



A Holistic Reading of the Streetscape and Building Articulation: The Case of the Canadian City of Halifax

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Abstract

The Streetscape provide a conceptual framework for guiding sustainable urban space improvements. Building forms form refers to architecture that is the height of buildings, the articulation of their form, and the quality of their materials and construction. Building form is also primarily concerned with the character, shape, scale, and design of buildings. While the study provides a holistic view of the streets of Halifax city, it includes the evaluation of the articulation created by the coming together of the buildings and the physical and perceptual components affecting the public interfaces examined on the examples. For this purpose, the study is examined under two headings as the streetscape and building articulation. As part of the holistic evaluation of the buildings in the study, the use of materials, entrances, roof ends of the buildings, signs and wall-paintings on the buildings, awnings and canopies on the facades of the buildings is examined. As part of the holistic evaluation of the streets, design of building-street interface, building orientation and settlement, type of building uses, pedestrian walkways are examined. At the end of the study showed that design principles and harmony with each other of the buildings that determine the street boundaries guides the shaping of the city.

1. INTRODUCTION

Gordon Cullen, (1961) in his work Townscape noted that a single building can be experienced as an architectural work, and a group of buildings can be experienced as an art form different from pure architecture [1]. This situation in urban space occur that needs relationships with streets and open spaces between buildings with differing scales and intensities. Within the urban structure, this art constructs occupancy, voids, and a network providing communication between them that named interface [2]. An interface's identity is formed by the walls and buildings coming together in the city [3]. The concept of interface as a part of urban space is the transition zone between subjective and public space [4]. According to Broeckmann (2004), an interface defines an area in which two different elements in a network interact. The interface bordering the urban space is not only the primary surface in the building's contact with the city, but also an important element in its interaction with the city dweller [5,6]. The interface, which is an element of intersection between the building interior and the urban exterior, has both a separating and connecting role for these two spaces [7]. The presence of public space's uses and activities at the interface creates an area of attraction in the pedestrian space, supporting the pedestrian movement and flow. Hosting activities that support social interaction on the interface creates an active social life environment for pedestrians using the space [8]. For Lynch (1960), urban component edges play a critical role in the way that urban environments can be imageable and visually identifiable [9]. Boundaries have the capacity to control the relations between the two domains of potential strangers and inhabitant [10]. Therefore, urban interface has been one of the critical concerns in architecture, urban design, and planning [11].

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Pekmezci Yolal (2019), in the scope of Ankara Dumlupınar Boulevard (Eskişehir Road) and its name is *An Evaluation on Urban/Public Interfaces* showed that the separations, detachments and urban interface gaps on the Boulevard, which were caused by globalization were identified [12].

According to Bala and Alar (2003), the urban interface features in the Konya province urban environment were examined and defined the components that should be in a qualified interface within the scope of the literature [13].

Kökner (2001), while designing the occupancy in the city in her work that she carried out in Beyoğlu, she was pointed to the potentials of voids and their interaction with people [14].

In the study of Ünlü (2006), while criticizing the strict approaches to the creation of urban space, which are implemented only with zoning plans in Turkey, he focused on various design guidelines used in the management of change in urban space in Western Europe and the USA. The experiences in the reviewed guides and the urban environment creation practice for Turkey were evaluated together [15].

Contrary to the importance of the issue mentioned in the literature, each of the buildings built in the boundaries of the parcel in Türkiye can be considered as a surprise design. It is not enough to design only one building or just open areas in urban spaces to qualify as architecture, urban design, and urban planning. It is necessary to design the building in relation to other buildings together with its environment.

In this study, which was carried out in the city of Halifax, Canada, various design guides produced by focusing on different problems within the context of the urban environment were examined. The experience of creating urban space has been evaluated at the street and building scale, and it has been explained through on-site investigations and examples. Scope of the study evaluated the role of architecture in the formation of urban interfaces as a space where human-city interactions take place. In this study, the building-urban space interface features are gathered under two headings as *building-street interaction* and *interaction of buildings*. The study examines that the articulation of the public space interface to the urban texture in the Halifax city, Canada.

The scope of the study, the physical and perceptual components affecting the public interfaces were examined on the samples. In conclusion, it is important to draw attention to the significance of the concept of interface in building-urban space relationship on the creation of urban environments.

The output of the study will also set sample for the design of interface space, which is not owned by the urban environment like Türkiye. In addition, it is thought that the urban environmental experiences created and supervised by these guides will be a guide for Turkish cities.

2. MATERIAL and METHOD

The city of Halifax/Canada, which is the research area, was examined. The sample areas are selected based on that the buildings served different purposes in the city. Halifax is a historic port city with Georgian architecture and a block structure dating back to 1749. A series of viewplanes were established in the 1970's in order to protect the views of the city, its harbour, and harbour islands from the Citadel, the highest point in the city [16].

The downtown area of Halifax is divided into nine the regional center-designations, each with their own character, functional identity, and architectural style (Figure 1).

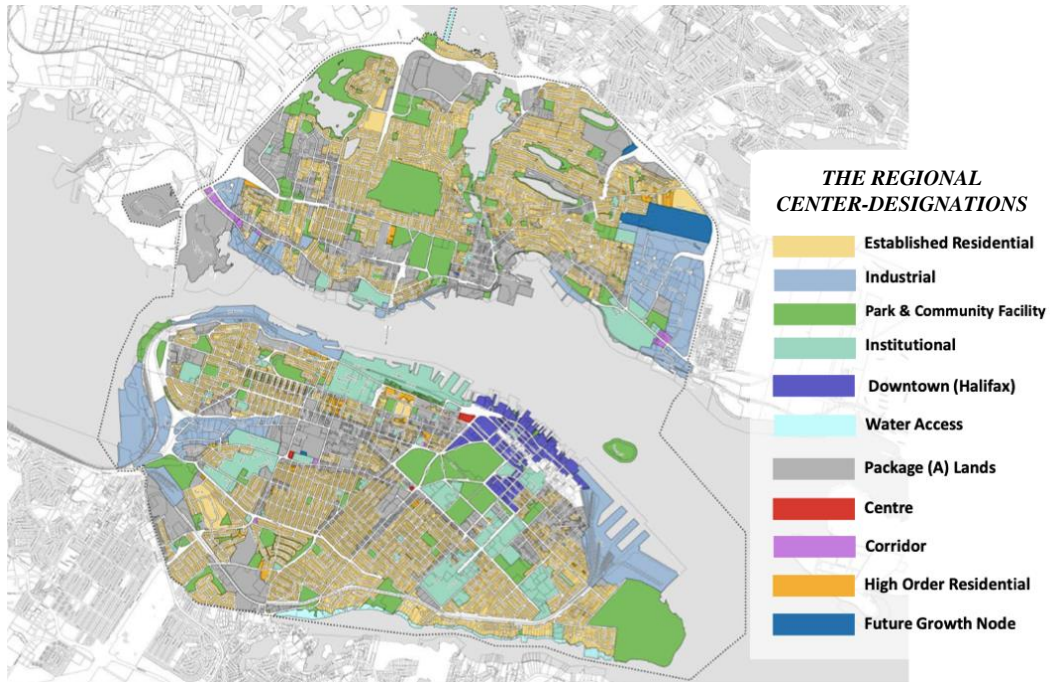


Figure 1. Halifax City Plan [17]

The neighbour-based design approach provides to maintaining context-specific detail required to treat heritage resources appropriately, prescribe maximum building envelopes for new developments, and maintain a vibrant public realm.

