated with retail and service establishments that cater to the working population. A variety of convenience stores, dry cleaning stations, and dental practices exist across the pedestrian network.

A mixture of learning spaces, such as classrooms and seminar rooms, can disrupt the repetition of these common commercial spaces, bringing new and exciting activity into the storefronts. While it is important to provide visual connection between classroom and circulation spaces, particular care should be placed on the treatment of the storefronts to ensure an appropriate level of privacy is achieved.

The food court is extremely active during lunch hours but is idle for the rest of the day. Many of the food vendors are closed in the evenings and on weekends, leaving many of the dining furniture unused.

Food courts contain ample floor space and extensive mechanical systems that are well suited for academic spaces in need of moderate ventilation, such as dry laboratories. Unlike the food court, research labs are not limited to use over lunchtime. They can be made available at different times of the day to students, faculty and businesses.

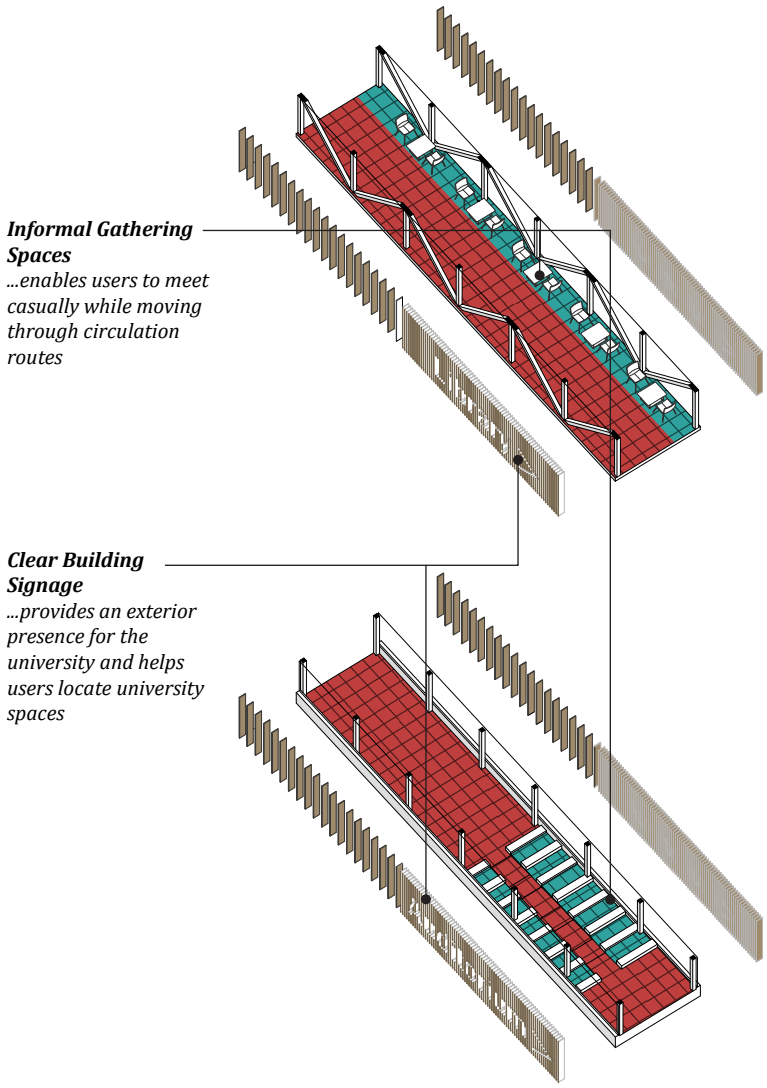


Fig. 70 Diagram of proposed public corridor

PUBLIC CORRIDOR

Overpasses are some of the most visible features of the +15 from street level. They measure a minimum of 4.5m wide and span across the width of a street. Despite their generous size, they exist to simply connect buildings together. Aside from their truss design, which sometimes vary, many of the overpasses look the same from the inside, making it difficult for users to get ahold of their bearings.

Implementing various types of informal gathering spaces and applying signage to the facade can animate the sterile corridors that exist throughout downtown and provide context about their surrounding buildings.

TOWER TYPOLOGY TRANSFORMATION

The next series of diagrams provides example scenarios of how the proposed building components can be arranged in each office tower typology. The diagram shows existing spaces that are to remain, as indicated in a grey hatch, while other spaces are to be replaced by new design elements. The objective is to reinvigorate the +15 system by introducing new types of spaces without removing all of its current functions. Existing retail and service programs are still necessary for serving downtown office workers and the university students. The goal is to achieve a good balance between academic and commercial programs and to eliminate extraneous or vacant spaces that are inhibiting the vibrancy of downtown.

