Typological Design Language of Urban Public Space : An Analysis of Pedestrian-oriented Piazzas in Rome

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ABSTRACT : This study examines three piazzas in Rome that are pedestrian-friendly public spaces in an urban setting. The goal is to find the typological characteristics and design elements that successfully contribute to the quality of pedestrianized public environment. The piazzas of Spagna, Rotonda, Navona are comparatively analyzed to examine a set of typological features for two pedestrian design frameworks: ① horizontal 'Open Space' for pedestrian movement and activity; ② vertical 'Building Façade' for architectural design intervention. The study identifies that Node, Core and Flow of 'Pedestrian Open Space' critically influence the visual structure and spatial configuration of buildings, blocks, and streets as well as pedestrian movement within and beyond the piazza areas. In addition, Massing, Frontage and Terminus of 'Pedestrian Building Façade' are positively related to the physical quality of the built contexts that facilitate the spatial occurrence of outdoor activities. The findings suggest this typological framework be effectively adaptable to possible design application and design review that help enhance the timeless quality of urban public space.
Key Words : Public Space, Pedestrian, Urban Open Space, Piazza, Spagna, Navona, Rotunda

요약 : 본 연구는 로마의 중심부에 위치한 보행중심 광장에서 보행중심 공공환경의 질적 수준을 향상시키는 물리적 환경의 형태적 특성과 도시건축적 설계요소의 체계를 도출하고자 한다. 이를 위해 본 연구는 스파냐, 나보나, 로툰다 광장들을 비교 분석하여 보행자 중심 설계를 유도하는 ① 보행이동과 보행활동을 위한 수평공간의 '오픈스페이스', ② 건물의 전면설계를 위한 수직공간의 '건물파사드'의 두 가지 형태설계 체계를 도출하였다. 본 연구는 이를 근거로 '보행 오픈스페이스' 체계를 구성하는 노드, 코어, 흐름이 광장 내부와 주변부에 입지한 건물, 블록, 가로, 그리고 보행동선의 시각적 구조와 공간적 배치에 영향을 주고 있으며, '보행 건물파사드' 체계를 구성하는 매싱, 전면설계, 시종점이 야외활동의 유발과 물리적환경의 질과 높은 상관관계가 있음을 관찰하였다. 도출된 이러한 공공광장의 형태요소 체계는 시공간을 넘어 도시 공공환경의 질을 향상시키려는 도시설계 및 심의과정에 효과적으로 활용될 수 있을 것이다.

주제어 : 공공환경, 보행자, 도시오픈스페이스, 광장, 스파냐, 나보나, 로툰다

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I. Introduction

1. The Goal and Background

This study investigates three piazzas in Rome that are pedestrian-friendly public spaces in an urban setting. The goal is to find their typological characteristics and pedestrian design language that successfully contribute to the pedestrian-oriented environment filled with everyday's public activities. The physical expansion of high-density development in a city calls for increased demand of a "good" public space - a place where people can meet together, enjoy their social activities, and feel part of a neighborhood and city. While a public space influences how people lead life, this study assumes that the quality of their life be equally enhanced by a series of deliberate city and building design that aims at placing people first in the center of urban environment.

The study precedes with the premise that people be a central character in public space – that is, a pedestrian-oriented[1] environment particularly in a central urban space. Under this direction, the study looks into the underlying physical structures of piazzas[2] of Spagna, Rotonda and Navona in Rome, to understand what makes them good public spaces from designer's aspect through a series of analysis of their typological languages. In order to suggest a prospective guidance for pedestrian design intervention, the typological observation of the piazzas is conducted based upon two pedestrian design frameworks that may determine the quality of a public space. They are 'Building Façade' as the vertical framework and 'Open Space' as the horizontal one that make together the piazza a pedestrian-oriented public space with typological design languages. The observation of the piazza through the vertical and horizontal frameworks can be effective for understanding how people perceive, use and experience a piazza in three-dimensional setting. By nature, human perception in space is three-dimensional with multiple layers of individual spaces defined both vertically and horizontally.[3]

The modern typological interpretation was developed from a group of theoretical propositions and their design applications by Italian architect Also Rossi. Characterizing the nature of the type[4] as simple yet principle and

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1) In this study, the 'pedestrian-oriented or pedestrianized space' means an urban public space that not only allows efficient public access and pedestrian movement, but also accommodates various public activities including walking, shopping, and socializing within and beyond the center of public space.

2) A piazza originated arguably from Italy is an open public square surrounded by buildings and landscape elements equivalent to today's urban city square. The Italian piazza, particularly in Rome is an open exterior place for public activity with providing a sense of community as well as functioning as node of urban life. It is also a fundamental structure of the Italian urban fabric connected by streets to other parts of the city.

3) These vertical and horizontal frameworks are inter-dependent and inter-connected. Without vertical framework of 'Building Façade', 'Open Space' can not be defined nor enclosed and it can not accommodate a human need for a sense of place. Likewise, without horizontal framework of 'Open Space', 'Building Façade' can not be remembered and it loses its own identity for people's memory.

4) Also Rossi stated that the type is developed according not only to aspirations to beauty, but also to needs; a particular type was associated with a form and a way of life, although its specific shape varied widely from society to society(Rossi, 1982, The Architecture of the City. p. 40).

constant 'basis of architecture', he posed the typological debates addressing the ubiquitous value of the typical element in his words of "whenever urban problems are confronted."[5] By so doing, Aldo Rossi further remarked its effective applicability into developing the analytical understanding of urban space. In Aldo Rossi's typological theory, people's memory of a particular 'type' is essential to experience the architecture of the city. To him, the perception of fundamental 'type' in urban artifacts gives people the lasting memory of a particular place. He said, "The city itself is the collective memory of its people, and like memory is associated with objects and places. The city is the locus of the collective memory." in his The Architecture of the City.[6] Thus, understanding the typology of objects and places in a city is what gives people the collective memory of the city according to Aldo Rossi. Such efforts were followed by subsequent academic commitments to the development of design theories (Mitchell, 1990) and continuous searches for computational form generation until the early 1990s (Mitchell, 1977; Mitchell and McCullough, 1995; Stiny, 2008). Yet, their undertakings were focused on the classification of architectural components from designers' perspective. In fact, a few early

interpretations of public space in the last century had been limited to outline design principles based on morphological observations (Sitte, 1889; Zucker, 1959; Krier, 1979) and social behaviors in public space (Whyte, 1980) in horizontal plane, rather than in three-dimensional pedestrian realm.

