

**ENHANCING SOCIAL DYNAMISM IN INTERIOR ARCHITECTURE THROUGH THE USE  
OF SOCIAL FRICTION**

by

**Nazia Kachwalla**

A thesis submitted in partial fulfilment of the requirements for the Degree of

**Master of Architecture**

at

Victoria University of Wellington

June 2010

Under the supervision of

**Daniel K. Brown**

and

**Christine McCarthy**

## **ABSTRACT**

This thesis views urban design as a discipline that influences social patterns and interaction by using design elements to provide for different types of social connections. It studies the phenomenon of “social friction”, a term coined by Richard Sennett in 1971, as a productive mechanism for social interaction in the urban context. The aim of the thesis is to explore whether urban design models to promote social friction are valid for interior architecture, and if so, to consider how social friction might positively inform the level of social dynamism in large public buildings.

Since the 1960s urban theorists like Jane Jacobs, Christopher Alexander and others discuss urban elements within overlapping city structures that facilitate social interaction between the different social groups. Critical characteristics of successful urban structures recognise this system of overlap or exchange as a positive contribution to the social life in a city. Permeable boundaries, spatial adjacencies of different functions, the composition of new and old architecture on the same footpath, etc. are seen to establish activity flows between various categories of people. The ability of urban design to affect the social dynamism in any area is seen in this thesis as an opportunity to be exploited by the discipline of interior architecture.

The thesis studies various elements that create an overlapping system within the city structure to enhance social interaction. During such a study it discovers three different social friction types: manipulated friction, visual friction and indirect friction. Each of these is seen to create different types of connections between diverse social groups. The thesis then analyses interior architectural elements which have similar characteristics and explains how they become mechanisms that can manipulate social friction when used in the interior setting of large public buildings like museums, libraries and airports. Traditional interior architectural circulatory elements and spatial elements are analysed with a view to determine the level and type of social interaction they allow. The study of the urban context enables such an analysis of the interior elements in terms of social interaction and the type of social friction they create.

“Seen in the long-term historical perspective, city space has always served three vital functions-meeting place, market-place and connection space. As a meeting place, the city was the scene for exchange of social information of all kinds. As a market-place, the city spaces served as venues for exchange of goods and services. And finally, the city streets provide access to and connections between all the functions of the city.”

Gehl “Public Spaces for a changing Public Life” p3

## TABLE OF CONTENTS

<b>Introduction .....</b>	<b>4</b>
 <b>Chapter 1: Background Study .....</b>	<b>15</b>
The Social Context .....	18
The Urban Elements .....	26
The Urban Structure .....	30
 <b>Chapter 2: Characteristics of the Mechanisms of Friction .....</b>	<b>39</b>
The Pathway .....	40
The Filter .....	45
The Generator .....	48
The Inactive Generator .....	51
The Connector .....	53
 <b>Chapter 3: Interior Circulation and Friction .....</b>	<b>56</b>
The Passage .....	56
The Corridor .....	61
The Elevator .....	67
The Staircase .....	71
 <b>Chapter 4: Interior Spaces and Friction .....</b>	<b>77</b>
Wall Openings .....	77
The Room and Open Planning .....	83
 <b>Conclusion.....</b>	<b>94</b>

## INTRODUCTION

### Friction:

*Physics and Mech. The resistance which any body meets with in moving over another body.<sup>1</sup>*

*Experiencing the friction of differences and conflicts makes men personally aware of the milieu around their own lives...<sup>2</sup>*



Figure 0.01: Social movement

Social friction is a phenomenon that creates awareness of difference via the engagement of differences between various community groups through productive confrontation and conflict<sup>3</sup> This thesis studies social friction as a mechanism for social interaction using research by a number of individuals including sociologists, urban theorists, architectural theorists, architectural historians, philosophers, social scientists, public policy makers, and urban and regional planners.<sup>4</sup> The theories chosen relate to ideas around social patterns and interactions that exist in the built urban fabric. Social friction is studied as a mechanism for social interaction that supports exchange between the diverse social groups in the city.

---

<sup>1</sup> Oxford English Dictionary "Friction" unpaginated

<sup>2</sup> Sennett Uses of Disorder p 139

<sup>3</sup> Conflict is seen as a way to communicate difference. Richard Sennett critiqued people's perception of conflict as violence. He suggested that it is in the hands of the individuals of the society to resolve disputes amongst themselves. According to Sennett there should be no police involvement in conflict. "Because men are so innocent and unskilled in the expression of conflict, they can view these disorders as spiralling into violence." Sennett Uses of Disorder p164

<sup>4</sup> Refer to figure 0.02 on page 5

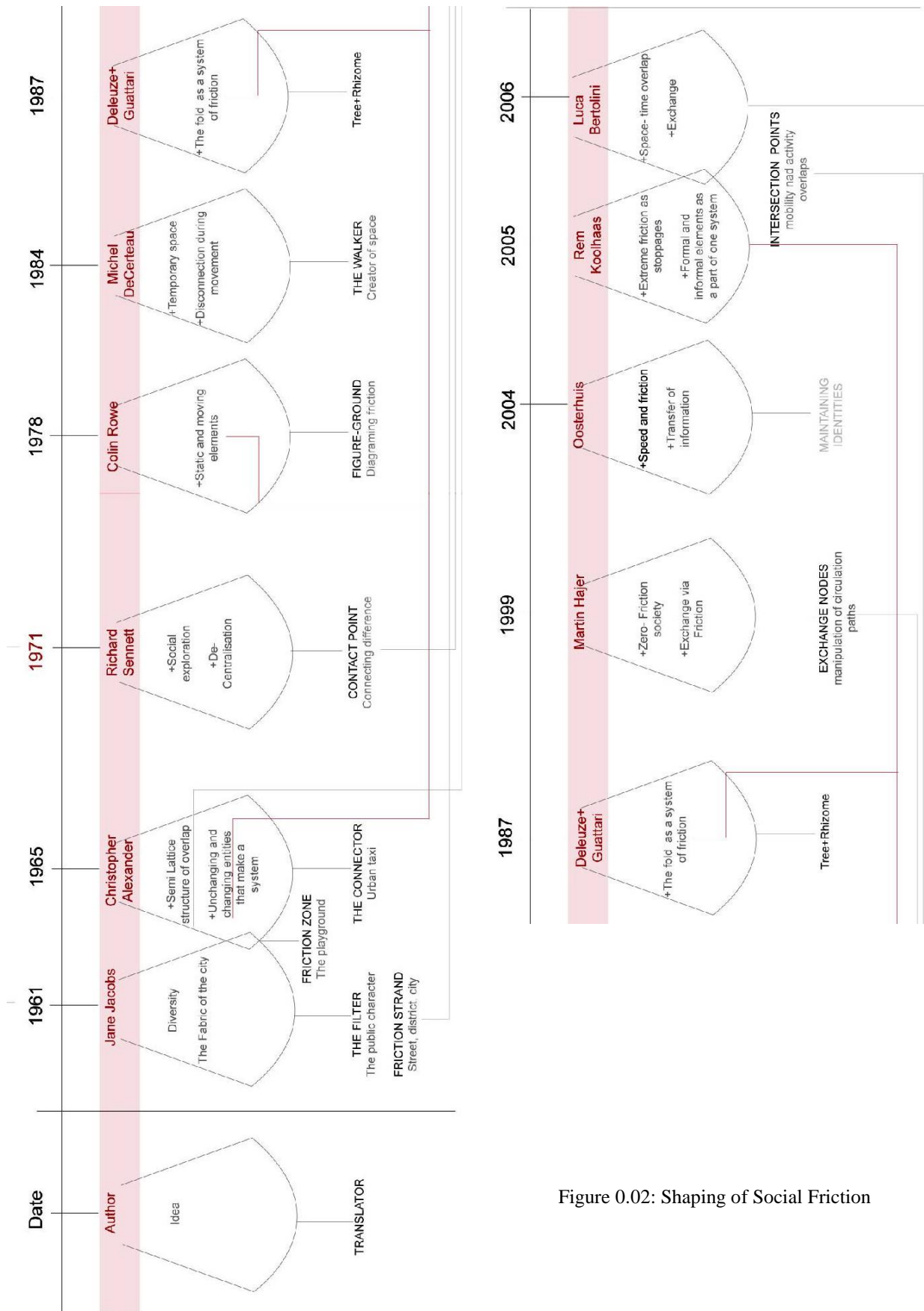


Figure 0.02: Shaping of Social Friction

The thesis investigates how social friction can be used in interior architecture in order to enhance social dynamics within the interiors of large public buildings. The human being is a social animal.

With hundreds of miles open to habitation, people still tend to build their houses close to the houses of other people. No matter the continent, no matter the culture, no matter the era, this is what we do. And to find an individual choosing to live completely alone in the world is so rare as to confirm that human beings need to live amongst each other; indeed we are compelled from within ourselves to group together. Humans are social animals; it is our nature to be so.<sup>5</sup>

The importance of social engagement has been recognised by various disciplines including architecture. People environmental studies, for example, have been carried out since the late 1960s.<sup>6</sup> Research done by the International Association of People Environment Studies relates to human interaction and relationships in urban design. Abdelwahab's "Critical Theory, Place Making and Architectural Practice" is an example. This paper discussed the urban park as a public space that is made for the people (*place making*) and analysed it as a design element that was constantly changing due to the different social activities that were present in it.<sup>7</sup> Abdelwahab studied the characteristics of a built park that created changing social patterns. She rated the success of a park based on the human activity present in it. Her study linked built form to social patterns. In contrast, interior architectural studies related to human interaction tend to explore user participation, personal space, gender and other cultural issues. Ahuva Windsor, Joshua Manor and Ayelet Zikli examined the interiors of office buildings by using a "participatory design process [that] included active involvement of user representative committees in physical design, and a preparation program for workers to the physical-organizational change in their work life."<sup>8</sup> Another architectural study "argued that people's perceived [architectural] meanings are the outcome of a cognitive interaction between human motivations and needs and the affordances of the built environment."<sup>9</sup> There appears to have been little evidence of the discussion of social engagement caused by the characteristics of built interior architecture elements.<sup>10</sup> This gap in interior architectural research led to this thesis. The thesis concentrates on the characteristics

---

<sup>5</sup> Yeatts "Social Animals" unpaginated

<sup>6</sup> Although it was officially founded in 1981, the IAPS (International Association of People Environment Studies) ran successful conferences in Europe from 1969 onwards. IAPS "Some History" unpaginated

<sup>7</sup> Abdelwahab "Critical Theory, Place Making and Architectural Practice" unpaginated

<sup>8</sup> Windsor, Manor and Zikli "Participatory Design of Government Office Buildings" unpaginated

<sup>9</sup> Motalebi Esfidvajani "A theory of meaning in architecture and urban design" p 2259

<sup>10</sup> Robert Sommer discussed the importance of considering personal space in interior design as a means of improving social interaction in 1969. Sommer Personal Space p 26

of built architectural elements within a greater interconnected system that can affect levels of privacy and social interaction, via a study of parallel urban design strategies.

The thesis was initiated from a fascination with the interconnected social patterns in the city. The initial research of social patterns within the urban context brought a realisation that the built environment and urban social patterns are closely connected. For instance the provision of a small park in the middle of four different buildings will bring the occupants of the different buildings to use that open area for leisure. Furthermore the introduction of a café in that open park will entice walkers who pass by to use that open space as well. Such a park, surrounded by four buildings that house diverse functions, has the capacity to create a social space and to affect the social structure of the city. The placement of parks, supermarkets, retail shops, streets and squares has an impact on the level of social interaction. Studies since the 1960s indicate a clear relationship between the social fabric and the built urban fabric. The built environment has the capacity to manipulate social patterns and the social dynamism of the city. The study of social patterns in the urban context resulted in the identification of “social friction” as a phenomenon that created an awareness of difference via the engagement of differences between various community groups through productive confrontation and conflict.<sup>11</sup> Social friction is seen as a productive way to exchange different ideas across diverse community groups present in the urban structure, resulting in a socially dynamic city. According to Maartin Hajer, Luca Bertolini and others, social friction in the urban context is caused by the overlap of various activity patterns and mobility options in the context of a city. Such an overlap in movement patterns is seen by them, to generate points of exchange creating points of friction. Although diversity is seen to be the key element for different activity flows, the way this diversity is organised can also be considered to be a vital element in the formation of social friction. Social friction, as defined by Richard Sennett, encourages interaction between different social groups and strengthens social dynamics in the urban context.

This observation from the urban context was taken as an opportunity for this thesis; an opportunity that has not yet been applied to interior architecture. Interior designers and architects traditionally consider relationships of colour, lighting, surface, materials, decoration,

---

<sup>11</sup> Sennett Uses of Disorder p 164



etc. in depth, but not how permeable boundaries, spatial adjacencies, the composition of new and old, etc. can establish activity flows leading to the positive social qualities of social friction in architecture itself. The exploration of such an opportunity for interior architecture will not only provide a different understanding for the discipline, but it will also provide a potential way to design for social interaction and exchange within the interior setting of large public buildings.

The thesis studies social friction as a mechanism for social interaction that is achieved by manipulating built form in the urban context to create healthier societal groups. Social friction is seen by Richard Sennett as a phenomenon that creates an awareness of the diversity of options, functions and people in the surrounding. According to Sennett, this awareness generates knowledge of the unknown or the new. It encourages people to exchange ideas and creates new groups that are not based on similarity but ones that are based on exchanging differences. “The existence of informal social networks within organizations has long been recognized as important”<sup>12</sup> and research shows that informal contact helps “development, exchange and dissemination of knowledge within the R&D [Research and Development] function.”<sup>13</sup> Large public buildings could benefit from such a phenomenon. Railway terminals, libraries, museums, and art galleries invite various socio-economic groups to visit them. They have a complexity in the type of functions they house and therefore have the capacity to generate intersecting activity flows. They are buildings that are meant for the public and therefore there is a need for considering interaction of the public within the public spaces. A study of the social characteristics of existing architectural circulatory elements and spatial elements can ensure the use of the appropriate elements within areas of these public buildings. Public buildings also house private functions such as offices for staff and back of house facilities that are strictly planned and require privacy. Large public buildings therefore can be treated as architectural structures that are a mixture of strict planned private spaces and informal overlapping public spaces. Hence the study of urban structures becomes very relevant for these building. The urban context is seen to be a mixture of the planned elements that create private closed groups and the overlapping informally planned patterns that create socially dynamic units. The mixture of the two structures creates various levels of social friction in the city and can be seen to do the same for these public buildings. Studying the elements that create and manipulate social friction in the

---

<sup>12</sup> Allen, James, and Gamle “Formal versus Informal Knowledge Networks in R&D” p 179

<sup>13</sup> Allen, James, and Gamle “Formal versus Informal Knowledge Networks in R&D” p 179

urban structures can therefore benefit the interior architecture. The thesis recognises the spaces in public buildings that benefit from lower levels of social friction (like private offices or work spaces) and ones that benefit from higher levels of social friction like (entrances, atriums, reception and information areas and other public spaces that house shared activity- cafés, seating, reading etc). It studies a range of circulatory architectural elements like the passage, the corridor, staircases, and the elevator, and then determines how they might encourage social friction or minimise it. It also proposes the possible use of these elements depending on the level of social friction required for that space. Similarly it also studies the social friction's potential tendencies of spatial architectural elements like the room, wall openings, permeable open planned spaces and enclosed open planned spaces to validate their use depending on the level of social friction required for the interior setting.

The thesis outlines the development of the idea of friction in the urban and social context. It discusses and defines several aspects and elements of urban design that engage, create and enhance friction and which enable the engagement of different people and different ideas. Engaging difference by using various types of connections can be seen as an essential strategy towards the creation of friction resulting in a socially dynamic environment.

## **DEFINING SOCIAL FRICTION**

The word “friction” was first coined in the social context by Richard Sennett in 1971. He explained, in Uses of Disorder, that the city allows for encounters between people of different groups/communities to take place due to the diversity it provides: “Experiencing the friction of differences and conflicts makes men personally aware of the milieu around their own lives...”<sup>14</sup> Conflict in this context is seen as a positive attribute and is not perceived as violent. It is seen as a way to engage difference via confrontation. Without difference there would be no friction.

Even though Sennett first coined the term friction in the social context, the ideas he was referring to were an accumulation of the work of other theorists including Jane Jacobs and Christopher Alexander. Similar strategies to positively engage differences had also been discussed by Jane Jacobs in 1961 in The Death and Life of Great American Cities. Jacobs emphasised diversity as a key attribute that forced people from different social groups to

---

<sup>14</sup> Sennett Uses of Disorder p 139

interact. She illustrated the role of diversity in the formation of different kinds of social networks that connect different groups of people together<sup>15</sup>. She also suggested ways to maximise diversity in the city. Soon after Jacobs, Christopher Alexander in 1965<sup>16</sup> anticipated a city structure that would allow for exchange between groups creating friction between them. He explained the concept of the *semi-lattice structure* as one that allowed for an overlap<sup>17</sup>. The semi-lattice is a system which contains groups of elements that overlap to create smooth connections between two or more different groups engaging their differences thus making it a system of friction. Ideas around social engagement in the city continued to grow after Sennett. Michel de Certeau in 1984 added the contribution of ‘the walker’ in the city to the idea of friction.<sup>18</sup> He explained how the walker created the space in which social interaction occurred. Without the walker there would be no space for friction to occur. The walker is the *flâneur*<sup>19</sup> who experiences the city via the act of walking or strolling. By discussing the walker, de Certeau also allowed the study of different levels of engagement of the walker with the surroundings depending on their movement and position in their journey.

Jacobs, Sennett and de Certeau discussed ideas related to friction in the social context. After 1984 the discussion about friction was more focused on the built fabric and formal organisation patterns that led to the formation of various social structures. Urban models and formal mechanisms for creating social friction were theorised by Deleuze and Guattari, Maartin Hajer and Luca Bertolini. Deleuze and Guattari’s theory on ‘the fold’ in 1987<sup>20</sup> added to Alexander’s ideas of the city structure of the *semi-lattice* overlap. They theorised the fold as a condition of space that “is not a crease or boundary, rather it involves a focus away from things, elements or points of stability and onto movements and folding between them”<sup>21</sup>, for instance an “enfolding of public/private, sacred/secular, temporary/permanent and legal/illegal.”<sup>22</sup> The fold creates an urban structure which provides an overlap between two different states allowing a connection between them. Within such an urban structure different formal elements contributed to the creation of the fold. One of these was illustrated by Maartin Hajer in 1999. He introduced

---

<sup>15</sup> “A mixture of Uses, if it is to be sufficiently complex to sustain city safety, public contact and cross-use, needs an enormous diversity of ingredients.” Jacobs The Death and Life of Great American Cities p188

<sup>16</sup> Alexander’s work was published in the article “A city is not a Tree”

<sup>17</sup> Alexander “A city is not a tree- part 1” p 58-62

<sup>18</sup> Certeau The Practice of Everyday Life p 91-110

<sup>19</sup> Charles Baudelaire introduced the notion of the *flâneur* in The Painter of Modern Life (1964)

<sup>20</sup> Deleuze and Guattari first published their findings in A thousand plateaus : Capitalism and Schizophrenia

<sup>21</sup> Dovey and Polakit “Urban Slippage” p116

<sup>22</sup> Dovey and Polakit “Urban Slippage” p116

friction as a phenomenon that was created by manipulating circulation paths and one that created exchange between different social groups.<sup>23</sup> The strategic planning of circulation paths had the capacity to create varying levels of friction in the urban context. In 2006, Luca Bertolini added to Hajer's views on the creation of friction. He suggested that exchange points could be created between various social groups via the manipulation of the paths of various mobility options in order to create an overlap<sup>24</sup>. He believed that a space and time overlap of different mobility options caused paths of various social groups to intersect allowing for exchange and thus creating social friction.

Although these urban models and elements helped the understanding of how friction could be created in the urban context, architectural theorists like Rem Koolhaas developed other ideas related to friction. In 2005 Koolhaas discussed Lagos (the former capital of Nigeria) as a city of visible frictions<sup>25</sup>. For Koolhaas, friction was seen to be created by the collision of paths of different people, moving in different directions and performing different functions in the same space. He noticed that high levels of friction in the city of Lagos resulted in stoppages in movement. From Koolhaas' work friction was understood to have an effect on the rate of movement of the walker on the footpath as well as the rate of vehicular movement on the street. Friction was related to acceleration and deceleration.

All of these models, experiments and elements in the urban context not only provide varying levels of friction in different situations but in doing so they allow varying levels of movement and, as a result, varying levels of engaging the citizen with their surrounding context. The urban research of this thesis results in the categorisation of different friction types, namely: visual friction, manipulated friction and indirect friction.

## **THE ORGANISATION OF THE THESIS**

After a thorough exploration of three different friction types in the urban context and their social effects, the thesis explores elements of interior architecture in terms of social friction. Such an exploration creates an understanding of traditional interior elements in relation to the social interaction they allow. Elements like the corridor and the elevator are typically used in

---

<sup>23</sup> Hajer, Maarten "Zero- Friction Society" pp 29-34

<sup>24</sup> Bertolini "Fostering Urbanity in a Mobile Society: Linking Concepts and Practices" p 328

<sup>25</sup> Lagos: Wide and Close unpaginated

architecture for purposes of circulation. An analysis of such elements in relation to the type of connections they allow, the speed of movement they enable, the level of social connectivity they permit, the extent and type of their physical and invisible boundaries etc., also enables us to understand these traditional elements in a similar way to the urban mechanisms of social friction researched earlier in the thesis. Studying the history of interior architectural elements enables an understanding of the development of different circulatory devices, open planning, interior openings etc. and how they facilitate or deny social interaction and friction. Robin Evans, for example, explains the history of interior architectural elements such as the corridor, the passage, the door and the open plan etc with regard to the formation of social relationships in a domestic setting.<sup>26</sup> The traditional corridor was described as a mechanism for speedy transactions since it minimised intersection of circulation paths of the servants and the residents who lived in the interior.<sup>27</sup> The door however, was one that allowed connections between the various rooms and therefore between the different people who occupied those rooms. The wall is an architectural element that created a divide, but the introduction of the door allowed connections between the spaces the wall separated. The use of more than one door in a room created an interconnected spatial matrix in the interior context.<sup>28</sup> The social tendencies of conventional interior architectural elements like the corridor, the passage, the elevator, staircases, rooms, wall openings and open planned areas are studied in order to explore the different levels of friction they are capable of creating in the architectural context. This enables their comparison with the urban elements studied in the first part of the thesis. The comparison of the interior elements with the urban elements facilitates the transfer of social friction from the urban context into the interior context.

Consequently the thesis has the following aims and objectives:

- To research urban design models that focus on public interaction
- To define elements in urban design that manipulate levels of friction
- To study different types of friction in the urban context
- To study the characteristics of friction at its extremes
- To study the social tendencies of traditional interior architectural elements

---

<sup>26</sup> Evans "Figures, Doors, Passages" pp 57-91

<sup>27</sup> Evans "Figures, Doors, Passages" p 71

<sup>28</sup> Evans "Figures, Doors, Passages" p 65

- To create parallels between the urban mechanisms for social interaction with interior architectural elements

These objectives are developed in four chapters.

Chapter 1 is a background study. It acknowledges the work of the theorists that have contributed to ideas relating to social friction in the urban and social context. It discusses the evolution of the idea of friction as a social mechanism in the city by explaining the social structures that are formed due to friction or the lack of them. It then studies the work of theorists who have discussed elements in the urban context and their capacity to modify the social structure. After establishing a relationship between the urban built fabric and the urban social fabric, the chapter studies the work of theorists who discuss the urban structure as constructed from a mixture of social movement and built form, of informal activity and formal planning, of changing elements and unchanging factors. It analyses the various connections within these urban structures that create smooth transitions from one entity to another allowing differences to be engaged and thus creating friction within its several parts. Friction is studied as a productive social mechanism that encourages the exchange of ideas, concepts and thoughts across different social groups and is explored to achieve similar goals when applied to interior architecture. This chapter also studies the tendency of friction at its extremes. Such a study enables an analysis of the relationship between speed and friction. The study of such a relationship suggests that social friction might be manipulated by scrutinising the notion of speed.

Chapter 2 defines the elements that create, manipulate and control levels of friction in the urban environment. It identifies five friction elements that were identified in chapter one as being mechanisms that create different social conditions, namely: the pathway, the filter, the generator, the inactive generator, and the connector. Defining the characteristics of these elements enables the study of interior architectural elements in similar terms in chapter three. An analysis of the characteristics of the friction elements also results in exploration of the different friction types: visual friction, manipulated friction and indirect friction. These friction types are seen to create different types and levels of social engagement.

Chapter 3 takes the circulatory urban elements (connector and the pathway) from chapter two and considers how these mechanisms might produce different kinds of friction in the interior

architectural context. Circulatory architectural elements like the passage, the corridor, the elevator and staircases are identified as relevant interior architectural mechanisms. Hence parallels are constructed between the friction elements from chapter two and these circulatory interior architectural elements. These definitions study the properties of the architectural elements in terms of social friction. The chapter proposes ways in which these architectural elements can manipulate movement, restrict access, isolate, connect, and engage the different social groups that use an interior space.

Chapter 4 has a similar approach to chapter three. Chapter four takes the generator and the filter from chapter two and considers how these might function in the interior context. Interior spatial elements like wall openings, the room and types of open planned areas are seen to have similar social properties to the filter, the enclosed generator, and the open generator. The chapter studies the level of friction each of the interior elements generates and proposed their use in different private and public areas of large public buildings.

## **CONCLUSION**

This thesis validates the use of urban design theory to inform interior architectural practice by exploring the potential to use social friction in interior architecture through the strategic use of existing interior mechanisms.

## CHAPTER 1: BACKGROUND STUDY

This chapter is divided into three sections which explain the history of the different social structures and urban structures that contribute to the idea of friction (figure 1.01). These sections are: the social context, the urban elements and the overlapping urban structure. The chapter introduces the three sections by discussing the inhabitant of the city as the agent of social interaction. It draws from the work of Michel De Certeau and explains the walker as a vital contributor to the dynamic social structure of the city.

The social context section introduces the work of Richard Sennett who first coined the term “friction” in 1971 as being a condition that creates an engagement of difference. Sennett’s work explains the social effects of friction in the city. It enables the understanding of different conditions that are created in the social structure of the city with the introduction of friction. The section also touches on the work of other theorists like Christopher Alexander, Maartin Hajer, Jane Jacobs and Kevin Lynch who contributed to ideas related to mechanisms of social interaction, namely: *contact points*, *collision points* and *social strands*. The introduction of the social context allows an understanding of the social consequences of the application of friction.

This second section: the urban elements, links the urban context to the social context. It discusses the work of Jane Jacobs and Christopher Alexander, who link built urban elements to social patterns. Such a study results in finding various urban elements that contribute to the varying levels of friction in the city. The characteristics of these elements are discussed further in chapter two.

The final section, the urban overlapping urban structure, discusses the work of Christopher Alexander, Rem Koolhaas as well as Colin Rowe and Fred Koetter. These theorists explain the overlapping structure of the city (which is a mixture of the built urban elements and the social patterns discussed in section one and two) that creates transitions from one zone to another. In doing so it allow differences from each of the zones to engage and therefore create an urban system within which different types of friction exists. The discussion of the overlapping nature of the city results in finding of three friction types – visual friction, manipulated friction and indirect friction.





Figure 1.01: Chapter Structure

### **The walker as the agent of social interaction**

Michel de Certeau in The Practice of Everyday Life contributed the idea of the walker (developing Baudelaire's notion of the flâneur) as the inhabitant of the city. De Certeau discussed the walker as a vital contributor to the creation of space within which friction exists.

De Certeau used the analogy of English literature to explain how the walker can create thick and thin sentence structures in the urban context by the act of walking, similar to the way the poet would compose a poem. The walker is a part of many of the intertwining daily behaviours and therefore is not able to read the sentences they write or the knowledge they create. "The paths that correspond in this intertwining, unrecognised poems in which each body is an element signed by many others, elude legibility."<sup>29</sup> Thus de Certeau explained that the 'writing' that is composed by the intersection of all the patterns and created by a number of different walkers, forms a network that has no author. This anonymous 'writing' is created by the connection of different 'sentences' that the walker 'writes'.

De Certeau explained that the walker is in search of another place which persuades them to walk towards it. Therefore they are not connected with the space they inhabit while they walk.

To walk is to lack a place....The moving about that the city multiplies and concentrates makes the city itself an immense social experience of lacking a place - an experience that is, to be sure, broken up into countless tiny deportations...compensated for by the relationships and intersections of these exoduses that interwove and create urban fabric, and placed under the sign of what ought to be, ultimately, the place but is only a name, the City.<sup>30</sup>

The pedestrian/walker disengages themselves from the place that they define by the act of walking. Walking outlines the social space in which individuals may find temporary meeting points to engage difference thus creating friction but at the same time the walker (during the act of walking) is disconnected from that very space they define. The walker defines the friction zone but is disengaged from the zone while they are in motion. Without the walker there will be no social friction which makes the walker the agent of social interaction.