In order to document the interfaces in the research area, observation and photographing methods were used. In the research area, visuals were used to illustrate places where buildings interact with the street. The flow chart of the study is given in Figure 2.

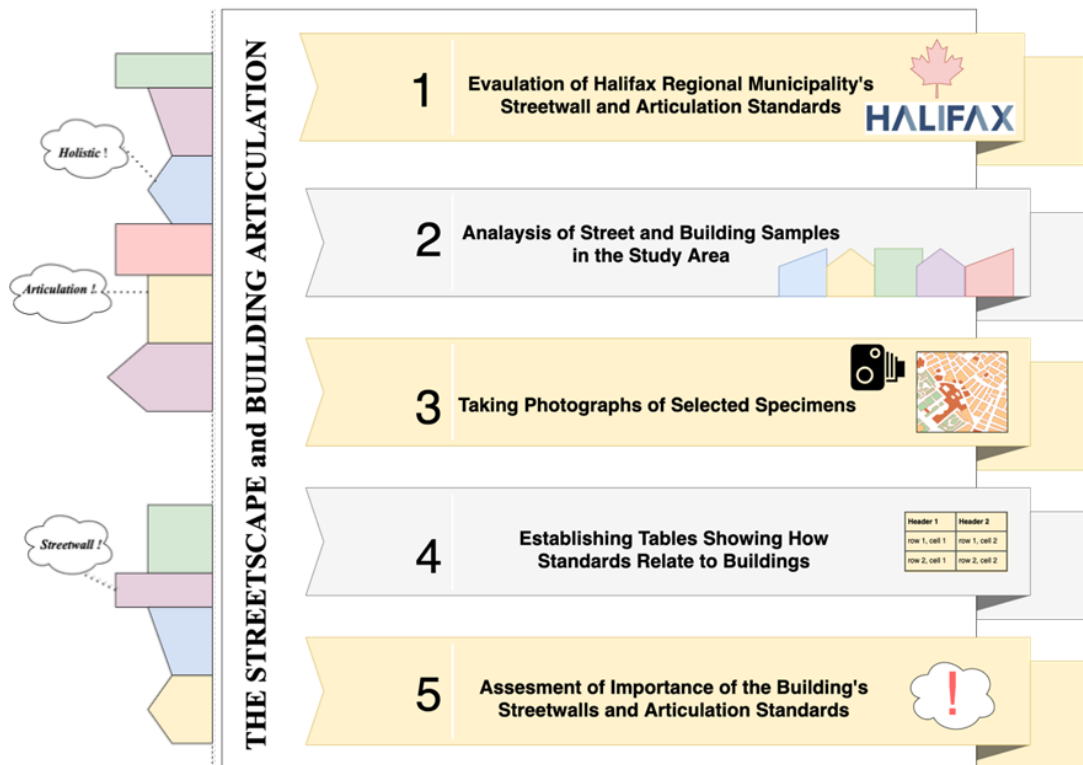


Figure 2. Flow Chart of the Study

3. COMPONENTS OF THE INTERFACE CONCEPT AND IT'S STATUS IN THE WORKING AREA

The urban environment has a significant impact on how we live, work, and travel. Thus, urban design should be designed and shaped the physical features of cities in a way that supports a sense of place, social and cultural contexts, environmental sustainability, and economic growth [18].

There are four horizontal components of the interface in urban design. The relative positioning of the structures, the compositions of the building masses, the ground plane forming the boundary line, and the outdoor spaces containing the volume between them. On the other hands, the vertical components are composed of the facades of the buildings that limit the external spaces and the views entering the vertical sections [19]. Creating a qualified interface requires architectural details such as divisions, recesses, proportions of the building units in the vertical component, elevations and descents of the building walls, changes in elevations, use of eaves, columns, and arcades that decrease the scale to pedestrian scale [20]. For this reason, the study is examined under two headings: streetscape and building articulation.

3.1. Buildings' Interaction (Building articulation)

As the city of Halifax develops along the Atlantic Ocean coastline, basement use as parking structure use, underground parking, amenity space, storage space is not permitted below approximately 3,2 meters [21]. In most cases, basements cannot be used. In these areas, pedestrianization is emphasized. It is seen that architectural designs that go down to the ocean water level or bridges that can be walked over the ocean for the city-dweller of the city to relate to the water. Viewing terraces is also designed to watch the ocean in coastal area (Figure 3).

The city's relationship with ocean



Figure 3. Coastal Area Elevation and A Sample of Study Area
Graphic:[21], Photo by Author,2022

Building facades or any area that enters pedestrian's viewpoint are among the basic design principles. Thus, it is important to design the part of the side façade of the buildings that are visible from the main street. If the side facade is not design in the streets of the city, it is desired to draw attention to this area by special painting by the artists (Figure 4).

Design standards for grade-related units in residential uses



Figure 4. Design Standards for Grade-Related Units in Residential Uses and Side Yard Façade Articulation, Graphic:[21], Photo by Author, 2022

There are clearly defined street walls with distinct, narrow sections that reflect the character of the neighborhood and reflect the fine-grained fabric of the lot [22]. Human-scaled elements are architectural details that reflect the scale of people, such as materials, colours, doors, windows, projections, recesses, and other architectural details (Figure 5).

Walls longer than 21.5 meters must be modulated through the use of rules such as the articulation of the building mass, significant step backs from the water's edge or boardwalk's edge, and the interruption of the building wall with public space [17].