In this regard, this study tries to extend further such interpretative efforts by identifying pedestrian dynamics guided by urban block and building configurations and their responsive architectural characteristics of urban public space in both horizontal and vertical planes. This typological understanding of public space based on pedestrian design languages may be effectively adaptable to possible design application and design review that help enhance the timeless quality of urban public space.

2. Research Method and Field Survey

The piazzas in Rome[7] were initially considered for possible study subjects of pedestrian-oriented public spaces given their multiple physical, social, economic and political functions through historical evolution up to the present. Upon comparative evaluation of the qualities and characteristics of many public spaces, the three piazzas were eventually

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5) Ibid, p. 40
6) Ibid, p. 130
7) A total of 20 piazzas in Rome were preliminary identified to be ritual center, active public meeting ground, market place, social gathering and political center. These piazzas are located with their mutual physical proximity to the others within the city area, yet with pedestrian distance enough to maintain its unique characteristics. In addition, each piazza is equally known well for its role as a basic component of urban fabric where architectural forms and urban contexts manifest themselves to be the ultimate gem of the classical architectures.

narrowed down[8]) to became the focus of the study for typological analyses and on-site observations: Piazza di Spagna; Piazza della Rotonda; and Piazza Navona. Three piazzas share a primary function to serve as urban centers for retail, commercial, social and cultural activities in pedestrianized public space as well as to feature human-scaled building elements of canopy, balcony, gateway, etc. which are highlighted by historical buildings and urban monuments of tower and fountain (See Table 1. and Figure 1.).

The study first analyzes the typological characteristics of three piazzas through the modern interpretation of three horizontal elements of Open Space that are assumed to collectively contribute to the definition and employment of pedestrian movement within a citywide urban network: 1) Pedestrian Node for internal and external convergence in local and urban contexts; 2) Pedestrian Core for pedestrian activities with spatial hierarchy; 3) Pedestrian Flow for internal and external circulations. Each of the horizontal languages activates the three piazzas into pedestrian-friendly open spaces. In addition, the typological characteristics of three piazzas are further analyzed through the modern interpretation of Pedestrian Building Façade which is a charac-

teristic face of a building or a group of buildings in public space. Based on the compositional arrangement and architectural expression experienced vertically by pedestrians on street level, the three languages of Pedestrian Building Façade are analyzed: (1) Pedestrian Massing for contextual and formal identity; (2) Pedestrian Frontage for human-scaled building articulation; (3) Pedestrian Terminus for visual experience and directional orientation.

Ⅱ. Three Piazzas in Rome

Piazza di Spagna is located at the intersection of Via del Babuino and Via Condoti, the busiest and most commercialized streets in Rome. Its unique location in the middle of the city's major streets makes the Piazza full of constant crowds with a series of shops and cafes. The size of the Piazza is approximately over 18,600 ㎡ with angled geometries defined by 12 building blocks and 12 alleys and streets which in turn infiltrate into the piazza. Piazza di Spagna is characteristic of 'street' with flowing traffics of people and vehicles because the Piazza is part of Via del Babuino. The most prominent features are the Cheisa Santa Trinita dei Monti [s1] with a frontal tower, Scalinata di Spagna [s2], la Fontana della Barcaccia [s3]

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8) Two main factors critically determine the selection of three pedestrian-oriented piazzas with possibility of comparative understanding of typological structures. First, they are different from other popular piazzas in terms of their 'gathering and hovering' nature of a place for people. Their spaces are not meant to be transient with temporary exhibition, but to be permanent with every day's pedestrian activity. Second, the piazzas have several characteristics of similarities and dissimilarities in their design elements. While their neighborhood location, lot size and traffic intensity being singular, their figure-ground configuration, building volume character and urban elements are quite similar in their typology. These features contribute to a sense and identity of neighborhood environment through connection of streets and alleys to other piazzas and sections.

Spagna	Rotonda	Navona
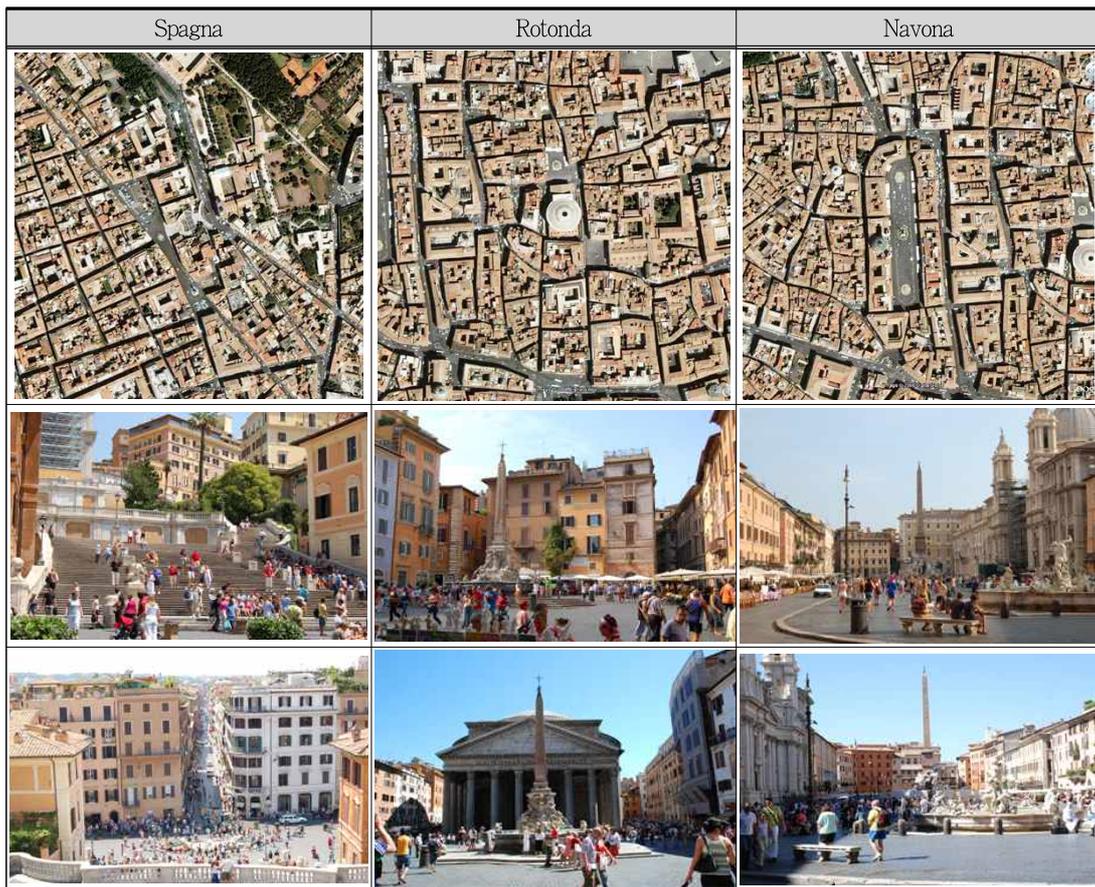
Figure 1. Piazzas of Spagna, Rotonda and Navona