---

<sup>29</sup> De Certeau The Practice of Everyday Life p 93

<sup>30</sup> De Certeau The Practice of Everyday Life p103

## THE SOCIAL CONTEXT

Richard Sennett, a Professor of History and Sociology and University Professor of the Humanities at New York University, was the first to use the word “friction” in the social context as a phenomenon that allowed differences between various social groups in the city to engage. He explained in Uses of Disorder (1971) that the city was an ideal place for engaging differences because of the diversity present within it. Diversity gives rise to difference in the urban context.

Sennett (and others)<sup>31</sup> identified key aspects of the social context which can be categorised into two groups. The first group consists of a social structure that leads to the formation of community groups and the second group consists of social structures that promote interaction between the groups.

## COMMUNITY GROUPS: AN ACT OF EXCLUSION

Sennett discussed suburban areas as ones that promoted community life. Community groups as seen by Sennett are exclusive entities. He believed that suburbs attract people of similar social groups thus creating closed units. “People in the suburbs have a sense of togetherness, of possessing an identity, a sense of “we” as a community, but that kind of social cohesion is exactly what most people nurtured in suburbs are seeking to escape.”<sup>32</sup> A community is seen as a group of people who share something in common. People in a community are scared of “*otherness*”. Otherness can be seen as a phenomenon that leans towards difference; difference in ideas, religion, financial status and/or ethnicity. Thus access can be denied to a community if an individual is different from the rest. People who are brought up in such communities do not get exposed to otherness. They find new experiences unreal or even painful. These communities can be seen as groups with minimal friction in their social structure since they do not engage difference but encourage similarity therefore restricting diversity.

Christopher Alexander, Professor of Architecture at the University of California, Berkeley also described such community groups as closed units in 1965.<sup>33</sup> He defined communities to be self-

---

<sup>31</sup> Christopher Alexander and Maartin Hajer

<sup>32</sup> Sennett Uses of Disorder p xii

<sup>33</sup> Alexander “A City is not a Tree- Part 1” pp 58-62

sufficient entities. Such communities place great emphasis on their identity and increase their segregation from other communities by providing their own schools, hospitals, retail centres, supermarkets, recreation etc.<sup>34</sup> They do not encourage two groups with different ideas to engage due to their self-sufficient nature. Community groups are therefore discussed in this thesis as realms of exclusion and minimum friction entities.

The second category of ideas Sennett examined can be described as contrary to the formation of community groups. Instead these mechanisms cut across the boundaries of such closed groups and promote interconnection.

### **SOCIAL PENETRATION AND INTERACTION**

This section introduces and defines the mechanisms for social interaction, namely: *contact points*, *collision points* and social *strands* and as points or lines through which information is exchanged between different social groups. These enable interconnection and interaction between different socio-economic groups that exist in the city.

In Uses of Disorder Sennett found that the city, unlike the suburbs, had the potential to break the exclusive tendency of the social structure of community groups due to the degree of diversity present within it. He asserted that diversity in a city forces an overlap in various kinds of groups making it very hard for any one group to control its limits and create walls around it. “The garment district of New York, for example, [Sennett noted] spills into a district of offices which spills into a district of social-work agencies which spills into a district of elegant townhouses which spills finally into the great shopping areas around Fourteenth Street.”<sup>35</sup> Sennett used Jane Jacobs’ text The Death and Life of Great American Cities to summarise that the city is made up of neighbourhoods that allow the “penetration of diverse modes of labour and life into each other.”<sup>36</sup> A social overlap is created by diversity in groups of people present in an environment, namely: social, economic and ethnic diversity, diversity in facilities and services available, diversity in commercial products, diversity in market types, diversity in transport options etc. Diversity resists the creation of walls around any one social group, forcing

---

<sup>34</sup> Maartin Hajer explained that the self-sufficient nature of *privatopias* do not allow for exchange from other social groups and therefore do not promote friction. “For themselves they will have a sense of community yet their new public domain is one with clear rules of exclusion.”<sup>34</sup> Hajer “Zero-Friction Society” p 33

<sup>35</sup> Sennett Uses of Disorder p 46

<sup>36</sup> Sennett Uses of Disorder p 47

it to spill into another social group creating an overlap. The social walls that are created without diversity are strong and thick however these walls become nimble, responsive, active and perforated with the introduction of diversity. The spilt area is where the overlap occurs. This area is where the two or more different groups engage creating friction, and can be distinguished by their use of *contact points*, *collision points* and social friction *strands*.



Figure 1.02: Points of social contact

### Contact points

Sennett introduced the idea of *contact points* as points through which social interaction takes place in areas where there is a social overlap. He used the example of Halstead Street in Chicago to illustrate the concept of *contact points*. Halstead Street is one that appears to be filled with a mixture of foreigners: Chinese, Greek, Polish and Irish. Although the functioning of the street may appear to be jumbled Sennett explained that there are “hidden threads of a structured social existence.”<sup>37</sup> This structure is made up of a number of *contact points* which enabled people

to enter into social relations across various groups. These points ensured that new groups formed by the contact “were not massed together in one spot on the map; rather they penetrated into each other, so that the daily life of an individual was a journey between various kinds of group life, each one different in its function and character from the others.”<sup>38</sup>

*Contact points* can be seen as points where two or more individuals confront each other and differences are engaged (figure 1.02). These points act as gateways into a new social experience and are created when there is an overlap between two or more social groups. They are points

---

<sup>37</sup> Sennett *Uses of Disorder* p 54

<sup>38</sup> Sennett *Uses of Disorder* pp 56-57

that facilitate the transfer of knowledge from one group to another. *Contact points* mark the formation of new groups which are a result of differences engaging. The new groups that are formed are a consequence of social friction through points of contact between two or more walkers from different social groups (figure 1.03).

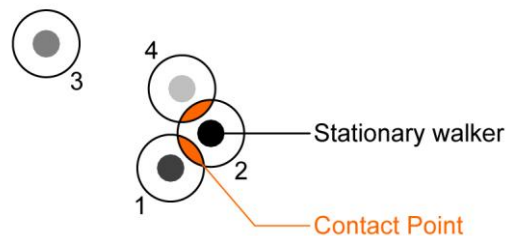


Figure 1.03: Points of exchange between two or more stationary walkers

### Collision points

In 1999 Maartin Hajer, Urban Planner and Professor of Public Policy at the University of Amsterdam, discussed another mechanism that created exchange of information between different social groups. He believed that avoiding colliding circulation paths is a result of the celebration of movement and speed in public places. Railway stations and airports work in their own right, however their emphasis on speed and congestion control does not allow them to take opportunities of the multi-cultural and multi-modal interchange in order for them to function as a public domain<sup>39</sup>. Hajer mentioned that these terminals have the potential to become socially dynamic areas within the urban context because of their capacity to create points of exchange by the manipulation of the movement patterns of the different social groups that use them. These points of exchange, which are created during the phase of movement due to colliding circulation paths, allow differences to engage and generate friction between the different groups (figure 1.04).

In 2006 Luca Bertolini, Professor of Urban and Regional Planning at the University of Amsterdam, discussed a similar idea. He explained the importance of planned circulation paths in order to create a space-time overlap in mobility flows that allowed people to engage and therefore create an exchange between different social groups.

---

<sup>39</sup> He defined a public domain to be a space where “social interaction across different cultural segments of society ....takes place” (Hajer “Zero-Friction Society” p 32) as opposed to a public space that everyone in the public is allowed to use.



Figure 1.04: Intersecting Movement Patterns

Bertolini theorised multi-modal passenger interchanges as being important elements in the urban context that allowed for exchange and overlap across a number of societal groups. He explained that the ability of various groups to be mobile allowed for the creation of a socially dynamic environment. “Mobility systems are ever more crucial in granting individuals and organisations the access to the spatiality and temporally disjointed resources they need to thrive.....”<sup>40</sup> Thus activity patterns are caused by different mobility options and different user requirements. According to Bertolini diversity will cause different social groups to gather in an area and exchange ideas. A diverse surrounding attracts people from a number of social groups into that space allowing for exchange amongst the different groups. This helps create a cluster of activity patterns that is caused by the interaction, confrontation and collision of different clusters of people resulting in the creation of *collision points* that allows an exchange of different ideas. “Both diversity and exchange can be seen as essential ingredients for urbanity”<sup>41</sup> and vital factors in the development of a public realm. Bertolini theorised that *space-time*

---

<sup>40</sup> Bertolini “Fostering Urbanity in a Mobile Society: Linking Concepts and Practices” p319

<sup>41</sup> Bertolini “Fostering Urbanity in a Mobile Society: Linking Concepts and Practices” p320

*overlap* is the essential element for exchange to be created.<sup>42</sup> It is necessary that “the mobility flows associated with the different activities actually *overlap* in space and time.”<sup>43</sup>

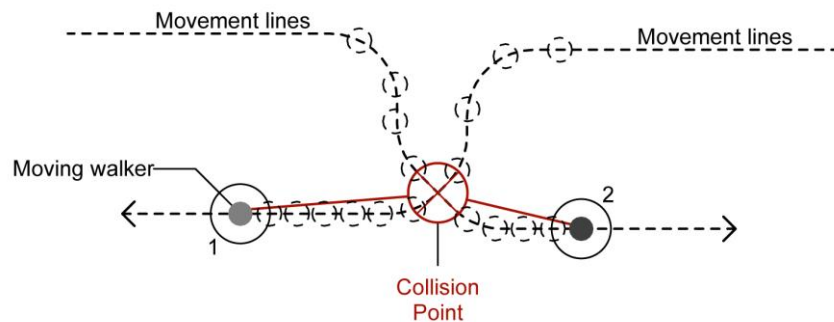


Figure1.05: Point of exchange between two walkers in the state of movement

*Collision points* are points that are created by the manipulation of movement patterns of different social groups. They are points that allow exchange between individuals *in a state of movement*. As stated above *collision points* can be seen to be a result of a planned *collision* of two or more walkers (from different social groups) in movement (figure 1.05). They encourage exchange of ideas by taking opportunities of the movement and activity patterns of mixed social groups present in the city.<sup>44</sup>

*Collision points* differ from *contact points*. Although they allow confrontation of two or more different groups the condition that causes them is very different. *Collision points* are points that allow for exchange in the process of experiencing movement from one point to another. *Contact points* are, on the other hand, created by an overlap of social groups that allow for the exchange of ideas in slow movement areas (figure 1.06). *Collision points* develop in areas where a number of mobility options intersect and maximise opportunities from the movement

<sup>42</sup> William Whyte discussed a similar idea to Bertolini in *The Social Life of Small Urban Places*. He explained the success of the plaza of the Seagram Building in New York to be an intersection of a number of different activity patterns. The steps facilitated shortcuts through the plaza but also allowed seating space. The water pools were an important feature since they allowed children to play. The location of the plaza by the footpath and street corner further allowed complexity in activity since there was a visual connection from the plaza to the moving walker on the footpath and the stationary ones at the traffic lights. Therefore the open plaza not only allowed an overlap of activity flows but also allowed visual connections to other activities that happen around it.

<sup>43</sup> Bertolini “Fostering Urbanity in a Mobile Society: Linking Concepts and Practices” p328

<sup>44</sup> Urban design has the capacity to address a brief which concentrates on the “development of the public domain as a realm within which (the) exchange of ideas, cultural preferences and political arguments takes place, opinion change and preferences are formed....” Hajer “Zero-Friction Society” p 34



of people created by various activity patterns.<sup>45</sup> The intersection of such activity patterns results in a state of collision (figure 1.07). Collision may result in an abrupt stoppage or a sudden reduction in the rate of movement of the activity patterns that intersect. Unlike the *contact point*, the stoppage or reduction in speed which occurs with *collision points* is not gradual or caused by a spill in social structure but rather is caused by an intersection of movement allowing “mobility flows associated with different activities (to) actually overlap in space and time.”<sup>46</sup>

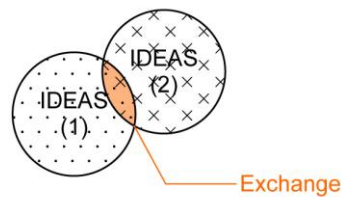


Figure 1.06: Contact points - Exchange due to social overlap

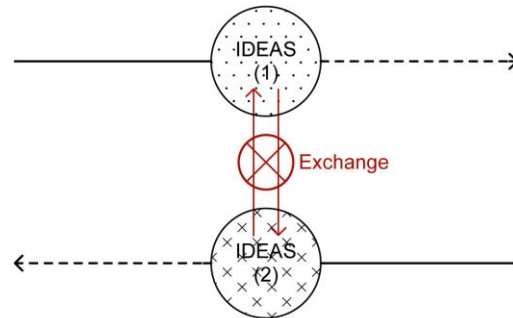


Figure 1.07: Collision points – Exchange due to intersecting movement patterns

## Social Strands

In 1961 Jane Jacobs, American-born Canadian writer and activist anticipated the ideas that led to Sennett’s work on friction in 1971. Jacobs’ The Death and Life of Great American Cities discussed the role of diversity in creating a dynamic social experience. She explained that the only thing that will get people from one part of the city to venture out into another is difference and not duplication.<sup>47</sup> Difference (diversity of options, function etc.) will encourage individuals from one street to weave their way to another in order to explore diversity of options available to them. The social experience that is caused by diversity in the city is created by a number of intertwining *strands* of contact that make up the social fabric of a dynamic city.

<sup>45</sup> Luca Bertolini explained that activity patterns are caused by different mobility options and different user requirements. A diverse surrounding attracts people from a number of social groups into that space allowing for exchange amongst the different groups. This helps create a cluster of activity that is caused by the interaction and confrontation of different clusters of people. Bertolini “Fostering Urbanity in a Mobile Society: Linking Concepts and Practices” p 328

<sup>46</sup> Bertolini “Fostering Urbanity in a Mobile Society: Linking Concepts and Practices” p 328

<sup>47</sup> For instance if Vivian Street were the same as Lambton Quay then there would be no cross- use across residents/users of those streets which would create a discontinuation of the street network. “Differences, not duplication, make for cross-use and hence for a person’s identification with an area greater than his immediate street network. Monotony is the enemy of cross-use and hence of functional unity.” Jacobs Death and Life of Great American Cities p 169

Jacobs divided the city into different categories of neighbourhoods: the street, the district and the city neighbourhood. These were not discussed as physical boundaries that create settlements but rather as regions that were created by social contact.<sup>48</sup> For instance a social connection across several streets created a street neighbourhood across several districts. This social connection is created when an individual from one street interacts with an individual from another street who then interacts with someone else on a different street. Therefore there is continuity in the connections creating a *social strand* along which ideas are exchanged and shared.

A *strand* is a social link that has the capacity to weave through different districts and create a connection between them. It forms a continuous link between different socio-economic groups by connecting *contact points* and *collision points* (figure 1.08). Such a *strand* enables the transfer of information into different social groups in various parts of the city.

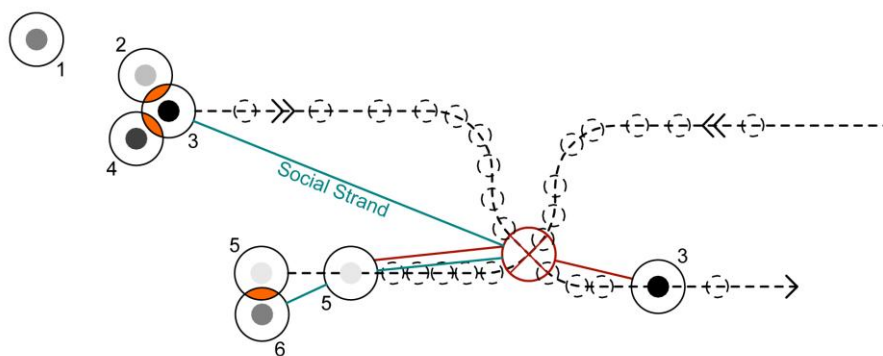


Figure 1.08: Social Strand: *Contact points* create a possibility for exchange of information between (stationary) walker 3 and 4 potentially creating a social link between them. This link continues when the paths of walker 3 and 5 collide. The link further grows due to the interaction of walker 5 and walker 6 creating a social *strand* through which information can be transferred (between walker 2,3,4,5 and 6).

A social *strand* has the capacity to connect different areas of the city. As discussed by Jacobs the continuity of a social *strand* depends on the diversity of options in the surroundings. Diversity of function ensures that the movement of the walker is not confined to a specific area.

<sup>48</sup> Placing Jacobs ideas in the Wellington context, she was not discussing (for example) the neighbourhood of Te Aro in Wellington as a district neighbourhood but she is looking at how for instance an individual from Vivian St has a social connection with someone on Willis Street, who in turn has a connection with an individual on the Terrace, who has one with a person on Tinakori Road.

It persuades the walker to cut across the boundaries of areas. Diversity therefore ensures the continuation of the social *strand*, making it a social mechanism that has the capacity to create exchange across the edge of two or more areas in the city. Kevin Lynch, in *The Image of the City* (1960), explained the quality of the edge that would ensure the continuation of a social *strand*.

An edge may be more than simply a dominant barrier if some visual or motion penetration is allowed through it - if it is, as it were, structured to some depth with the regions on either side. It then becomes a *seam* rather than a barrier, a line of exchange along which two areas are sewn together.<sup>49</sup>

Lynch discussed Cambridge Street in Boston as being an edge that acted as a *seam* due to the visual connections it allowed to the 'two major areas' around it.<sup>50</sup> A visual connection to the diversity and difference in another area entices people from one region to explore the diversity in the area they have a visual connection with and creates movement patterns between the two zones. These movement patterns ensure the continuation of a social *strand*. The movement of the walker from one area to another enables the social *strand* to cut across the edge converting it into a line of exchange or a *seam*. The movement of the walker across the edge provides opportunities for them to engage with other walkers from different social groups further increasing the possibility for the social link to continue.

## THE URBAN ELEMENTS

This section discusses the work of theorists who discuss built urban elements that influence and facilitate the different social connections (*contact points*, *collision points*, and *social strands*) amongst the citizens. It uses the work of urban theorists to explain how different built elements in the urban context can contribute to the different social structures like community groups or interconnected social conditions.

## THE FOOTPATH

Jacobs noted various urban design elements that contributed to varying levels of social engagement. She studied the 'sidewalk' (footpath) and playgrounds as spaces within which social relations were formed. Such spaces acted as friction zones since they were spaces within which different social groups interacted through *contact points* and *collision points*. Jacobs explained footpaths as urban elements that have the capacity to maintain the privacy of an

---

<sup>49</sup> Lynch *The Image of the City* p 100

<sup>50</sup> Lynch *The Image of the City* p 65

individual.<sup>51</sup> The footpath defines the **pathway** which allows for people from different social, financial and/or ethnic groups to use it at any time without feeling unwelcomed and unwanted; making it possible for them to occupy the same space and make decisions regarding who they want to interact with, excluding any social pressure. For example an individual may stop and buy a newspaper from a shop on the footpath and they may also choose to have a casual conversation with the shopkeeper. The level of interaction and involvement is determined by the footpath user.

### THE PUBLIC CHARACTER

Jacobs went on to explain the contact between the shopkeeper and the individual as being a point of interaction and interchange. Such points facilitate exchange between the different social groups that use the footpath. They become points where the transfer of information takes place and therefore create friction between the different groups that use the footpath.

The shopkeeper in the instance mentioned above is described by Jacobs as the ‘public character’, one of those people who play an important role in the exchange of information. “A public character is anyone who is in frequent contact with a wide circle of people... his main qualification is that he is public, that he talks to lots of different people. In this way news travels that is of sidewalk interest.”<sup>52</sup>

A public character interacts with a number of people from different social groups. Due to such interaction there is an exchange between the two or more different people which causes friction amongst the people who interact with the public character. The public character can be seen as a mechanism that facilitates friction. At the point of interaction of one individual with the public character, differences are engaged and information is exchanged. When the same public character interacts with another individual on the footpath, the information that was exchanged from the first might be passed onto a second and as a result filtered back into street life. The public character can be understood as a **filter** since they are confronted with a number of different ideas and people and then filter out those ideas back into the social structure of the street.

---

<sup>51</sup>“A good city street neighbourhood achieves a marvel of balance between its occupant’s determination to have essential privacy and their simultaneous wishes for differing degrees of contact, enjoyment or help from the people around.” Jacobs The Death and Life of Great American Cities pp 77-78

<sup>52</sup> Jacobs The Death and Life of Great American Cities pp 89-90

## THE PLAYGROUND

In her book, Jacobs also discussed (along with the footpath and the public character) the park as another element that is the **generator** of social exchange (via *contact points* and *collision points*) between different social groups that used it. She explained the park as being an area that enabled new social connections to be formed.

Jacobs suggested that the diversity of function around a park will cause different types of people to use it at different times in the day. For example if the park is surrounded by a university, an office building, cafés and residential flats it will have joggers early in the morning, students using it during the course of the day, office staff using it during lunch and coffee breaks, mothers bringing their children in the afternoons and so on. Therefore the park becomes a point in the city where different social groups cross paths and may create new connection *strands* resulting in the formation of social friction. For Jacobs, a successful urban park will have diversity of functions surrounding it in order to attract a diverse social population. In doing so it will create social exchange between the groups that use the park, via informal mingling, creating friction zones in the park.

Although parks were seen as areas with the potential to enhance social connections they were also explained by Jacobs to be elements that have the capability to detract from their surrounding areas. “Unpopular parks are troubling not only because of the waste and missed opportunities they imply, but also because of their frequent negative effects.”<sup>53</sup> They affect the neighbouring property value and as a result restrict socio-economic diversity becoming areas with minimal friction. Jacobs goes on to explain that isolated parks are potential targets for vandals and therefore become unsafe environments due to lack of use. Jacobs used Lynch’s idea (of treating the edge of the park as a *seam*) as a way to resolve this issue.<sup>54</sup>

Christopher Alexander in 1965 also contributed to the criticism of the isolated park.<sup>55</sup> Alexander critiqued many playgrounds with fenced enclosures as elements that discourage social

---

<sup>53</sup> Jacobs *The Death and Life of Great American Cities* p 123

<sup>54</sup> Jacobs *The Death and Life of Great American Cities* p 349 Jacobs added to Lynch’s idea (of the edge behaving like a *seam*) by explaining that borders of dead spots should be treated as a *seam*. If parks are placed as a divide between two different localities they need to be treated as *seams* to enable social exchange between two different groups. Such borders enable exchange by engaging differences from two sides and as a result create friction.

<sup>55</sup> Alexander “The city is not a tree- part 2” p 59

interaction. He expanded on Jacobs' concept of the playground by explaining that places of play are most productive when they happen in an area of overlapping activities. He believed that a playground has its own system that consists of people who play in it and objects that are used for play. Play happens in different places - sometimes at the lake side, other times in a car park, and many times on streets. In these places the system of play overlaps with the system of the surrounding environment. Some fenced playgrounds do not allow this overlap by isolating their objects of play and their inhabitants. Such isolation, caused due to the enclosed condition of the playground, does not allow the borders of the playground to act as a *seam* or a line of exchange as a result isolating the different groups and creating closed units resulting in minimal friction.

### THE DEAD SPOT

Small parks were seen by Jacobs as being a part of the 'general land' type which is the kind of land that people use to circulate and move freely in. Jacobs explained that such land is distinct from and in constant tension with what she terms 'special land' or 'dead place' which she defines as land that people never walk through but always walk alongside or around. A vacuum in a general land type (such as ponds in parks) results in a dead place.<sup>56</sup>

As Jacobs notes:

There is always a pull and counter pull between special land's [or dead place's] two roles: as a contributor to the use of general land [parks] on one hand, and an interference with its use on the other.....Variations and intensity of the special lands give and take with general land are needed, because quiet spots and crescendos of busy spots are necessary results and aspects of street and district diversity...<sup>57</sup>

According to Jacobs, cities need small quiet dead spots. William Whyte discussed a similar idea in The Social Life of Small Urban Places.<sup>58</sup> He emphasised the importance of a pool of water in the public plaza of the Seagram Building in New York. He explained that the pool not only had the potential of creating intersecting activity patterns in the surrounding areas (children playing with the water, people reading by the side of the water, couples enjoying the calm atmosphere whilst being in a public place) but also had the potential to create a certain degree of privacy along its perimeter. By discouraging people from walking through it, it created a vacuum in the middle of a busy public plaza. The dead spot, due to the lack of activity within its boundaries,

---

<sup>56</sup> Jacobs The Death and Life of Great American Cities p 345

<sup>57</sup> Jacobs The Death and Life of Great American Cities p 344

<sup>58</sup> The Social Life of Small Urban Places unpaginated

allows visual connections with the diversity of activities, functions and people who occupy the spaces around it, becoming an **inactive generator** in the city.

### THE URBAN VEHICLE

Alexander introduced the urban taxi as an overlapping entity that created connections in the urban context. The taxi, as a vehicle, allows the transition from the slow pedestrian world into the fast vehicular zone and back into the pedestrian world. This urban taxi, as explained by Alexander, can be understood as another element within the urban structure that creates connections and engages two different experiences.

“The system which contains the taxi cabs needs to overlap both the fast vehicular traffic system and the system of pedestrian circulation.”<sup>59</sup> It acts as a **connector** that facilitates the transition between two changing states of motion allowing them to engage. Therefore the taxi can be seen as an element that engages different phases of motion to create friction between them.

The taxi as a vehicle is an important element within the urban structure. This element moves from a stationary position into a high speed zone and back into the stationary state. This transition from slow to fast and back into slow it allows varying levels of engagement with the surrounding context.

The urban elements like the footpath, the public character, the playground, the dead spot and the vehicle have the capacity to manipulate the social structure of the city. They therefore become friction elements since they have the ability to manipulate the mechanisms for social interaction (*contact points*, *collision points* and *social strands*). The footpath becomes the pathway on which social interaction takes place, the public character behaves as a filter of information in the process of exchange, the playground becomes the generator of new points of interaction, the dead spot creates vacuums within the city making it an inactive generator and the vehicle acts as a connector that connects different experiences allowing their differences to engage.

---

<sup>59</sup>Alexander “A city is not a tree - part 2” p 59

## THE URBAN STRUCTURE

The previous sections discuss the mechanisms of social interaction (*contact points*, *collision points* and social *strands*) and the urban elements which activate these (the footpath, the public character, the playground, the dead spot and the vehicle). It also discovers the abstract qualities of the urban elements that convert them into friction elements, namely: the pathway, the filter, the generator, the inactive generator and the connector). The diversity in function and options around these elements affects the different social groups who may use or visit any space. This section discusses the urban structure within which these urban elements and social patterns exist, namely the semi-lattice city structure. This overlapping city structure is seen to create a mixture of three different friction types.

## THE OVERLAPPING STRUCTURE

A semi-lattice city structure was explained by Alexander as a collection of sets which when “two overlapping sets belong to the collection, then the set of elements common to both also belongs to the collection.”<sup>60</sup> The semi-lattice structure allows for social interaction because its “social structure is thick with overlap.”<sup>61</sup> Alexander described the urban condition of the semi-lattice overlap by illustrating a condition in Berkeley. At the intersection of two streets there is a traffic light. On that very intersection just by the traffic light there is a drug store (dairy) that displays the daily newspaper on a newspaper rack at its entrance. People wait to cross the street and stop by the light while vehicular traffic passes by. The visibility of the news rack from the traffic light makes some people read the headlines while they wait; others even buy the paper. This makes the sales of the newspaper dependant on the traffic light signal. “The news rack, the traffic light, and the sidewalk between them as related as they are, form the fixed part of the system. It is the unchanging receptacle in which the changing parts of the system - the people, newspapers, money and the electrical impulses can work together.”<sup>62</sup> In this case of the semi-lattice structure different instances of exchange are created. The traffic light signal has the capacity to form *contact points* within its immediate area creating a small friction zone. This friction however is different to the type of friction that is created when the walker who visually engages with the newspaper rack. The engagement of the walker with the newspaper stand is created due to a **visual connection** as opposed to a **social connection**. This visual interaction attracts the walker towards the dairy which in turn causes him to interact with the public

---

<sup>60</sup>Alexander “A city is not a tree - part 1” p 59

<sup>61</sup>Alexander “A city is not a tree - part1” p 62

<sup>62</sup>Alexander “A city is not a tree - part 1” p 58



character (the dairy owner). The interaction between the walker and the public character creates a *contact point*. However the public character has the capacity to create an **indirect line of contact** between this walker and another one, by filtering out the same information to them, creating another type of friction.

A semi-lattice city structure encourages social interaction by manipulating physical form as well as providing visual connections that allow different levels of friction. This system contains elements like the public characters as the filter, the playground as the generator and the taxi as the connector, the dead spot as the inactive generator and the footpath as the pathway, as urban design components that facilitate the transfer of information via productive engagement of different social groups creating friction within its many parts. It is a system whose sets intersect to create a transition from one group to another caused by the overlap and element or area of intersection.