Articulation principle of building façade

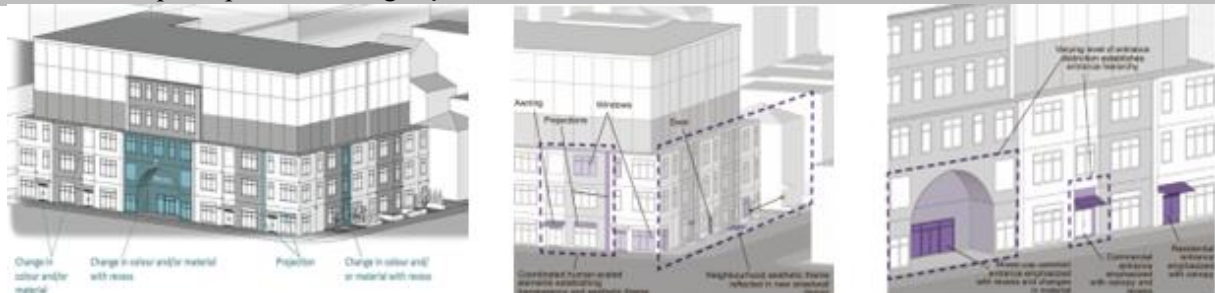
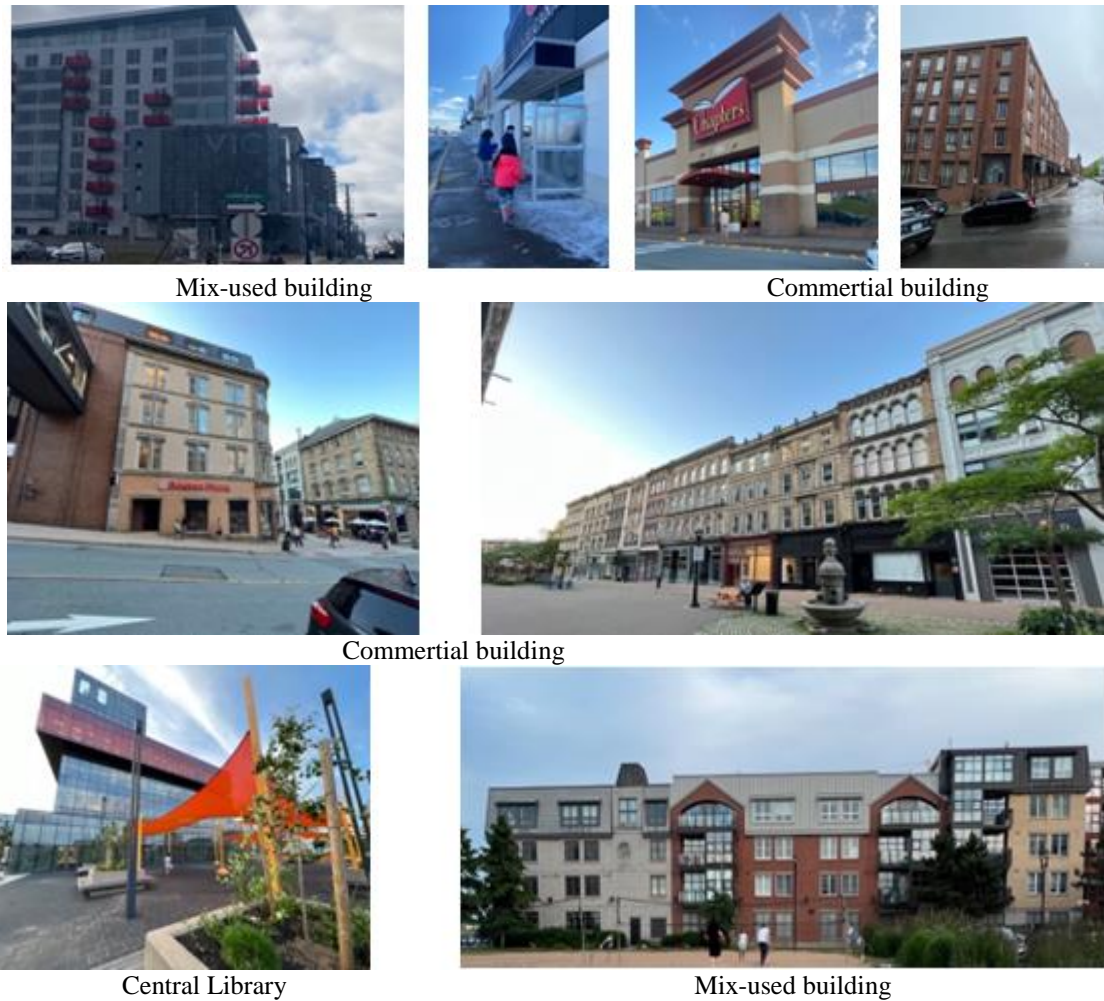


Figure 5. Streetwall Articulation, Graphic: [21,22]

It is important to design streetwalls with frequent and clearly distinguished entrances. Awnings and canopies are provided along pedestrian-oriented commercial frontages to protect pedestrians from adverse weather conditions. In addition to this application, a ground floor that is pulled back protects pedestrians from adverse weather conditions when there are only a few entrances with a single purpose in a building (Figure 6).



Mix-used building

Commercial building

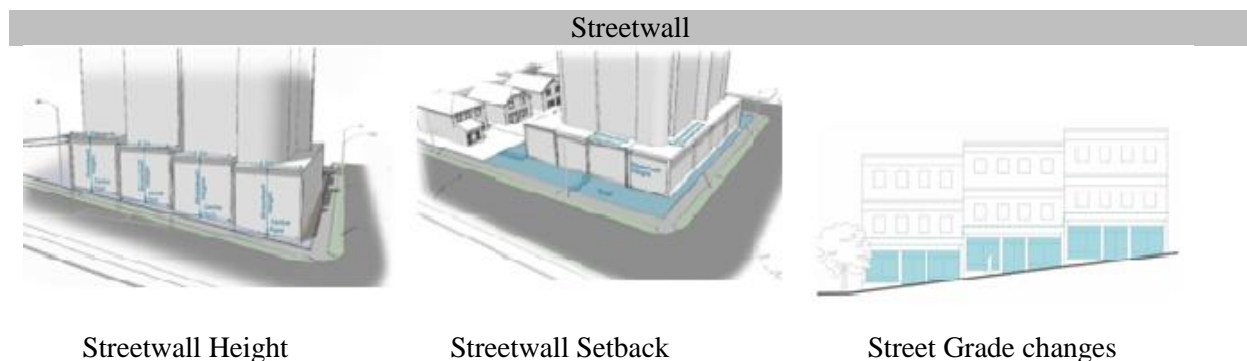
Commercial building

Central Library

Mix-used building

Figure 6. Sample of Streetwalls Design, Photos by Author, 2021/2022

All new buildings should employ effectively interact with these sloping street conditions. A flexible streetwall height is used in order to transition from façades at lower elevations to façades at higher elevations on intersecting streets. At-grade active uses seen that is maintained, in relation to the sidewalk, stepping with the slope.



Streetwall Height

Streetwall Setback

Street Grade changes

Figure 7. Streetwall Height/Setback, Grade Changes of Streetwall and a Sample of Study Area Graphic:[21]

The midpoint of each segment of the streetwall greater than 8.0 metres wide, or a part thereof, is assigned a streeting grade [21]. At-grade setbacks and upper-storey stepbacks have been used to maintain a positive pedestrian experience at street level as well as to reduce the impact of wind and shadow on the street. Stepped floor plates respond to grade changes. Streetwall heights can be adjusted to accommodate sloping conditions in building forms (Figure 7).

On the first-floor elevation of the streetwall, a minimum of 75% of the glazing must be non-reflective and non-tinted [17] (Figure 8). A streetwall emphasizes that pedestrian-oriented retail shops and services will frame open spaces.