and Colonna dell'Immacolata in front of Palazzo di Propaganda. The Scalinata di Spagna among the others, is a central node for pedestrian traffic from Via Condoti in east-west from Via del Corso and Via del Babuino in north-south. These distinctive elements are evenly placed throughout the irregular-shaped piazza along with four to six story buildings on the streets. They rigorously interact visually and physically with the merged streets and alleys to make the Piazza an active public stage set of resting, walking and viewing for the city dwellers and visitors as well.

Piazza della Rotonda is located three blocks away to west from Via del Corso, the major commercial corridor and historical gateway to the heart of Rome. Yet, the Piazza is in the center of complex web of streets and alleys [r3] along with other piazzas and palazzos in the adjacent blocks. The size of the Piazza is approximately over 9,300㎡ with a trapezoid shape delineated by nine city blocks and 10 infiltrating streets. The Pantheon [r1] and a fountain designed by Vincenzo Felici [r2] with the obelisk on top of sculpture are the center of pedestrian activities in the Piazza with visual

Table 1. Piazzas of Spagna, Rotonda and Navona

	Spagna	Rotonda	Navona
Urban location	Old city neighborhood of Rome		
Monument	Fountain, tower, historical building		
Street connection	Walking through alley		
Physical character	Building, material, color, pattern and height		
Traffic	Medium traffic: at intersection of major streets	Least traffic: in middle of residential/commercial	Medium traffic: close to the Tiver and major streets
Size	18,600㎡	9,300㎡	16,700㎡
Functional usage	Resting place	Visiting pantheon	Hosting festival
Spatial character	Moving/dynamic	In/out directional	Open/crowded

and physical interaction of streets and alleys from all directions in 360 degrees. The Pantheon is in fact a dominant architectural element in the Piazza and the most prominent building in Rome as well. Along with this monument, the streets and alleys play an important role to bring people to the slightly angled rectangular Piazza. The value and function of the Piazza is in its supporting role for the Pantheon. The Pantheon creates its own three alleys due to its free-standing position in the Piazza. All these streets and alleys, particularly coming from adjacent piazzas and palazzos are pedestrian-friendly with shops and cafes along the side of buildings. These small and compact sized settings do not overshadow the Pantheon but instead embrace it respectfully with simple spatial expression.

The location of Piazza Navona is in the middle between Via del Corso and River Tevere in the western part of Rome. Its size is approximately over 16,700㎡ with nine city building blocks and nine alleys and streets. The Piazza featuring an unusual, elongated oval shape coming from following the plan of an ancient 1st century Stadium of Domitian, began its history when the city market was opened as public space in the 15th century. The Piazza feature three fountains of la Fontana dei Fiumi with a tower [n2] in the middle, Fontana del Moro [n3] at south, and Fontana di Nettuno at north which are predominantly present in this open public space along with Chiesa di Sant'Agnese in Agone [n1].

While the fountains forming a linear structure of horizontal nodes for pedestrian activities, the church with elaborately-designed building façade with prominent historical image, guides a visual direction for pedestrian terminus. Unlike other piazzas in Rome, the Navona has a unique pedestrian-oriented space since it accommodate special events like art and music festivals as well as everyday's place for eating and resting within an extended open space filled with art works,

Table 2. Piazzas of Spagna, Rotonda and Navona

[s1] Cheisa Santa Trinita dei Monti	[r1] Pantheon	[n1] Chiesa di Sant'Agnese in Agone
[s2] Scalinata di Piazza	[r2] Rotonda Fountain Tower	[n2] la Fontana dei Fiumi
[s3] la Fontana della Barcaccia	[r3] Alley next to Pantheon	[n3] Fontana del Moro

cafés and shops. They contribute to forming a monument-shaped yet again human-scaled public space for various pedestrian activities extended via streets and alleys to the busy and congested urban environment.

Ⅲ. Piazza as Pedestrian Open Space

The experience of urban open space starts with people coming to a city; finding a place where they want to go, and resting at a destination where they want to enjoy walking,

eating, shopping, sightseeing, etc. This urban journey from one place to another requires a spatial transition of 'pedestrian flow' bridging the gap between different destinations and then the transitional space leads to people's concentrated activity area of 'pedestrian core', which is pivoted around the visual and physical connection point of 'pedestrian node'. Thus it is important to analyze the pedestrian dynamics by three open space elements – pedestrian node, pedestrian core and pedestrian flow to understand how people move in and out of the open space, how the open space accommodate the people's activity, and how the public activity is concentrated around the focal points for the memory of urban experience.

1. Pedestrian Node for Citywide Pedestrian Network

Pedestrian Node is in this study defined as a converging point on pedestrian network where citywide pedestrian movement merges into and spreads out from while generating various types of daily activities and seasonal festivities. Unlike many urban pedestrian nodes which simply demarcate the boundaries of neighborhood and district, Pedestrian Node also plays a role of providing people with a visual reference to their memorable urban experience of a particular place through a strong visual relationship with its building design. The study identifies that Pedestrian Node of three piazzas consists of not only internal nodes within the piazzas, but also citywide pedestrian nodes

which account for the axial structure associated with Pedestrian Terminus of Building Façade. Thus, the typological arrangement of Pedestrian Node features a combination of at least one or two internal nodes inside of the piazza along with citywide nodes located in the city (See Figure 2.a.). Furthermore, this networked nodal chain of Pedestrian Nodes strongly establishes the horizontal pedestrian movement of Pedestrian Node anchored by vertical Pedestrian Terminus of Building Façade within the Piazza.