An overlapping city structure<sup>63</sup> contains both planned and unplanned elements, changing and unchanging elements that work together to create transitions between different identities. Such a city structure enables social interaction. Extreme overlap creates extreme interaction levels which are seen to create stoppages or halts in the city by Koolhaas during his research in Lagos, Nigeria.

In 2001 Rem Koolhaas started his research in Lagos; the former capital of Nigeria, with a view to explore and research a new way of planning western cities. According to Koolhaas, Lagos is a city of constant activity and improvisations. During the day the city is filled with the hustle and bustle of markets, traffic and pedestrians but the activity does not stop at night. For instance goods trucks load, unload and deliver goods during the night so that markets continue to work during the day. Lagos was seen by Koolhaas as a city with an *incredible energy*. It is made up of a number of inter-performing conditions. A city of ‘huge contrasts; it has elements of a modern city (skyscrapers, roads) but also a strong presence of the ‘informal’.’<sup>64</sup> The different self-

---

<sup>63</sup> Deleuze and Guattari also contributed to ideas on a similar city structure, that resulted in the fold, which are discussed as an intersection of rhizomatic practices with a strict hierarchical planned city structure. Alexander’s semi-lattice system and Deleuze and Guattari’s fold are similar in many ways. The changing elements within the semi-lattice system have qualities similar to the rhizomatic practices of the fold. These elements have the horizontal informal connections of the rhizome. The unchanging elements of the semi-lattice system have qualities similar to the tree structure of the fold.

<sup>64</sup> Lagos: Wide and Close unpaginated

organising entities represented the informal condition in Lagos. One example is the Alaba International Electronics Markets which is the largest importer of electronics in Africa and has about 50,000 traders. Amongst the structured elements of the planned city was the *informal* market. This is described by Koolhaas as a ‘*white space*’-“places that are blank on the map”<sup>65</sup>. These ‘*white spaces*’ are spaces that appear to have no activity on a map but in fact are areas which have a high level of activity and productivity. This constantly changing activity can be too difficult to represent on the two dimensional surface of the map. The city was thus seen as a combination of the formal *black* spaces and the informal *white* spaces. The combination of “formal, serious, complex structures; and lightweight, informal, impermanent, and flexible entities”<sup>66</sup> was very visible in urban Lagos. What appeared to be randomness of formal and informal was in reality a system of very elaborate organisational networks. These networks were caused by different activities and diversity of people present in the same space. For example the strict planned city streets were filled with informal pedestrian, vehicular and market activities. Not only was the type of activity differing but the people using the same space came from different backgrounds. The vehicular traffic comprised of people using buses, cars, bicycles, taxis etc.; the pedestrian traffic comprised of children, tourists, shoppers etc. from mixed ethnic backgrounds. This created a functional overlap due to various functions, a social overlap due to the different social groups and an overlap in activity and movement patterns.<sup>67</sup> Koolhaas described this as friction. “The entire city has a system of ‘GO SLOW’; this made it a city not of ‘flow’ but..... of



Figure 1.09: Lagos, Nigeria

<sup>65</sup>Koolhaas' reference to “whitespaces” has a close connection with voids on a figure-ground diagram. Therefore the ‘white’ and ‘black’ spaces on a map can be read as the solids and voids of a figure- ground drawing of the city. *Lagos:Wide and Close* –notes p 09

<sup>66</sup>*Lagos:Wide and Close* unpaginated

<sup>67</sup>Kim Dovey and Kasama Polakit explained (using Deleuze and Guattari’s notion of the fold) that the overlapping structure of the city creates a spillage between two or more identities allowing for connections between them. Dovey and Polakit “Urban Spillage” p 113. A spillage of meaning, function, identities from one area into another allows a transition between two more different identities, spaces, functions or meanings thus connecting them and allowing the people between them to engage creating friction in the area of the overlap.

‘stoppages’ (figure1.09). The city was a zone of visible frictions of different categories of inhabitants.”<sup>68</sup> The intersection of paths of different social groups moving in different directions created friction in the cityscape of Lagos. Lagos can be seen as an extreme case of friction.

Maximum friction is therefore seen to have the tendency to reduce the rate of movement. It creates stoppages in movement. In creating a halt it demands the attention of the walker. It forces them to engage and take notice of the diversity in their surroundings. Maximum friction also has the tendency to create distractions due to the level of activity in the area. Each inhabitant, object, area, function demands focus and attention thus slowing down the process of reaching one’s destination.

Koolhaas discovered, during his research in Lagos, that there was an interdependency between the planned and unplanned Lagos; just as Alexander noticed the interdependency between the changing and unchanging elements in Berkeley. The informality that happened in Lagos happened within the constraints of the planned 1970s modern city model. What appeared to be self-organising practices were in fact organised to a certain extent by the original rigid city plan. The “self-organisation is inscribed upon an organised model of the city.”<sup>69</sup> Prior to his visit to Lagos, Koolhaas was convinced that *laissez-faire* city planning was the answer for western cities. On studying Lagos closely he admitted that there needs to be the right balance between the planned elements and the unplanned activities that happen around them. “The definition of what works can be stretched to include informal conditions, or overlap of formal and informal, so that instead of one perfect model there is a gradation of different conditions that coexist in the city and feed one other.”<sup>70</sup> Koolhaas admitted that the condition of high friction in Lagos needed to be pulled back. He then viewed the planner as someone, who can provide a skeletal organisation for self-organising practices. Thus the planner/designer could be seen as someone who designed *black* and *white* spaces (on a map) where the black spaces are strict planned elements (buildings) and *white* spaces around the *black* ones allow informal activities to happen within them.

---

<sup>68</sup>Lagos:Wide and Close unpaginated

<sup>69</sup>Lagos:Wide and Close unpaginated

<sup>70</sup>Lagos:Wide and Close unpaginated

In the semi-lattice city structure Alexander saw changing and unchanging elements. In Lagos, the unchanging elements can be seen as elements that are a part of the strict urban plan while the changing ones are unplanned. In 1978 Colin Rowe and Fred Koetter studied figure-ground diagrams of cities to discover cities to be mixture of the planned elements and the unplanned social structures.



Figure 1.10: Nolli map of Rome,  
Figure- Ground City Diagram

Rowe's and Koetter's Collage City discussed the city as a "solid-void dialectic which might allow for the joint existence of the overly planned and the genuinely unplanned..."<sup>71</sup> In 1978 they analysed the city as a combination of *solids* and *voids* by using a figure- ground diagram (figure 1.10). They explained that the voids allow social interactions to occur because they allow people to

gather in them. The scale of the void can determine the amount of people who gather and the position, function and scale of the adjacent solids determine the different groups who do interact and the type of interaction that occurs.

The three different types of friction that are seen within the overlapping urban structure (which are a mixture of *solids* and *voids*) are manipulated, visual and indirect friction. They are created when people interact with each other, with their surroundings and with a shared public character.

### Manipulated Friction

Manipulated friction is caused when two or more individuals physically interact with each other to exchange ideas (*contact points* and *collision points*). Manipulated friction is a social function and a socially dependant phenomenon. It is controlled by the manipulation of *solids* and *voids* in the urban plan.<sup>72</sup> The type of solids placed affects manipulated friction. Manipulation of *solids*

---

<sup>71</sup> Rowe The Collage City p83

<sup>72</sup> Colin Rowe studied the figure ground in a way to understand the city as a construction of solid and voids; voids as pockets that allow people to gather and solids determining the type of people that gather.

and *voids* enable the creation of friction zones in voids via the placement of diverse solids around that void.

In Alexander's example of the overlapping city structure in Berkeley, interaction between the people waiting by the traffic light would create manipulated friction.

### **Visual Friction**

Visual friction is a visual engagement with one's surroundings which is an engagement with difference in one's line of sight. Visual friction redefines the term 'view' by allowing it to be much more than simply 'seeing' or 'sight'. View becomes a process of becoming aware of the diversity in the surrounding and a phenomenon that has the capability to capture one's attention. Visual friction is a result of a visual interaction or exchange that is caused due to a visual engagement. The physical placement of *solids* in the urban plan can block views into areas affecting visual friction.

In the instance in Berkeley, discussed by Alexander, visual friction is created when the walker visually engages with the news paper stand.

### **Indirect Friction**

Indirect friction is created by *indirect points* of exchange: points that do not create direct links between two or more walkers (*contact points*) but points that create connections between the walkers due to the type of information they have obtained from the public character. Indirect friction is initiated with the *contact point* since that is when they receive information from the public character. Indirect friction creates invisible social *strands* between the walkers that have received the same information from the public character.

In the example referred to by Alexander in Berkeley, the walkers interaction with the dairy owner would have created indirect friction if the dairy owner had passed on information that he has received by another walker.

## **CHAPTER CONCLUSION**

Friction builds new social relations between different social groups by productively engaging their differences. It creates a socially dynamic environment in which people interact with each

other. This creates an exchange of different ideas and makes people aware of the diversity of options, experiences and beliefs around them. It minimises inequality.<sup>73</sup> Friction facilitates the act of learning; learning about ‘otherness’, the new and the previously unknown. It has the potential for creating connections between scattered identities. The lack of friction has the tendency to create a social structure that is based on similarity rather than difference. Such a social structure has a number of community groups that are closed units. Societies with minimal friction do not encourage exchange and minimise social interaction. These societies behave in a ‘single-minded and uniform’ way.

Friction is generated when two or more walkers/people from different social groups exchange ideas. The walker is the agent of social interaction. This creates a *contact point* or a *collision point*. The connection of these points of exchange creates a social *strand*. A social *strand* has the capacity to weave physical neighbourhoods together by connecting *contact points* and *collision points* in different areas of the city which transforms the boundary of the neighbourhood into a *seam* - a line of exchange. The interwoven social *strands* in the city make up the social fabric of the city. A social *strand* is formed by a number of *contact points* and *collision points* at which a transfer of knowledge takes place or exploration of a new experience begins. Therefore the *strand* is the path through which a number of different ideas move and get transferred across the urban social fabric.

A social link can also be created by an indirect connection between two or more walkers creating indirect friction. Such friction is generated through a *contact point* with the same public character. When the same information is passed on to two or more different walkers (by the same public character) it creates an indirect link, between the walkers who have received that information, creating indirect friction in the city.

Social *strands* have the capacity to be manipulated by the built urban elements. Overlapping city structures control the way social interaction takes place by controlling the placement of

---

<sup>73</sup>Sennett explained in an interview with Robert Sampson (conducted by Richard Wright) that people’s perception of disorder needed to change. They need to stop relating disorder to crime. He illustrated that in USA an African American teenager with his groups of friends is perceived by the people of a white neighborhood as violent because that neighborhood is not usually exposed to such difference every day. Due to the lack of such exposure the residents of the white neighborhood perceive the presence of the black teenagers as a disruption. This white community rarely engages with the black people in their neighborhood which makes them uncomfortable with the group of black teenagers on the street. Such a perception results in inequality. British Journal of Sociology Podcasts “A Brief History of Disorder” unpaginated

urban elements like playgrounds, dead spots, footpaths, public characters, vehicles and city streets, and also controlling the diversity of options around these elements. Such elements allow the inhabitant to create connections with areas outside their boundary through visual interaction, creating visual friction. A visual connection then entices the inhabitant to move into areas that they have a connection with, allowing movement patterns to connect two or more different areas. Such a connection that is caused by movement patterns creates *collision points* during the phase of movement.

Although social friction initially started as a phenomenon that was created by the engagement of difference it soon evolved into one that could be created by the intersection of complex structures that formed an overlapping system. This overlapping system allowed difference to engage in the area of the overlap. Parks, footpaths, open squares were elements where the overlap was likely to happen depending on the diversity around those elements. These urban elements formed *contact points* and *collision points* through which the exchange of information would take place creating manipulated friction.

The strict planning of road networks, traffic lights, commercial areas, residential areas, industrial areas in cities creates a hierarchical system. However the intersection of the horizontal changing connections within the strictly planned zones creates a semi-lattice overlapping system. This interaction between the changing elements and the strict hierarchical structure, allows an overlap in function, meaning and form. Such an overlap connects the strict spaces with the smooth practices which enables an exchange between the functions, meanings or forms that are overlapped. This system creates friction zones in areas of the overlap. These zones consist of intersecting *strands* that are created due to urban elements the pathway, the generator, the connector and the filter which generate *collision points* and *contact points* creating a combination of manipulated, visual and indirect friction.

## CHAPTER 2: CHARACTERISTICS OF THE MECHANISMS OF FRICTION

Since the early 1960s theorists have contributed to the concept of friction by discussing its social consequences, the overlapping urban structure that create a system of varying levels and types of friction, and urban elements like playgrounds, footpaths, vehicles, newspaper vendors etc that enhance or reduce the friction levels that are a part of urban structures. This chapter expands on the definition of the urban elements by treating them as friction elements. It discusses the four key mechanisms of friction, namely: the pathway that creates varying levels of engagement mainly due to visual friction, the filter that indirectly connects different people who belong to different social groups and therefore creates indirect friction, the generator (of *contact points* and *collision points*) that creates manipulated friction and, the connector that connects two different environments and in doing so minimises levels of visual and manipulated friction (figure 2.00).

The characteristics of these four mechanisms of friction allow the translation of these urban elements into architectural elements that provide varying levels of engagement, filter information, generate *contact points* and /or *collision points*, and connect two or more environments. Such a translation into architectural elements with similar characteristics then enables their use to create socially dynamic public areas and as well as disconnected private areas.

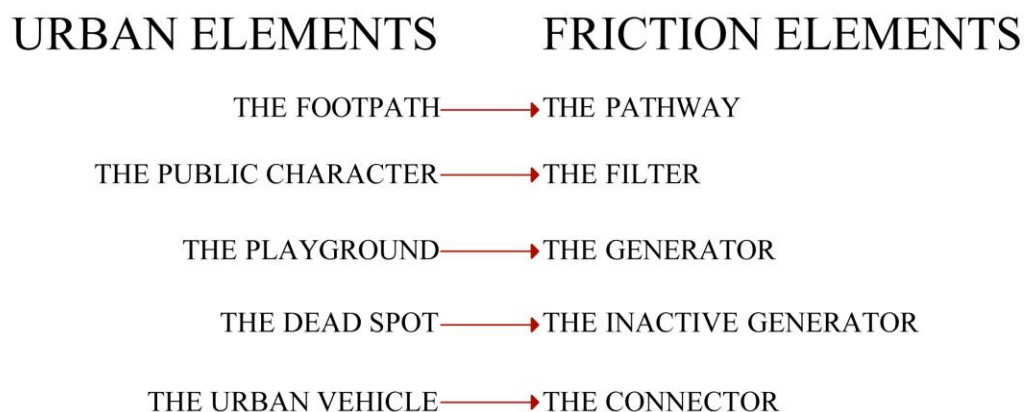


Figure 2.00: Translation from Urban Elements to Friction Elements



## THE PATHWAY

The pathway is an element of urban design that has the potential to enhance the social dynamism of the city depending on the diversity of options it has around it. Although its primary function is to allow circulation from one point to another, it also is a mechanism that provides small areas where different social groups may gather and interact. In circulating people from different social groups it provides opportunities to create *collision points* either by allowing visual connections<sup>74</sup> with other people and places or by physical connections which may be caused by a collision in the path of two or more inhabitants. This creation of *collision points* between the different groups that collide creates friction within its area. Social connections through *contact points*, within the boundaries of the pathway, are also caused by the introduction of other elements like the public character, bus stops, café seating etc. These other functions create *contact points* (instead of *collision points*); points of interaction that are caused due to a social overlap which may be created by an overlap in function, meaning or form.

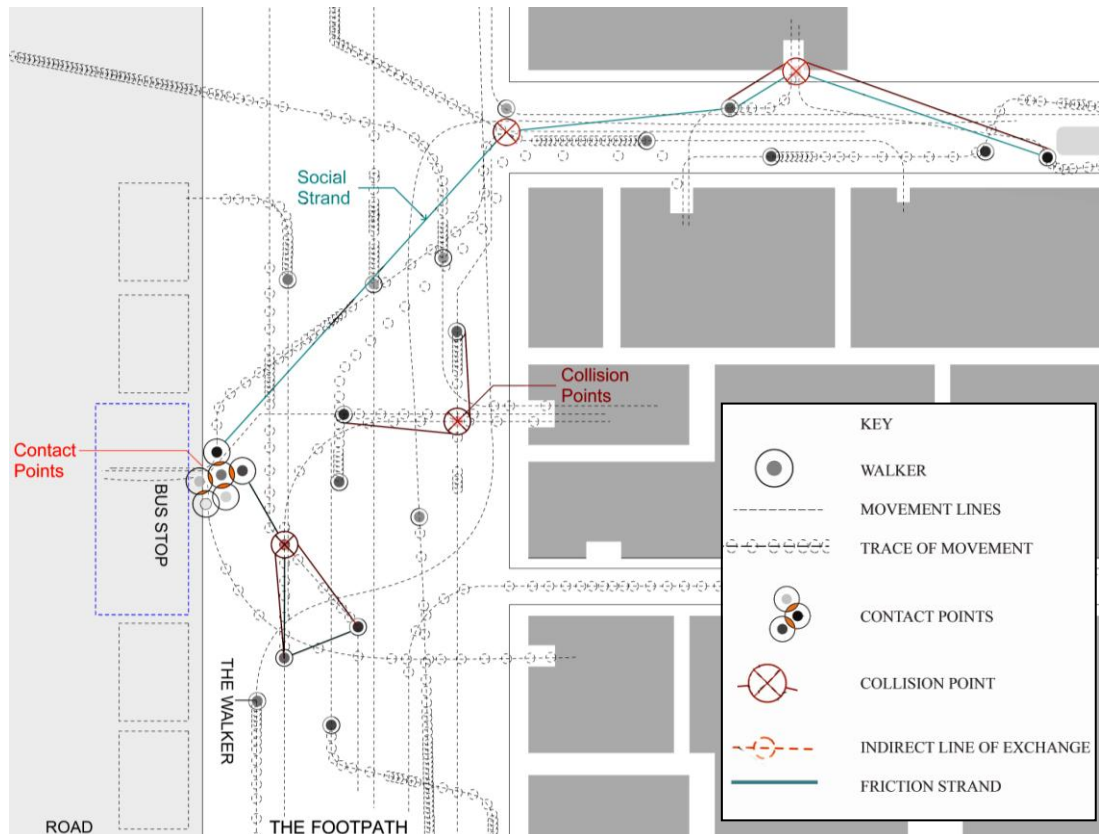


Figure 2.01: Movement patterns and social connections on the pathway

<sup>74</sup> One of the many visible differences prevalent on the footpath is the noticeable diversity in people's clothing. It describes the occupation of an individual and to an extent their financial status. It creates an awareness of the various trends in fashion. The sight of people on the footpath creates a transfer of information.

The formation of *collision points* and *contact points* on the pathway are greatly influenced by the level of visual complexity within their surroundings. Visual connections result in the creation of visual friction since such a connection with an object, a form, a person, a texture not only creates an engagement with it but in doing so it reveals information about it. This information exchange from one object to an inhabitant or from one inhabitant to another creates friction due to such a visual connection, and this is due to people slowing down as they take the time to read their environment.

A visually complex environment has the tendency to shift the attention of an individual from one element to another.<sup>75</sup> The shifting of attention results in eye movement starting from the visual point of focus and then moves towards the periphery or the secondary element in that scene.<sup>76</sup> While the eye shifts from one to another the information received from the first element is being processed.<sup>77</sup> Therefore the complex environment can be studied as one which has a number of elements that behave like sources of interference or visual distractions.<sup>78</sup> These interference mechanisms have the tendency to slow down the rate of movement of the inhabitant perceiving that visually complex surrounding.

A visually complex and different activity, object, form or scene in the distance has the tendency to attract people towards it. It is difference that encourages movement and exploration, not similarity. An unusual shift in scale in form, material, movement etc is prone to attract the attention of the walker. It encourages the walker to explore that complexity and in doing so it has the tendency to reduce the speed of the walker. Different people respond differently to such visual complexity depending on the time of day or night, their daily schedules etc. However most people are attracted to and tend to engage with complexity in the environment. Studies show that “increasing the aesthetic merit of visualizations is a promising approach to increasing engagement.”<sup>79</sup> Tateosian notes that the “different visual qualities important to aesthetics [are]: interpretational complexity (IC), indication and detail (ID), and visual complexity (VC).”<sup>80</sup>

---

<sup>75</sup> “Attention involves cognition to extract relevant information from the environment and process it.” Bora Studies of Visual Attention p 1

<sup>76</sup> Lawrence, Myerson and Abrams “Interference with spatial working memory” p488-489

<sup>77</sup> Bora Studies of Visual Attention p 2

<sup>78</sup> Lawrence, Myerson and Abrams “Interference with spatial working memory” p488-489

<sup>79</sup> Tateosian Investigating aesthetic visualizations abstract

<sup>80</sup> Tateosian Investigating aesthetic visualizations abstract

These affect levels of engagement the viewer has with the object. Therefore an increase in visual complexity will increase the level of engagement the walker has with the object. Such an



Figure 2.02: The Bucket Fountain, Cuba St, Wellington, New Zealand

object, form or activity has the tendency to create an area of stoppage around its immediate surroundings. It also creates an area of fast movement in its wider context. The individual increases speed to reach the visual point of focus. The Bucket Fountain on Cuba Street in Wellington city creates such a situation (figure 2.02). Its visibility from the far end of Cuba Street attracts people towards it. Friction levels increase in its immediate context due to the people who gather around it or the ones who pause to explore the dynamic structure. This friction provides an opportunity for *contact points* to be generated. In spite of the visual engagement from the far ends of the street and the social interaction closer to it, the colours, the movement and the flowing water remain the focal point

that continues to slow the speed of the fast moving pedestrians on that street. These objects then become landmarks on the pathway and create orientation points within the complex structure of the city.

The pathway appears as a *void* in the figure-ground diagram of the city. Because of its ability to provide circulation for different people it allows social connections to be made. The walker, as the user of the footpath, is the social body who weaves spaces together via the act of walking<sup>81</sup>. Their movement in the city is characterised by the choices they make and is confined to a certain extent by the boundaries of the pathway. In some instances the physical boundaries of the pathway are broken when the walker leaves the pathway (for instance to cross the street). Although the pathway is strictly planned as a part of the overall urban plan it gives the perception of being informal to the walker because of the freedom it allows and choices it provides.<sup>82</sup> This perception of informality comes from the permeable invisible boundaries of the

---

<sup>81</sup> Michel de Certeau in 1984 discussed the act of walking in the city as a creation of social space in his book- *The practice of everyday life*. Chapter1: The walker as the agent of social interaction. page 17

<sup>82</sup> This may differ depending on different cultures. For example, pedestrians are fined for jaywalking (illegal or reckless pedestrian crossing) in the USA however in New Zealand the same act of crossing the road in absence of a pedestrian crossing is not illegal. The pathway in Mumbai or Lagos is highly informal due to the extreme

social structure which creates the social overlap<sup>83</sup>. It has the ability to maintain the privacy of the individuals who occupy it allowing different level and type of social interaction.<sup>84</sup> The pathway gives the walker the option of revealing themselves and the extent to which they want to reveal information about their private lives. The participation of the walker therefore facilitates friction on the pathway because it has the ability to give to the walker “an invisible shield, a right to be left alone”<sup>85</sup> but at the same time allows a visual connection with the other walkers on the path. The act makes “public behaviour ...a matter of observation”<sup>86</sup> and not only participation; it protects and connects constantly creating *collision points* when one walker visually engages with another. Therefore the pathway provides a condition for compulsory visual interaction however the participation in physical social interaction is optional.

The condition created by the movement of the walker on the pathway is temporary. The act of walking creates invisible patterns around the physical boundaries of the pathway.<sup>87</sup> These

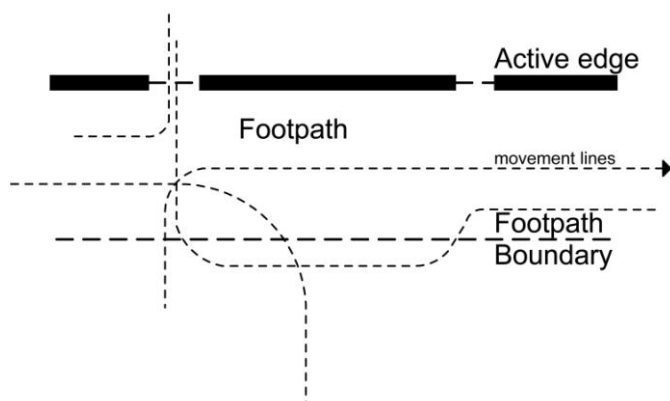


Figure 2.03: Changing boundary of the pathway created by the movement of the walker

interwoven patterns form a new space that is constructed by the movement patterns of a number of different walkers (figure 2.01). It is temporary and invisible in nature because it changes with the movement of the walker (figure 2.03). The walker therefore creates space on the pathway by inhabiting it. It is this new space within which

social interactions take place via *collision points* due to the interwoven nature of the movement patterns. The interwoven patterns on the pathway also have the tendency to make some walkers

---

overlap in function and activity which blurs the boundaries of built form (the footpath) creating more informal conditions, compared to the pathway in New York which strengthens the boundary along some areas of the footpath by restricting movement patterns across it.

<sup>83</sup> Chapter1 - Social Penetration and Interaction on page 19

<sup>84</sup> “A good city street neighbourhood achieves a marvel of balance between its occupant’s determination to have essential privacy and their simultaneous wishes for differing degrees of contact, enjoyment or help from the people around.” Jacobs *The Death and Life of Great American Cities* pp 77-78

<sup>85</sup> Sennett *The Fall of Public Man* p27

<sup>86</sup> Sennett *The Fall of Public Man* p27

<sup>87</sup> “The networks of these moving, intersecting writings compose a manifold story that has neither author nor spectator, shaped out of fragments of trajectories and alterations of spaces: in relation to representations, it remains daily and indefinitely other.” Certeau *The Practice of Everyday Life* p 93

avoid the areas of the pathway that are already entwined. Such an avoidance of an entwined condition breaks the physical boundary of the pathway by creating movement patterns that lie outside its physical boundary. Therefore the space within which social connections are made are not defined by the pathway's boundaries but instead defined by the walker. The walker creates the space within which *contact points* and *collision points* may be created or social *strands* develop. The pathway controls the walker and the walker redefines the limits of the pathway that enable social interaction.

The level of engagement of the walker on the pathway not only depends on the visual complexity in the surrounding but also depends on the rate of movement of the walker. At any one point on the pathway the walker engages with the surroundings at different levels depending on whether the walker is stationary or moving as well as on the level of familiarity with the surroundings.<sup>88</sup> If an individual is at the final stage of a journey the level of engagement with the surroundings will be more concentrated in contrast to an individual who is at the early stages of a journey. For instance a person who is running late for a meeting will disconnect from their surroundings by not only increasing the speed of movement but also by mentally disengaging from the activities on the pathway to concentrate on the meeting, or the consequences of being late. Towards the end of the journey the levels of engagement with their surroundings increase because the walker slows down to orientate back into the physical environment that the walker once disconnected from. The walker slows down towards the end of the journey eventually coming to a halt. If the walker is familiar with the surroundings the walker will be less engaged with the environment in contrast to someone who is not familiar with the route. Familiarity with the built environment has the tendency of decreasing the level of visual friction. Familiarity enables the walker to be an expert with the surroundings. Such an expertise is developed over time. Familiarity allows the walker to learn about all the diversity in their surroundings over a period of time. Due to this the walker then tends to categorise the options available and puts them into groups and in doing so condenses the information in the environment by disregarding it.<sup>89</sup> Familiarity therefore results in a lack of engagement since there is nothing new to attract the

---

<sup>88</sup> Certeau discusses the walker as an inhabitant of the city. He explains that the walker is disconnected from the space s/he inhabits during the act of walking. Chapter1: The walker as the agent of social interaction, page 17

<sup>89</sup> Psychologist Sheena Iyengar discussed George Miller's ideas from 1956. She explained if an individual takes the time to learn about the different options that are available to them then they begin to categorise the options and make a well informed decision. This however takes time but makes them an expert due to the time they take to study the various choices. For example after a thorough study of the various types of cereal in a supermarket people become aware of the nutritional content of the cereal and can make a choice based on their study. Since

attention of the walker and force the walker to engage with the environment due to lack of difference. By placing a number of options along the route the level of engagement that the walker has on the pathway can be manipulated. Variety makes people stop and try.<sup>90</sup> The placing of a variety of options like a magazine stand, a newspaper rack, a sandwich cart, a mobile coffee cart etc. along the footpath will reduce the rate of movement of the walker and as a result force the walker to engage with the environment. Studies show that when people are given a large number of options and choices (as seen on a pathway) they are attracted to the option which is the most visually attractive.<sup>91</sup> Therefore although the rate of movement can be manipulated by a variety of options, a moment of pause can be created by adding a visual point of focus to one of those options.