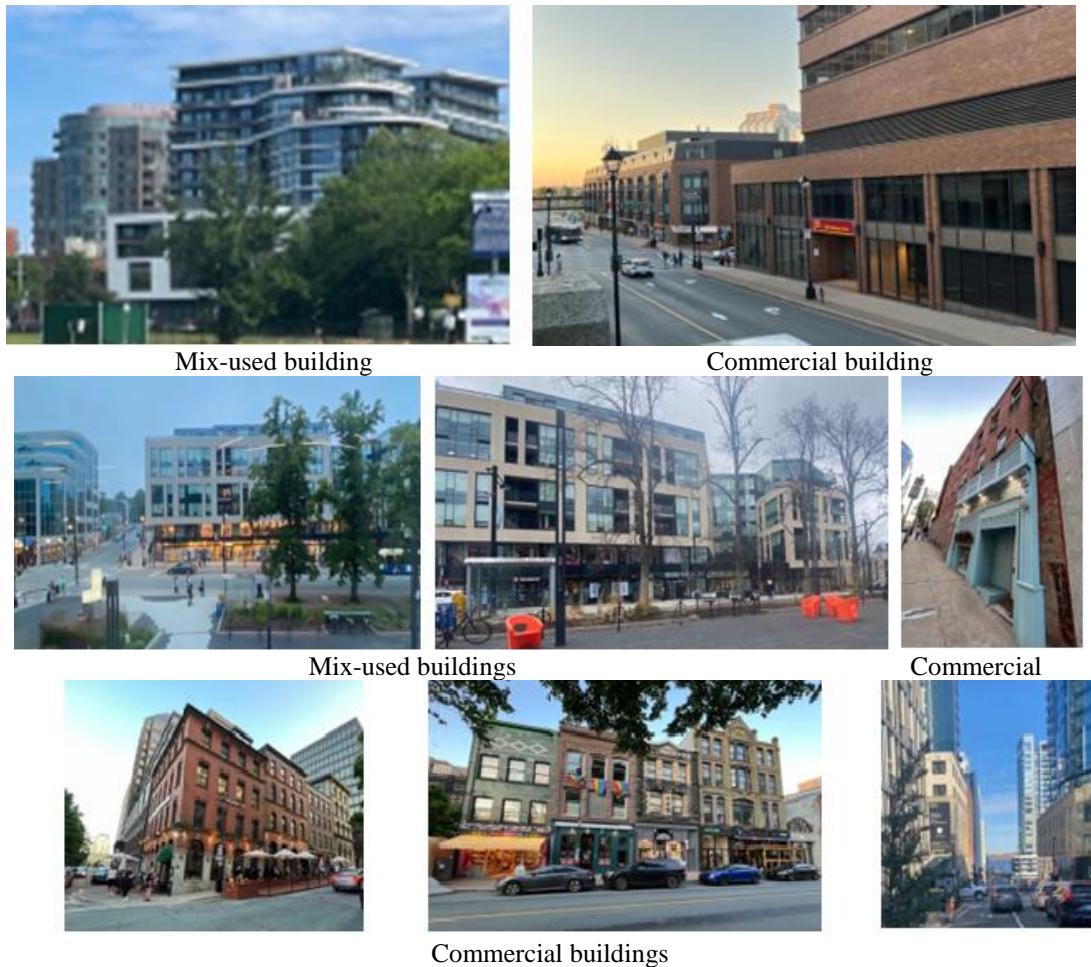


Figure 8. *Pedestrian-Oriented Retail Shops and Services on Streetwall*
Photos by Author, 2022)

Besides street walls in Halifax, murals have been transformed into icons by artists are also considered important. In this reason, The Halifax Mural Festival is organized community-based art event, producing murals on Quinpool Road and the Halifax Waterfront in July in ever year. Over the course of a week, well-established and local artists is brought color to iconic public spaces. The goal is to activate, beautify Halifax's wall and draw attention the wall. The event was held between 11-17 on July in 2022. Wall pictures of this event are included in the Figure 9.

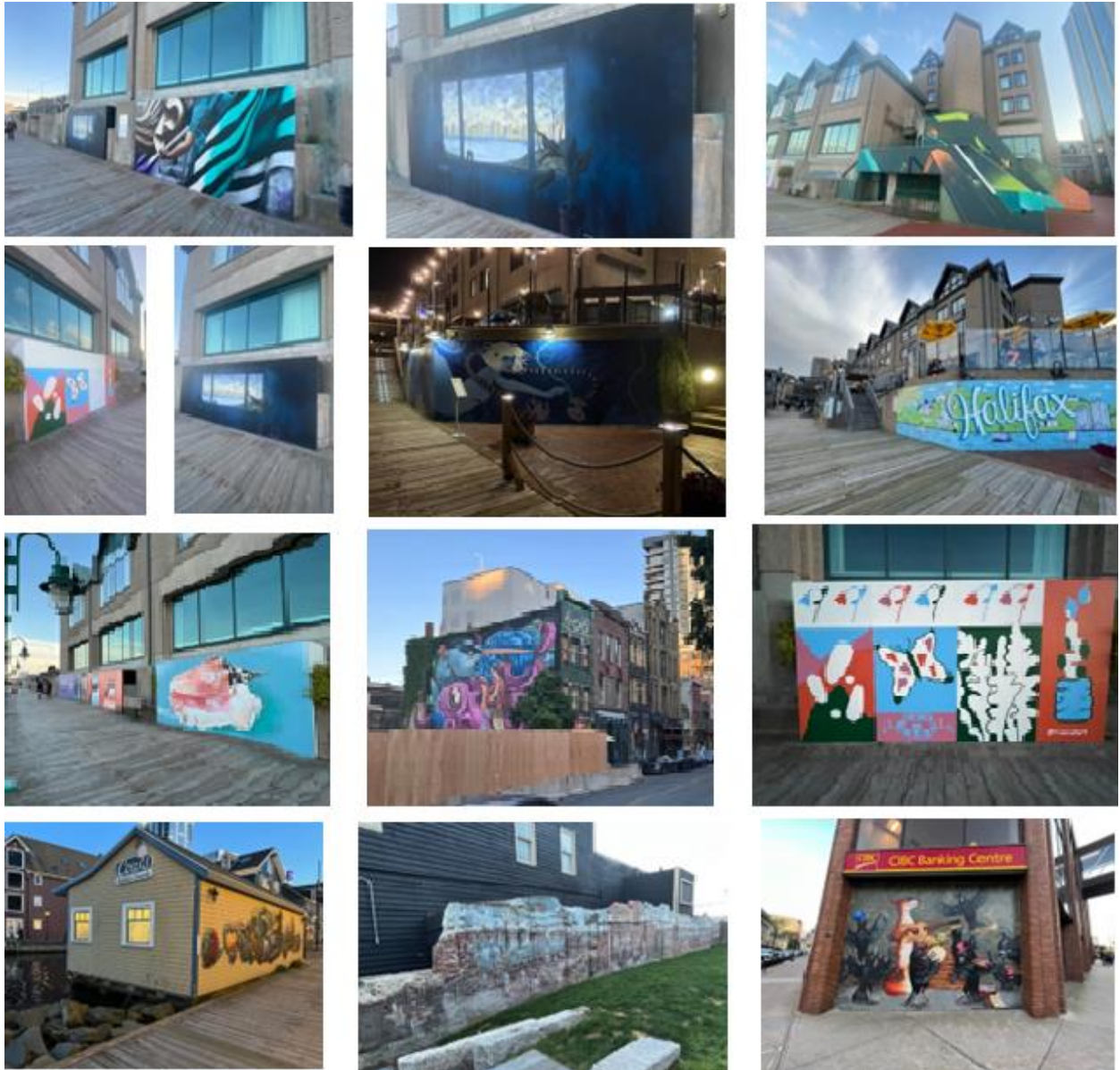


Figure 9. Mural art in Halifax (Mural's Photo by Author, 2022)

Tops of buildings can have a significant impact on the character of a neighbourhood and the urban design. Applied studies have shown the significance of existing building forms, heights, and rooflines in defining the historic character of a district, as well as the impact of regulations governing maximum heights and setbacks of permitted additions (Figure 10). Incomplete building tops should be designed specifically because of top tend to have less impact on the pedestrian realm than the streetwall [22].

It has been observed that building top features are used strategically to enhance the appearance of a building and screen unsightly rooftop mechanical equipment. In addition, differentiating the top of a building with strategies such as color, material, fenestration, pitch, projections and recesses, and parapets and cornices is observed.