There are four Pedestrian Nodes in Piazza di Spagna; they are Scalinata di Spagna, la Fontana della Barcaccia, the Monti tower, and Colonna dell'Immacolata. Scalinata di Spagna and la Fontana della Barcaccia function as Pedestrian Nodes for both the city and the Piazza because they are positioned along the central axis of Via del Babuino and Via Condoti. In relation to Building Façade, Scalinata di Spagna and la Fontana della Barcaccia also have a strong axial relationship with Cheisa Santa Trinita dei Monti as Pedestrian Terminus (See Figure 2.a.). Yet Colonna dell'Immacolata and the tower, play as internal nodes just for the Piazza even though it is located along Via del Babuino.

In Piazza della Rotonda, the Pantheon and a fountain in front of it are Pedestrian Nodes of Open Space. The Pantheon alone, however, plays Pedestrian Node for both the Piazza and the city as well. Besides, it functions as Pedestrian Terminus of Building Façade thanks to its central location in the middle of the

	Spagna	Rotonda	Navona
a. Pedestrian Node for City-wide Pedestrian Network ■ Pedestrian Node (for Piazza and City) ◉ Pedestrian Node (for Piazza)			
b. Pedestrian Core for Structured Pedestrian Activity ■ Primary Pedestrian Core ▨ Secondary Pedestrian Core ● Tertiary Pedestrian Core			
c. Pedestrian Flow for Extended Circulation Access Flow Main Circulation Flow Circulation Flow			
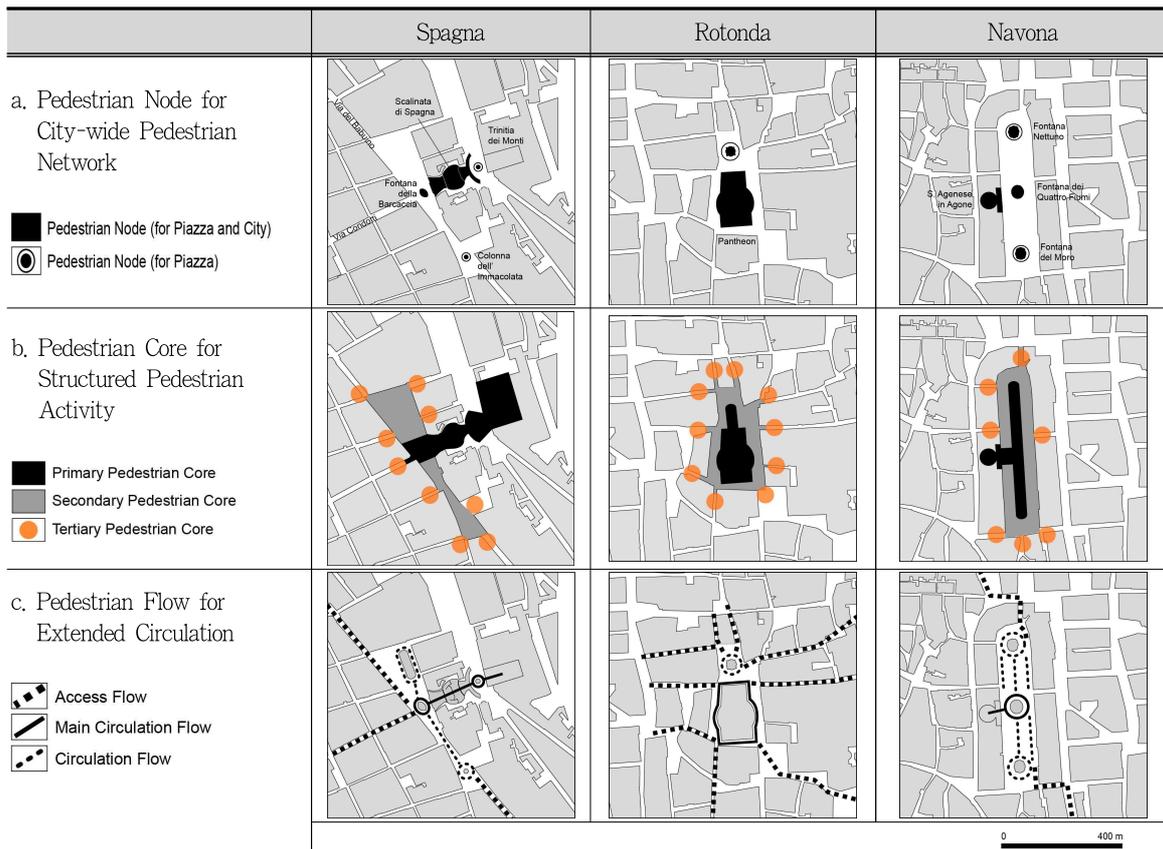
Figure 2. Analysis of Pedestrian Open Space of Three Piazzas

Piazza. The vertical elements of the monument have intriguingly developed their own dual relationships that highlight the Pantheon to be both Pedestrian Node and Pedestrian Terminus (See Figure 2.a.).

In Piazza Navona, the three fountains with an obelisk tower are Pedestrian Nodes of Open Space while la Fontana dei Fiumi in the middle functions as Pedestrian Node for both the city and the piazza. Yet, Fontana di Nettuno at north and fontana del Moro at south play as Pedestrian Nodes just for the Piazza. In relation to Building Façade, la Fontana dei Fiumi provides a strong axial connection with Chiesa

di Sant'Agnese in Agone as Pedestrian Terminus in Building Façade (See Figure 2.a.).

2. Pedestrian Core for Structured Pedestrian Activity

Pedestrian Core, mostly around Pedestrian Nodes, is defined as a concentrated area whose typological structure features the spatial intensity of pedestrian activities and movement. The study identifies that Pedestrian Core is analyzed by a complex of primary, secondary and tertiary sections of Pedestrian Core which allow a symbiotic balance of a variety of public

activities in the pizzas. In fact, primary Pedestrian Core provides people with open quality of public space accentuated with civic monuments and historical buildings (See Figure 2.b.). The primary section creates a visual and physical centrality for various pedestrian activities in pubic space along a strong axis established by towers, fountain and steps in the piazzas. Secondary Pedestrian Core appears to develop at the boundary of Building Facade and alleys/streets while serving people with cafes, parks and shops [s11] along the perimeter wall of Building Façade (See Figure 3.). In addition, the secondary section accommodates new types of public activities including commercial, recreational and social functions outside of yet adjacent closely to the primary Pedestrian Core. Tertiary Pedestrian Core can be formed further for functional auxiliaries of the piazza to accommodate a cleared access of pedestrian and vehicles to the piazza as well as a functional elements for street lights, benches, planters, trash cans, etc. [s12]