A bare surrounding to a pathway will disengage the walker with the surroundings and reduce the level of friction on the footpath.<sup>92</sup> Greater numbers of facilities and destinations around or along a pathway have the capacity to increase friction levels.

## THE FILTER

The variety of options like sandwich carts, mobile coffee carts, newspaper vendors etc. discussed above behave as filters on the pathway. The filter is an urban mechanism that facilitates friction due to its ability to give out information to people who engage with it. Not all elements that create a pause on the pathway can be filters. There are two types of filters in the urban context: the *interactive* filter and the *static* filter (figure 2.05). An interactive filter is an interactive stationary facilitator of friction: coffee carts, newspaper vendors etc; any element that has a human operator.

---

the study is already done they do not have to conduct such a study again but can buy the same cereal every week. Once they are familiar with the variety of options they simply need to pick up the same box every time they need more without repeating the study. Hill "Sheena Iyengar: Choice" unpaginated

<sup>90</sup> In an interview with Kim Hill psychologist Sheena Iyengar discussed her book The Art of Choosing. She explained that a large number of choices provided to an individual will make them stop and try the options they are provided with. Hill "Sheena Iyengar: Choice" unpaginated

<sup>91</sup> Iyengar explained when the human mind is faced with a large number of options it is overwhelmed. It then begins to look for anything that is different or visually attractive- 'a pretty picture'. Hill "Sheena Iyengar: Choice" unpaginated

<sup>92</sup> "Visual attention is affected by contrast, target size and spatial gratings" (Bora "Studies of Visual Attention" p iv) Bora explains in her thesis that the attention of an individual is affected with any contrast or spatial changes. If there are no changes there is no new visual focus and therefore no distraction from the previous thought of the individual which will keep them disengaged from the surrounding. "Other essential components (of attention) involve the ability to 'maintain attentional focus' at a point and later 'disengage' to resume information processing anew at a different location." Bora "Studies of Visual Attention" p 2

The *interactive* filter has the tendency to create a halt in the movement of the walker. When it creates a moment of pause it is confronted with a number of different ideas due to the interaction of the walker with the *interactive* filter. This is the first point of exchange that occurs. An *interactive* filter is confronted by a number of different walkers during the course of the day or night. At any one time the *interactive* filter transmits the information they got from one walker to another walker, generating friction between the walker and the filter but also generating indirect friction between the two walkers - the one they got the information from and the one who they passed the information to. Therefore the *interactive* filter enables the process of confrontation between two or more individuals in an indirect manner creating indirect friction (figure 2.04 and figure 2.06).

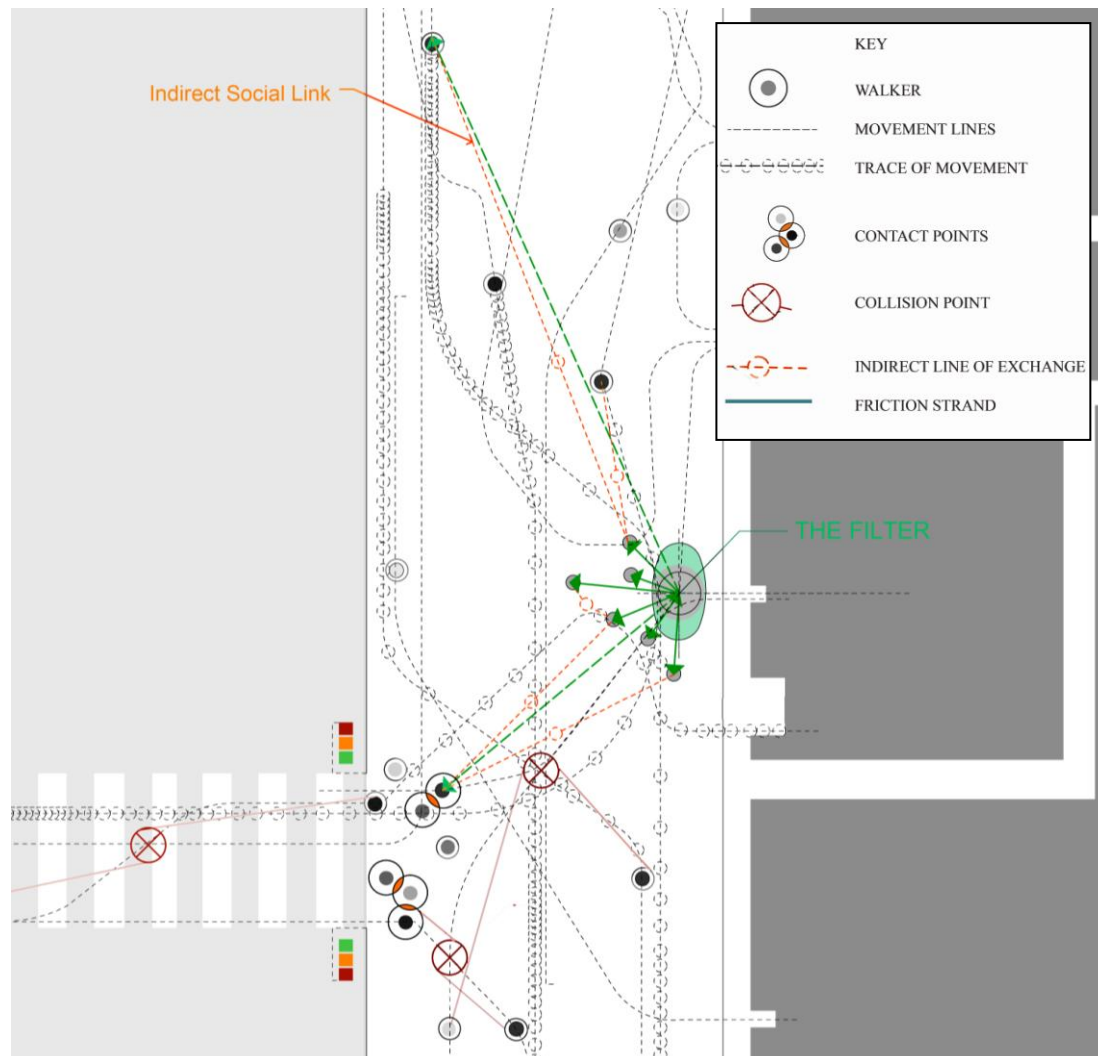


Figure 2.04: A diagrammatic representation of the indirect connections made by the filter on the pathway.

The *interactive* filter decides what information to pass and which walker to pass it on to. The walker, to a certain extent, can control the type of information they receive from the filter. For instance, when purchasing a coffee from a café an individual may ask the cashier for information on the best restaurant in town. The cashier due to the interaction with so many people may have got recommendations or overheard another customer discussing a similar topic and then passed on that information to the individual. Therefore the cashier in this case become the filter since they filter through all the different information given to them and then transmits relevant information to a walker (back into the social structure of the city).<sup>93</sup> The filter is constantly filtering through the information they have received in order to then reveal relevant information to the other walkers they interact with. The exchange between one walker and the *interactive* filter spreads to another walker and creates indirect friction. The invisible connection lines created by indirect friction have the capacity to reunite the walkers at another location or another time and create direct points of contact between them.

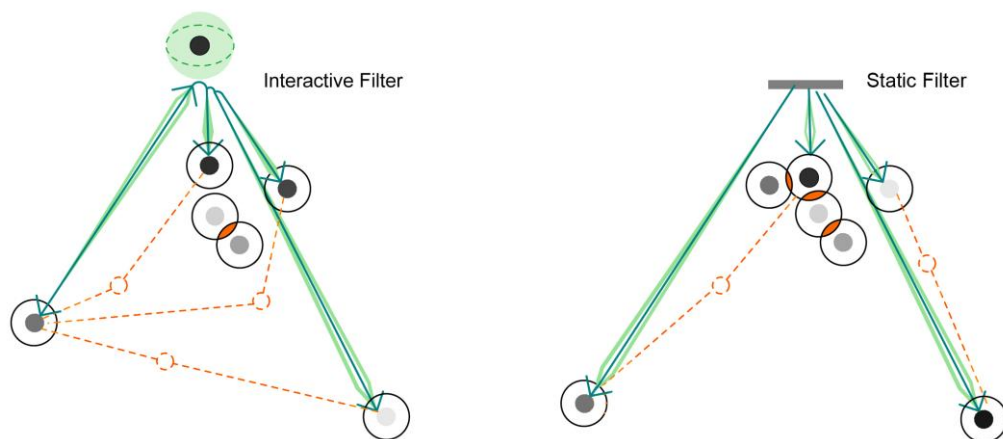


Figure2.05: Social condition created by the interactive filter compared to static filter.  
(The dotted orange line represents an indirect social link)

A *static* filter is a stationary facilitator of friction, however it is not interactive as does not require a human operator. Bus time-tables, information boards, location maps etc are *static* filters. They give out information to the stationary walker and generate indirect friction between the walkers that engage with them due to a visual connection. A *static* filter has the tendency to

---

<sup>93</sup>Jacobs' 'public character' can be seen as a filter since they are indirect points of exchange on the street.  
Chapter1: The Public Character page 27



create more *contact points* in its immediate area as compared to an *interactive* filter. This is because the walker is more likely to make direct contact with the other people around them if they are in doubt. For instance, when studying a bus timetable the stationary walker is more likely to ask questions about the bus schedule to other people in the surroundings. An *interactive* filter, however due to the direct human contact creates less *contact points* amongst the occupants that interact with it, within its immediate surroundings.

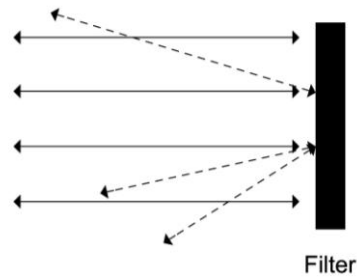


Figure 2.06: Diagrammatic representation of transfer of information enabled by the filter

## THE GENERATOR

Parks, playgrounds, open squares and other such urban spaces act as generators in the urban social fabric because of their ability to generate *contact points* within their boundary and

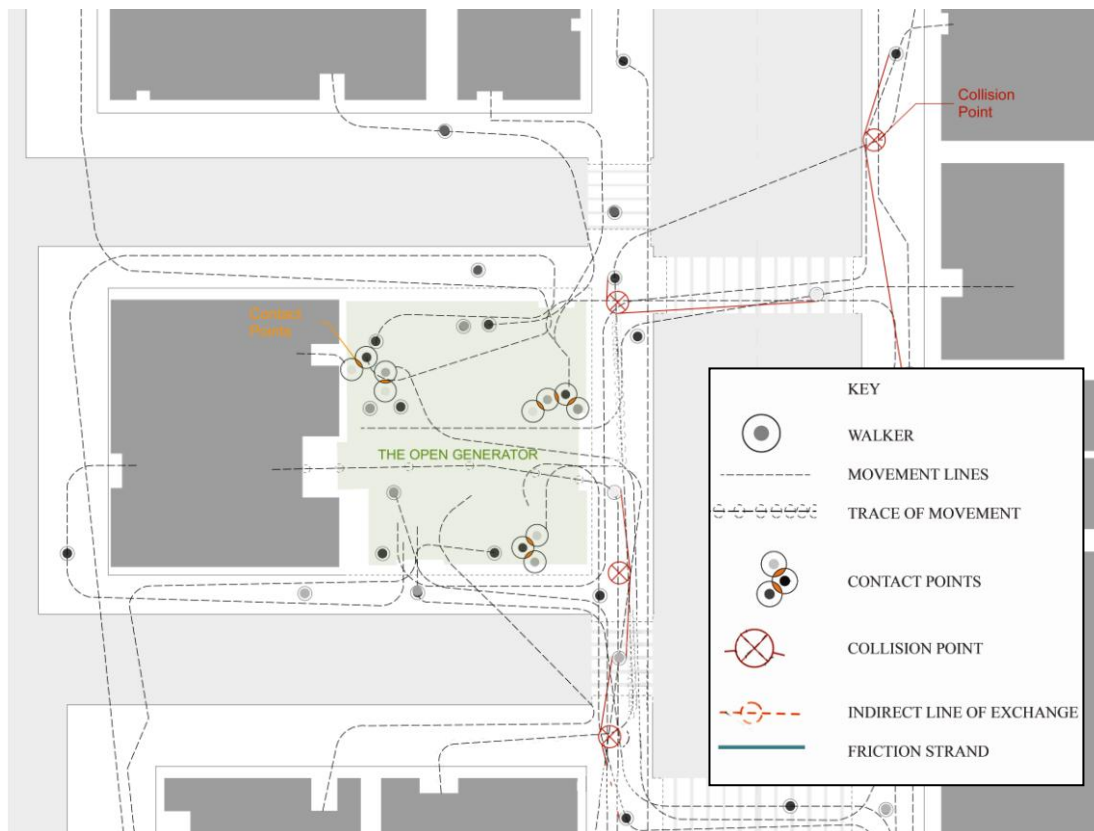


Figure 2.07: A diagrammatic representation of movement patterns and social connections created by an open generator

*collision points* in their surroundings. Shopping malls, supermarkets and other public buildings can also perform the same function, however they are different to the playground since they appear to be *solids* in the figure-ground diagram of the city unlike a park or playground. Solid generators function differently since they are interior spaces which are more enclosed in nature in contrast to a park or playground. They generate *contact points* mainly due to their function. They can actively contribute to the creation of *contact points* irrespective of their position in the city. They still manage to attract different social groups due to the diversity of options or the type of function they house.<sup>94</sup> A void generator does not do the same. A void generator such as a park or playground or open square relies on the diversity of the surrounding city more than internal diversity of functions to generate *contact points* within its boundaries.

A generator is different to a pathway in many ways. The movement of the inhabitants of a generator is much slower than the pathway. The occupied space of the generator is more permanent than that of the pathway. People tend to spend more time in these areas since they mainly serve as destination zones and sometimes as transition zones.<sup>95</sup> The friction condition of the pathway is reversed in the generator. The pathway creates more *collision points* and smaller areas with *contact points*. The generator creates larger areas for *contact points* (still interaction) and fewer *collision points* within its boundaries (figure 2.07).

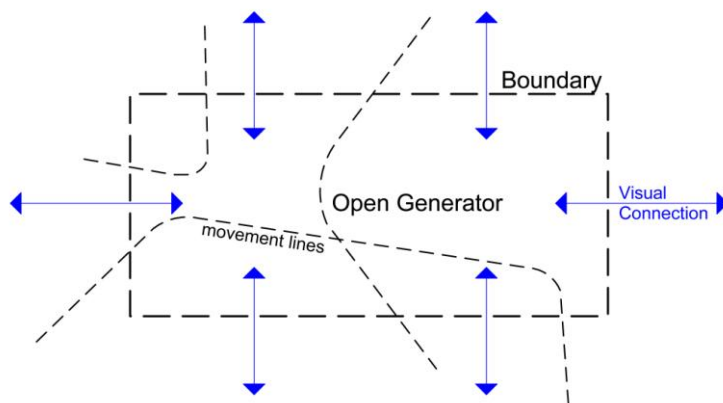


Figure 2.08: Diagrammatic representation of the boundary qualities of an open generator.

Just like the pathway, the generator enables a group of people to interact within its boundaries depending on the diversity of functions around it. The generator has the capacity to influence the areas around it<sup>96</sup> because of the qualities of its boundaries. The

<sup>94</sup> For instance a super market will attract diverse social groups due to the wide range of food products while a shopping mall attracts different people due to the variety in food, clothes and entertainment options it houses.

<sup>95</sup> For instance people plan trips to the park or they go to a square to meet friends. It becomes a destination in their journey.

<sup>96</sup> Jacobs explains the effects of an unsuccessful park on the property value of the surrounding area. Chapter1: The playground, page 28.

boundaries of a generator tend to act as a *seam*<sup>97</sup>; a thick line of exchange between the area it encompasses and its surroundings. This quality of the boundary allows movement patterns from its surroundings to penetrate into its area creating *collision points* in the process of movement (figure 2.07). The permeable boundaries therefore contribute to urban circulation patterns by enabling the generator space to act as short cuts into areas that lie on either side of it. The boundary as a *seam* allows the interior condition of the generator to spill onto the outside.<sup>98</sup> Therefore its success as a generator of friction via the creation of *contact points* and *collision points* enhances its surroundings.

The generator has the tendency to create manipulated friction. A smaller generator (*void*) between diverse *solids* will allow fewer *contact points* and more *collision points* but a larger one will create more *contact points*. The diversity of the solids around a generator determines the level of friction. For instance diverse functions around a generator will attract diverse social groups to use that generator space and therefore provide a greater opportunity for differences to engage. The *solid:void* ratio in plan can change the intensity of friction by controlling the number of people who can gather or circulate in any one *void*. Such a strategic plan has the ability to control levels of friction and therefore the levels of social interaction in the urban context. Manipulated friction allows individuals from different community groups to physically meet by manipulating circulation paths to various destinations.<sup>99</sup> It creates a friction of interaction and convergence.

The design of Cuba Mall positions the Bucket Fountain (figure 2.02) in such a way to generate manipulated friction. The fountain itself acts an object of visual complexity within that generator space. Here the visual friction and manipulated friction work together; the footpath and the generator work together. If there was a lack of generator space around the fountain, people would have no space to halt, and this would minimise the level of social contact. If this were the case the Bucket Fountain would remain a marker that only allowed for a visual orientation, visual friction and minimal social engagement. Therefore generators are necessary mechanisms for the generation of manipulated friction.

---

<sup>97</sup> Jane Jacobs uses Kevin Lynch's idea (published in 1960) of the border behaving like a *seam* where the border becomes a line of exchange between two different areas that are sewn together. Chapter 1: Social strand, page 24

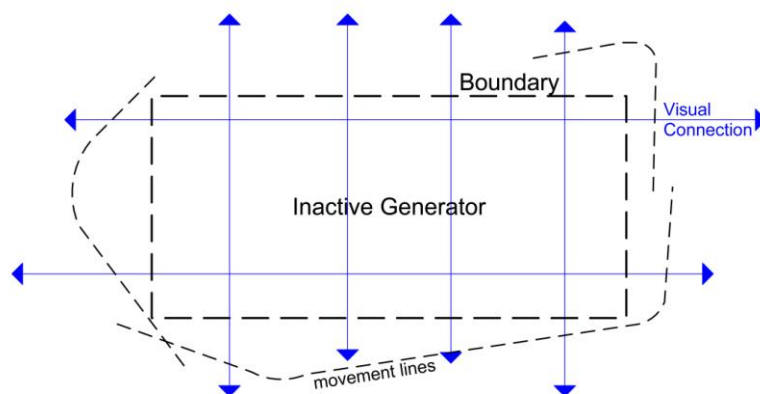
<sup>98</sup> This condition of the generator differs to the pathway since the condition of the generator is more permanent than that of the pathway. The social patterns on the pathway are temporary and change constantly.

<sup>99</sup> Bertolini and Hajer discuss the manipulation of circulation paths to create *collision points* between different social groups. Chapter 1: Collision points, page 21.

Generators create new *strands* by providing still spots where *contact points* can be generated and connected to form *strands*. Park benches, provision of food and beverage outlets (filters), play facilities and equipment, jogging paths etc can provide for these. Generators have the potential to mend a broken social connection or extend an existing one by reconfiguring it, redirecting it or reforming it via the manipulation of various design components such as the use of paved areas versus green patches, use of seats, cafés and public toilets, allowing open areas for sports and other events etc. A walking path in a generator can be manipulated to go around a play area. This creates visual points of interaction between the joggers and the children who play as well as the joggers and the parents who supervise the children. The circulation of the joggers intersects the circulation paths of the children as they enter the play area creating *collision points*. The introduction of a water fountain on the outer perimeter of the walking track allows *contact points* between the inhabitants that use the play area and the joggers who use the walking path. Such a situation allows for visual friction to function between the walkers, joggers, children and parents but also provides areas of *contact points* not only within the play area but also by the water fountain. In such an instance a *contact point* may be formed between two mothers who bring their children to play. This social connection continues when the mother makes contact with a jogger at the water fountain, which then continues when the jogger interacts with another jogger and so on. Thus a new *strand* is formed due to the position and placement of the water fountain, the play area and the walking track all within the boundaries of the generator.

## THE INACTIVE GENERATOR

Depending on their scale, generators can be used to either create zones within which friction



exists by productively engaging difference or by creating a dead spot which is an open area that people rarely walk through but mostly walk along side or around. A dead spot is an inactive empty space; a void with no activity; a

Figure 2.09: Diagrammatic representation of the boundary qualities of an inactive generator

vacuum<sup>100</sup>. It is an inactive generator. An inactive generator has the capacity to increase levels of visual friction because it provides uninterrupted views through it (figure2.09). They act as vacuums that create invisible *strands* of visual friction joining the areas on either side of it due to a visual connection.



Figure2.10: Ariel view of Te Aro Park, Wellington, New Zealand

Therefore the dead spot allows for an uninterrupted view to the other spaces, people and



Figure 2.11: View from Dixon Street to Manners Street, Wellington, New Zealand

functions surrounding it depending on its size relative to the areas that surround it. This direct line of sight into other areas through an inactive generator also has the capacity to generate visual friction and connect the two areas. An example of an inactive generator being a contributor to visual friction is Te Aro Park in Wellington (figure 2.10). It is situated between

---

<sup>100</sup> Jacobs Death and Life of Great American Cities p 345. Jacobs refers to a dead place as a vacuum.



Dixon Street and Manners Street. Some people walk across it connecting Dixon Street to Manners Street but its position between the two city vehicular streets and its changing topography and the use of water pools restricts the position and the amount of people that gather within its boundaries (figure2.11). The inactive generator therefore creates minimal points of exchange within its boundaries but enables visual points of exchange (visual friction) across it. The scale of such an inactive generator relative to the connecting areas is important since a large inactive void will not allow focused views across it and therefore break the visual connection resulting in no friction.

## THE CONNECTOR

An urban vehicle (bus, taxi, car) is an example of a connector in the urban context A connector is an element of urban design that connects two or more different experiences. It can be seen as an element that moves through different phases of motion to connect two spaces creating friction between them. In the process of connecting these experiences the connector disengages its inhabitants from the extended context, creating zero-friction with it. It has the tendency to collapse the space that lies in between the two experiences through acceleration and deceleration.

When it comes to a halt it allows a maximum engagement with the surroundings and therefore provides high levels of visual friction through the openings in its form (e.g. doors and/or windows). However when it accelerates the level of engagement with the surrounding context decreases resulting in lower levels of visual friction with the wider context. Acceleration decreases the levels of visual friction with the extended environment (figure2.12).

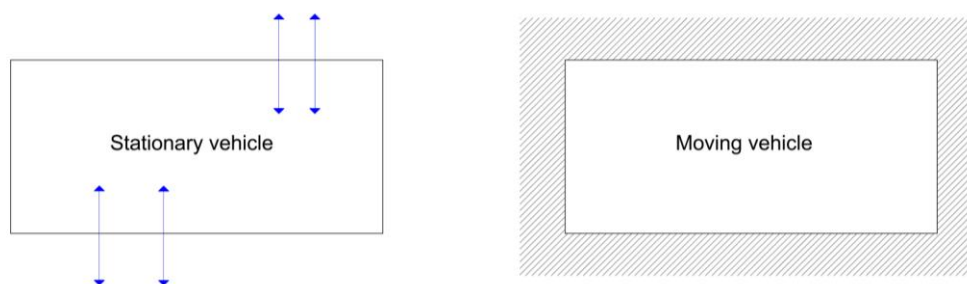
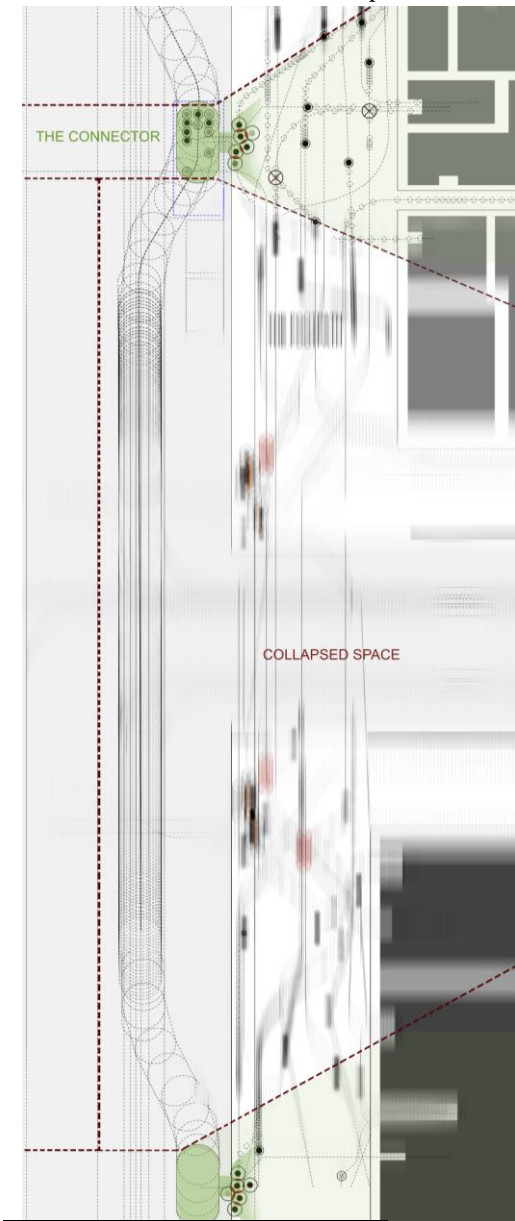


Figure 2.12: Boundary qualities of the stationary vehicle compared to the moving vehicle

Figure 2.13: Diagrammatic representation of the connector connection two experiences



This change in speed, results in the blurring of the extended environment which creates a disconnection with the wider surroundings.<sup>101</sup> In Learning from Las Vegas (1972) Robert Venturi, Denise Scott and Steven Izenour explained that ornamentation has been replaced by the distortion and an over articulation in architecture that is nearly always found in big spaces and at high speeds. This blurred environment at high speed is a result of the compression of large amounts of information in the wider context (figure2.13). However at the same time acceleration allows for a strong connection with the immediate context. It shelters and encapsulates an individual within the object in which they travel<sup>102</sup> by stripping away detail from the wider context. It therefore allows for levels of manipulated friction to increase between the inhabitants who are travelling within it. Depending on the number of people who are travelling in the connector, it provides opportunities for the inhabitants to engage with each other. As a result the wider context tends to go unnoticed and neglected which empowers speed with the ability to collapse/compress the space in-between.

<sup>101</sup> Richard Sennett discussed speed as a phenomenon in the urban context that caused disconnection with one's surroundings in the introduction of Flesh and Stone. Sennett explained that cities as spaces that are created by motion and can be defined by their highways and routes that allow motion from one end to another. He theorized that urban spaces can be measured by how easy and quick it is to move from one area to another. "An urban space becomes a mere function of motion, it thus becomes less stimulating in itself; the driver wants to go through the space, not to be aroused by it ....The physical condition of the travelling body reinforces this sense of disconnection from space." (Sennett Flesh and Stone p18)

<sup>102</sup> Oosterhuis discussed a person in speed as being disconnected from the environment. "People in speed let only limited information into their bodily system." Oosterhuis "BCN Speed Friction work shop at ESARQ" p 14. He explained that speed causes the environment to blur and at the same time strengthens the connection with one's inner self. For the driver of a vehicle moving at high speed the extended still surrounding is a blur however s/he is engaging with their immediate context that is moving at the same or similar speed. They are fully aware of the vehicles adjacent to them as well as are engaged with the vehicle and components that encapsulated them

## CHAPTER CONCLUSION

Manipulated friction is friction that is caused due to *social* interaction between two or more people from different social groups and visual friction is caused when there is a visual engagement with the diversity in the surrounding environment. Visual friction is a facilitator of manipulated friction. Visual engagement with the surrounding context has the capacity to decelerate or accelerate the speed of an individual depending on the position of the visual point of focus. The placement of the filter or generator around the visual point of focus (object with visual complexity) can then control the level of manipulated friction. An open area with a visually bare surrounding (lack of visual diversity) will not slow the movement of people within it. The inhabitant will walk past it due to the lack of visual complexity (or will avoid it entirely by taking another, more interesting route). However an open area that surrounds a visually complex object has the tendency to slow down the rate of movement of the walkers creating an area with manipulated friction around the visual point of focus. High levels of manipulated friction have the tendency to affect visual friction. Manipulated friction causes a number of social groups to interact in an area creating a visually dynamic scene generating visual friction.

The study of the characteristics of the pathway, the filter, the generator, the inactive generator and the connector in this chapter not only defined their properties in terms of friction but further allowed the study of the friction type that is most dominant in each of the elements. The social interaction on a footpath is influenced by the level of visual friction. The success of a generator however can be measured by the level of manipulated friction. The presence of a filter on the pathway/generator can manipulate the level of friction on it. The presence of a connector within a city then connects a generator to the pathway or one filter to another. All these are interconnected and work together within an overlapping structure. These relationships are investigated in architectural elements in chapter three.