MULTI-TOWER BLOCK TRANSFORMATION

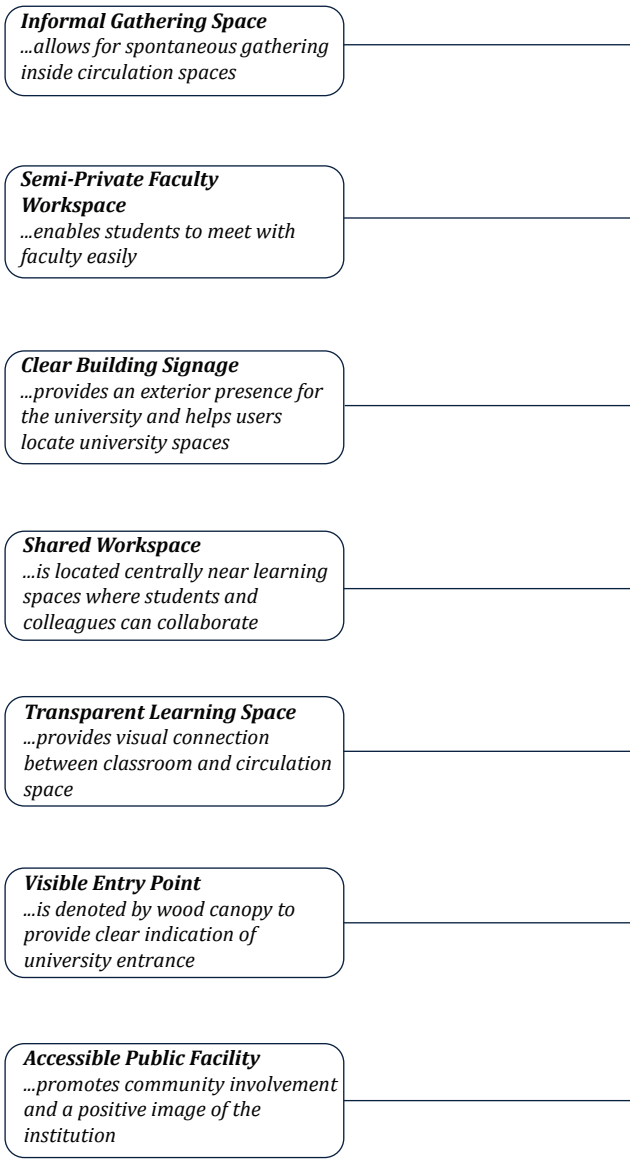
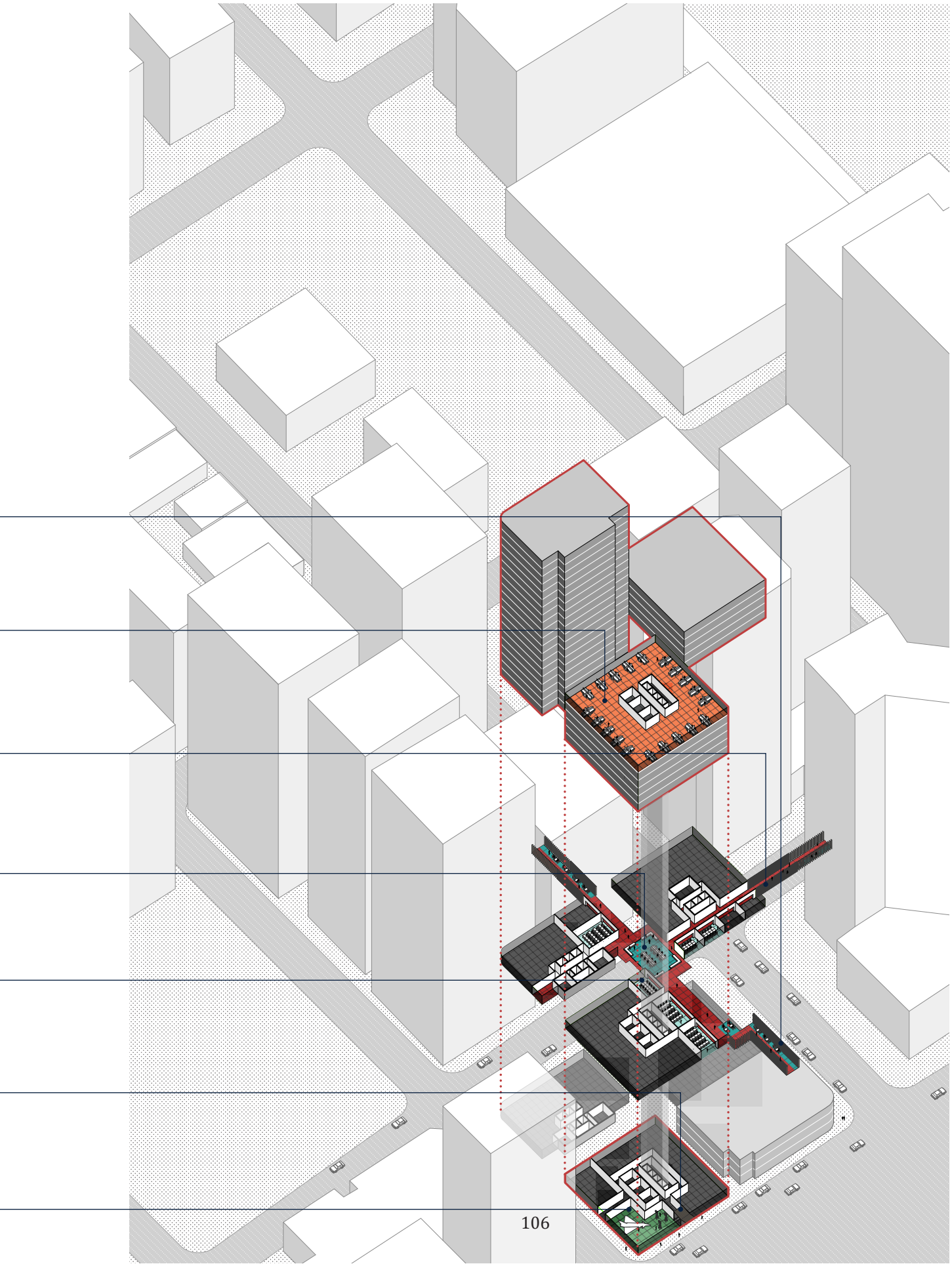