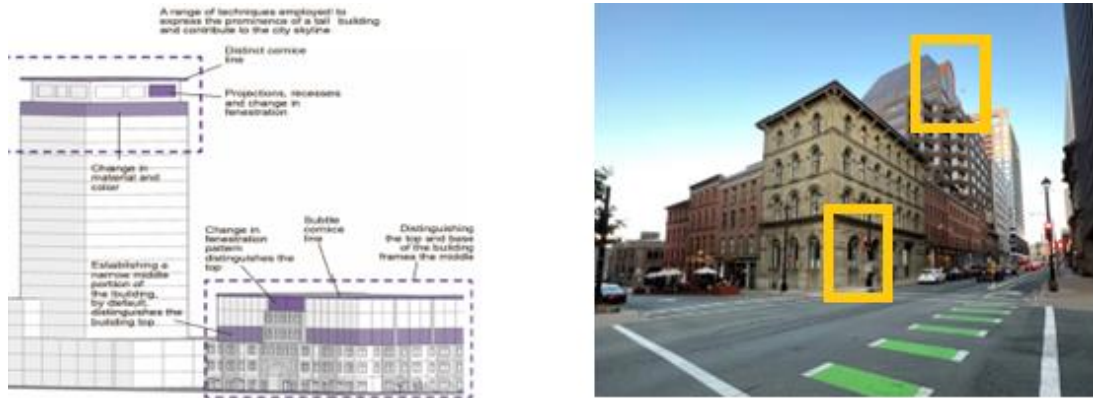


Figure 10. Building Top Distinction/Roof Line/Roofscape and A Sample of Study Area
Graphic:[22]; Photo by Author, 2022

According to the new downtown plan, all roofs with a pitch of 1:12 or less will have mandatory green roofs as different as old one. It is seen that the window ratio or facade material of the low building is used in the roof ends of the tall building (Figure 11).



Waterfront mixed-use building



Halifax central library roof



Residential Building

Figure 11. Samples of building top (Photo by Author, 2022)

In terminus design protection of the Citadel view planes and rampart views is important. In addition to these streetview there are other important visual terminus sites that are architectural elements of heritage site (Figure 12).

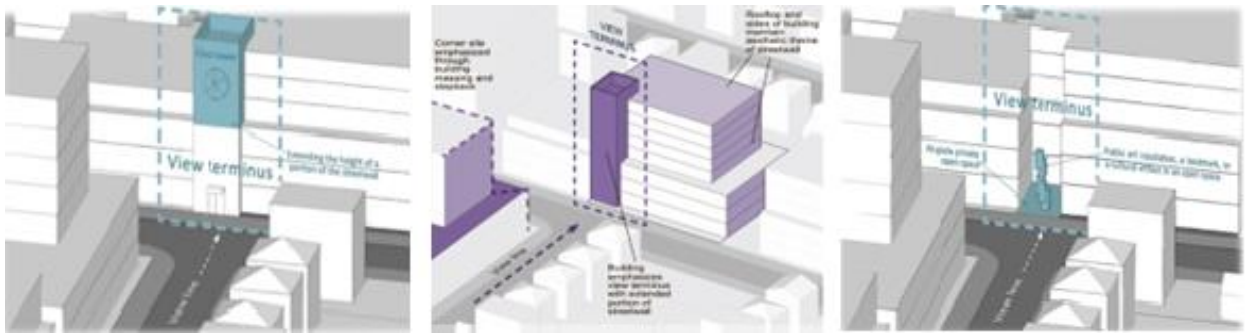


Figure 12. View Terminus Site Articulation and A Sample of Study Area, Graphic:[21]

It is shown in the photo that view terminus is located in the centre of symmetry of the historical building located in a square. The other photo shows that view terminus is located in the junction on the street (Figure 13).



Figure 13. View Terminus of Building (Photo by Author, 2022)

The articulation of a building is detail that give human scale with architectural elements. The study show that it is important that buildings are designed to encourage continuity of the streetscape and to ensure vertical and horizontal breaks in the façade, through the use of setbacks, extrusions, textures, materials, and detailing, among other things.

It is important that the base stage cover within the first four storeys, contribute positively to the quality of the pedestrian environment, transparency, articulation, and the quality of the materials used. Middle stage covers the building's structure above the base should contribute to the physical and visual quality of the streetscape as a whole. Roofing top should contribute to the visual appeal of a skyline by standing out from the remainder of the building [17]. This application in the city samples is included in the Figure 14.

While building façade is design as dividing three parts as well as contributing to a mix and variety of high-quality architecture, buildings should respect the context and tradition of downtown. Attention to detail is what gives a building a human scale and a sense of quality. Building articulation occur that a three-dimensional façade, where windows and other architectural elements have the use of solids and voids. The articulation of the Halifax buildings provides a sense of transition between floors and interior spaces, giving the façade a sense of scale. It is seen that the buildings contribute to the mix and variety of high-quality architecture while remaining respectful of downtown's context and tradition. A façade that faces the street has the highest level of design quality, while a façade that faces the side or rear also has a consistent design expression. Building materials define buildings character and quality, as well as its relationship to its environment. This definition creates integrity in buildings. In order to achieve an unified building image, it is not to use too many kinds of building materials in the front façade.

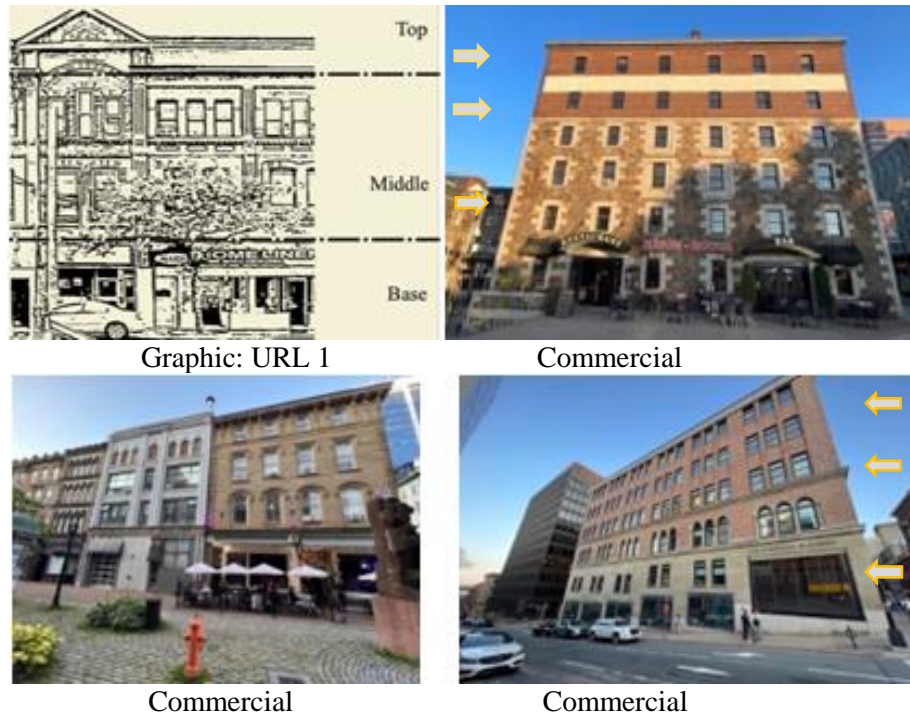


Figure 14. Articulation in Building Envelope (Photos by Author, 2022)

Stucco and stucco-like finishes shall not be used as a principle exterior wall material. Among the prohibited materials are vinyl siding, plastic, plywood, concrete blocks, exterior insulation and finish systems (EIFS), and metal siding utilizing exposed fasteners. The use of darkly tinted or mirrored glass in windows and doors is prohibited. It is preferable to have clear glass over light tinted glass. Wood that is left unpainted or unstained, including pressure-treated wood, is prohibited for permanent decks, balconies, patios, porches, railings, and other similar architectural embellishments except for seasonal sidewalk cafes [23]. It has been observed that there are dark color applications especially in the use of glass in buildings constructed before 2010.