## CHAPTER 3: INTERIOR CIRCULATION AND FRICTION

The first two chapters outlined social friction as a mechanism for social interaction in the urban context. They discussed the characteristics of five friction elements that facilitate social interaction through three different friction types, namely: visual friction, manipulated friction and indirect friction. They also explained the tendencies of high friction levels and low friction levels on the engagement the walker has with their wider surroundings and immediate context. Similar mechanisms of social friction are studied in this chapter but with specific reference to interior architecture. This chapter aims to identify the social characteristics of interior architectural circulatory elements, namely: the passage, the corridor, the elevator, and the staircase, which have similarities to three friction elements: the pathway and the connector and the inactive generator in relation to the type and level of friction they create. It provides a historical context in order to understand how these interior elements have performed socially across a range of time.

This comparison between the interior architectural circulation and the urban design circulatory elements demonstrates the potential for the use of urban design theory in understanding interior architecture in terms of facilitating social friction.

### THE PASSAGE

The first known English passage was designed by John Thorpe in 1597 at Beaufort House, Chelsea.<sup>103</sup> It was described as “a lounge entry to all”<sup>104</sup>. Such an idea was derived from

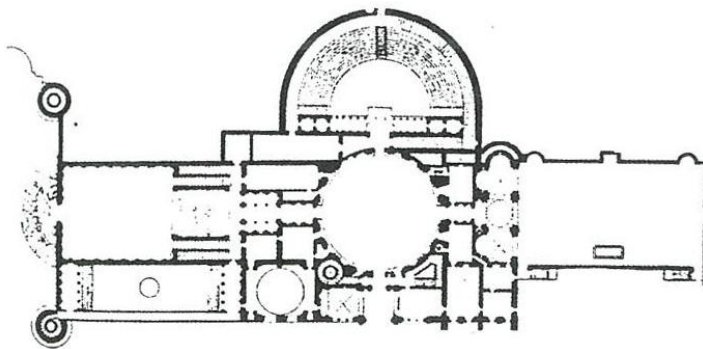


Figure 3.01: Villa Madama Plan, 1518, Raphael

Italian architecture where the passages and staircases [circulation paths] “nearly always connect[ed] just one space to another and never serve[d] as general distributions of movement.”<sup>105</sup>

---

<sup>103</sup>Evans “Figures, Doors and Passages” p70

<sup>104</sup>Evans “Figures, Doors and Passages” p70

<sup>105</sup>Evans “Figures, Doors and Passages” p 64

In England prior to the mid sixteenth century (as in Italian architecture such as the Villa Madama- figure3.01 and 3.02), doors or wall openings created connections between the different domestic spaces to allow a journey through the different spaces in the house. This enabled the occupant to engage with the different activities that took place in every room before they reached their destination. Therefore “there was no qualitative distinction between



Figure 3.02: Villa Madama Interior

the way through the house and the inhabited spaces within it.”<sup>106</sup> Such a link between various rooms made the sixteenth century passage a connecting device.

The passage through rooms can be seen as an interior architectural mechanism that created social interaction through the use of both visual and manipulated friction between the people who occupied the rooms and those who transited through them. The lack of physical boundary (or in this case the wall) separating the room and the passage through it, enabled visual connections. Such a passage was allowed because of the liberal placement of the doors. Therefore the formation of a passage was influenced by the number and the location of the doors within the boundary of any space. In sixteenth century domestic Italian architecture, rooms had more than one door; some had two or three.<sup>107</sup> Italian theorists believed that the interior door should be positioned in such as way that it would lead to as many parts of the building as possible. “This meant that there was a door wherever there was an adjoining room, making the house a matrix of discrete but thoroughly interconnected chambers.”<sup>108</sup> Therefore, the placement of the door defined the limits of the passage. As the passage through the house crosses through the wall, the boundary of the passage is solid and strong; it becomes invisible and ephemeral within the connecting spaces of the room. These

---

<sup>106</sup>Evans “Figures, Doors and Passages” p 64

<sup>107</sup>Evans “Figures, Doors and Passages” p 63

<sup>108</sup>Evans “Figures, Doors and Passages” p 64

invisible boundaries are flexible and mobile since they change with the movement of the occupant who progresses from room to room (figure 3.03).

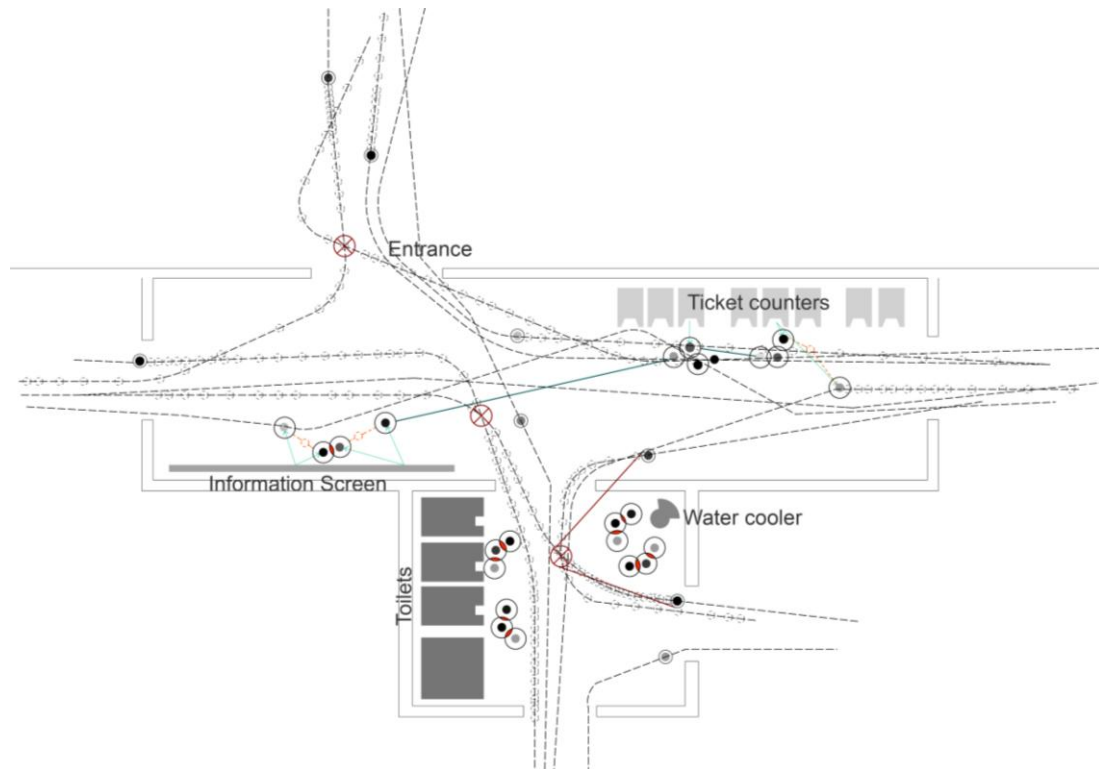


Figure 3.03: Movement patterns and social connections caused by passages in a railway terminal

At any one time the occupant may choose to engage with the activity or the people in the adjoining areas through *contact points* and in doing so may amend the invisible boundary of the passage. This passage through the different areas serves a dual purpose. It not only acts as a circulatory element which has the ability to create *collision points* due to the colliding movement patterns but also enables the activities of the surrounding spaces to spill into its area, creating a social overlap where *contact points* are likely to be generated. Therefore the invisible, flexible, moving, shifting boundary of this passage enabled both a transition through the space but also an engagement with the activities and the people in the room. Due to the permeable boundary of the passage it allows a spillage in function from one area to another, resulting in an overlap between the function of the passage and the function of the adjacent space.

When used as a circulatory device, the boundary of the passage is defined by the relationship between the moving occupant and the activity in the adjacent spaces. It allows the passing

occupant to visually connect with the surrounding activity and therefore creates visual friction within its ephemeral boundaries. Visual friction, as seen in the previous chapter, has the capacity to reduce the speed of the moving occupant and allow interaction with the inhabitants of the surrounding spaces creating manipulated friction.<sup>109</sup> Prior to the mid sixteenth century, the connection of the rooms in domestic English architecture allowed this filtering; an overlap and a visual connection between the various groups who used the space. Such an architectural passage has the tendencies of the urban pathway. The passage, just like the pathway, is the context within which social connections are made in the process of getting to a destination. Since it was the primary circulatory device in the interior setting it can be seen to have the capacity to create *collision points*. Just as the urban pathway allows the formation of *contact points* by providing access to elements like bus stops, coffee carts etc. (which act as furniture in the urban setting), the interior passage allows the formation of *contact points* by providing open access to the activities that each room housed in the domestic setting. These activities have similar tendencies to the urban furniture since they have the capacity to make the moving occupant pause and interact with the surrounding function or activity. The passage, just like the pathway, has invisible and flexible boundaries that are defined by the activities of the occupants of the space. Just as the walker changes the boundaries of the urban pathway, the moving occupant of the pre 1650s house could change the boundary of the passage. Similar to the urban pathway, the invisible boundaries of the passage allow high levels of visual friction and an overlap of function which results in the overlap of circulatory space with the adjacent activity.<sup>110</sup>

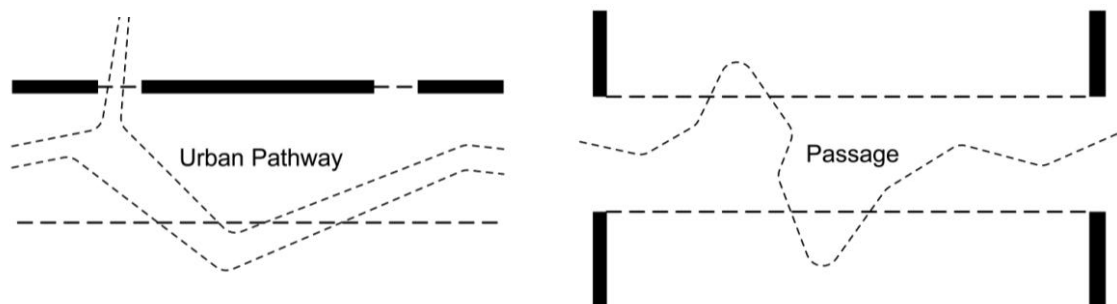


Figure 3.04: Boundary qualities (in plan) of the urban pathway compared with the architectural passage

<sup>109</sup> Chapter 2: The pathway, pages 41- 42

<sup>110</sup> The urban pathway also allows for such a fold to occur when the function of a café is spilt onto it by the introduction of seats in its area.

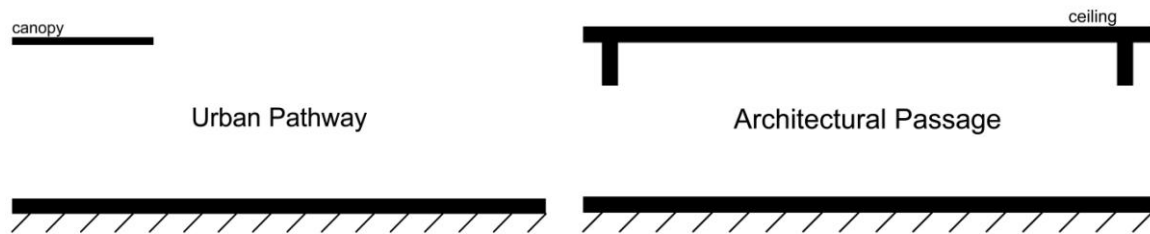


Figure 3.05: Boundary qualities (in section) of the urban pathway compared with the architectural passage

There are a few differences between the pathway and the pre1650s domestic passage. The urban pathway is seen as a void in the figure-ground diagram of the city only because it has *solid* element on one side. These *solid* elements may form active edges in some instances<sup>111</sup> giving a certain amount of flexibility to that edge. Such solid elements become destination points for the walker on the pathway. Therefore the pathway has a strict edge<sup>112</sup> (caused by the solid elements) and one ephemeral edge that elastically alters when a walker decides to cross the street or avoid congested areas. The interior passage however lacks that strict edge. It has strict points (at doorways) and both its edges are flexible within the room (figure 3.04). Due to the lack of solid edge on one side it provides a greater opportunity for social interaction between the occupants of the interior room that it passes through as compared to the pathway depending on the nature of the active edge (if any) . In section, however this condition is reversed. The interior passage has very strict boundaries and controls the level of visual complexity by controlling the height of the ceiling (the vertical boundary). The condition provided by the urban pathway is inversed. The urban pathway unlike the interior passage enables extreme amount of visual complexity due to the infinitely high invisible vertical boundary (figure 3.05).

The properties of the passage make it an element that facilitates social interaction in an open public space within large public buildings. Entrance foyers, atria and open plan public gathering spaces in libraries, museums, railway terminals, university buildings etc. will benefit from the

<sup>111</sup> Ground floors of buildings can be designed to encourage people to physically or visually interact with them. For instance the use of shops on the street front instead of apartments creates an active edge on the footpath.

<sup>112</sup> The level of flexibility depends on how active the edge is.

use of the passage as a circulatory mechanism. This is not only because the passage has flexible boundaries but also because it allows the folding of other activities into its area creating an overlap of the surrounding function and its role as a circulatory route. This overlap enables change and diversity of activity patterns within the same space. As noted by Luca Bertolini, diversity in activity type and movement patterns is seen to be beneficial in the creation of *collision points* and *contact points* in the urban context.<sup>113</sup>

## THE CORRIDOR

The meaning of the term “corridor” has changed over time with its different uses in Italian, Spanish and English<sup>114</sup> settings; however its function, as a mechanism for speedy connections, has remained constant. The first built corridor appears to have been in Italian urban design. It was built in the city of Florence by the Medici in 1565 and created a direct connection from Palazzo Pitti to Uffizi.<sup>115</sup> In the Italian context the corridor or the *corridoio* was referred to as a running place.<sup>116</sup> The first dictionary of Spanish in 1611 described a corridor as a person who could run fast; a scout, a messenger, a negotiator.<sup>117</sup> Although the Spanish did not define the corridor as a space, its reference to speed remained.

According to Jarzombek, the first architectural corridor originated in Italy within the domestic setting.

One of the first documentable uses of the word in architecture...is in a plan for a house designed in 1644 by Felice Della Greca in which the buildings *entrata* is connected with the *giardino* in the rear by the means of a *coritore* (the spelling no doubt reflects the Italian's unfamiliarity with the terms).<sup>118</sup>

This corridor was again used as a connecting mechanism and in this instance it connects the entrance to the exit dissolving the interior in its entirety. There are very few traces of the use of the corridor in Italian architecture during the sixteenth century however the upper classes in England began to use it after the mid sixteenth century in the domestic setting. English architects saw the corridor as a connecting, as well as a class segregating, device.

---

<sup>113</sup> Chapter 1: Social Penetration and Interaction on pages 20-22

<sup>114</sup> The corridor was referred to as a type of place in Italy, a person in Spain and a built architectural element in England.

<sup>115</sup> Jarzombek “From Corridor (Spanish) to Corridor (English)” p 7

<sup>116</sup> Jarzombek “From Corridor (Spanish) to Corridor (English)” p 7

<sup>117</sup> Jarzombek “From Corridor (Spanish) to Corridor (English)” p 7

<sup>118</sup> Jarzombek “From Corridor (Spanish) to Corridor (English)” p 7

During the sixteenth century the expansion of the British Empire brought luxury goods into the markets which created the consumer society but also increased the divide in the social classes. According to Evans, the upper social classes in England began to use corridors to create divisions within interior spaces (in the mid sixteenth century). These corridors were differentiated from the interconnected inhabited spaces of the house that were used by the residents and worked primarily as circulation devices for the servants (figure 3.06). It was a device to manage traffic and was “no more than a vestibule, since the inhabitants lived their lives on the other side of the walls.”<sup>119</sup> The purpose of this corridor was to separate the various interconnected rooms by allowing passage through them and to also hide the servants while they moved from one end of a house to the other.<sup>120</sup> The corridor prevented the different social and financial classes who used, lived and visited the house from engaging with each other. Thus the corridor can be seen as an interior architectural element that minimized social interaction between different class groups.

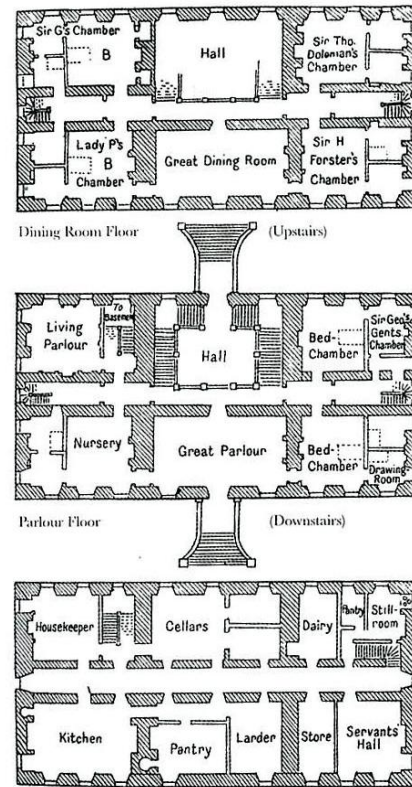


Figure 3.06: Coleshill, Berkshire, by Sir Roger Pratt, 1650-67 where the corridor was used to create a social division.

The introduction of the thoroughfare passage into domestic architecture first inscribed a deeper division between the upper and lower ranks of society by maintaining direct sequential access for the privileged family circle while considering servants to a limited territory always adjacent to, but never within the house properly...<sup>121</sup>

<sup>119</sup>Evans “Figures, Doors and Passages” p71

<sup>120</sup>Evans “Figures, Doors and Passages” p71

<sup>121</sup>Evans “Figures, Doors and Passages” p71

The inhabitants of the house used the doors to navigate through the various rooms; the servants used the corridors. “The corridor ... did not bring one into the depth of the building, but to a threshold, both real and conceptual - a within in the within.”<sup>122</sup>

The use of the corridor in England was still minimal since most of the architects were still influenced by the Italian idea of using doors to create an interconnected matrix of rooms, but by the nineteenth century the corridor “had certainly lost its mystique and come to be equated not with the world of international power-brokerage, but with remote passageways in castles and the nocturnal wanderings of old men in creaky mansions.”<sup>123</sup> The corridor as an architectural element came into existence in the domestic setting. It was not seen in the commercial setting until the nineteenth century. During this time the corridor appeared in office spaces. Jarzombek explains the reason for this was “the need of rationalization of space rather than by civic purpose.”<sup>124</sup> The commercial corridor was not used for the same purpose as the domestic corridor (to create a social divide). Rather, it was used as an element that enabled access to a number of different offices spaces whilst taking up the least possible space. In such an instance its social consequences appeared to have been ignored.

The domestic corridor can be seen as an architectural element that facilitates speedy transactions by providing controlled points of interaction. It is also an element that has the tendency to provide a connection between two or more spaces. The speed of the movement of an occupant using a space is increased by the corridor due to the lack of visual as well as social connections. The visual disconnection is created by the parallel walls - the physical dividers between the corridor and the spaces adjacent to it. The domestic corridor that extends along the length of the house is therefore strictly defined by walls that disengage the corridor from the adjacent spaces. This not only reduces the level of social interaction between the different social classes that used the house but also reduces the level of visual engagement the moving occupants have with their surrounding environment.

Thoroughfares were able to draw different rooms closer but only by disengaging those near at hand ... In facilitating communication the corridor reduced contact ... purposeful or necessary communication was facilitated while incidental communication was reduced.<sup>125</sup>

---

<sup>122</sup>Jarzombek “From Corridor (Spanish) to Corridor (English)” p 10

<sup>123</sup> Jarzombek “From Corridor (Spanish) to Corridor (English)” p 11

<sup>124</sup> Jarzombek “From Corridor (Spanish) to Corridor (English)” p 11

<sup>125</sup> Evans “Figures, Doors and passages” p 79



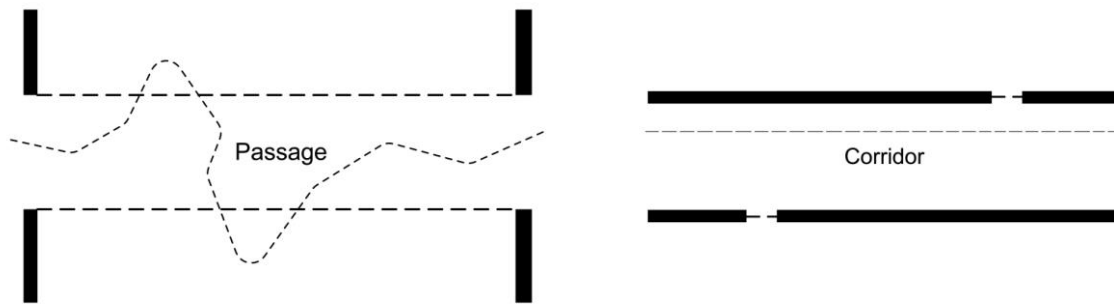


Figure 3.07: Boundary qualities (in plan) of the corridor compared to the passage

The corridor (both domestic and the office/commercial corridor) functions differently to the passage despite sharing similar circulatory functions. The corridor prioritises speed and exclusion from its surroundings; it portrays similar tendencies to that of an urban vehicle or the urban connector which is able to seal off itself from the external environment. In contrast, the passage prioritises slow movement (due to a functional overlap) and engagement with the surroundings and therefore portrays similar tendencies to that of the pathway (figure3.07). The corridor, just like the connector, enables the occupant to progress through different phases of movement and assists the connection between two or more different spaces. In the process of connecting to these spaces, the corridor has a tendency to collapse the experience of the space in between. The walls of the corridor detach the moving occupant from the adjacent activities and in doing so increase the rate of movement by decreasing peripheral visual complexity in order to provide an immediate connection. At the points of connection, the moving occupant slows down in order to engage with the intended activities and occupants through the wall opening or doorway. The wall opening/doorway behaves as openings<sup>126</sup> of a vehicle that allow visual and social engagement when the vehicle slows down or, in the case of the interior, when the inhabitant is permitted to engage with the occupants of the other side. The corridor serves as a connecting device which is primarily a separating device. It can protect from confrontation but at the same time connect to allow controlled interaction.

The walls on either side of the corridor can be seen to define solid elements in a similar manner to those in the figure-ground diagram of a city. Large public buildings tend to create a division

---

<sup>126</sup> Although the doors and windows of the urban vehicle always allow a visual connection with the extended urban environment, speed disables the function of the window by blurring the surrounding environment. Therefore when the vehicle is in motion the function of the window is disabled and it tends to have similar properties of the architectural wall of the corridor.

in circulation based on public and private spaces which define levels of hierarchy. The corridor within private areas are not required to create a divide in the social groups of the people who use those areas but the interior corridor of a large public building uses the corridor to provide direct access routes to the different offices and areas alongside it. Since these offices have only one door they do not allow an interconnected spatial state like sixteenth century Italian architecture. In allowing access to these single entry private offices the corridor becomes street-like, it enables *collision points* and *contact points* to arise when an individual crosses path with another on their way to other paths of the building, for example to the water cooler, which may be positioned in the corridor. The water cooler acts as an element within the corridor that has the potential to create a small area where *contact points* may be generated (figure 3.08).<sup>127</sup> Therefore although some corridors provide separated circulation to private areas, and in doing so establish office hierarchies i.e. boss and employees, shop staff and customers, university staff and students etc., they also accommodate mechanisms such as the water cooler that create small areas of interaction. Such elements begin to give the corridor street-like qualities, however one of the major differences between the street and the interior corridor is the variation in the level of visual complexity. The interior corridor tends to have lower levels of visual complexity due to the wall, the physical division between the corridor and adjacent areas. The solid wall is the element that creates a separation; a disengagement. Ideas around enclosure, confinement, exclusion, isolation, seclusion, blockage and avoidance relate to the spaces that are surrounded by walls.<sup>128</sup> Their main purpose is to divide and in doing so they become mechanisms for minimal visual friction. In creating barriers between two spaces solid walls prevent an overlap between the form, function and meaning of the two spaces which restricts the creation of *contact points* or *collision points* across the walls.

---

<sup>127</sup> The water cooler has a relationship parallel to an information post, a post box, vending machine, ATM etc. on the footpath.

<sup>128</sup> Evans "The Rights of Retreat and the Rites of Exclusion" pp35-39

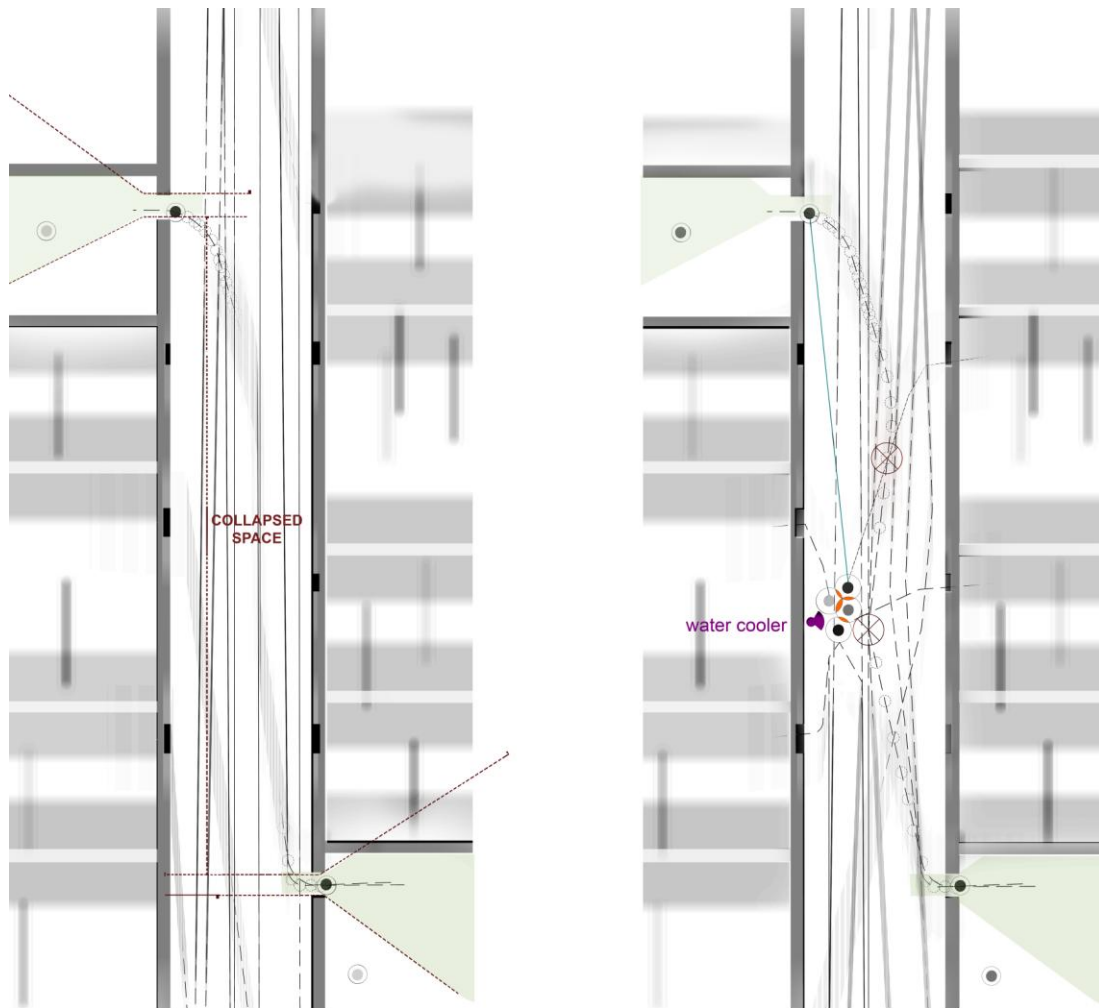


Figure 3.08: Corridor without a water cooler compared to a corridor with a water cooler

Unlike architectural passages, corridors refuse a functional overlap with adjacent spaces because of their strict boundaries. Consequently the use of the corridor in a public setting is unlikely to enhance the social interactions. Due to this lack of functional overlap, corridors do not provide for many opportunities that encourage social interaction. The corridor is therefore a fast mechanism designed with minimal friction. It is an architectural connector and can be used productively in parts of many building types like airports and hotels<sup>129</sup> when there is a requirement for direct thoroughfare routes.

---

<sup>129</sup> For example: corridor connecting the restaurant to the kitchen

## THE ELEVATOR

Just as the primary function of the architectural corridor is to provide horizontal circulation, the primary function of the elevator is to provide vertical transportation. “In the modern sense an elevator is defined as a conveyance designed to lift people and/or materials vertically.”<sup>130</sup> The elevator in its earliest form is shown in figure 3.09. Prior to the invention of the architectural elevator, ladders, staircases and other such elements were used as for vertical transportation. The first passenger-carrying elevator came into existence when Elisha Graves Otis invented the elevator safety device in 1853 (figure 3.10).<sup>131</sup> “People ceded space on early elevators to freight, because early elevators were prone to going into free fall when a lifting rope broke.”<sup>132</sup> The elevator from the very beginning was a device that facilitated the transportation of goods or people easily from one vertical point to another vertical point by avoiding interaction with the space in between.