Primary Pedestrian Core in Piazza di Spagna features a strong axial structure established by Via Condotti, la Fontana della Barcaccia, Scalinata di Spagna and the Monti tower in order from west to east. This Pedestrian Core meets the secondary Pedestrian Core at la Fontana della Barcaccia, and ends at Cheisa Santa Trinita dei Monti which functions Pedestrian Terminus of Building Façade. Since the Piazza is located at one of major streets in the city, wheeled vehicles can have a full yet limited access to the entire open space except

terraced areas of Scalinata di Spagna and Cheisa Santa Trinita dei Monti. This vehicular access to the Piazza however does not discourage pedestrians to flow through the Piazza for their social gatherings and outdoor activities within Pedestrian Core (See Figure 2.b.). Even though Piazza della Rotonda is not located at one of major streets in the neighborhood, it is crowded with people with densed pedestrian activities especially in alleys and streets due to the visitors to the Pantheon. The fountain with sculpture and obelisk stands alone in prominent position at the center of forecourt to counteract with the Pantheon to create a high pedestrian section of primary Pedestrian Core (See Figure 2. b.).

Piazza Navona has long and airy public space without any major dynamic features of street and alleys, but there are lots of pedestrian activities of entertainment performances, art work displays and café/restaurant tables [n11, n12]. These daily social and cultural events create one of the most active pedestrian atmosphere in the city, which makes the Piazza a public center for a city life. Three marble fountains of Fontana dei Fiumi, Fontana del Moro, Fontana di Nettuno in the center create primary Pedestrian Core along at Chiesa di Sant'Agnese in Agone in straight and angular axial relationship (See Figure 2.b.).

3. Pedestrian Flow for Extended Circulation

Pedestrian Flow is defined as a spatial pattern

of linear pedestrian movement in-and-out of public space through alleys and streets which carry people from other parts of the city. Thus Pedestrian Flow is an extend pedestrian circulation system that weaves together the adjacent blocks and neighborhoods beyond the piazza. The study identifies that the typological layout of Pedestrian Flow is initially determined by pedestrian access to the piazzas through an external circulation of alleys and streets; and then shifted subsequently to tower, fountain and historical building via an internal circulation (See Figure 2.c.).

Pedestrian Flow in Piazza di Spagna is influenced by the division of the piazza through Via del Babuino. People come to the piazza through alleys from all directions, but the main pedestrian stream is from and to Via Condotti which is a high-end shopping street filled with retail shops and cafes [s11]. Wheeled vehicles from Via del Babuino and pedestrians from Via Condotti merge into the Piazza with concentric rings of inner circulation whirling around la Fontana della Barcaccia to provide a stage set for an ever-changing act of public commotion on Scalinata di Spagna (See Figure 2.c.).

In Piazza della Rotonda, there is a strong inner circulation of pedestrian stream

Table 3. Pedestrian Open Space of Three Piazzas

Spagna	Rotonda	Navona
[s11] Café and Restaurants	[r11] Café and Restaurants	[n11] Café and Restaurants
[s12] Plants and Trees	[r12] Plants and Trees	[n12] Benches and Art Display

established interactively between the Pantheon and the fountain with sculpture and obelisk via a chain of pedestrian traffic in all directions from other parts of the city. Thus, the piazza has the highest concentration of pedestrian movement in alleys and streets along with a series of shops and restaurants [r11] (See Figure 2.c.).

There is a linear pattern of pedestrian movement along the axis of three fountains within Piazza Navona, but the axis changes at 90 degree towards Chiesa di Sant'Agnese in Agone as Building Terminus to form a primary internal circulation for its spatial hierarchy. Except this primary pattern of linear circulation, the big and open courtyard becomes a free zone of internal circulation for all travelers, residents, shoppers and etc. The main pedestrian access comes from Via Agonale which connect the Piazza to many other parts of the city (See Figure 2.c.).

Ⅳ. Piazza as Pedestrian Building Façade

The experience of building façade comes from people's perception at the eye level. How people experience the building façade at the street level determines the lasting memory of people's journey at a particular place. The height and volume of the building ‑ 'pedestrian massing' affects people's perception of the façade; and the articulation of the building front at the street level ‑ 'pedestrian frontage' influences the pedestrian activity in the open

space. Particularly the visual and physical terminus within the building façade ‑ 'pedestrian terminus' gives people a sense of arrival at the final destination as well as a unique character of a particular place. Thus a good building facade requires an articulation of a pedestrian-friendly frontage in relation to overall building massing along with hierarchical arrangement of building blocks. It is important to analyze three building facade elements - 'Pedestrian Massing', 'Pedestrian Frontage', and 'Pedestrian Terminus' to understand how people's perception of building facade is affected by articulation of the massing, how the building front at street level affect people's activity and how the public activity is oriented toward the hierarchical building terminus.

The study identifies that Pedestrian Building Façade of three piazzas can be grouped into two types of building elevations - General Building Façade and Historical Building Façade based on inherent building types in each piazza where one historical building(s) is surrounded or continuously juxtaposed to enclose the piazza by four to six story residential and commercial buildings as a context. For the purpose of analytical observation, General Building Façade is intended to be a prototypical elevation of commercial and residential buildings in the piazza; Historical Building Façade is an abstracted elevation of the church or the temple (See Figure 3.).

