

**ISTANBUL TECHNICAL UNIVERSITY ★ GRADUATE SCHOOL OF SCIENCE**  
**ENGINEERING AND TECHNOLOGY**

**URBAN SECTIONS: INTERACTION BETWEEN  
TRANSPORTATION INFRASTRUCTURE AND GROUND**

**M.Sc. THESIS**

**Nurgül YARDIM**

**Department of Interdisciplinary**

**Urban Design Programme**

**JUNE 2012**



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**İSTANBUL TEKNİK ÜNİVERSİTESİ ★ FEN BİLİMLERİ ENSTİTÜSÜ**

**KENTSEL KESİTLER:  
ULAŞIM ALTYAPISI VE ZEMİN ETKİLEŞİMLERİ**

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*To my parents  
Sıdıka and Mustafa Yardım  
for their endless love and smiles,*



## FOREWORD

I know only moments, and lifetimes that are as moments, and forms that appear with infinite strength, then ‘melt into air’. I am an architect, a constructor of worlds, a sensualist who worships the flesh, the melody, a silhouette against the darkening sky. I cannot know your name. Nor can you know mine. Tomorrow, we begin together the construction of a city.  
(Papadakis, 1993)

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## **ABBREVIATIONS**

<b>İBB</b>	: İstanbul Metropolitan Municipality
<b>İUAP</b>	: İstanbul Metropolitan Area Urban Transportation Plan
<b>BRT</b>	: Bus Rapid Transit
<b>TOD</b>	: Transit Oriented Development



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# **URBAN SECTIONS: INTERACTION BETWEEN TRANSPORTATION INFRASTRUCTURE AND GROUND**

## **SUMMARY**

Cities are changing years by years. The sighted transformation from traditional city to metropolitan cities is more likely to become by the effect of the city growth. This means the transformations in technology, increasing population in 20th century and vehicle developments have directly affect the social and physical conditions. As the cities grow, need for transportation infrastructure is formed. The reason is that citizens want to move and they need more construction and more layered transportation systems. Today, the perception of layered transportation infrastructure has to be merged with the architecture and urban design. Especially the underground transportation modes affect the grounds of the city. This thesis focuses on investigating the relations of grounds and the transportation infrastructure. Exploring the interaction level of urban spaces with the transportation systems in terms of their expansions below and above the ground is the problem itself. Moreover finding a relation between urban spaces, transportation hubs and their typologies and how these typologies shaping urban grounds in the transportation context.

The analysis of layered transportation infrastructures and their architectural diagrams are the main initiatives put into practice in this study. In the same way the underground space formations and their ground level relations are to be analyzed. The examination is mostly placed on section drawings of the projects. These sections are including the project transportation and functional layers and also the structures' interaction with the all urban environment in both vertical and horizontal manner. Equally important, to explain interaction levels in the city context, typologies of transportation structures are introduced with their differences in the ground relations. Nevertheless, these typology making process has certain parameters. For this, analyzed case projects' values, their philosophies and conceptual approach of interaction are used. In this case, there exist new relations and parameters. At the same time, due to the impact of relations between underground structures with urban space, the value of research coming from the attitudes of integration. These interactions have strong relations with the sectioning. Urban sections demonstrate the concept of urban public space's significance. These sections are needed to understand the area in both directions in space. Dealing with these sections, the interactions on ground level and coexistence of transportation are shared by the urban sections responsively. Since these sections are perceived by the legends of the transportation, urban ground and users, they include definitions and examples of everyday urbanism.

There appear to be six primary types of ‘urban in between transportation related structures’, namely; ‘stations as usual’, ‘public spaces’, ‘continuous transportation part’, ‘mega structures’, ‘hubs in network’ and ‘through mixed-use spaces’.

After that, İstanbul is the case area of analyzing the urban sections with respect to ground and underground relations and typologies that have examined. The selected zones of İstanbul for showing the relation between ground and transportation have the major quality of being in the networks of city transportation system. Whether they have designed multi-functional or entirely for transportation purposes, these urban structures show the urban section quality as well. One of them is Yenikapı area and the other zone is the metro line of Hacıosman-Şişhane. The urban structures have become centers of attraction, when the increasing demands of qualified ground level getting higher. These zones analyzed in terms of leading factors and their priorities of the programming that they have been transforming large-scale multi-used architectural forms. Besides all the typological approaches and the selected zones of İstanbul, the conclusion of the research ends with the ‘typology mapping’. Transportation and regeneration projects has taken into consideration by means of connections and relationships are principally defined in that respect. Therefore, it is a way to see defined typologies in their design approaches. By doing so, their impact on İstanbul and effectiveness on their sites makes the perception of interacting of ground and transportation respectively.