Fig. 71 Proposed multi-tower block typology



SINGLE TOWER BLOCK TRANSFORMATION

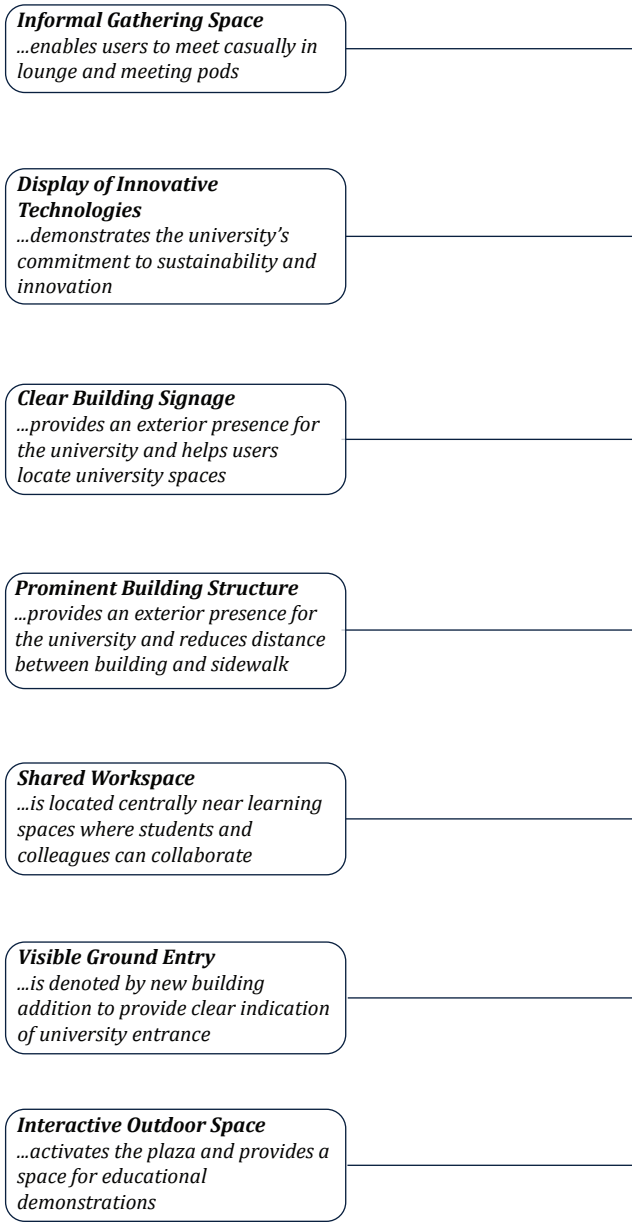
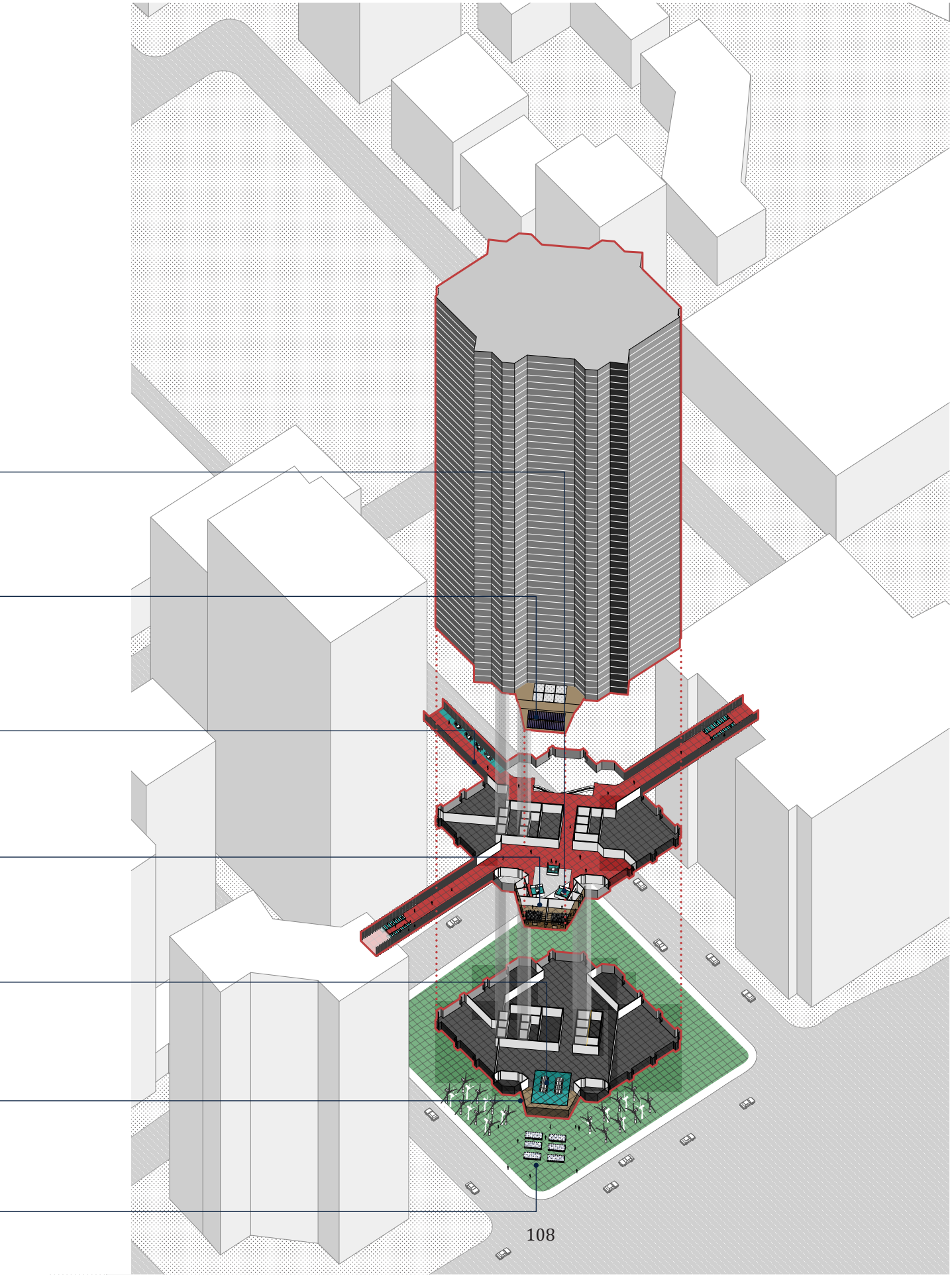