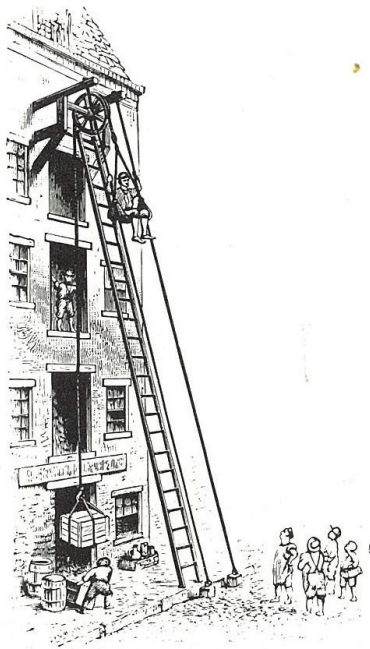


Figure 3.09: Early vertical transportation

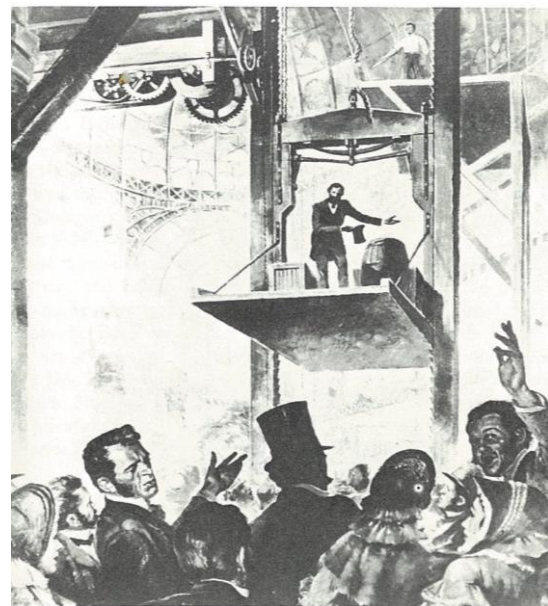


Figure 3.10: First Elevator, 1853

---

<sup>130</sup>Strakosch Vertical Transportation: Elevators and Escalators p 1

<sup>131</sup> Strakosch Vertical Transportation: Elevators and Escalators p 1

<sup>132</sup> Petroski “Vertical, Horizontal, Diagonal” p37

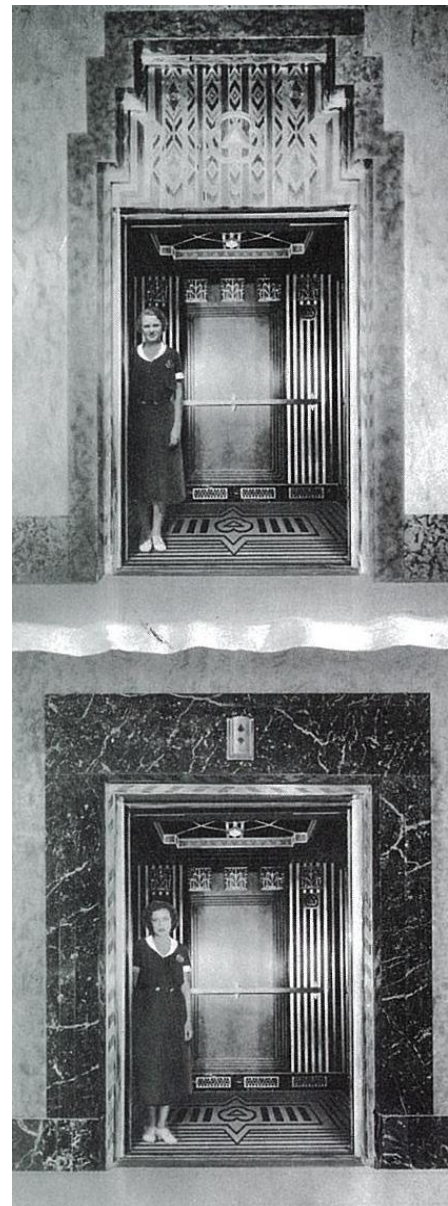
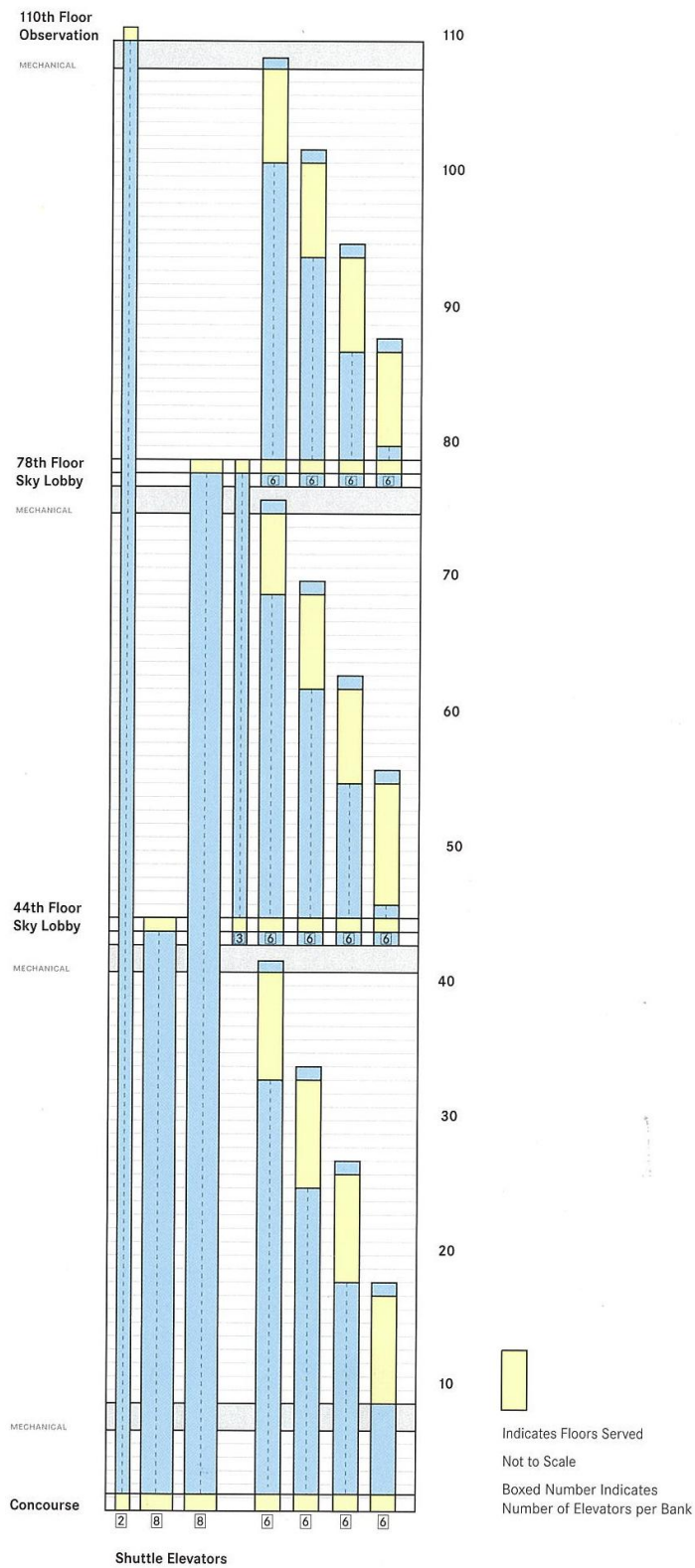


Figure 3.11(top): Double-decker elevator scheme- doors open at both floors. 60 Wall Tower, New York, 1934

Figure 3.12 (left): Diagram of Passenger elevator arrangement in World Trade Centre, New York

In New York high rise buildings like the World Trade Centre in 1970 used different schemes to minimise the stops the elevators would make, as well as to minimise the space that the elevators themselves used, providing more area for rented office spaces (figure 3.12).

Express elevators transported passengers from the ground- floor lobby to the transfer floor, where they move to local elevators. In this way, more than one elevator can use the same shaft, thus reducing the amount of space in the building taken up by the elevators, and effectively providing more rentable office space.<sup>133</sup>

Another scheme that was used in a number of high rise buildings in New York was to provide ‘double-decker’ elevators (figure 3.11). This scheme provided one elevator that went through two levels. The passenger of the elevator entered it at the appropriate level depending on their destination floor: odd or even floor numbers.<sup>134</sup> This meant that the occupant skipped every other floor even if the elevator stopped at every floor. Once again, similar to the Trade Centre scheme, the elevator was a mechanism that saved space and time. The elevator as an architectural element was used as a mechanism that made quick vertical connections by disconnecting the passenger or occupant from the spaces in between.

Chris Speed an English artist investigated the elevator as an architectural element that could collapse space. He introduced the random lift button in an elevator as a way of making people engage with different floors that they would usually go unnoticed. He illustrated the idea of an elevator as an architectural element that can enhance social dynamism in a vertical space via movement. He played with the curiosity of the human mind to experience new ideas by introducing a Random lift button in an elevator. “When you press the button, you end up on a random floor where you can meet people and experience things that you wouldn’t otherwise have experienced had you skipped that floor and simply gone to your original destination.”<sup>135</sup> His installation explored issues of space and time. He believed that in large architecture lifts are used to ‘squash space’ which allows its inhabitants to move at a higher speed to reach their final destination. By introducing the random lift button in the elevator he tried to get the inhabitants of the lift to explore the lack of journey; ‘lost space’.

---

<sup>133</sup> Petroski “Vertical, Horizontal, Diagonal” p41

<sup>134</sup> Petroski “Vertical, Horizontal, Diagonal” p41

<sup>135</sup> Web Urbanist “Random Lift Button” unpaginated



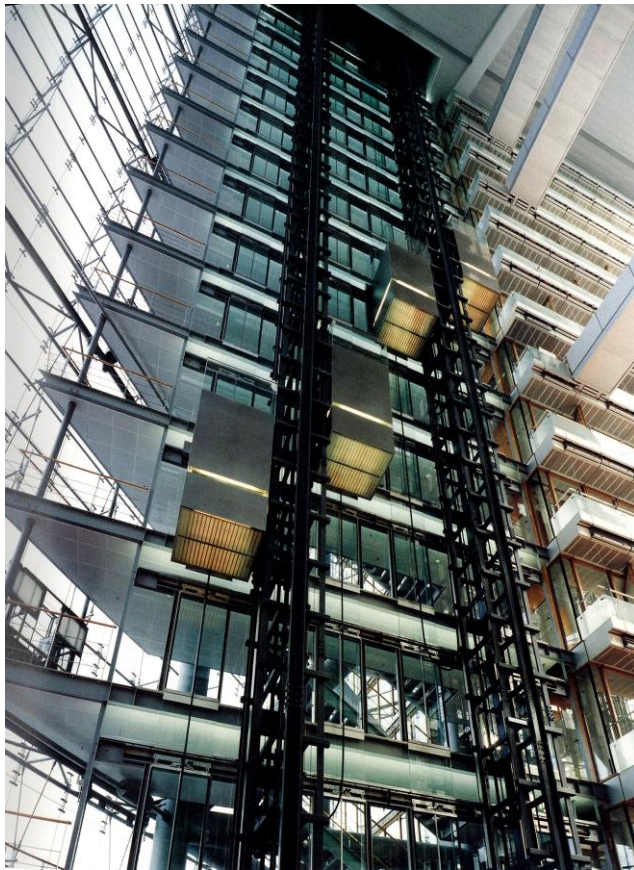


Figure 3.13: Use of multiple elevators in Town Gate Building, Germany, 2001

The elevator, even today, can be seen as an architectural element that has the potential to collapse space and has a relationship parallel to the vehicle in the urban context. The vertical elevator behaves as a connector in the architectural context. It allows maximum engagement with the immediate surrounding (i.e. the interior of the elevator) and minimum engagement with the wider context. “Lifts become a temporal slippage in the experience of a building as a whole; we skip space and avoid people, places and opportunities to see the ‘whole’.”<sup>136</sup> There the elevator facilitates a transition between two different vertical experiences, not by allowing an overlap in meaning, form or function, but

instead by creating a compression of different experiences due to vertical movement. In compressing these experiences it creates a disconnection from the space the inhabitant had just experienced, followed by the transitional state of the compressed space and then a connection with the space the inhabitant has stepped into (figure 3.13). The door of the elevator acts as the doors of the urban vehicle. Through the elevator door the inhabitants begin to engage with the external environment. When the elevator is in motion the closing of the doors strengthens the engagement with the immediate context and disconnects the extended environment. On the interior the disconnection is not caused by the blurring of the extended environment (as the urban vehicle) but by a visual disconnection (the wall). “Lift travel is ... devoid of visual experience.”<sup>137</sup> On reaching the destination, the opening of the doors once again allows the inhabitants to engage with the extended environment. The elevator collapses the space between

<sup>136</sup> Speed “Dismantling Teleological Navigation” unpaginated

<sup>137</sup> Simmen “The Earth-rooted Ascent to Heaven” p 62

two vertical points by creating a temporal disconnection with the surrounding environment. By connecting two different experiences it acts as an interior connector.

The lift abolishes the vertical. A vehicle of vertical continuity, it promotes vertical discontinuity. It is a license to forge horizontal space: in a concrete equivalent of counting sheep, it rhythmically lays floor slabs as it sleep-walks up and down. These slabs are then back-filled with diverse ideas of inhabitation and their accompanying architectures.<sup>138</sup>

The elevator and the corridor function in a similar way. The elevator can be seen as a vertical corridor. Just like the corridor it allows speedy and necessary transactions along its height. Such an elevator or traditional corridor can be used to create a disconnection or skip areas that require more privacy or areas which the occupant does not want to be distracted by.

## THE STAIRCASE

A staircase has a similar primary function to the elevator (of providing vertical circulation from one floor of a building to another) however the social implications of using a staircase compared to an elevator differ.

The word stair “derives from the Old Teutonic *staigri*, and the terms stairway and staircase have



Figure3.14: Stone Age Stair



Figure3.15: Stair made out of a single log

come to be the established usage for the collective element, incorporating steps, support framework, banister and handrail.”<sup>139</sup> Cleo Baldon and Id Melchoir in *Steps and Stairways* define the stair case as a “graceful and practice ladder.”<sup>140</sup>

Stairs were used for the primary purpose of vertical ascent and decent. “The earliest stair, in use already in the early Stone

<sup>138</sup> Bass “Vertical – Lift, Elevator, Paternoster: A Cultural History of the Vertical Transport” p 29

<sup>139</sup> Spens *Staircases* p6

<sup>140</sup> Baldon and Melchoir *Steps and Stairways* p 13



Age [figure 3.14], was the so-called climbing trunk which consisted of a tree trunk placed into a diagonal position with branch stumps serving as steps.”<sup>141</sup> This evolved into a stair that was carved out of a single log of wood<sup>142</sup> shown in figure 3.15. These early stairs have similar characteristics of the elevator since they connected the occupant from one space to another in the quickest possible way.

The stair has evolved from the tree trunk to the log and now can be made from a number of different materials including brick, glass, metal, concrete, wood etc. Prior to the invention of the elevator it was used as the primary vertical circulation mechanism however with the invention of the elevator its function changed. Staircases today now often only take on the role of fire exits and emergency escapes in multiple story buildings. These escape routes are enclosed spaces that are fire proofed and blocked off from the other spaces in the building. This disconnection makes them function as speedy vertical circulation systems enabling them with the ability to collapse the space in between. Minimal visual friction levels facilitate speed within the enclosed fire stair.

After the invention of the elevator the staircase was also treated as a sculptural element in architecture. "Perhaps more than any other period, the nineteenth and twentieth century stair has been explored as a spatial-structural-aesthetic object."<sup>143</sup> They are used as ornamental sculptural elements and therefore have the capacity to increase the visual complexity of an interior



Figure 3.16: Open Staircase, Institute of Molecular Genetics, Czech Academy of Science, by P-H-A Studio in Prague

environment. The rhythmic repetition of the threads supported by the stringer and the continuous flow of the balustrade create an eye catching sculptural form (figure 3.16 and 3.17). The staircase, depending on its type, material and design has the capacity to generate different levels of friction when used in a large public building. To the passing occupant the increase in visual complexity created by the stair has the potential to create *contact points* in its immediate area creating

<sup>141</sup> Hattstein “Stairs- step by step” p7

<sup>142</sup> Baldon and Melchoir Steps and Stairways p 13

<sup>143</sup> Templer The Staircase: History and Theories p167

manipulated friction. Here manipulated friction to a certain extent<sup>144</sup> is a result of visual friction that is created due to the direct view of the sculptural staircase. The visual complexity of this staircase is further increased when people use it. The subtle movement of the occupant within the static and complex structure creates a similar situation to the Bucket Fountain on Cuba Street (figure 2.02) discussed in chapter two.

For the moving occupant the sculptural staircase is also exposed to high levels of visual friction.

The staircase creates a dynamic, kinesthetic experience the result of combining both vertical and horizontal movement. This is heightened by the means by which the staircase stimulates our visual and tactile senses. For example, the staircase constantly transforms our perspective view as we move along its sectionally diagonal path. It can lead our vision from the foreground (that is, where we look for assurance that our foot makes proper contact with the tread) to the background (that is, where we look to see what awaits us at the end of the path). The tactile sense is also heightened by this spatial experience. For example, our hand instinctively reaches out to grasp the railing. Satisfying this need to proceed safely on a staircase brings us into direct contact with the materials with which it is constructed.<sup>145</sup>



Figure 3.17: Staircase as an object of Visual Complexity, 26 Sloane Street (Internal Stair to Retail Store), London, by Eva Jiricna Architects in 1989

The open staircase therefore can be seen to have similar characteristics to the urban pathway. Just like the pathway, the open staircase provides views into different spaces increasing the visual complexity. Due to the movement patterns in a staircase there are more opportunities for the creation of *collision points* compared to *contact points*. *Contact points* are more likely to be created at landings since people tend to halt on landings. Therefore the landings of stairs take on the properties of urban elements like the bus stop. Although the landing does not have the functional properties of the bus stop, it still creates small areas where *contact points* can be generated. People stop on landings is if they cross paths with a

---

<sup>144</sup> Manipulated friction can also be caused when the paths of two or more people who may know each other, overlap in space and time.

<sup>145</sup> Senft "The staircase: history and theories [and] The staircase: studies of hazards, falls, and safer design [by] John Templer [book review]" p 129

familiar occupant or if they need to rest during their vertical ascent/decent. People also tend to stop on landings when the stair (if it is the primary circulation route) is open to a larger space



Figure 3.18: Grand Staircase, Palais Garnier, by Charles Garnier

(atriums and entrances), because there is a limited number of people (compared to the urban context), who are likely to know each other. This makes landings on the stair a place for gossip and informal knowledge exchange. Charles Garnier's Grand staircase in the Palais Garnier creates such a situation (figure 3.18). People tend to spend time on the grand staircase creating *contact points* on the landings and *collisions points* during the phase of movement. The visibility of the occupant on the main circulation route becomes a social act of seeing and being seen. Therefore by manipulating the number of landings and the size of the landing of

an open stair, the number of social connections on the stair can be manipulated which in turn can manipulate the visual complexity in the surrounding spaces giving the open stair similar social properties of the urban pathway.

The difference between the staircase and the pathway is that the staircase does not often house elements like filters or other objects/ furniture within their boundaries. Its architecture does not obviously encourage the moving occupant to stop and wait. Therefore a staircase (that is not open to large areas or areas with other social groups) generates less *contact points* as compared to the pathway.

The boundary qualities of the staircase and the pathway are very different. The pathway has flexible boundaries that can be expanded by the movement of the walker. The staircase however has strict boundaries. The occupant cannot change them. This is because staircases are surrounded by inactive generator<sup>146</sup> space. The inactive generator is a vacuum or a void with no activity. It is seen as space that people do not walk through but walk along side. The constant

---

<sup>146</sup> Chapter 2: The Inactive Generator, page 51

change in height of the staircase results in the formation of voids beyond the limits of the staircase. It is because of these voids visual connections can be made from the staircase to the adjacent spaces and vice versa.



Figure 3.19: Double-Helix Staircase, Place Jussieu 4, Paris

The social interaction on a staircase can be controlled by using different stair types. Leonardo da Vinci's double helix staircase creates a different social scenario compared to an open staircase discussed above (figure 3.20). This stair creates two distinct paths that never physically intersect (figure 3.19). In the process of connecting vertical spaces it separates the people that use each of the two circular paths. Even if the double helix is not enclosed (with solid walls or screens), its design prevents the occupant from one path to have a visual connection with the occupant on the other path. It can therefore be used to avoid social friction between two or more social groups by not only preventing their movement patterns from intersecting but also visually disconnecting them

from each other during the phase of movement. An open helix staircase behaves in the same manner as the open sculptural one discussed above in reference to the visual connections with the adjacent spaces (caused by the inactive generator). The double helix therefore only



Figure 3.20: Double-Helix Staircase, Château de Chambord, Loire Valley, France

disconnects the social groups that use each of its circular paths (from each other) during the vertical ascent/ decent and at the same time allows visual connections with the spaces that lie adjacent to it. This type of staircase therefore becomes an element that avoids congestion. It reduces the possibility of *collision points* by providing two disconnected routes to the same space.



## CHAPTER CONCLUSION

Interior architectural elements like the passage, the corridor, the elevator and staircases have similar tendencies to urban elements that are studied in chapter two. The analysis of the interior elements, in order to determine the level and type of interaction, enables their use in different public and private interior spaces within large public buildings. In spite of having the same primary function of being circulatory devices, the passage, the corridor and the elevator possess different social qualities. They perform differently in terms of the level of engagement they allow with the surrounding spaces and people. The elevator, the corridor and the enclosed staircase are mechanisms that minimise friction levels and therefore disconnect the occupant from external distractions. The passage and the open staircase makes the most of the opportunities from surrounding facilities and functions in order to create overlapping activity flows to maximise levels of social interaction. The physical and visual boundary qualities of these elements largely determine their social consequences. The boundaries of the passage are flexible and invisible and therefore allow functional overlap as well as visual penetrations across these elements. In spite of its strict physical boundary the open staircase facilitates friction due to the surrounding voids. The boundaries of the elevator, the corridor and enclosed staircase are solid and prevent distractions from the adjacent spaces to enter into them. Elements with solid boundaries are better used in private working environments that need higher levels of concentration, or privacy; while ephemeral boundaries encourage different activities and different social groups to engage and are therefore best used within public spaces, or those spaces identified as benefiting from informal knowledge exchange.

This chapter identifies the use of the circulatory interior elements to generate high, low and moderate interaction levels depending on the programmatic requirements of a large public building. By analysing the social tendencies of interior architecture elements, the chapter also enables our understanding of the formation of interior space in terms of social interaction and relationships between the different social groups, who use, live and visit these spaces.

## CHAPTER 4: INTERIOR SPACES AND FRICTION

The previous chapter discussed the social characteristics of the interior circulatory elements like the passage, the corridor, the elevator and the staircase. These are seen to enable different types and levels of social friction in an interior setting. This chapter aims to identify the social characteristics of the interior architectural spatial elements, namely: the room, wall openings and open planned spaces which have been discovered as physically similar to the urban manifestation of the generator and the filter in relation to the type and level of friction they create.

### THE WALL OPENING

The door was an important interior architectural element that determined the type of social relationships between the various occupants in the domestic setting in Italian and English architecture. The Italians used many doors to create an interconnected state – “a feature which, since the early years of the nineteenth century, has been regarded as a fault in domestic buildings of whatever kind or size.”<sup>147</sup> An Enfilade<sup>148</sup> (in architecture) can be seen to create such an interconnected state where the position and alignment of the doors creates a penetration across several solid boundaries, dissolving the restrictions each of the walls create.

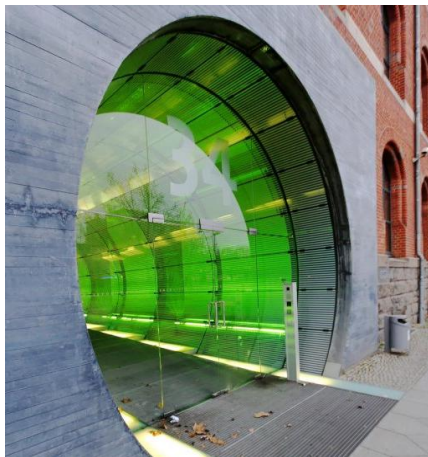


Figure 4.01: Energie Forum Entrance Door, Berlin

English architect Robert Kerr (1823-1904) believed that the addition of more than one door “made domesticity and retirement unobtainable.”<sup>149</sup> Therefore, although Italian architecture used the door to create social connections, English architecture after the nineteenth century used the door to minimize social connections. Depending on its position, the door, as an architectural element, has the capacity to manipulate social interaction by allowing a space to either act as a private room that is disconnected, or one that enables overlapping activities which maximize social interaction.

---

<sup>147</sup> Evans “Figures, Doors and passages” p 63

<sup>148</sup> “A suite of apartments, whose doorways are placed opposite to each other” Oxford English Dictionary “Enfilade” unpaginated. Enfilade originated from the French military term *enfiler* which meant to thread.

<sup>149</sup> Evans “Figures, Doors and passages” p 63

Doors can also be used to frame focal points of visual complexity (figure 4.01). Val Clery noted:

Architects of real vision never use doorways merely to divide, they so arrange them that they serve to focus attention on some vista of grace or beauty beyond, framing another doorway, or glimpse of garden, an enticing succession of rooms, or upward spiral of a stairway. Their doorways never bring us to stop; they reveal another prospect.<sup>150</sup>

Hence the door can be used to entice the walker to experience a new environment, by framing it, creating a connection, (caused by the movement patterns) through *collision points*, from one space to another.

The window is another type of wall opening in the architectural context. The word window originated from *vindauga* which meant ‘wind eye’ and suggested that “ventilation was the primary function in places of habitation.”<sup>151</sup> The first window was seen in the domestic dwellings of the Neolithic village in Anatolia and was an opening created in thick walls so that fresh air and light could enter the interior of the home but it also was created to allow views to the exterior.<sup>152</sup>

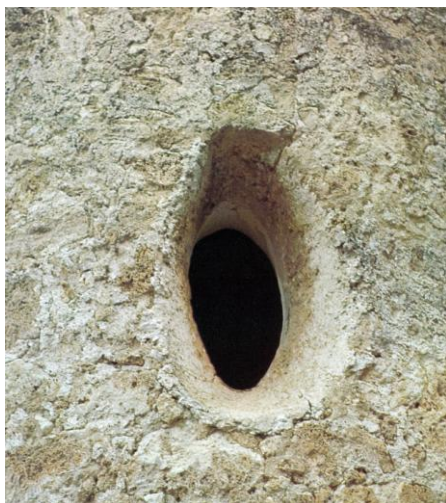


Figure 4.02: San Antonio, Texas, U.S.A



Figure 4.03: Selkirk, Manitoba, Canada

These openings were not only meant for light, views and ventilation, but were also symbolic in nature. “The [Neolithic] village meant that men had learnt at last how to live and work together

---

<sup>150</sup> Clery Doors unpaginated

<sup>151</sup> Louw “The Development of the Window” p 8

<sup>152</sup> Clery Windows unpaginated

in peace. The opening of the window was a token of their growing sense of security and of community.”<sup>153</sup> Therefore the historic window allowed a visual connection and transfer from inside to outside and vice versa.

Clery explains that architectural windows today are the “simplest and most direct means of communication.”<sup>154</sup> They enable exchange of ideas from one space to another either by allowing a visual connection from one space to another or by allowing the condition of one space to infiltrate into the other (letting light and air from the exterior into the interior). Therefore the window from its origins was a facilitator of friction since it provided the opening, through the solid wall, that linked two spaces, engaging their differences.