## **KENTSEL KESİTLER: ULAŞIM ALTYAPISI VE ZEMİN ETKİLEŞİMLERİ**

### **ÖZET**

Kentler yıllar geçtikçe büyürler ve değişirler. Kentlerin büyümesiyle, geleneksel şehirlerden metropollere doğru, ileriye tahmin eden değişimler olmaktadır. Artan nüfusla beraber, teknolojiler ve ulaşım araçları gelişerek 20. yüzyılın sosyal ve fiziksel koşullarını etkiler. Bu bağlamda, kentler gelişip değişime ihtiyaç duydukları sürece de ulaşım altyapısı yeniden biçimlenmek için evrilir. Bunun altında yatan sebep, kentlilerin hareket etme isteklerine cevap olarak çok katmanlı ulaşım sistemlerine gereksinim duymalarıdır.

Tüm bu gelişimler, günümüzde özellikle yer altı ulaşım sistemleri ile farklı seviyelerden oluşan ulaşım altyapısı algısının kentsel tasarım ve mimari ile birlikte yapılaşmakta olduğu bir yere gelmektedir. Bu bağlamda, yeraltı ulaşım modları kentin zeminini fazlaca etkilemektedir. Kentlerin bu dinamik halleri kentsel mekan ve ulaşım altyapısını birleştiren yeni haller aramaktadır. Bu noktada altyapı strüktürlerini zeminin farkında olarak yapmak, onlara bir kimlik kazandırmak suretiyle farklı bir yol olarak görülebilir. Bu durumda ele alınan problem, kentsel mekanların ve ulaşım sistemlerinin yer altı ve yerüstündeki uzantılarıyla nasıl bir etkileşim içinde olduklarını araştırmaktır. Ortaya çıkan farklı ilişkilerin hangi sebeplerden kaynaklandığını ve nasıl farklı tipoloji yaklaşımları ortaya çıkardığını anlamaktır.

Bu çalışma, zeminin ve ulaşım altyapısının ilişkisine odaklanmaktadır. Kentsel mekânların ve ulaşım sisteminin etkileşim seviyesi zemin üstü ve altına yayılmaları problem olarak ele alınmaktadır. Diğer taraftan, ulaşım bağlamının içindeki kentsel mekânlar, geleneksel merkezler ve bunların tipolojileri ile bu tipolojik yaklaşımların kent zeminini nasıl şekillendirdiği üzerine bir ilişki bulmaya odaklanmaktadır.

Araştırmanın temelinde yer alan hareketlilik kavramı; kamusal mekanların ve ulaşım yollarının yüksek standartlarda ilişki kurmasını ve geliştirilmelerini sağlar. Bu durum kentlinin de hızının artmasına neden olur. 21. yüzyılın yaşam biçimi bu hızın izlerinden oluşmaktadır denilebilir. Kolaylaşan ve ekonomikleşen ulaşım ile beraber bireylerin hareketlilikleri de artar, kentin sosyal ve çevresel halleri de bu durumdan etkilenir. Böylece, kent mekanlarının zemin altı ve üstü ile olan ilişkileri tasarım sürecini birebir etkilemeye başlar. Dış mekanlar ve girişler elemanlaşırlar. Kamusal mekan bu durumlara göre yeniden şekillenir. Özellikle kentin olaysallıklarını zemin kelimesiyle tasvir ederken, zemin ve yer altı kelimeleri karşımıza çıkmaktadır.