Fig. 72 Proposed single tower block typology



PODIUM TOWER BLOCK TRANSFORMATION

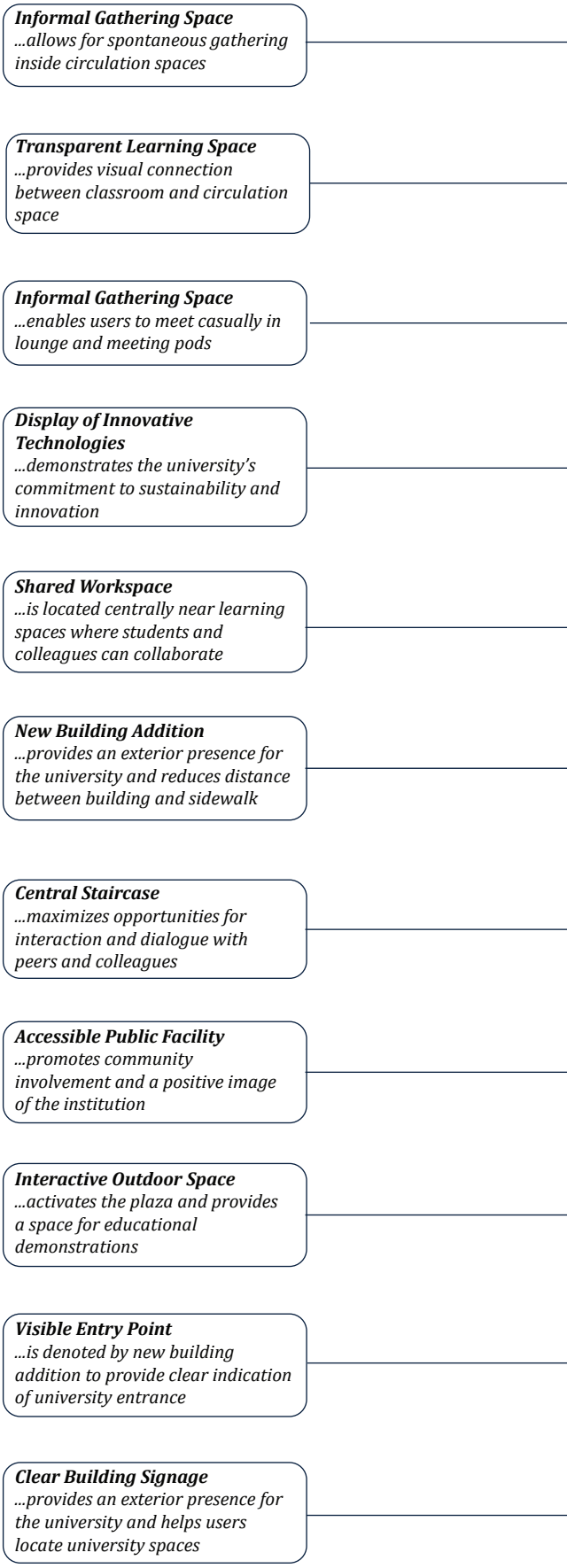