Figure 4.04: Interactive Architectural Filter  
Oregon State Library, Information Desk, 1954

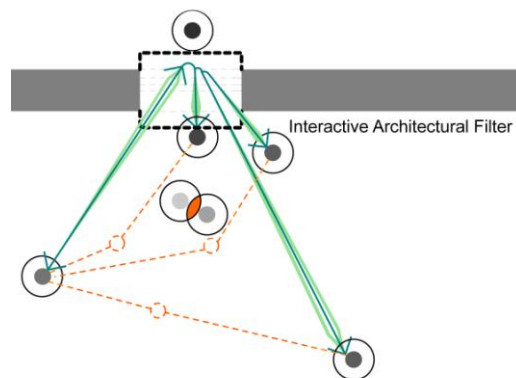


Figure 4.05: Diagrammatic representation of social connections created by the interactive architectural filter



Figure 4.06: Static Filter, Main Press Centre,  
Olympic Village, Beijing

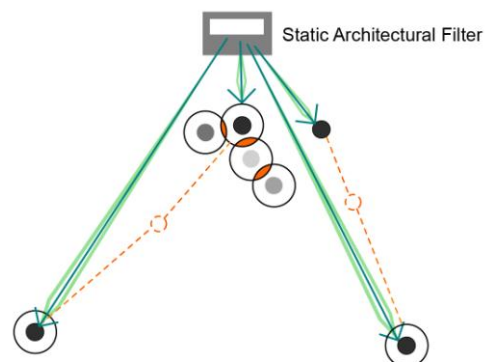


Figure 4.07: Diagrammatic representation of social connections created by the static architectural filter

<sup>153</sup> Clery Windows unpaginated

<sup>154</sup> Clery Windows unpaginated



The window just like the door also has the capacity to affect the social structure in an interior setting. A penetration into a wall, whether to create full access or a partial opening, enables connections between the two spaces that the wall separates. While the introduction of the wall is to create a divide, the introduction of the opening within a wall enables necessary and controlled connections. The interior window, as an architectural element, has similar properties to that of



Figure 4.08: Front Desk, Hotel Park Inn, Krakow, Poland, by J Mayer H Architects and OVOTZ design

the urban filter. The interior window which allows the occupant to interact through it creates a slightly different social scenario to one that does not encourage social interaction. In the urban context coffee carts, new paper vendors and other such elements that have human operators (public characters) are discussed as an interactive filter, however a bus timetable, posted on a board by the bus stop, acts as a static filter. An interactive interior window performs the same task as the interactive urban filter (filtering information to the stationary walker). Inside buildings, the interactive window forms the setting for the interior equivalent of a public character. An interactive window is a window through which the occupant may interact with

another individual (public character). Helpdesks, information desks, receptions, ticket counters and other such elements that have human operators make the architectural window interactive (figure 4.04). The interactive window is the built object that has the ability of the urban interactive filter to create indirect connection points creating indirect friction between the occupants who interact with it (figure 4.05). Such an interior window gives out information just like the urban filter. The occupant, just the walker, can control the type of information they get from the interior filter. In many instances interactive windows become pieces of furniture within an interior setting. The opening within the built form enables interactions from one side to another giving the furniture characteristics of the urban interactive filter (figure 4.08).

Static filters in the urban context are inactive elements. Bus timetables, city maps, information posts etc are static elements that have no human operators. They give out information to the stationary walker and have the tendency of creating indirect friction.<sup>155</sup> Each walker gets information they require from the bus timetable but they do not need to socially interact with the post. A visual connection will give them the information they require. Inactive windows such as TV and computer information screens behave as static filters (figure 4.06). “The screen - the film screen, the TV Screen, the computer screen - is a component piece of architecture, a ‘virtual window’ that renders the wall permeable to light and ‘ventilation’ and that dramatically changes the materialities of built space.”<sup>156</sup> Such static interior windows act as filters since they allow information to be filtered due to a visual connection. It is up to the occupant to determine what kind of information or knowledge they gain when they look at a static filter. Another occupant may look at the same “window” and find the same or different information creating indirect points of exchange (figure 4.07). In some instances computer screen may be interactive in the way that they allow the occupant to communicate with the virtual world. Such an interface, which enables the occupant to interact with it, then takes on the properties of a static architectural window. This interface makes the static computer screen a window into another space.<sup>157</sup>



Figure 4.09: Object of Visual Complexity

---

<sup>155</sup> Chapter 2: The Filter, page 45

<sup>156</sup> Friedberg The Virtual Window- from Alberti to Microsoft p 138

<sup>157</sup> Chat rooms, virtual helpdesk etc. make the static screen an interactive architectural window.

Not all windows act as filters. A window that is static and provides a view into another space can behave as an object or space with visual complexity (similar to the Bucket Fountain on Cuba Street in Wellington). Figure 4.09 shows a similar situation on the interior where the full height windows provide a view into another interior condition that differs to the one the occupant is walking through. This change in visual complexity has the tendency of reducing the speed of the moving occupant and creating manipulated friction around the object.<sup>158</sup>

Architectural filters, irrespective of the building type, have the ability to create *contact points* within their immediate surroundings but also have the potential of creating indirect friction in the extended environment. Information desks at museums, reception desks in office buildings, help desks in shopping malls, book issue desks in libraries, ticket offices at railway terminals etc, are some of the elements within which an interactive window enables the transfer of information from one side of the desk to another. Such functions allow the occupant to interact with them, creating an interaction through the opening in the form. They become filters in the architectural context. Other functions like the check-out operators in shops, cashier posts in a café also behave as filters. The important observation from the urban that benefits the interior condition is the placement of such a filter. A placement of the filter (within the overlapping structure) has the capability to transform the social structure of an interior. Filters in the socially dynamic urban area are found along the footpath, edges of a playground or even within the context of the playground. In some instances a filter by a traffic light is found to create an overlap in the social condition of the footpath. The strategic placement of the filter in the overlapping urban structure can therefore enhance the social life. Similarly the strategic placement of a filter to create a social overlap within an interior condition can prove to be beneficial to the social structure of the interior within any building type. In museums, for instance, information desks and bag/coat check posts are the most obvious filters. Information screens also act as filters. The placement of the information desk next to the bags/coat check post is traditionally seen within the museum. This is a missed opportunity since each of them has the capacity to generate manipulated friction and indirect friction. Distance between the two filters will ensure the continuation of a friction *strand* and a distribution of points of exchange within the public areas of the museum. The introduction of such a filter into an open planned area will ensure its use and the creation of direct and indirect points of exchange. Although

---

<sup>158</sup> Chapter 02: The Pathway, page 42

information desks and coat check desks are placed at the entrance due to functional reasons the addition of café, shops and other showcased exhibits at the entrance will create a passage with a number of activity patterns that can be used to separate the information desk from the entrance. The placement of such a desk away from the entrance will create density in the movement patterns towards it but in doing so can force an overlap in the social structure of the occupants visiting the café, the shop and the museum.

## **THE ROOM and THE OPEN PLAN**

The open plan originated from the strategic spatial arrangement of the room. The concept of open planning was first seen in Italian architecture in the sixteenth century.<sup>159</sup> In the sixteenth century, the open plan was referred to a space that had permeable boundaries.

An open plan [was] relatively permeable to the numerous members of the household, all of whom – men, women, children, servants and visitors - were obliged to pass through a matrix of connecting rooms where the day-to-day business of the life was carried on. It was inevitable that paths would intersect during the course of a day, and that every activity was liable to intercession unless very definite measures were taken to avoid it.<sup>160</sup>

Although the sixteenth century domestic interior was divided by a number of walls which created rooms, the numerous penetrations in the walls created openings that allowed the domestic interior to work as an open planned space (figure 4.12 and 4.13).

Robin Evans in “The Developed Surface” discussed the room as an element in architecture that enclosed space and one that was created by binding of several surfaces together.<sup>161</sup> Evans explained that drawing techniques in the early seventeenth century “illustrated things that were unequivocally outside, but which shared one characteristic of the interiors; being enclosures of one sort or another.”<sup>162</sup> This changed in the eighteenth century where “individual rooms [became] the subject of architectural drawing.”<sup>163</sup>

The room is a component of an architectural plan and therefore a plan determines the relationship between the different rooms. Rooms can be organised in different compositions in an architectural plan to determine the levels of intimacy, privacy, identity, interaction and

---

<sup>159</sup> Evans “Figures, Doors and Passages” p 65

<sup>160</sup> Evans “Figures, Doors and Passages” p 65

<sup>161</sup> “The molding [on the ceiling of a room] was the conceptual tape that bound several surfaces back together.” Evans “The Developed Surface” p 212

<sup>162</sup> Evans “The Developed Surface” p 203

<sup>163</sup> Evans “The Developed Surface” p 203

circulation flows. As seen in the previous chapter the passage is a component of the room. It is created by the introduction of two or more doors within the enclosed state of the room to create an interconnection between the other rooms that lie adjacent to it allowing one space to flow into another creating an open planned state. This type of linear arrangement of rooms is what Evans refers to as the circuit plan. He describes a circuit plan to be rooms that are like ‘beads on a string’.

There is little difference between the relationship of the rooms, one to another, when they are circuited this way. The hierarchy all but disappears.<sup>164</sup>

Due to this interconnected circuit of rooms, each room loses its individual identity. There is an overlap created between the different enclosures creating friction within its open boundaries.

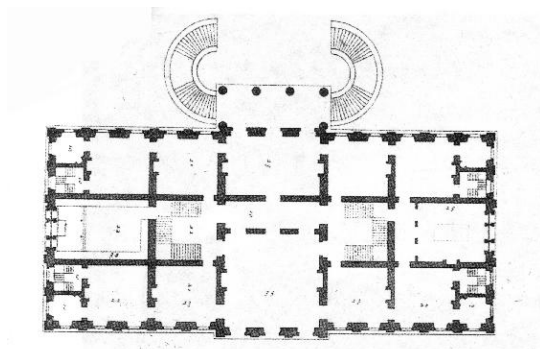


Figure 4.10: The Circuit Plan  
Principal storey of house at Milton, from James Gibbs, 1792

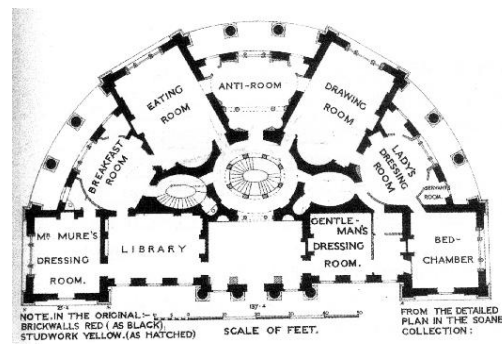


Figure 4.11: The Ring Plan  
Principal storey of Saxham House, by Robert Adam, 1779

In contrast to the circuit of rooms, Evans discussed the ring plan (figure 4.10 and 4.11). This plan has rooms that were of different shapes and sizes. This gave each room a distinct characteristics and added variety. The movement through such a plan of rooms would mean that the occupant would have to go through a number of different enclosures rather than a string of similar ones. Therefore the occupant would be exposed to a different function and different spatial identity whilst moving through these rooms. This spatial arrangement of rooms during the eighteenth century however did not allow the one room to open up into the other. The idea of the room being an enclosure was made stronger.

To preserve their precious identity, so easy to dilute, they are forbidden to mix. Apart from the restricted information disclosed by enfolding of doors (an archaizing glimpse of unity), interiors are introverted and boxed in. Doors might open out onto one another but spaces rarely do.<sup>165</sup>

<sup>164</sup> Evans “The Developed Surface” p 206

<sup>165</sup> Evans “The Developed Surface” p 208

Therefore the identity of the room was made stronger and a hierarchical relationship between rooms was established by enclosing spaces, changing their size and blocking them in.

The room can be seen as an architectural element that is made up of walls to create a disconnection from the space that lies around it to house a singular function. When blocked in (closed doors) it protects its identity (function or aesthetic) from filtering out through wall openings. This disconnection blocks visual and social connections between the enclosed space of the room from the space that surrounds it. The enclosed space therefore becomes private space with minimal distractions.

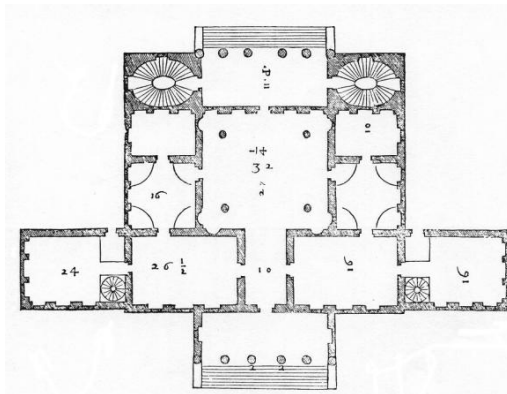


Figure 4.12: Interconnected interior spaces, Palazzo Antonini, Udine, by Andrea Palladio, 1560-65



Figure 4.13: Interior spaces, Villa Cornaro, by Andrea Palladio, 1560-65

The Industrial Revolution in the late nineteenth century changed the way the open plan was created. “By 1900 there were new construction materials creating new structural possibilities.”<sup>166</sup> The use of steel, iron and glass enabled the creation of large open spaces that required less internal structural supports. “The 1909 Robie House, [by Frank Lloyd Wright] with its fluid space between living and dining room and extraordinary number of windows, embodies his principles for an open plan.”<sup>167</sup> After the industrial revolution the concept of open planning was not only confined to the interior (like in Italian architecture) but also focused on creating a flow from the exterior condition into the interior condition by dissolving the external boundary (figure 4.14).

---

<sup>166</sup> Elliott “Breaking Down Walls” p 52

<sup>167</sup> Elliott “Breaking Down Walls” p 53

Adolf Loos used a different approach to open planning as compared Wright after 1916. He referred to this concept of planning as the *Raumplan* which is a “space plan – a manner in which a sort of three dimensional or vertical space is ordered.”<sup>168</sup> Prior to 1916, many houses designed by Loos had rooms on one level (Steiner Villa 1910, Stoessi Villa 1911, Horner Villa 1912, Scheu Villa 1912) however this changed after 1916 where movement of the occupant through the house “was dramatized by intensified spatial contrasts.”<sup>169</sup> Loos’s approach created closed areas that needed privacy (bedrooms and study) and provided continuous visual connections between the public spaces (living area and dining room) of the house. He achieved this by using split levels and open staircases in the public areas. The spaces below these elements were blocked in, not only to maximise the use of the available space but also to prevent visual connections and distractions into the private areas of the house. Loos’s *Raumplan* stretched Lloyd’s ideas on the open plan from a horizontal floor plane into a three dimensional spatial approach (in the public areas) by increasing visual friction via the use of inactive generator space.<sup>170</sup>

The use of steel as a structural element eliminated the need for load bearing interior walls which made it possible for the open plan to achieve a visual continuity from one space to another horizontally and vertically. With the elimination of the interior wall, the single floor open plan allowed passages through space. It also allowed functional overlaps which meant that one large room became multi-functional.<sup>171</sup> Split-level spatial open plan allows continuity through the use of inactive generator space.

---

<sup>168</sup>Van de Beek “Adolf Loos - patterns of town houses” p 27

<sup>169</sup>Van de Beek “Adolf Loos - patterns of town houses” p 30

<sup>170</sup> Chapter 3: The Staircase, page 74

<sup>171</sup>“Philip Johnson’s 1949 glass house is the ultimate expression of the open plan. With the exception of the chimney/bathroom column, there are no barriers inside and, because it’s clad in glass, no barriers to the house’s surroundings.” Elliott “Breaking Down Walls” p 53





Figure 4.14: Single Storey Open Planning, Villa Savoye, Le Corbusier, 1928-1929

Open planning during the modern movement therefore used an approach different to that of sixteenth century Italian architecture. Today, influenced by the modern movement, divisions in an open planned space are created by the use of built-in and movable furniture instead of solid walls (figure 4.15). Movable furniture allows flexibility in the boundaries that are created by the furniture making the internal boundaries permeable and nimble. Such a planning method has proved to be useful for “some types of communication, such as interdepartmental contact and supervision”<sup>172</sup> in a work environment.

---

<sup>172</sup> Sundstrom, Herbert, Brown “Privacy and Communication in an Open-Plan Office” p 380





Figure 4.15: Open Plan Office Space

An open planned space, like reading areas in public libraries, airports cafés etc., with permeable internal boundaries, has a function parallel to the urban generator. Just like the urban generator, single storey open planning allows the creation of *contact points* within its boundaries since they are spaces of slow movement. On the interior they allow a number of different people to use the same space and perform various activities creating an overlap in activity patterns. In allowing such interaction they create patterns of slow movement within their external boundary.

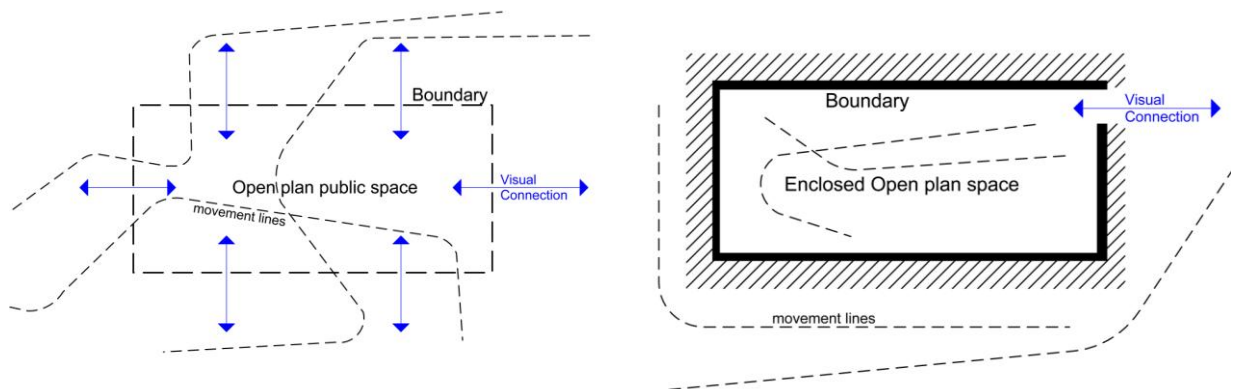


Figure 4.16: Boundary qualities (in plan) of open plan public spaces compared to enclosed open plan office spaces

The enclosed urban playground has similar properties to private open planned spaces like office spaces. An enclosed playground in the urban context is seen as an isolated entity that does not allow the systems from the surroundings areas to overlap with it.<sup>173</sup> Enclosed parks

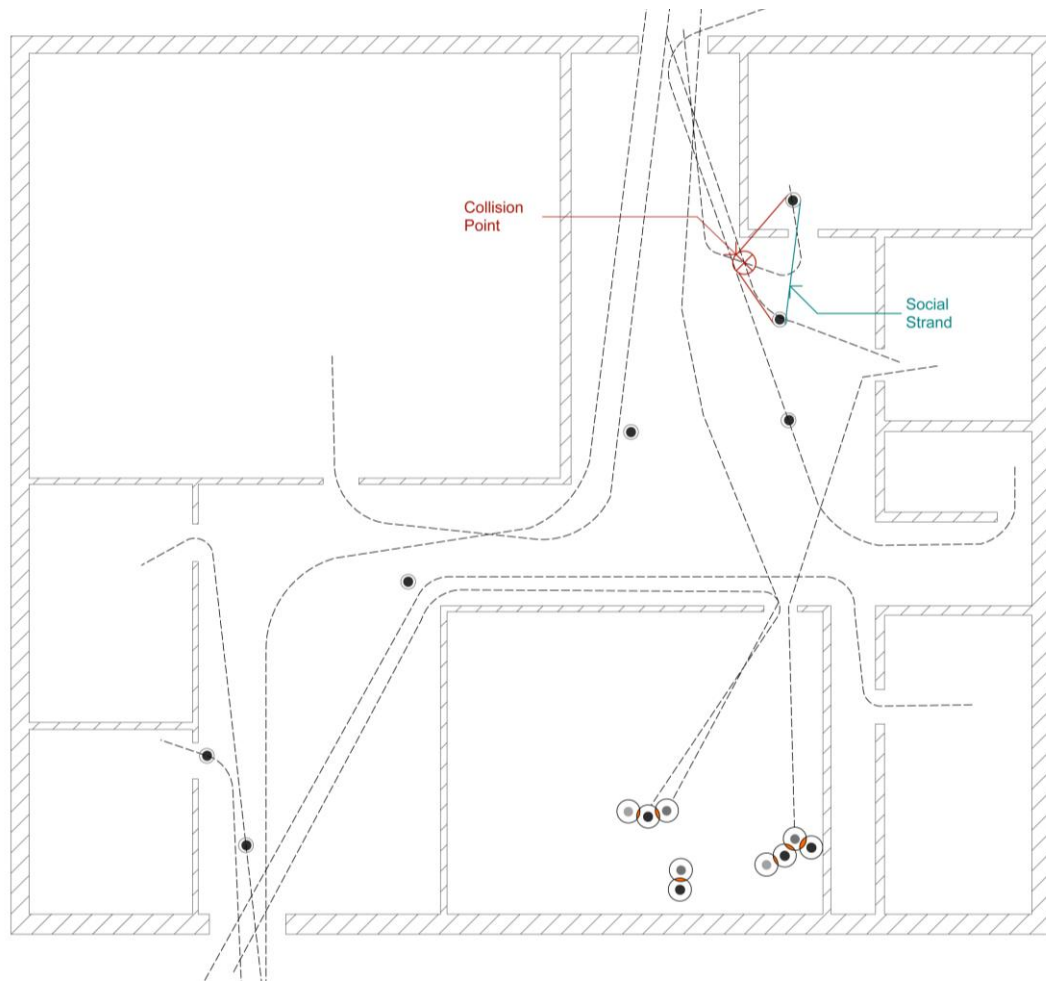


Figure 4.17: Movement patterns and social connection in an enclosed open plan space  
(Compare with figure 4.18)

therefore create closed social groups since they are a part of the strict tree-like city structure with no overlap.<sup>174</sup> Community groups are groups that are usually formed on the basis of similarity and are described as closed entities by Sennett. Enclosed parks generally contain closed groups and encourage a feeling of oneness instead of encouraging engagement with different ideas from outside their boundary. Open planned enclosed office spaces tend to

<sup>173</sup> Alexander discusses a fenced enclosed playground as an isolated entity that is “cut off from the systems of the city.” Alexander “A city is not a Tree- Part 2” p 59 The strength of the visual link depends on the design of the fence.

<sup>174</sup> Alexander explains that the social structure consists of closed groups within cities that have a strict tree structure. Alexander “A city is not a Tree- Part 1” p 62

work in a similar manner. Many of these offices have solid boundaries (dividing them from other internal spaces in the building) that block visual connections from inside to outside and vice versa (figure 4.16). Due to this visual disconnect the enclosed interior generator is independent of the social condition that lies outside of its external boundary (figure 4.17). It is not capable of affecting the movement patterns that happen around it. Due to their solid boundary they do not allow passages through them and therefore minimise distractions that may be caused visually or by the intersection of movement patterns from exterior activities. Windows within their solid boundary of such enclosed spaces begin to create connections with the external environment, however this connection depends on the view the window provides. A window that provides a constantly changing view (into a public space) will attract the occupant to visually engage with the external condition however most office spaces tend to have still views (towards building facades). These still views may attract the attention of the occupant at first but once the occupant gets familiar with the view they no longer are affected by it.<sup>175</sup>

Urban generators that have permeable external boundaries work differently to enclosed ones. Public open planned interior spaces have tendencies similar to the open urban generator. Due to the lack of external boundary they allow visual connections with the people and options in the surrounding environment. The permeable boundary of the open plan public space acts like a *seam* – a line of exchange. A view across the interior open planned space into areas with diversity of options enables movement patterns from the surrounding areas across the open planned space. This results in overlapping activity patterns and greater chances for *collision points* to be generated. Food courts in shopping malls, café seating areas in museums act as interior generators. The lack of wall not only allows access to such a space from different directions but also allows visual connections across it. In doing so this visual connection begins to encourage the inhabitant from the adjoining functional areas to approach the open planned space further increasing the changes of *contact points* to be generated converting its external boundary into a *seam* (figure 4.18).

---

<sup>175</sup>Familiarity is discussed earlier in the thesis (Chapter 2: The Pathway, page 44) as a phenomenon that creates a disconnection between the walker/occupant and their surroundings.

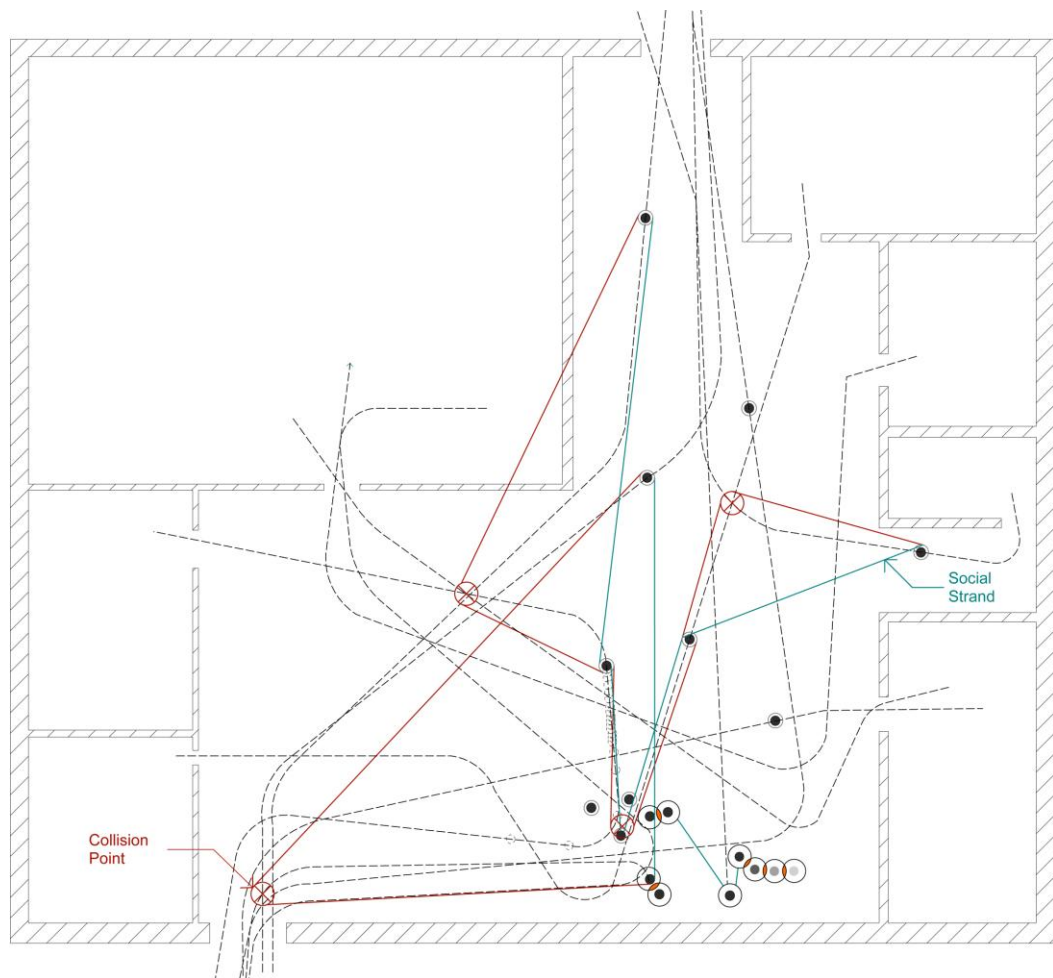


Figure 4.18: Movement patterns and social connection in a permeable open plan space

## CHAPTER CONCLUSION

Spatial interior architectural elements take on characteristics of urban design spatial elements of the generator and the filter. The discussion on the room and the open plan provides an introduction towards the construction of space as a composition of various forms that may be enclosed or open. Their identities and level of privacy can be achieved by manipulating wall openings. Therefore rooms do not exist by themselves. Levels of friction and interaction can be manipulated by introduction of circulatory mechanisms like the pathway or the corridor and wall penetrations like the window or the door. The wall openings again provide varying friction levels and types depending on their position and function.

Enclosed open plan private spaces and rooms are mechanisms that minimise friction levels and therefore disconnect the occupant from external distractions. It is the solid boundaries of these private spaces that make them areas with minimal friction and enable higher concentration. Public open planned spaces and wall penetrations make the most of the opportunities from the surrounding facilities and functions to create overlapping activity flows to maximise levels of social interaction. The ephemeral boundaries of open planned spaces facilitate a functional overlap as well as visual connections across them. The split-level open planning (by Loos) creates a continuous visual connection whilst maintaining a physical divide between the two spaces it connects visually. Semi- private areas like staff rooms etc. could benefit from such a scheme. Similar to the interior circulatory elements, the spatial elements with solid boundaries are better used in private working environments that need higher levels of concentration while ephemeral boundaries facilitate connections across several social groups and are therefore best used within public spaces.

The social tendencies of these spatial interior elements can ensure their appropriate use within an interior setting.