Bu çalışmada pratiğe dökülen ilk başlangıç noktası, katmanlı ulaşım altyapıları ve onların mimari diyagramlarının analizleridir. Aynı durum, yeraltı mekânlarının biçimlenmeleri ve zemin seviyesi ile ilişkilendirilmeleri için de geçerlidir. Bu inceleme özellikle projelerin kesit çizimleri üzerinden yürütülmüştür. Amaç, projelerin ulaşım ve fonksiyonel katmanlarının yanı sıra, onları oluşturan strüktürlerin de kentsel çevre ile olan etkileşimlerini hem dikey hem de yatay tutumları ile kesitler üzerinden okumaktır. Bu süreçte belirlenen yöntemle incelenen örnek projeler kendilerine ulaşım modları , zemin perspektifi ve kentsel strüktür başlıklarının altında yer bulmaktadırlar. Aynı derecede önemli olan bir konuda, kent bağlamında, ulaşım strüktür tipoloji yaklaşımlarının zeminle kurdukları ilişki farklarıyla nasıl değiştiğini açıklayabilmektir. Tüm bunların yanında, bu tipolojilerin bir yaklaşım olarak literatürde yer bulabilmesi için bazı seçilmiş parametreler oluşturulmuştur. Bu parametreler, çalışma boyunca belli başlıklar altında incelenen örnek projelerin değerleri, felsefeleri ve kavramsal yaklaşım etkileşimleri üzerinden çıkarılmıştır. Aynı zamanda, yeraltı strüktürlerinin kentsel mekânlar ile olan birbirlerini etkileyici ilişkileriyle birlikte, araştırmanın değeri tüm bu yaklaşımların bütünleşmesinden gelmektedir.

Etkileşimlerin kentsel kesitlere etkisi de büyük olmaktadır. Bu bağlamda kesitler kentin kamusal spotlarının kavramsal önemini de ispatlamaktadır. Zemin seviyesinde ve ulaşımın oluşturulduğu ve devam ettiği alanlarda kentsel kesit kavramı hem düşey hem de yatay düzlemde anlaşılmaya çalışılmaktadır. Kesitlerin ulaşım kavramının en önemli anlatımlarından biri olduğu düşünülürse, günlük kentleşme örnekleri üzerinden çeşitli tanımlamalar yapılabilir. Tüm bu karşılaştırılan ve incelenen örneklerin kesitsel varyasyonlarında yeni kentsel tipolojiler ortaya sunulmaktadır. Bunlar sadece fiziksel değil sosyal etkiler ve farklar olarak da okunmalıdır. Bu şekilde altı farklı “ulaşım ilişkili kent mekânı” olarak tipoloji yaklaşımlarına isim verilmiştir. ‘olağan istasyonlar’, ‘devamlı ulaşım parçası’, ‘kamusal mekânlar’, ‘büyük strüktürler’, ‘ağlardaki düğüm noktaları’ ve ‘karma kullanımlı mekanlar boyunca alanlar’. Tüm bu tipolojik yaklaşımlar, mevcut dokunun belirli bir süreç içine giröresiyle oluşmaktadır. Bağlamla başlayan bu devamlılık üzerine ölçek, form, mimari tasarım ve program parametrelerinin eklenmesiyle, öngörülen tipolojilerin gerçek aksiyon alanlarını belirler.

İstanbul, literatür çalışmalarının ve tipolojik yaklaşım sürecinin üstüne örnek alanların seçildiği kent olarak çalışmada yer almaktadır. Kentsel kesitlerin yerüstü ve yeraltı ilişkiler ele alınarak tip değerlendirmeleri yapılmıştır. Gelişen istanbulun sosyal ihtiyaçları zeminlerin altyapı ile ilişki kurmasını desteklemiştir. Karma kullanımlı fonksiyonlaşma mekanların tasarımına bir girdi oluyorsa, rasyonel ulaşım sisteminin kalitesi de kamusal mekan oluşturarak artmaktadır. Ulaşım strüktürlerinin İstanbul’da kamusal alanlarla etkileşimli yerleşmesi kentin karakteristiği öne çıkarmaktadır. Bu bağlamda, farklı kentsel ve mimari ölçeklerde oluşan proje alanları İstanbul örneği içinde ele alınmıştır. Bu alanların ortak paydası ulaşım altyapısı ve zemin ilişkisinde oluşturdukları ilişki çeşitleridir. Seçilen bölgeler İstanbul’daki çok katmanlı ulaşım altyapısını ve zemin ilişkisinin kuvvetli olduğu ve kentin ulaşım ağında bulunan ana merkezler olarak seçilmiştir. Bu bölgeler çok fonksiyonlu bölgeler ya da tümüyle ulaşım amaçlı tasarlanmış olabildikleri halde her durumda da kentsel kesitlerinin farklı değerleri bulunmaktadır.