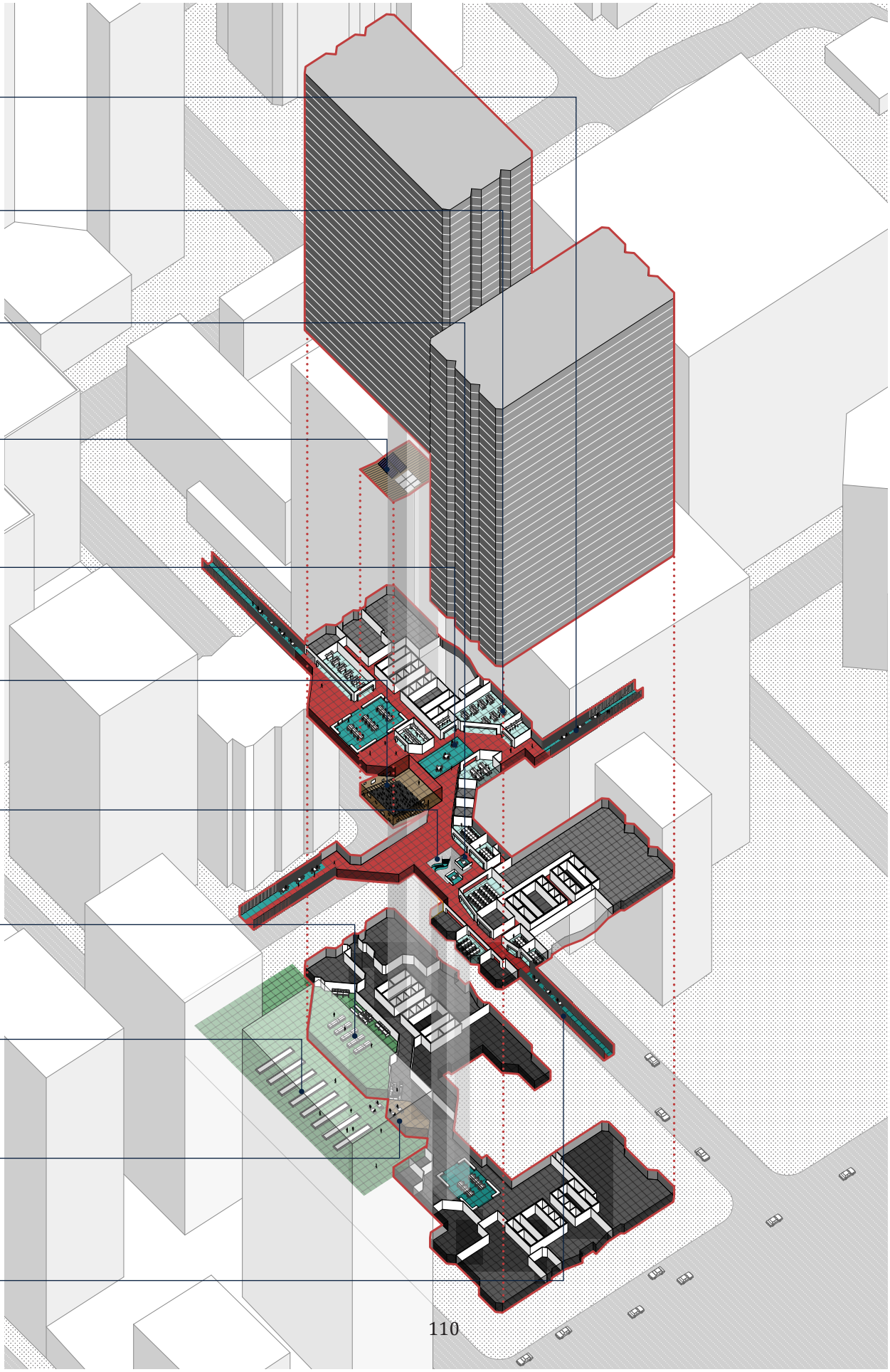
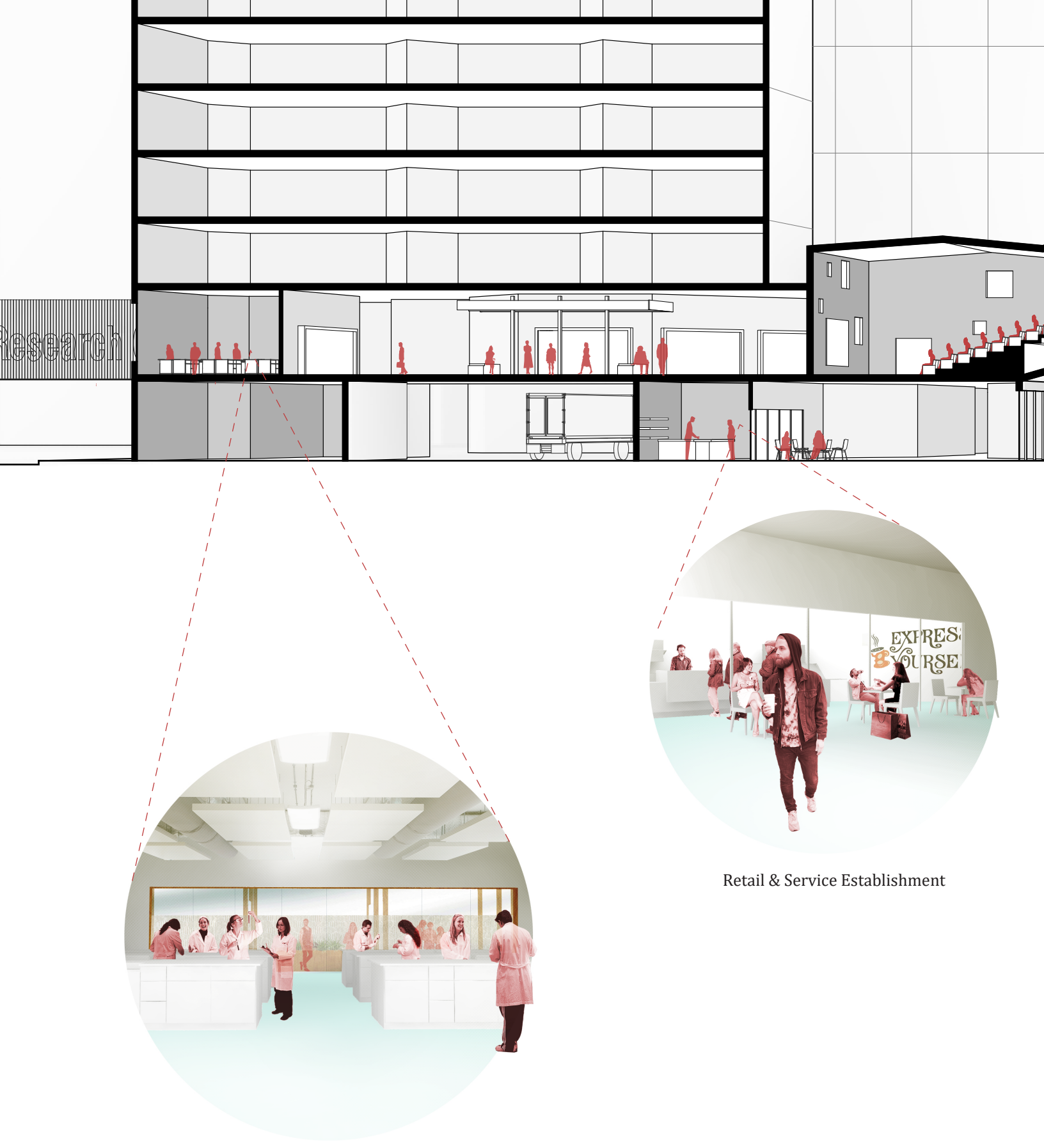