The study also identifies that General

|	Spagna	Rotonda	Navona
General Building Facade			
Historical Building Facade			
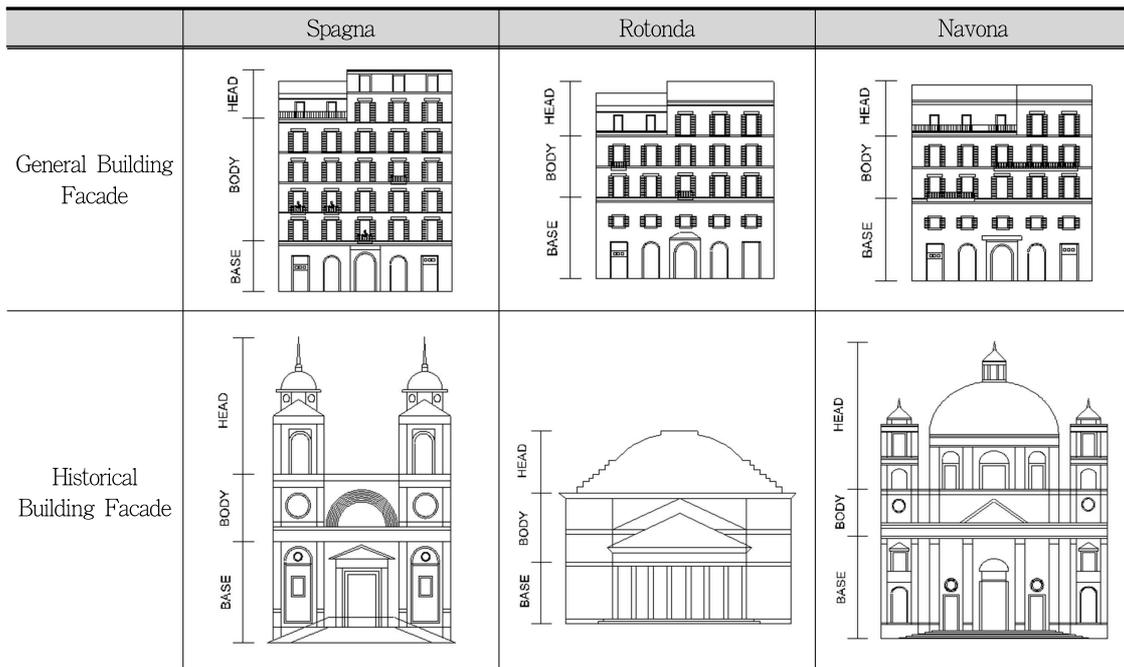
Figure 3. Pedestrian Building Façades of Three Piazzas

Building Façade and Historic Building Façade of three piazzas are generally composed of three main parts of head, body and base[9] that form a basis for the pedestrian friendly building face in public space. This tripartite composition of head, body and base, particularly, of Historic Building Facade indicates their own sub-types of design variations of the three piazzas.[10] Indeed, each of three piazzas features a single historical building with its historical importance and its hierarchy within the piazzas.

1. Pedestrian Massing for Vertical Configuration

Pedestrian Massing is in this study defined as a vertical arrangement of roof, wall and window in building design for the pedestrian-oriented public space. Critical components for Pedestrian Massing of public space are variations of roofscape, horizontal articulation of wall by decorative cornice molding, and various sizes and proportions of window

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9) The tripartite building composition of head, body and base in the three piazzas are identified with the following features: 1) Head has two types of roofscape of flat roof and gabled roof with occasional feature of penthouse [P20]; 2) Body has two main components of windows and cornice ornament [P21], yet window has many variations in size and proportion of opening along with decorative elements like shutters [P22], jamb/header ornaments [P23]; 3) Two components for base are windows and doors, but windows at base are quite different than at body in shape and decoration. They have generally arched openings with awnings [P24], and doors have always larger in size with highly decorative architectural treatments, such as canopy with arched doorway [P25], balcony with columns [P26], etc.

10) Historic Building Facade features the same structural components of head, body and base as General Building Façade, but their size and proportion are larger with more decorative details. Specifically, Historical Building Façade generally has a grand-scaled massing and elaborate articulation along with introduction of new elements, such as pilaster [P27], decorative opening [P28], clock [P29], roof dome, and tower.

openings. The study identifies that the general language of Pedestrian Massing of Historical Building Façade is similar to those of General Building Façade given the basic tripartite structure of roof, window opening and wall molding (See Figure 4.a.). Yet, because of the historical importance as a church or a temple with their hierarchical characteristics, the design elements of Historical Building Façade are grand in scale and proportion, and their articulation is elaborate in details. The three cases also feature rows and columns of windows, shape of roof, and horizontal cornice molding that affect positively the pedestrian perception of building massing. In addition, the entire building mass is broken down into multiple components of smaller volumes to lessen the severity of tall and long massing by design articulation. For example, horizontal cornice moldings sub-divide a blank wall into smaller wall surfaces with various roofscapes capped at the top; rows and columns of windows for functional and aesthetic purposes. Such design approach transforms the uncharacteristic wall into Pedestrian Massing that exhibits multiple faces of building components featuring their own character.

In General Building Façade of Piazza di Spagna, the building is six story high in average with some four and five story variation except the monumental height of Cheisa Santa Trinita dei Monti (See Figure 4.a.). Flat roof and gabled roof are equally present with occasional appearance of penthouse [P20]. This roof variation gives each building its identity while horizontal articulation of wall finished with decorative cornice molding [P21] tie together as one unity a series of different buildings in juxtaposition. In addition, different sizes and proportions of window openings give another layer of many faces of Building Facade. In Historical Building Façade of the Piazza, however, the size and proportion of roofscape, window and cornice molding are grand-scaled with more elaborate details with the introduction of tower with domed roof, decorative opening, niche ornament [P30] and pilaster.

In General Building Façade of Piazza della Rotonda, the building is five story high in average with four and six story variation except the monumental height at the Pantheon (See Figure 4.a.). Gabled roof is dominantly present in the Piazza with some variation of the roof shape. Decorative cornice molding is applied in various horizontal length and vertical spacing between them. Window openings are diverse in size and proportion to give many different faces of buildings. Yet, as in Historical Building Façade of the Piazza, the Pantheon has a new design language for Pedestrian Massing which contrasts to General Building Facade. The overall form is circular with decorative cornice moldings wrapped around and gigantic dome roof at the top. Instead of window openings, rows of monumental columns with pediment above is featured at the front side of the temple to relate to the pedestrian activity, but also the monumental columns with entablature [P31] is expressed in the rear side of the temple.

In General Building Façade of Piazza Navona, the building is five story high in average with four and six story variation except the monumental height at Chiesa di Sant'Agnese in Agone (See Figure 4.a.). Gabled roofs are widely used in the Piazza with some flat roofs. Window openings are diverse in size and proportion to give many different faces of buildings. But as in Historical Building Façade of the Piazza, the size and proportion of roofscape, window and cornice molding are grand-scaled with more elaborate details and new design elements including tower with domed roof, niche ornament, clock and pilaster. Especially a forest of vertical pilasters are articulated in human scale to reduce the entire massing of the church.