Çalışmada kentsel kesitler mekansal, ölçeksel ve hız bakımından jenerik olarak ele alınmaktadır. Bu duruma büyük ölçek ve kara kullanımlı alanların mimari olarak yorumlanması da denilebilir. Kentin çekim noktası olarak da kentsel strüktürlere sahip olan yada olacak olan bu alanlar Yenikapı bölgesi ve Hacıosman-Şişhane metro hattıdır. İki durumda da kenti etkilemesi beklenen strüktürler istenilen ve beklenen nitelikli zemin arayışlarının da cevaplarını bulmaya çalışmaktadırlar. Bu iki bölge, onlara öncülük eden faktörlerin ve içerdikleri öncelikli program elemanlarının etkisiyle büyük ölçekli ve karma kullanımlı mimari formlara dönüşmektedirler. Yenikapı örneğinde, metropollerdeki erişilebilirliğin ulaşım modlarının çeşitlenmesi olarak düşünülmesi geçerlidir. Yenikapı, İstanbul metropolitan ölçeğinde kentsel bir yenileme projesi olarak görülmektedir. Bu durumda İstanbul ve Yenikapı ilişkisini sorgulamak ulaşım altyapısı ve zemin açısından önemlidir. Aynı durum Hacıosman-Şişhane metro hattı üzerindeki zeminlerin özellikle durak denilen tipolojisi farklı strüktürlerde nasıl farklılaştığının sorgulanmasını sağlar.

Genel çerçevede, zemin denilen aksiyon alanlarının özellikle yer altı ulaşım sistemleri ile ilişkisi sorgulanmaktadır. Bu durum İstanbul'un Avrupa yakasındaki yer altı ulaşım haritalamasına tipolojiler üzerinden bakılmasıyla yeni bir haritalama yaklaşımı oluşturmaktadır. Ulaşım altyapısının kendi strüktürünü yaratırken tek başına olmadığı, kentsel mekanların hem sosyal hem de fiziksel anlamda ve farklı ölçeklerde yapının bileşini olduğu sonucu çıkarılabilir.

Bunun yanı sıra, oluşturulan tipolojik yaklaşımlardan ve İstanbul'da örnek bölgelerinin incelenmesi sonucunda, gözleme dayalı bir 'tipoloji haritalaması' oluşturulmuştur. Bu şekilde İstanbul Avrupa yakasındaki genellikle yeraltı bazlı ulaşım sistemlerinin kentsel zeminler ile olan ilişkisi kentsel kesitlere verilen tipolojiler üzerinden okunabilmektedir. Ulaşım ve yenileme projelerinin kentle ve birbirleriyle kurdukları bağlar ve ilişki yöntemleri bu şekilde bir parçada olsa tanımlanabilmektedir. Böylece, tipolojilerin tasarım yaklaşımlarında bir yöntem olarak ele alınması bir yol olarak ortaya çıkarılmış olur.

İstanbul ve ulaşımın kent üzerindeki etkisinde 'zemin' kavramı önem kazanmaya başlar. Sonuç olarak çok katmanlı ulaşım altyapısının kentsel mekanda etkileri görülmektedir. Düşünölmüş mimari çözümler ve kentsel tasarımlar, yeraltı katmanlarını tipolojik olarak etkileyebilir ve kente hizmet etmelerini sağlayabilir. Gelecekte, özellikle Yenikapı örneğinde olduğu gibi, kentsel tasarım ve altyapı etkileşiminin çok daha içiçe geçeceğinin izlerini görmekteyiz.

Zeminin farkındalığını arttırmak, ulaşım altyapısının kentsel mekanlar ve mimari dille ifadesi kentin kesitlerine bakarak mümkün olmaktadır.





## **1. INTRODUCTION**

“Anything is possible to build, or not to build, we could therefore ask the question as to why styles and fashion and methods tend to become common practice within our environment” (Alsop and Störmer, 1993, p.15).

### **1.1 Purpose of Thesis**

Urban transportation systems are significant determining parts of daily functions. Particularly after the first half of the 20th century, people's movement capability in the cities are limited. Afterwards, cities become important centers of global and national economics then this leads to transportation systems are restructuring accordance with the needs of developments. As the cities getting modernized by the help of economical developments, the city has more mobility than ever. There is a triple daily density than the population itself. This guides forming new spaces and grounds for citizens including different types of programs. Cities are dynamic so that they need new ways to handle this participation in the urban space and transportation. In addition to that, people want to be mobile and they desire to use every square of the space. Yet growing population density and these social transformations modified the above and below the ground.