Fig. 73 Proposed podium tower block typology





Retail & Service Establishment

Research lab

Fig. 74 *Section showing proposed activities and spaces*

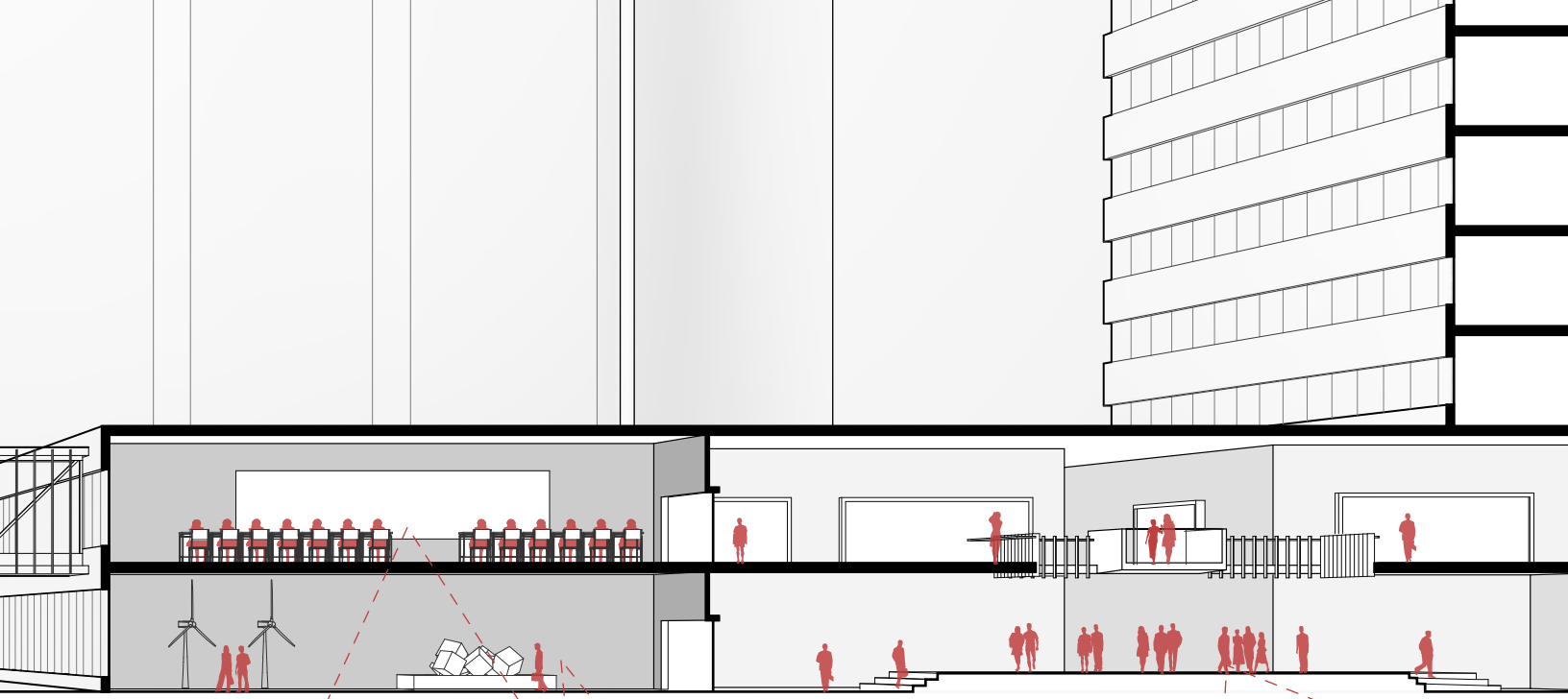




Urban farm



Auditorium





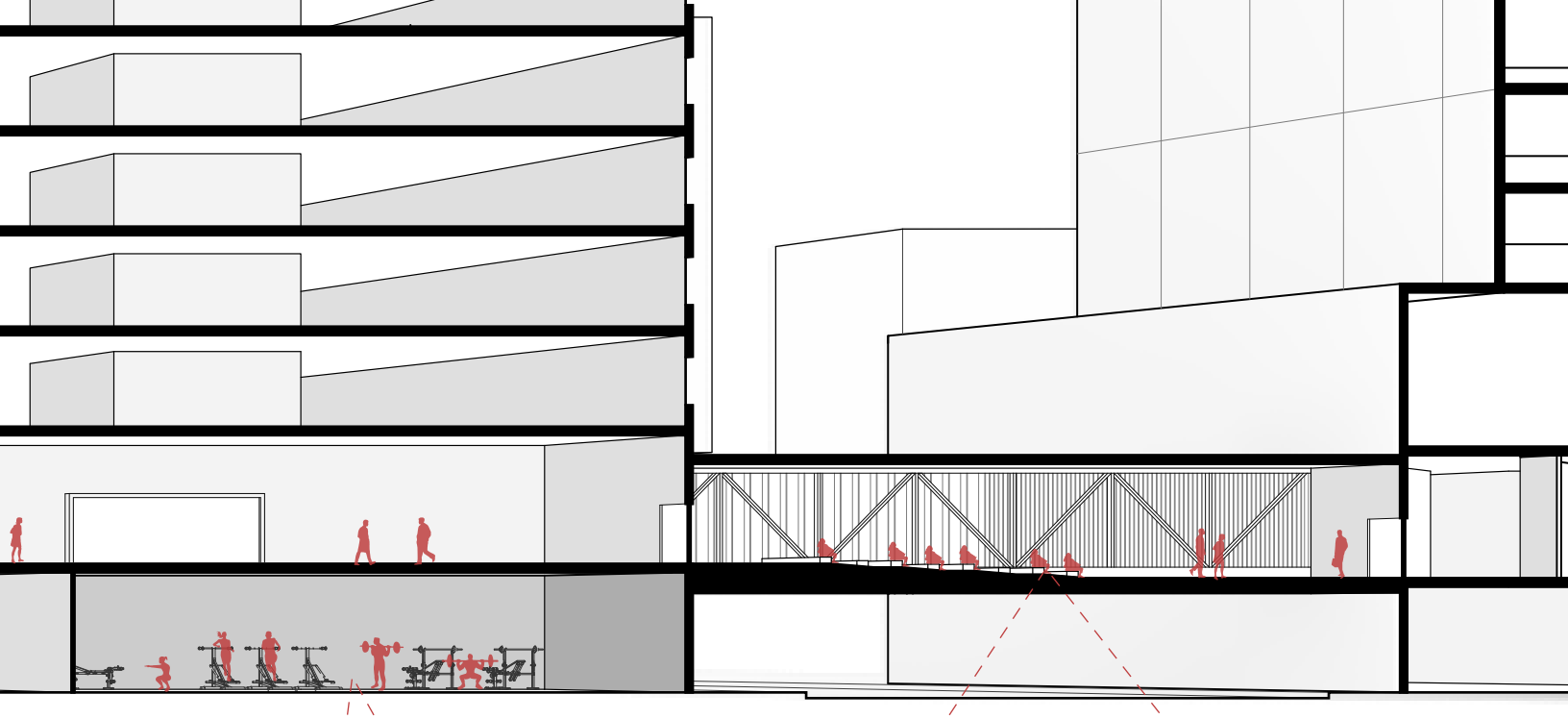
Classroom

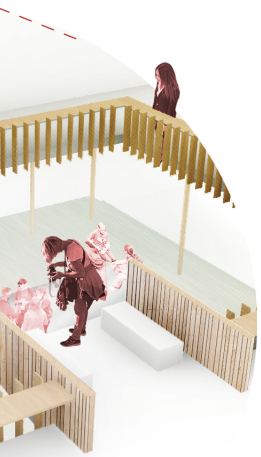


Networking Spa



Exhibition Space





ace



Shared building facility



Circulation Space



Fig. 75 New building addition and interactive outdoor space





Fig. 76 Learning and shared workspaces


Organize
&
Prioritize
Re prioritize



Fig. 77 Central staircase with informal gathering spaces



CONCLUSION

Calgary is witnessing adverse changes in its economy and urban landscape, particularly in the downtown region. The instability of the energy market frequently threatens the city's social and economic health, and the most recent oil crisis is no exception. Calgary is slowly moving towards a more diverse industry base, with politicians advocating for growth in funding, research, and development in alternative industries. Despite the decreasing dominance in oil and gas, there is still a great reliance on these energy businesses to generate wealth for the city.

The downtown core is designed and developed as a commercial hub for oil and gas businesses. The district is dominated by white-collared workers, which is reflected in the operations and functions of the +15. There is a limited variety of activities and choices in the +15 system to attract a diversity of users, causing the pedestrian network to be inactive during off-hours. Due to the singular function of downtown, there is a perception that the district is exclusive to office workers and noninclusive of citizens and visitors.