The cornice line of any abutting registered heritage building shall be stepped back from the streetwall of any new development in a heritage context. When a detached building is a new development in a heritage context and is adjacent to a heritage building, any sections that are higher than the cornice line of the heritage building must be stepped back a minimum of 3.0 metres from the heritage building for a depth of 12.0 metres. This rule shows in Figure 15 [21]. Sample of this rules was shown that in Figure 16.

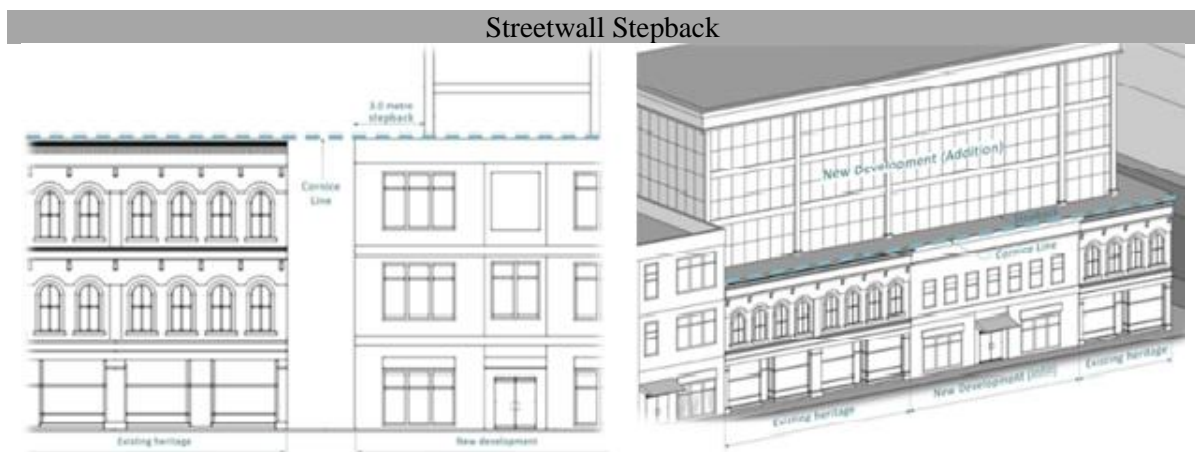
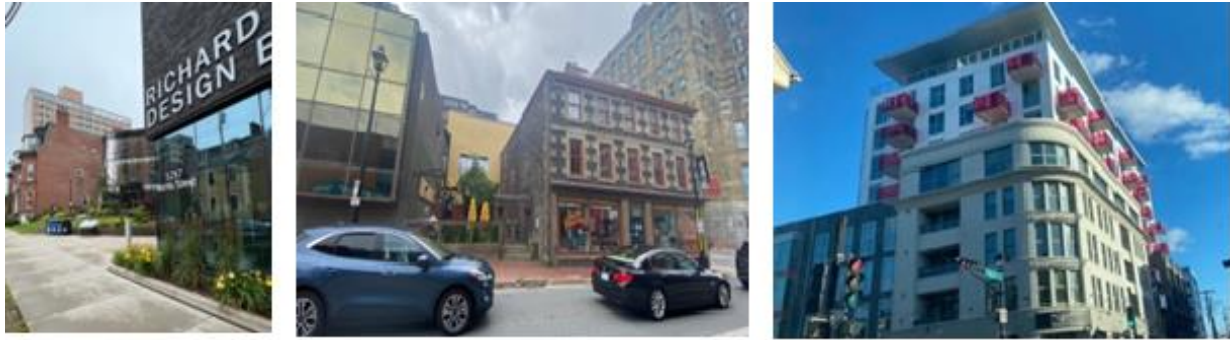


Figure 15. Heritage-Friendly Streetwall Stepbacks for Taller Portions of New Developments and A Sample of Study Area, Graphic:[21]



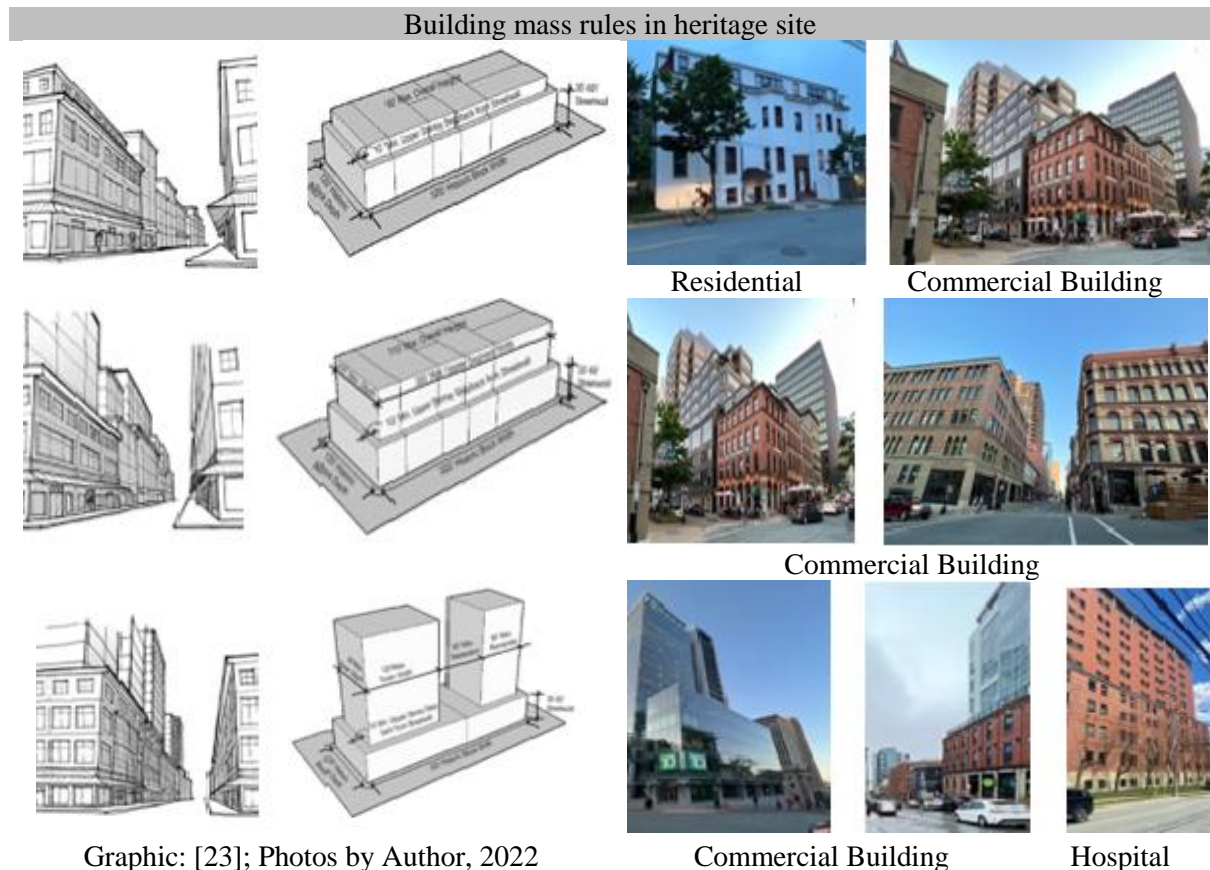
Educational Building

Commercial Building

Mix-used New Building

Figure 16. Combination of New and Old Building in Heritage Site (Photos by Author, 2022)

It is the height, the form, and the quality of materials and construction of buildings that make up built form. Building height, massing and character - provides occur of the unique qualities of the city that make up the different streetscapes and precincts. Although heritage and streetwall conditions are consistently applied to all building envelopes (low-mid-high-rise façade), the massing standards will differ among them. Increasing the height of buildings has different effects on the public realm, which requires corresponding controls on massing, floor plate size, and separation distances to mitigate. Figure 17 includes these regulations. Built-form rules target to provide comfortable, human-scaled streetscapes that maximize sunlight penetration and the view of the sky.