2. Pedestrian Frontage for Frontal Articulation

Pedestrian Frontage is defined as a frontal accentuation of building elevation at the street level, designed particularly for pedestrian experience. The use and method of building material and articulation differentiate Pedestrian Frontage mostly two story high from upper floor elevation along with design elements like entry gateway, awning, canopy, balcony, steps, etc [P24, P26]. The study observed that the critical design elements for Pedestrian Frontage of Building Façade of three piazzas are arched windows with awning, overhang, entry doors with balcony, column and pilaster [P27] and entry steps/stairs (See Figure 4.b.). They are the main components of Pedestrian Frontage to make the building visually and physically

	Spagna	Rotonda	Navona
a. Pedestrian Massing for Vertical Configuration			
b. Pedestrian Frontage for Frontal Articulation			
c. Pedestrian Terminus for Hierarchical Arrangement			
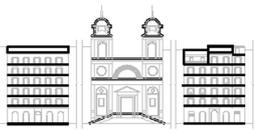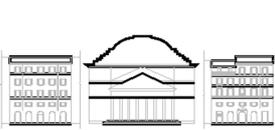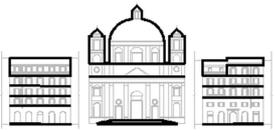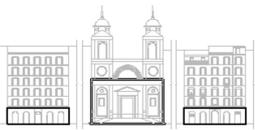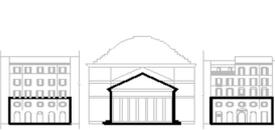
Figure 4. Analysis of Pedestrian Building Facade of Three Piazzas

pedestrian-oriented on the street with inviting architectural features. Three case studies feature one or two story street elevation to have the entry door at the center of Pedestrian Frontage with gateway features, such as balcony with pilaster or columns and ornamented arch or pediment with door jamb ornament. At each side of the entry gateway, arched and rectangular windows are alternatively used along with decorative use of overhang canopy at either type of windows. Pedestrian Frontage for the Historical Building Façade, however, is characterized by a series of monumental colonnades or a heavy forest of pilasters along with grand steps/stairs because of their historical and symbolic importance in urban context.

In General Building Façade of Piazza di Spagna, Pedestrian Frontage has one story high elevation characterized by a mix of arched and rectangular windows with overhang canopy (See Figure 4.b.). The entry gateway is treated with special architectural expressions such as a bigger opening with decorative cornice trim, arched stone masonry, elaborate balcony with column, etc. The contrast between Pedestrian Frontage and the upper floor elevation is marked by wall cornice molding [P21] instead of different use of material. In Historical Building Façade of the Piazza, Pedestrian Frontage has, however, an unusual small rectangular window and circle opening within arched shape of window-mimicking wall decoration at two flanking sides of entry door which has pediment above it. Such reduced

window and openings are effective in controlling natural light by dramatizing a transient atmosphere in interior space. High flights of stairs indicate the architectural importance as the main entry to invite people at side ends.

Typically in General Building Façade of Piazza della Rotonda, Pedestrian Frontage has two story high elevation with a mix of arched and rectangular windows, but with arched windows more dominating (See Figure 4.b.). The entry gateway is treated with special architectural feature like bigger opening with decorative wall molding, heavy pilaster with balcony, etc. The wall cornice molding differentiates Pedestrian Façade from the rest with occasional use of different material. In Historical Building Façade the Piazza, Pedestrian Frontage has the monumental colonnades with gigantic pediment erected from low foundational steps that extend out to the pubic space to embrace people.

In General Building Façade of Piazza Navona, Pedestrian Frontage has a well-balanced mix of height, material and articulation. It features one or two story high elevations, stone/stucco walls and arched/rectangular windows. In addition, the entry gateway is treated with special architectural features like bigger opening with decorative wall molding, columns with balcony, pediment, etc. (See Figure 4.b.) The wall cornice molding differentiates Pedestrian Façade from the rest with occasional use of different material, but at Piazza Navona, elaborate balconies [P34] are

the most prominent architectural expression. They effectively break down the long and high wall façade and relate to people below by human scale articulation. In Historical Building Façade of the Piazza, Pedestrian Frontage is, however, characteristic of a forest of pilasters filled with intricate decorations of arches, circles and rectangles. The steps are monumental in length, but pedestrian-scaled in height with layers of risers.

3. Pedestrian Terminus for Hierarchical Arrangement

Pedestrian Terminus is defined as a hierarchical arrangement of building(s) as the most important structure for the pedestrian experience of the piazza. As a final destination point of the pedestrian progression, Pedestrian Terminus draws the attention of people for their visual experience with a guiding orientation. The study observes that in three piazzas, Pedestrian Terminus is generally a historical building – that is a church or temple and there exists only one Pedestrian Terminus in each piazza. It is the most prominent feature with monumental entrances and soaring towers. Generally it also functions as a landmark in urban space with its dominant size and elaborate articulation. Three primary elements for Pedestrian Terminus in the three piazzas are towers with domed roofs, monumental entrances and grand steps. There are however other secondary elements such as decorative opening, clock, pilaster and niche articulation

that feature more elaborate details introduced in Historical Building Façade. In the typological structure of Pedestrian Terminus of the piazzas, the center of towers with domed roofs is vertically mirrored along symmetrical axis with centers of monumental entrance and grand step. They are also aligned with a fountain as Pedestrian Node in Open Space. Such space arrangement generates visual and physical connection between Pedestrian Terminus and Pedestrian Node between the horizontal Open Space and the vertical Building Façade. In this relationship, the steps are the spatial mediator between them as an extension of Building Façade to reach out to accommodate people coming from Open Space.

As Historical Building Façade of Piazza di Spagna, Cheisa Santa Trinita dei Monti at the top of Scalinata di Piazza is Pedestrian Terminus with its visual and physical dominance (See Figure 4.c.). It is a terminating point of visual progression coming from Via Condotti which makes the church the most pedestrian-oriented monument in the Piazza and in the city as well. Along with strong linear axis at east-west, the pedestrian visual experience escalates at la Fontana della Barcaccia, culminates at Scalinata di Spagna, and soars into Cheisa Santa Trinita dei Monti where two bell towers with domed roof and pediment gateway are the main pedestrian attraction for their monumental façade.

As Historical Building Façade of Piazza della Rotonda, the Pantheon is a terminating point of pedestrian visual experience from all directions

thanks to its monumental position in the Piazza (See Figure 4.c.). Since it plays a role of Pedestrian Node in Open Space, the Pantheon receives the most pedestrian attention as Pedestrian Terminus in Building Façade. Its cylindrical building also secures its central position along with monumental colonnade entry and pediment roof as well as stepped-up dome.