The thesis proposes the university as an agent for economic and urban revitalization. Over the years, universities have established a reputation for successfully developing their local industries and surrounding neighbourhoods. The growth of the university campus across the +15 will likely inspire growth in other areas, including an increase in jobs and tourism. Since universities are promoting more collaboration among academic peers and industry members, this will increase the likelihood of innovation and knowledge exchange that help industries develop. Mixed-use programs on campus also provide various activities for the participation of the public, enhancing both student and

community life. While in the past, universities alienated students from the outside world, today they play a large role in engaging communities, industries, and academics.

The success of the city does not simply rely on the new university establishment or serving the academic community, but is also dependent on developing other programs outside of academia. The design proposal draws attention to developing institutional relationships, but in reality the project will likely expand beyond the walls of the institution. The university is part of a larger ecosystem; commercial spaces, residences, and streetscapes also need to be considered for the sustainability of the enterprise. The development of student-oriented retail spaces at grade, including coffee shops and bookstores, the presence of residential buildings to house faculty and families, the proximity of businesses that target the student population; these possibilities can change the course of development for downtown Calgary.

The proposition is intended to be an introduction to a larger discussion about downtown Calgary's future. The question about safety, control, and accessibility will inevitably become part of the discussion to challenge the current ownership of the quasi-public system. While many unanswered questions remain, the participation from multiple stakeholders is a critical and necessary part of the process in order for the urban campus to be built. The proposed tactics challenge the way in which urban spaces operate today and envisions a new kind of public realm that addresses issues about Calgary's economy and local identity.

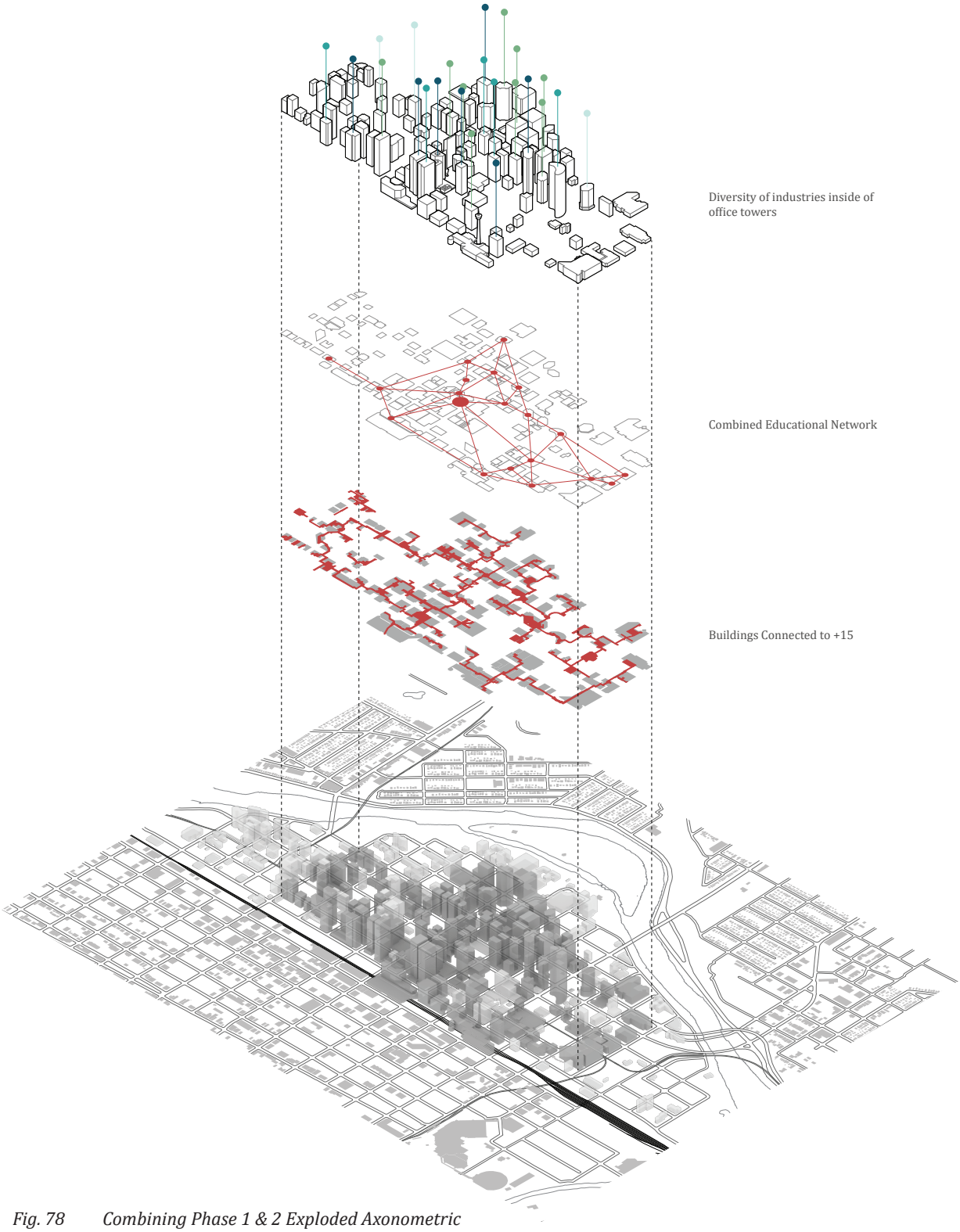


Fig. 78 Combining Phase 1 & 2 Exploded Axonometric

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