Graphic: [23]; Photos by Author, 2022

Figure 17. In Heritage Areas, Built Form Massing Rules Apply

3.2. Building-Street Interaction (Streetscape)

The streetscape includes elements that define the street’s appearance and scenery (overall appearance of the street), identity, and functionality, including adjacent buildings and land uses, street furniture, landscaping, trees, sidewalks, and pavement treatments, among others. Each street looking from the

waterfront towards the citadel has a different beauty street view. These parallel streets see both the ocean and the castle due to the fact that they were designed with pedestrians in mind by utilizing the slope and orientation.

The viewplanes were established in order to protect the views of the city, its harbour and islands from the Citadel, the highest point in the city. Today, this historical area is used as a museum. This castle hill provides a holistic viewpoint of the city (Figure 18).



Figure 18. Viewing Positions to the Ocean in the Halifax Citadel (Photos by Author, 2022)

Any outdoor solid waste management area, except where associated with a low-density dwelling, must be fully enclosed by an opaque wood fence or masonry wall that must be at least 1.8 metres high, except for an opening or gate that is required for access [21]. It was shown that in Figure 19.



Figure 19. Screening for Solid Waste Management Areas and A Sample of Study Area, Graphic:[21], Photos by Author, 2022

As part of the new downtown plan, surface parking lots are limited to 20 cars and must be invisible from the street. The plan permits limited surface plan and encourage appropriately designed parking structures [23]. As a result, pedestrians can be experiencing a gap-less pedestrian experience.

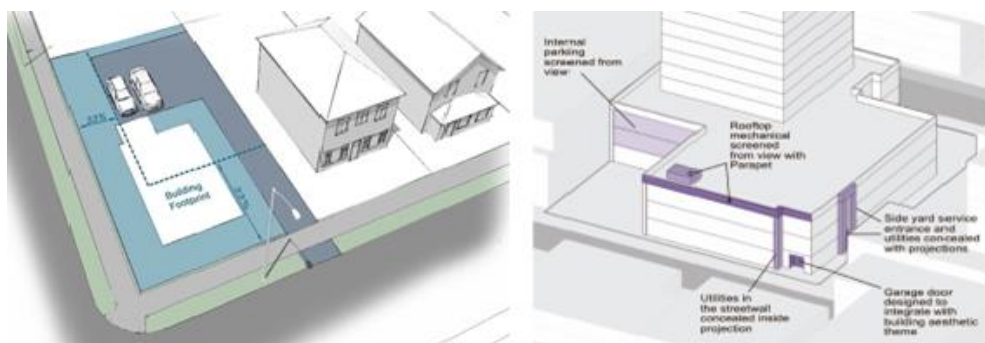


Figure 20. Surface Parking Lots/Building Utilities, Services and Parking and A Sample of Study Area Graphic: [21,22]

Commercial parking garages require a streetwall. The streetwall height must not exceed 11 metres where the building height exceeds the required streetwall height. In the case of buildings that are less than 11 metres in height, the streetwall height shall correspond to the full height of the building. Streetwalls greater than 15 metres in width measured parallel to the street line shall have the appearance of two or more buildings by altering the appearance of the facade or roof in increments of 6 metres to 12 metres [23]. Some examples are given in the Figure 21.



Residential

Mix-used Building

Commercial

Residential

Library

Figure 21. Samples of Parking Rule, Photos by Author, 2022

It is not permitted for parking lots to be located within the first 33% of the depth or width of the lot abutting any streetline, unless the lot is located within an internal courtyard [21]. Access to service vehicles is provided by an access void integrated into the façade of the building (Figure 21).

Whenever possible, parking areas are resolved under the building because the parking areas affect and change the streetwall a lot. The open parking areas created on the ground create very large undefined openings areas (Figure 22). Additionally, surface parking lots are not able to provide protection against especially cold weather conditions.



Downtown/University Parking

Commercial Parking

Mix-Used Parking

Figure 22. Large or Small Undefined Openings Areas Reserved for Vehicle, Photos by Author, 2022

The use of surface parking lots should decrease or is prohibited in some areas because creates an undefined area in the city. In this reason new city plan present that the size of surface parking lots is limited to 20 cars, and they must be invisible from the street, thus ensuring a pedestrian-friendly environment.

There are two types of bicycle parking. One of them protects it from inclement weather. The other type permits the locking of a bicycle by the frame and the front wheel in open space (Figure 23). The minimum and maximum number of required bicycle parking spaces are variable by facilities type. Bicycle parking don't require for single, two-three-unit dwellings, town houses, self-storage facilities, car washes, cemeteries, and funeral homes [23].



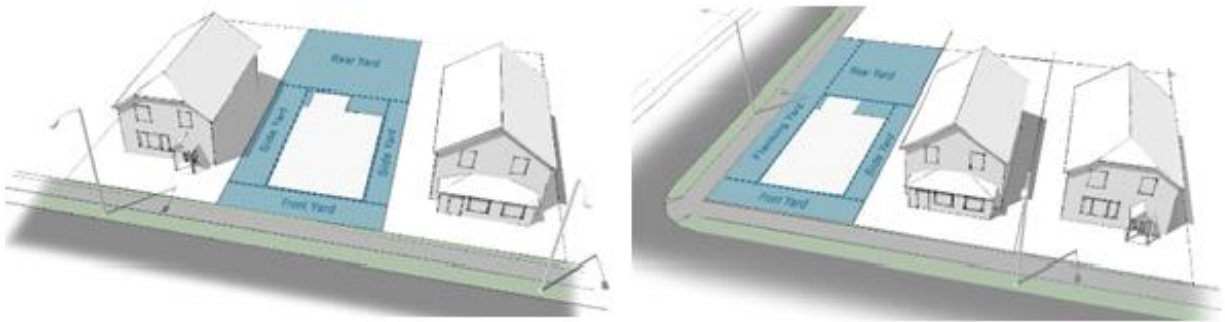
Bicycle Parking Graphic

Discovery Center

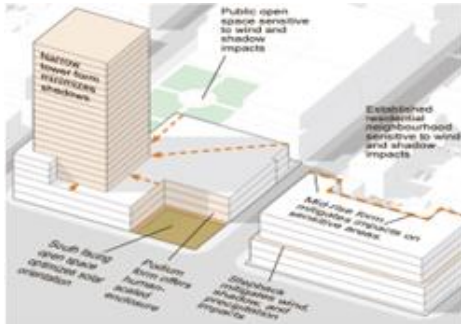
University Building

Figure 23. Bicycle Parking and A Sample of Study Area, Graphic:[21], Photos by Author, 2022

The setback refers to the distance between the lot line and the nearest building wall. In a lot, a side yard extends from the front yard to the rear yard between the side lot line and the nearest building wall. The streetwall setback refers to the distance between the front face of the building and the street line. Commercial and retail streets are framed by uniformly placed buildings at the sidewalk with no setback, while residential and institutional areas are framed by buildings that vary in their setback. More detail streetwall setbacks rules are accessed in the *Design Manual* section of the Land Use By-law [24].