As Historical Building Façade of Piazza Navona, Chiesa di Sant'Agnese in Agone is Pedestrian Terminus with gigantic dome, domed towers, and pediment entrance (See Figure 4.c.). It is part of continuous façade fabric in the Piazza, but its elaborate articulation and monumental roofscape make the church distinguished from other surrounding buildings. They create a strong axial

Table 4. Pedestrian Building Façade of Three Piazzas

[P20] Penthouse (Rotonda)	[P21] Cornice Ornament (Rotonda)	[P22] Window Shutter (Spagna)	[P23] Window Jamb/Header Ornament
[P24] Window Awning	[P25] Arched Doorway	[P26] Entry with Balcony	[P27] Pilaster
[P28] Decorative Opening	[P29] Clock	[P30] Niche Ornament (Spagna)	[P31] Entablature (Rotonda)

relationship in east-west with la Fontana dei Fiumi as Pedestrian Node which is also positioned axially in south-north to two other fountains. The visual termination comes from angled views because of pedestrian movement in south-north according to the linear layout of three fountains.

V. Conclusion

If a city by nature is a product of diversities, the quality of urban environment can be significantly enhanced by establishing public space in pedestrian-oriented environment – an activity center for residents and visitors in everyday's environment. Besides, its urban form and architectural expression may change in response to program and context of their societal value. Yet, their typological structure remains timeless in its presence for local and regional identity. Three piazzas of Piazza di Spagna, Piazza della Rotonda and Piazza Navona provides exemplary public spaces for many public activities, including eating, performing, walking, displaying, visiting, resting, socializing, etc. Basically given their spatial configuration and visual structure, they are determined to be more pedestrian than governmental or religious and are among the most successful pedestrianized public spaces over others beyond temporal sense.

The study of three piazzas indicates that the typological characteristics observed in three piazzas are fundamental elements for better occurrence of pedestrianized public activity in human-scaled building forms even in contemporary urban space. It also implies that the typological framework effectively guides a set of spatial and physical orders of public space (See Table 5.). These findings suggest a range of following prototypical design knowledge to be adaptable to possible design application and design review of pedestrian- oriented public spaces in urban settings.

First, Pedestrian Node, Core and Flow of Open Space are definitively framed out for the horizontal configuration for the pedestrian-oriented public space within a citywide pedestrian network of alleys and streets. They are the visual and physical extension of Open Space that provide an introduction as well as a finale to the public space. Such network guides access and circulation of pedestrians within and beyond the neighborhood into major and minor of pedestrian activity cores as well. Second, Pedestrian Massing, Pedestrian Frontage and Pedestrian Terminus of Building Façade are vertically structured into the pedestrian built surroundings. While the Massing and the Frontage useful for building a general atmosphere with facial articulation, the Terminus plays multiple functions with Node, Core and Flow of Open Space such as creating a vertical node highlighted by a strong axial relationship with the Node, establishing a spatial hierarchy in the Core, and providing a memory of the public space as a final destination in the Flow. Third, monumental and human-scaled elements are alternatively arranged in Open Space like tower and sculpture as

Table 5. Analysis Summary of Three Piazzas

Framework	Spagna	Rotonda	Navona
Pedestrian Node: Citywide Pedestrian Network	▪ 4 Nodes: 2 nodes (Scalinata di Spagna and la Fontana della Barcaccia) for city/piazza; 2 nodes for city/piazza with strong axis to Pedestrian Terminus	▪2 Nodes: 1 node (Pantheon) for city/piazza; 1 node for city/piazza functioning as Pedestrian Terminus	▪3 Nodes: 1 node (la Fontana dei Fiumi) for city/piazza; 1 node for city/piazza with strong axis to Pedestrian Terminus
Pedestrian Core: Structured Pedestrian Activity	▪Pedestrian Terminus as part of the Core structure	▪Pedestrian Terminus as the Core structure	▪Pedestrian Terminus as part of the Core structure
Pedestrian Flow: Extended Piazza Circulation	▪Pedestrian/vehicular access ▪One dominant flow from Via Conditti ▪Ends at Pedestrian Terminus	▪Only pedestrian access ▪Flows from all directions ▪Ends at Pedestrian Terminus	▪Only pedestrian access ▪One dominant flow from Via Agonale ▪Ends at Pedestrian Terminus
Pedestrian Massing: Vertical Configuration	▪Tripartite composition ▪G.B.F: 6 story; flat & gabled roof; various opening sizes ▪H.B.F: monumental height; different roof and opening from G.B.F.	▪Tripartite composition ▪G.B.F: 5 story; dominant gabled roof; various opening sizes ▪H.B.F: monumental height; different roof and opening from G.B.F.	▪Tripartite composition ▪G.B.F: 5 story; dominant gabled roof; various opening sizes ▪H.B.F: monumental height; different roof and opening from G.B.F.
Pedestrian Frontage: Frontal Configuration	▪G.B.F: 1 story high with entry gateway, overhang, wall cornice molding, opening sizes distinguished from upper elevations ▪H.B.F: monumental height as G.B.F., but more grand-scale and elaborate	▪G.B.F: 2 story high with entry gateway, overhang, wall cornice molding, opening sizes distinguished from upper elevations ▪H.B.F: monumental height, but with different language than G.B.F.	▪G.B.F: 1 and 2 story high with entry gateway, overhang, wall cornice molding, opening sizes distinguished from upper elevations with balcony features ▪H.B.F: monumental height with G.B.F. but more grand-scale and elaborate
Pedestrian Terminus: Hierarchical Arrangement	▪la Fontana della Barcaccia ▪Scalinata di Spagna ▪Cheisa Santa Trinita dei Monti	▪Pantheon	▪Chiesa di Sant'Agnese in Agone

well as in Building Façade like roof dome and balcony. This dual quality of public space expresses its civic value within the city as well as its pedestrian importance within the neighborhood. Steps are important pedestrian elements in both of Open Space and Building Façade, which invite and rest people for place identity. Fourth, the primary Pedestrian Core is effectively demarcated by strong axial arrangement between fountain with sculpture and tower in Open Space, and a historical building in Building Façade. This creates a seemingly simple yet strong durable sense of place for people. Outdoor elements like table, chair, canopy tent, light and bench are mediators of such clear delineation of

pedestrian activity between Open Space and Building Façade.

These findings imply that the design quality of urban public plaza be neither accomplished by urban designer's vision nor architect's imagination alone. Rather it is a constant compromise between their social communication and historic observation through design language. In this process, spatial structure ordered by horizontal configuration with artistic expression imposed by vertical articulation may put the plaza to any possibilities. Yet, their primary focus should be equally given to the dynamics of pedestrians whose visual and physical experiences in a three dimensional way will enrich the plaza and its contexts as well.

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