URBAN ELEMENT	FRICTION ELEMENT	INTERIOR ELEMENT	INTERIOR FUNCTION
The Footpath	THE PATHWAY	The Passage, The Open Staircase	Public circulation
The Public Character	THE FILTER	The Static and the Interactive Window	Reception Desks, Information Desk, Collection desks, Ticket Counters
The Playground	THE GENERATOR	Permeable Open-Planned Spaces	Lobbies, public spaces such as food courts, cafes, casual reading areas
The Enclosed Playground	THE ENCLOSED GENERATOR	The Room, Enclosed Open-Planned Spaces,	Work spaces
The Dead Spot	THE INACTIVE GENERATOR	Voids around Open Staircases, Multiple Height Atriums, Use of Split-Levels	Entrances and atriums, semi- public functions like staff lunch areas
The Urban Vehicle	THE CONNECTOR	The Corridor, The Elevator, The Enclosed Staircase	Direct thoroughfares at airports, hotes(connection from the kitchen to the restaurant)

Figure 4.19: Concluding Table

## CONCLUSION

The intent of this thesis was to find ways to enhance social dynamism in interior architecture. Urban design theories explore ways to facilitate social interaction. They theorise the city as a mixture of built form and social patterns. Facilitating social interaction within interiors of large public buildings is seen to be beneficial in creating informal knowledge exchange in private workspaces but also in creating exchange between the different socio- economic groups that use the public spaces. Since urban design already provides successful mechanisms for facilitating social interaction, this thesis has explored concepts from urban design and translated them into mechanisms for interior architecture.

The study of the urban setting led to the finding of social friction as a mechanism for social interaction. Social friction is found to be a productive phenomenon to engage different ideas between the different social groups that are present in any one place. This phenomenon is seen to be essential in creating healthy societal groups in the urban context by theorists such as Richard Sennett and Maartin Hajer. These theorists discuss social friction to be a phenomenon that causes exchange between diverse social groups which helps to minimise inequality in the city. Friction exposes new ideas to the people that interact. It makes them aware of the diverse options in their surroundings. The thesis therefore studied the various city structures that create different instances of social friction and then analyses the characteristics of the built elements within those structures which have the capacity to manipulate the levels of social friction. During the study of these urban elements, the thesis identified different friction types that exist in the urban context, namely: visual friction, manipulated friction and indirect friction. It recognised visual friction as a phenomenon that allows an exchange between two or more people or a person and their surroundings caused by a visual connection. On further analyses of this friction type it concluded that visual friction has the capacity to change the rate of movement of the occupant of the space and this change in the rate of movement in turn affects the level of engagement the occupant has with the surrounding context and people. Visual friction can be affected by changing the amount of visual complexity in any environment. Therefore the higher the visual complexity the more likely it is for the occupant to engage with the diversity in their surroundings, and to interact with other social groups around them. In contrast, manipulated friction exists when two or more people interact. It is a socially dependent phenomenon. Manipulated friction and visual friction are interrelated. The visual complexity

that causes people to pause then has the capacity to create a zone of manipulated friction around the visual point of focus. The zone of manipulated friction also becomes a part of the visual complexity in an environment and in turn causes the passing occupant to engage with the diversity in the surrounding context. These friction types evolved when urban elements like the footpath, the playground, the vehicle, the public character were studied. Each of these urban elements, depending on the quality of their boundaries and their location in the urban plan, facilitate different levels of manipulated and visual friction which in turn enable different types and levels of social interaction.

While attempting to study friction in the urban context and creating parallels between the built urban environment with the built architectural environment, the thesis does recognise the differences between the two. The urban context is more open to chance encounters than the architectural context. Access to public buildings is usually controlled around opening hours etc. and public buildings cater to people who have a particular reason to be there unlike some urban environments. Such differences limit the extent to which exchange of information will occur in public buildings compared to the opportunities that are available for visual, manipulated and indirect friction to occur in the urban context. However, public architecture still invites people from different socio- economic groups to visit and use them. This generates opportunities for interior architects to employ ideas around social friction within such public interior spaces.

The study of the urban elements not only identified various mechanisms that manipulate social interaction but also identify the qualities of built form that influence the formation of social connections. For the thesis this was an important step in translating urban characteristics into the interior since it analysed qualities of boundaries, spatial adjacencies, flowing of function, use of voids to enable visibility and other such characteristics in urban elements that can be easily analysed in interior architectural elements. The thesis then carried out an analysis of interior architecture elements in the same way. It analysed elements like the passage, the corridor, the elevator, the staircase, wall openings, the room and open planned spaces in order to study the qualities of the their boundaries, the type of spaces that typically lie adjacent to them, the function they house and the visual connections they allow. Such an analysis allowed the thesis to compare the interior elements with the urban elements. It created parallel relationships between the mechanisms for social friction in the urban context and proposed ways of using interior elements to create various levels of social connections in an interior setting. Corridors,



elevators, passages, and staircases are typically used for purposes of circulation in an interior setting. However understanding these circulatory devices in terms of the type of social connections they allow creates a better understanding of their function not only as a circulation mechanism but also as a mechanism for social exchange. Similarly, the study of the social tendencies of interior spatial elements like the room, the door, the window, the enclosed open plan and the permeable open plan enable their use in various interior settings depending on different requirements for informal information exchange in an interior setting.

The interior elements studied in this thesis can be used to influence social patterns depending on the building type. Each type of building and program invites different interior elements to engage the groups that use the space based on whether they are public or private. Offices, airports, libraries, hotels, schools, and museums all call for different levels of social interaction depending on the division of the program as well as division between public and private spaces. The passage, due to its permeable and invisible boundaries, is found to be the most beneficial in creating social connections within a public setting. Due to the lack of solid barriers, it not only enables visual friction within its area but also allows greater opportunities for the adjacent functions to fold or overlap with it. This however, would not be ideal in a space with private offices. In such a case the corridor proves to be a better solution since it serves as an element that maintains privacy to the private rooms. Similarly open planned enclosed spaces are best used in areas that require a sense of community. These spaces minimise external distractions and encourage sharing of internal ideas. Open plan public spaces however encourage interdisciplinary interaction due to their invisible boundaries. The social characteristics of these elements enable their use in an interior setting to create various levels of manipulated and visual friction.

The aim of the thesis was to provide a theoretical foundation for social friction in interior architecture; rather than a comprehensive accounting of all elements within interior architecture which might activate social friction. Elements like ramps, single- occupant rooms, different furniture types, entrances, and atriums etc. are also subject to these theories and would productively be topics for further study. This thesis creates a new understanding for traditional interior architectural elements that enables their use to enhance social dynamism in the interior setting.

## REFERENCES

- Abdelwahab, Mona Abdelazeem "Critical Theory, Place Making and Architectural Practice" IAPS Digital Library (June 2010)  
[http://iaps.scix.net/cgi-bin/works/Show?\\_id=iaps\\_19\\_2006\\_997&sort=DEFAULT&search=social%20design&hits=2389](http://iaps.scix.net/cgi-bin/works/Show?_id=iaps_19_2006_997&sort=DEFAULT&search=social%20design&hits=2389)
- Allen, James, James, Andrew D. and Gamlen, Phil, "Formal versus Informal Knowledge Networks in R&D: A Case Study Using Social Network Analysis" R&D Management Vol. 37, No. 3, pp. 179-196, June 2007. Available at SSRN: <http://ssrn.com/abstract=992032> or doi:10.1111/j.1467-9310.2007.00468.x
- Alexander, Christopher "A City is not a Tree- Part 1" The Architectural Forum (April 1965) v.122, pgs 58-62
- Alexander, Christopher "A City is not a Tree- Part 2" The Architectural Forum (May 1965) v.122, pgs 58-61
- Baldon, Cleo and Melchoir, Ib Steps and Stairways (New York: Rizzoli International Publications, Inc, 1989)
- Bass, David "Vertical – Lift, Elevator, Paternoster: A Cultural History of Vertical Transport" AA Files (1995 summer) n.29 pp 97-98
- Baudelaire, Charles The Painter of Modern Life and other essays (New York: Garland Pub., 1978 ©1964)
- Bertolini, Luca "Fostering Urbanity in a Mobile Society: Linking Concepts and Practices" Journal of Urban Design (October 2006) v.11, no.3 pgs.319-334
- Bora, Archana Studies of Visual Attention University of Waterloo for a Masters of Science in Visual Science (Canada: Heritage Branch, 2009)
- British Journal of Sociology Podcasts "A Brief History of Disorder" Wiley (November 2009)  
<http://www.wiley.com/bw/podcast/bjos.asp>
- Certeau, de Michel The Practice of Everyday Life (Berkeley: University of California Press, 1984.)
- Clery, Val Doors (New York: Penguin Book Ltd, 1979)
- Clery, Val Windows (New York: Penguin Book Ltd, 1979)
- Deleuze, G and Guattari A thousand Plateaus: Capitalism and Schizophrenia (Minneapolis: University of Minnesota Press, 1987)
- Dovey, Kim and Polakit, Kasama "urban Slippage: Smooth and Striated Streetscapes in Bangkok" Loose Space ed. Franck, Karen and Stevens, Quentin (London; New York: Routledge, 2007) pgs 113-131

Elliott, Lynn "Breaking Down Walls: interior spaces and the development of the open plan" Old-house journal (2002 May-June), v.30, n.3, pp 50-53

Encyclopedia "Modern Movement" Talk Talk (June 2010)  
<http://www.talktalk.co.uk/reference/encyclopaedia/hutchinson/m0039706.html>

Estevez, T. Alberto "The Fascination of Speed in Architecture and Design" BCN Speed and Friction-The Catalunya Circuit City (Santa Fe, N. M.: Lumen, Inc. /SITES Books, 2004) pgs 73-77

Evans, Robin "Figures, Doors and Passages" Translations from Drawing to Building Robin Evans (London: Architectural Association, 1997) pp 55-91

Evans, Robin "The Rights of Retreat and the Rites of Exclusion: Notes Towards the Definition of Wall" Translations from Drawing to Building Robin Evans (London: Architectural Association, 1997) pp35-53

Evans, Robin "The Developed Surface" Translations from Drawing to Building Robin Evans (London: Architectural Association, 1997) pp195-231

Friedberg, Anne The Virtual Window- from Alberti to Microsoft Robin Evans (Cambridge, Mass.: MIT Press, 2006)

Gehl, Jan "Public Spaces for a Changing Public Life" Open Space- People Space ed. Catharine Ward Thompson and Penny Travlou (London, New York: Taylor and Francis, 2007) pgs 3-10

Hajer, Maarten "Zero- Friction Society" Urban Design Quarterly (July 1999) n.71, pgs 29-34

Hattstein, Markus "Stairs – Step by Step" Stairs: Architectural Detail ed. Braun, Markus Sebastian (Berlin: Braun, 2008) pp 6-9

Hill, Kim "Sheena Iyengar:Choice" Radio New Zealand (April 2010)  
[http://podcast.radionz.co.nz/sat/sat-20100424-0905-Sheena\\_Iyengar\\_choice-048.mp3](http://podcast.radionz.co.nz/sat/sat-20100424-0905-Sheena_Iyengar_choice-048.mp3)

IAPS "Some History" International Association of People Environmental Studies (June 2010)  
<http://www.iaps-association.org/what-is-iaps/some-history/>

IAPS "Home" International Association of People Environmental Studies (June 2010)  
<http://www.iaps-association.org/>

Jacobs, Jane The Death and Life of Great American Cities (New York: The Modern Library, 1961)

Koolhaas, Rem S,M,L,XL (Rotterdam : 010 Publishers, 1995)

Kransner-Khait, Barbara "Survivor: The history of the Library" History magazine (March 2010)  
<http://www.history-magazine.com/libraries.html>

Lagos Wide and Close: An Interactive Journey into an Exploding City Bregtje van der Haak (Amsterdam, 2005)

Lawrence, M Bonnie and Myerson, Joel and Abrams, A Richard “Interference with spatial working memory: An eye movement is more than a shift of attention” Psychonomic Bulletin and Review Austin: (Jun 2004) vol.11, n.3 pp 488-495

Lee, So Young and Brand, L. Jay “Effects of control over office workspace on perceptions of the work environment and work outcomes” Journal of Environmental Psychology v.25, n.3, September 2005, pp 323-333

Louw, Hentie “The Development of the Window” Windows: History, Repair and Conservation ed. Tutton, Michael; Hirst, Elizabeth; Pearce, Jill (Michigan: Donhead Publishing Ltd, 2007) pp 7- 96

Lynch, Kevin The Image of the City (Cambridge [Mass.]: Technology Press, 1960)

Martens, Bob; Keul, Alexander G. Designing social innovation: Planning, building, evaluating. (Ashland, OH, US: Hogrefe & Huber Publishers, 2005)

Motalebi Esfidvajani, Ghasem “A theory of meaning in architecture and urban design” Dissertation Abstracts International Section A: Humanities and Social Sciences Vol 60(7-A), 2000, p 2259

Oosterhuis, Kas “BCN Speed Friction work shop at ESARQ” BCN Speed and Friction-The Catalunya Circuit City (Santa Fe, N. M.: Lumen, Inc. /SITES Books, 2004) pgs 8-34

Oxford English Dictionary “Friction” Oxford University Press Second Edition 1989 (Nov 2009) [http://dictionary.oed.com.helicon.vuw.ac.nz/cgi/entry/50089932?query\\_type=word&queryword=friction&first=1&max\\_to\\_show=10&sort\\_type=alpha&result\\_place=2&search\\_id=ucnb-IMFuQF-6961&hilite=50089932](http://dictionary.oed.com.helicon.vuw.ac.nz/cgi/entry/50089932?query_type=word&queryword=friction&first=1&max_to_show=10&sort_type=alpha&result_place=2&search_id=ucnb-IMFuQF-6961&hilite=50089932)

Oxford English Dictionary “Enfilade” Oxford University Press Second Edition 1989 (June 2010) [http://dictionary.oed.com.helicon.vuw.ac.nz/cgi/entry/50075225?query\\_type=word&queryword=enfilade&first=1&max\\_to\\_show=10&sort\\_type=alpha&result\\_place=1&search\\_id=sVgA-IRjajt-3749&hilite=50075225](http://dictionary.oed.com.helicon.vuw.ac.nz/cgi/entry/50075225?query_type=word&queryword=enfilade&first=1&max_to_show=10&sort_type=alpha&result_place=1&search_id=sVgA-IRjajt-3749&hilite=50075225)

Petroski, Henry “Vertical, Horizontal, Diagonal” Up Down Across:Elevators, Escalators, and Moving Sidewalks ed. Goetz, Alisa (New York: Merrell Publishers Limited, 2003) pp37-45

Robert Venturi, Denise Scott Brown and Steven Izenour Learning from Las Vegas (Cambridge: MIT Press, 1972)

Rowe, Colin and Koetter, Fred Collage City (Cambridge, Mass: MIT Press, 1978)

Senft, Carolyn “The staircase: history and theories [and] The staircase: studies of hazards, falls, and safer design [by] John Templer [book review]” Journal of Architectural Education 1994 Nov., v.48, n.2, pp 129-130

Sennett, Richard Uses of Disorder- Personal Identity and City Life (London: Allen Lane The Penguin Press, 1971)

Sennett, Richard The Fall of Public Man (Cambridge: Cambridge University Press, 1974)

Sennett, Richard Flesh and stone : the body and the city in Western civilization (New York: W.W. Norton, 1994)

Simmen, Jeannot "The Earth-rooted Ascent to Heaven" Vertical: Lift Escalator Paternoster: A Cultural History of Vertical Transport ed. Lampugnani, Vittorio Magnago; Hartwig, Lutz; Simmen, Jeannot; Imorde, Joseph (Berlin : Ernst & Sohn, 1994) pp55-69

Sommer, Robert Personal Space: The Behavioral Basis of Design (New Jersey: Englewood Cliffs, © 1969)

Speed, Chris "Dismantling Teleological Navigation" Arch-OS (6<sup>th</sup> January 2010) <http://www.arch-os.com/projects/rnd.html>

Spens, Michael Staircases (Great Britain: Academy Editions, 1995)

Strakosch, R. George Vertical Transportation: Elevators and Escalators p3 (New York: John Wiley and Sons, Inc, 1967)

Sundstrom, Eric; R. Kring Herbert and David W. Brown "Privacy and Communication in an Open-Plan Office: A Case Study" Environment and Behaviour (1982); v.14; no.3 pp 379-392

Tateosian, Laura G Investigating aesthetic visualizations Abstract for Dissertation for PhD in Computer Science (North Carolina: Graduate Faculty of North Carolina State University, 2006)

Templer, John The Staircase: History and Theories (Cambridge, Mass.: MIT Press, 1992)

Whyte The Social Life of Small Urban Places William H. Whyte (New York, 1988)

Van de Beek, Johan "Adolf Loos - patterns of town houses" Raumplan versus Plan Libre ed. Risselada, Max (New York: Rozzoli International Publications, Inc., 1988) pp 27-46

Venturi, Robert; Scott Brown, Denise and Izenour, Steven Learning from Las Vegas (Cambridge, Mass., MIT Press, 1972)

Web Urbanist "Random Lift Button" Going Up- 15 amazing elevator artworks and ads (6<sup>th</sup> January 2010) <http://weburbanist.com/2009/07/18/going-up-15-amazing-elevator-artworks-advertisements/>

Windsor, Ahuva; Manor, Joshua and Zikli, Ayelet "Participatory Design of government Office Buildings" IAPS Digital Library (June 2010) [http://iaps.scix.net/cgi-bin/works/Show?\\_id=1202bm614&sort=DEFAULT&search=social%20design&hits=2389](http://iaps.scix.net/cgi-bin/works/Show?_id=1202bm614&sort=DEFAULT&search=social%20design&hits=2389)

Yeatts, Harry W. Jr “Social Animals” Simply Complicated: Understanding the Human Being  
(June 2010) <http://www.threeleggeddragon.com/writings/simply/simple.social.html>

## LIST OF ILLUSTRATIONS

Figure 0.01: Social movement

Gustavs “Movement passing by” DeviantART (Jan 2010)

<http://gustavs.deviantart.com/art/Movement-passing-by-43294456>

Figure 0.02: Shaping of Social Friction

Diagram by author

Figure 1.01: Chapter Structure

Diagram by author

Figure 1.02: Points of social contact

Szukalski, Ted “Old men talking on a bench” WebMark Australia (September 2010)

[http://www.digital-photo.com.au/v/People/Street+Photography/Old-men-talking-on-a-bench\\_MG\\_2798.jpg.html](http://www.digital-photo.com.au/v/People/Street+Photography/Old-men-talking-on-a-bench_MG_2798.jpg.html)

Figure 1.03: Points of exchange between two or more stationary walkers

Diagram by author

Figure 1.04: Intersecting movement patterns

Eyupbdy “Crowded?” DeviantART (June 2010)

<http://browse.deviantart.com/?qh=&section=&q=crowded+street#/d25j6pn>

Figure 1.05: Points of exchange between two walkers in the state of movement

Diagram by author

Figure 1.06: Contact Points: Exchange due to social overlap

Diagram by author

Figure 1.07: Collision Points: Exchange due to intersecting movement patterns

Diagram by author

Figure 1.08: Social Strand

Diagram by author

Figure 1.09: Lagos, Nigeria

Koolhaas “City Limits” Blueprint (Jan 2001) n.179 p 44

Figure 1.10: Nolli map of Rome

The Regents of the University of California “La nuova topografia di Roma Comasco by Giambattista Nolli, ca. 1692-1756” UC Berkeley Library (29th Jan 2010)

<http://www.lib.berkeley.edu/EART/maps/nolli.html>

Figure 2.00: Translation from urban elements to friction elements

Diagram by author

Figure 2.01: Movement patterns and social connections on the pathway

Diagram by author

Figure 2.02: Bucket Fountain, Cuba Street, Wellington, New Zealand

Yellow Fever unpaginated (April 2010)

[http://upload.wikimedia.org/wikipedia/commons/6/61/The\\_Bucket\\_Fountain,\\_Wellington.jpg](http://upload.wikimedia.org/wikipedia/commons/6/61/The_Bucket_Fountain,_Wellington.jpg)

Figure 2.03: Changing boundary of the pathway created by the movement of the walker

Diagram by author

Figure 2.04: A diagrammatic representation of the indirect connections made by the filter on the pathway

Diagram by author

Figure 2.05: Social conditions created by the interactive filter compared to the static filter

Diagram by author

Figure 2.06: Diagrammatic representation of transfer of information enabled by the filter

Diagram by author

Figure 2.07: A diagrammatic representation of movement patterns and social connections created by an open generator

Diagram by author

Figure 2.08: Diagrammatic representation of the boundary qualities of an open generator

Diagram by author

Figure 2.09: Diagrammatic representation of the boundary qualities of an inactive generator

Diagram by author

Figure 2.10: Ariel view of Te Aro Park, Wellington, New Zealand

Google “Te Aro Park” Google Maps New Zealand (June 2010)

<http://maps.google.co.nz/maps?um=1&hl=en&client=firefox-a&rls=org.mozilla:en-GB:official&q=plan%20of%20te%20aro%20park&ie=UTF-8&sa=N&tab=il>

Figure 2.11: View from Dixon Street to Manners Street, Wellington, New Zealand

Photograph by Christine McCarthy, 2010

Figure 2.12: Boundary qualities of the stationary vehicle compared to moving vehicle

Diagram by author

Figure 2.13: Diagrammatic representation of the connector connecting two experiences

Diagram by author

Figure 3.01: Villa Madama Plan, 1518, Raphael

Evans, Robin “Figures, Doors and Passages” Translations from Drawing to Building (London: Architectural Association, 1997) p61

Figure 3.02: Villa Madama Interior

Di-ve “Villa Madama expected to get last-minute reprieve” Di-ve news details (May 2010)

<http://www.di-ve.com/Default.aspx?ID=72&Action=1&NewsId=71319>



Figure 3.03: Movement patterns and social connections caused by passages in a railway terminal  
Diagram by author

Figure 3.04: Boundary qualities (in plan) of the urban pathway compared with the architectural passage  
Diagram by author

Figure 3.05: Boundary qualities (in section) of the urban pathway compared with the architectural passage  
Diagram by author

Figure 3.06: Coleshill, Berkshire, by Sir Roger Pratt, 1650-67  
Evans, Robin "Figures, Doors and Passages" Translations from Drawing to Building (London: Architectural Association, 1997) p72

Figure 3.07: Boundary qualities (in plan) of the corridor compared to the passage  
Diagram by author

Figure 3.08: Corridor without a water cooler compared to a corridor with a water cooler  
Diagram by author

Figure 3.09: Early Vertical Transportation  
Strakosch, R. George Vertical Transportation: Elevators and Escalators (New York: John Wiley and Sons, Inc, 1967) p2

Figure 3.10: The First Elevator, 1853  
Strakosch, R. George Vertical Transportation: Elevators and Escalators (New York: John Wiley and Sons, Inc, 1967) p3

Figure 3.11: Double-decker elevator scheme- doors open at both floors. 60 Wall Tower, New York  
Petroski, Henry "Vertical, Horizontal, Diagonal" Up Down Across: Elevators, Escalators, and Moving Sidewalks ed. Goetz, Alisa (New York: Merrell Publishers Limited, 2003) p 41

Figure 3.12: Diagram of Passenger elevator arrangement in World Trade Centre, New York  
Petroski, Henry "Vertical, Horizontal, Diagonal" Up Down Across: Elevators, Escalators, and Moving Sidewalks ed. Goetz, Alisa (New York: Merrell Publishers Limited, 2003) p 40

Figure 3.13: Use of multiple elevators in Town Gate Building, Germany, 2001  
Goetz, Alisa Up Down Across: Elevators, Escalators, and Moving Sidewalks (New York: Merrell Publishers Limited, 2003) p 29

Figure 3.14: Stone Age Stair  
Baldon, Cleo and Melchoir, Ib Steps and Stairways (New York: Rizzoli International Publications, Inc, 1989) p15

Figure 3.15: Stair made out of a single log  
Baldon, Cleo and Melchoir, Ib Steps and Stairways (New York: Rizzoli International Publications, Inc, 1989) p15

Figure 3.16: Open Staircase, Institute of Molecular Genetics, Czech Academy of Science, by P-H-A Studio in Prague

Alter, Lloyd "Architecture makes you Fat" TreeHugger (June 2010)  
<http://www.treehugger.com/files/2009/07/what-makes-you-fat.php>

Figure 3.17: Staircase as an object of Visual Complexity, 26 Sloane Street (Internal Stair to Retail Store), London, by Eva Jiricna Architects in 1989

Spens, Michael Staircases (Great Britain: Academy Editions, 1995) p21

Figure 3.18: Grand Staircase, Palais Garnier, by Charles Garnier

Moatti, Jaques The Paris Opéra ed. Sefrioui, Anne (Paris, New York : The Vendome Press, 1987) p 82

Figure 3.19: Double-Helix Staircase, Place Jussieu 4, Paris

Lammersen, Marion "Paris, Place Jussieu 4" Stairs: Architectural Detail ed. Braun, Markus (Berlin: Braun, 2008) p109

Figure 3.20: Double-Helix Staircase, Château de Chambord, Loire Valley, France

Dylan "Spiraling Out of Control: The Greatest Spiral Stairs in the World" Atlas Obscura (June 2010) <http://atlasobscura.com/blog/spiraling-out-of-control-the-greatest-spiral-stairs-in-the-world>

Figure 4.01: Energy Forum Entrance Door, Berlin

Martin, Jan "Energie Forum Entrance" Contemporisist (June 2010)  
<http://www.contemporisist.com/category/architecture/page/59/>

Figure 4.02: San Antonio, Texas, U.S.A

Clery, Val Windows (New York: Penguin Book Ltd, 1979) Photograph no.4 unpaginated

Figure 4.03: Selkirk, Manitoba, Canada

Clery, Val Windows (New York: Penguin Book Ltd, 1979. © 1978) Photograph no.3 unpaginated

Figure 4.04: Interactive architectural filter -Information Desk, Oregon State Library, 1954

Oregon State Library "Historic Photos 1941-1958" Oregon.gov (May 2010)  
[http://www.oregon.gov/OSL/photos\\_1941\\_1958.shtml](http://www.oregon.gov/OSL/photos_1941_1958.shtml)

Figure 4.05: Diagrammatic representation of social connections created by the interactive architectural filter

Diagram by author

Figure 4.06: Static Architectural Filter

Mills, Andrew "China reeling over injury to track star Liu Xiang" New Jersey Online (May 2010) [http://www.nj.com/olympics/index.ssf/2008/08/china\\_reeling\\_over\\_injury\\_to\\_t.html](http://www.nj.com/olympics/index.ssf/2008/08/china_reeling_over_injury_to_t.html)

Figure 4.07: Diagrammatic representation of social connections created by the static architectural filter

Diagram by author

Figure 4.08: Front Desk, Hotel Park Inn, Krakow, Poland, by J Mayer H Architects and OVOTZ design  
Kaczmarczyk, Jakub “SOF by J Mayer H Architects and OVOTZ design Lab” Adrihal (June 2010) [http://adrihal.ucoz.ru/blog/sof\\_by\\_j\\_mayer\\_h\\_architects\\_and\\_ovotz\\_design\\_lab/2009-10-09-5991](http://adrihal.ucoz.ru/blog/sof_by_j_mayer_h_architects_and_ovotz_design_lab/2009-10-09-5991)

Figure 4.09: Object of Visual Complexity  
ZeoSpot “Wooden Office Interior Design” ZeoSpot (June 2010) <http://zeospot.com/wp-content/uploads/2009/11/headvertising-wooden-office-interior-design-07-588x413.jpg>

Figure 4.10: The Circuit Plan, Principal storey of house at Milton, from James Gibbs, 1792  
Evans, Robin “The Developed Surface” Translations from Drawing to Building (London: Architectural Association, 1997) p 206

Figure 4.11: The Ring Plan, Principal story of Saxham House, by Robert Adam, 1779  
Evans, Robin “The Developed Surface” Translations from Drawing to Building (London: Architectural Association, 1997) p 207

Figure 4.12: Interconnected interior spaces, Villa Cornaro, by Andrea Palladio, 1560-65  
Mitrovic, Branko “Andrea Palladio's Villa Cornaro in Piombino Dese” Nexus Network Journal: Architecture and Mathematics Online (June 2010)  
<http://emis.math.ecnu.edu.cn/journals/NNJ/Mitrovic03.html>

Figure 4.13: Interiors of Villa Cornaro  
Mitrovic, Branko Learning from Palladio (New York: W.W. Norton and Company, 2004) p 52

Figure 4.14: Single Storey Open Planning, Villa Savoye, by Le Corbusier  
Sullivan, Mary Ann “Villa Savoy First floor: Views of the living room and kitchen” Poissy, France (June 2010)  
<http://www.bluffton.edu/~sullivanm/france/poissy/savoye/corbu6.html>

Figure 4.15: Open Plan Office Space  
Chigot, Pierre “A news source for Ecophon partners in room acoustics” Ecophon: A sound effect on people (June 2010)  
[http://www.acousticbulletin.com/EN/2007/07/strong\\_open\\_plan\\_office\\_acoust.html](http://www.acousticbulletin.com/EN/2007/07/strong_open_plan_office_acoust.html)

Figure 4.16: Boundary qualities (in plan) of open plan public spaces compared to enclosed open plan office spaces  
Diagram by author

Figure 4.17: Movement patterns and social connections in an enclosed open plan Space  
Diagram by author

Figure 4.18: Movement patterns and social connections in a permeable open plan space  
Diagram by author

Figure 4.19: Concluding Table  
Diagram by author