**Figure 24.** Setback of Front Yard, Flanking Yard, Side Yard, and Rear Yard and A Sample of Study Area, Graphic: [21]**Figure 25.** Samples of Setback of Front Yard, Photos by Author, 2021/2022

There are observed three types of setback standards for streetwall placement to reinforce existing and desired streetscape and land use characteristics in the Halifax streets. One of them is used at street that located on traditional local retail shops in old town. Since the building heights are low in these streets, the setback is either not used at all or is applied at the range of 1-1.5 meter. The other practice is used residential-use building that although setback is not consistent in residential-use buildings, there is consistency in the streetwall height at the pedestrian scale. It has been observed that the setback of these buildings increases up to 4 meters. The other practice is observed that buildings located in front of urban park, square, public amenity etc. is setback more 4 meters.



Graphic: Url-2



Commercial



Hospital



Residential

Figure 26. Upper Storey Stepback from Streetwall-Optimize Pedestrian Comfort and A Sample of Study Area (Photos by Author, 2022)

Streetwall character refers primarily to how buildings interact with the sidewalk and the quality of the enclosure they provide to the street. It determines the streetscape's character and nature, as well as reinforces pedestrian or public realm objectives, depending on its placement, scale, and design quality. Thus, this study provides guidance on streetwall height and setbacks.

The photos illustrate a mixed-use street example, building entrances, and the use of awnings (Figure 27). The use of awnings, canopies, and columns allows the building's entrance to be pulled in, protecting the user from snow/ice and wind which falls from the roof. Adding existing awnings, canopies, and passages along the street can create an attractive effect on pedestrians through the use of colors and materials.



Graphic:[21]



Mix-used



Mix-used



Museum



Commercial



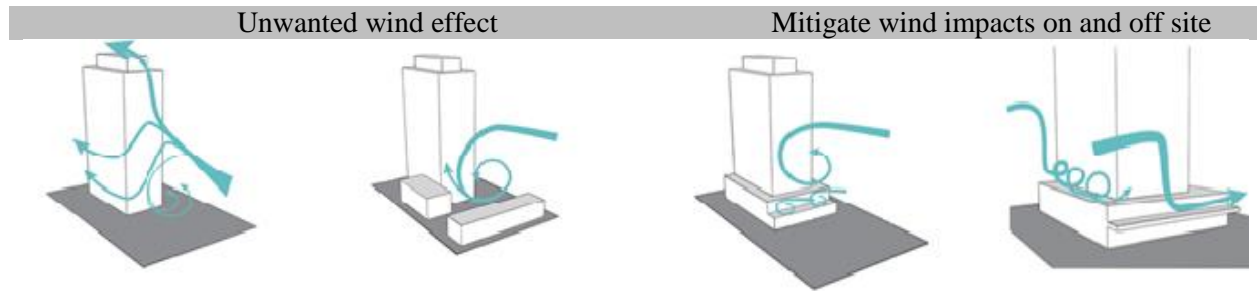
Commercial

Figure 27. First-Floor Elevation of the Streetwall, and A Sample of Study Area, Photos by Author, 2022

The use of evergreen trees on the northern façades provides wind protection for the building and pedestrians, while the use of deciduous trees on the southern façades allows the sun's rays to enter the

building. According to Figure 28, a tree that has been knocked over by the destructive effect of the wind poses a danger to pedestrians. In this case, a deciduous tree should have been used. The tree fell as a result of the wind direction situation was shown in the second graph.

As a result of creating a high-sloping side road on the north and northwest side of the buildings and shielding them with evergreen plants, the design will be strengthened by reducing the speed of cold winter winds and the negative effects of snow breezes [25].



Graphic: [22]



Residential



Mix-Used building



Commercial



Mix-Used Building

Figure 28. Optimize Pedestrian Comfort and A Sample of Study Area, Photos by Author, 2021/2022

In order to control and reduce wind speeds at street level, it is necessary to apply the most appropriate building orientation and to determine the mass that will shape the form accordingly. The application of staggered (doubled) catwalks at the base of an elongated structure is a strategy that can be used to disperse and reduce the downwind velocity. Table 20 shows the applications used to direct, control and reduce the wind flow created for the building mass and form and its surroundings.



Streetwall



View Termini



Commercial Street



View of Citadel Clock Tower



Mix-used Steet

Figure 29. Streetwall/View Termini and A Sample of Study Area

Graphic: [23], Photos by Author, 2002

As part of streetscape, the streetwall provides a vertical rhythm that is consistent with the narrowness of the buildings and storefronts on the street. The height of streetwalls is consistent with the height of heritage buildings. There is no mechanical utility permitted along pedestrian frontages. It is observed that streetwall heights is proportional to the width of the right of way and also used generally 1:1 ratio between streetwall height and right of way width. The height of street walls varies according to the width of the street.

Accordingly, maximum streetwall heights are varying widths of streets that are generally 15.5m, 17m, 18.5m or 21.5 [23]. Since the streetwall is related to the street width in a ratio of 1:1, this situation occurs the obligation of building façade setback in newly constructed high-rise buildings.

4. CONCLUSION

The study has shown that instead of focusing on a single building design in urban spaces, it is necessary to focus on designing the building and its environment together. It shows result of the study guided by the vision and important of the streetscape that the integration of streetscape vision refers constructability constraints and applies on multiple layers of the historic site and new building.

It was seen at the end of this study that in Halifax, the built environment is created not only in accordance with the city plans, but also with the urban form and urban settlement decisions, and the design guides that incorporate qualitative principles and criteria.

In Türkiye, the city is divided into parcels with urban master plans and implementation plans. While the buildings built in this parcel that form the urban interface, the resulting product creates variability, discontinuity, and incompatibility. Thus, interfaces should be considered a joint and compulsory design area within architecture, city planning, and regional planning disciplines. In spite of the fact that Halifax streets are to be shared among pedestrians, cyclists, and motorists, it is seen that the plan and streetscape places an unmistakable priority on pedestrian and active transportation.

On the other hand, there are still some streetwall inconsistencies between new build and old one as a result of a complete replacement of the 60-year-old *Land Use by Law* and the 35-year-old *Municipal Zoning Plan*. It is seen that the *Halifax Land Use By-law* covers downtown precincts, land use, building envelopes and streetwalls, development, and design review. Depending on the districts of the city vary the requirements in this regulation.

For each city and city zone in Türkiye, the *Land Use By-Law* should be reorganized by streetwall articulation design principles that include defining the building height for the street view terminus, building form, and design standards for grade-related buildings, top distinctions, design of roof lines and roofscapes, heritage-friendly streetwall design, solid waste area designs on the streetwall, design standard and limit of surface parking lots, pedestrian comfort design principles, and the first-floor elevation of a building. As a result, streetscapes should be treated as our greatest source of public space and designed with city plan together. In this holistic perspective should be connection with certain principles as design guidelines to support the city plan.

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