The major goal of this research was to investigate the importance of grounds having relation with the transportation infrastructure spaces. Bain (1990) stated that underground spaces are invisible so that their design has difficulties. They need to make people aware that there is a space. It is the role of their entrance spaces. The space that allows people to go below the surface. So that entrances should give people sense of arrival, the mood of the structure and they have a strong identity reflecting a place of psychological and physical transition between the exterior and interior world. Exploring the interaction level of urban spaces with the transportation systems in terms of their expansions below and above the ground is the problem itself.

Since the superposition of urban transportation modes in metropolises has resulted in the formation of transportation hubs; new public places are designed at urban space level with the mixed-use buildings in metropolises. Mixed-use public buildings occur as a result of the connection areas with the transportation hubs. The aim of this research is finding a relation between urban spaces, transportation hubs and their typologies. Besides, how these typologies shaping urban grounds in the transportation context.

## **1.2 Method of Analysis**

In this research, the analysis of layered transportation infrastructures and their architectural diagrams are the main initiatives put into practice. In the same way the underground space formations and their ground level relations are to be analyzed in the study. The examination is mostly placed on section drawings of the projects. These sections are including the project transportation and functional layers and also the structures' interaction with the all urban environment in both vertical and horizontal manner. Equally important, to explain interaction levels in the city context, typologies of transportation structures are introduced with their differences in the ground relations. Nevertheless, these typology making process has certain parameters. For this, analyzed case projects' values, their philosophies and conceptual approach of interaction are used. In this case, there exist new relations and parameters. At the same time, due to the impact of relations between underground structures with urban space, the value of research coming from the attitudes of integration. Therefore, one of the determining factors in the selection of the section diagrams to be analyzed is their hint of the transportation modes and program elements they include; and that the visuals of the case projects should give an indication of their urban contexts. Furthermore, this methodology has a chance to answer the questions for the case projects and typological approach. Even though this thesis' method is primarily intended to put forward a useful, multilayered thinking of urban grounds and underground, the answers of the questions about the city, time, mobility and the transformations of all are have been thought. On the other hand, following questions are used for helping through thesis in its methodological approach.

- Why is the urban space affected by transportation infrastructures?
- How can the interaction level of urban spaces with the transportation systems analyzing in terms of their expansions below and above the ground is the problem itself?
- How infrastructural values are shaping urban spaces in the transportation context?
- How can architecture and urban design enhance the social and commercial potential of the transport interchange
- Can architecture continue to relate the space of structures and cities, when this space itself, is dissolving into a universal flow?
- What are the mediums that coming from the below to above in urban context?

### **1.3 Structure of Thesis**

The argument of the thesis will be developed in three main chapters, covering the subject matters of ‘City, its Layers and Alteration’, ‘Below and Above Ground Structures’, and ‘Transportation Structure Assessment and Grounds in İstanbul’ respectively. These three basic entry points determine the construction of the chapters. A theoretical framework is to be developed in the second chapter of the study; while the main discussion of the thesis will be introduced in the third chapter, and the case of İstanbul in the fourth chapter.

Looking deeply for the chapters; the second chapter focuses on the problematic of the study. The facts those creating the city’s alteration in transportation and ground level interaction and questions are set according to this. In other words, making interpretations over the urban section with respect to selected case projects are aimed to discover the relation of ground with the structures. Thereby, modes of transportation, ground perspective and urban structures are asked in the concept of different approaches and projects. Considering these questions, the third chapter literature review is conducted within the conceptual framework of below and above ground structure typologies. Also each typology has the identity about the ground, the public level. Obviously, coding the types is a way of abstracting their spatial architectural qualities.

Finally the fourth chapter reflects the role of transportation infrastructure by covering selected transportation structures in İstanbul. This is based on a backward reading about the typology development. In this context, selected zones of İstanbul are examined in detail through the approaches of the projects with their transportation layers and modes. Moreover, for conclude the research, a map of İstanbul's rail network is superposed by the constituted typology forms mentioned in the previous chapter.

#### **1.4 Assumptions and Limitations**

Serres (2007) indicated where points, lines and beings are the relations, stations and path coming together and forms a system. This is the description of the complex system. It is a way to select the case projects which are built or designed within the title of transportation infrastructure. Besides their relevance to the thesis argument, another main criteria that has been used in the selection of the cases in this research is the level of their interactions to the city life and urban grounds. The idea of giving critical commentary on noteworthy projects and specific zones is assumed. Even though this research is particularly intended to put forward effective relations for city, the choosing of cases to demonstrate this attitudes remains critical.

## **2. CITY, ITS LAYERS and ALTERATIONS**

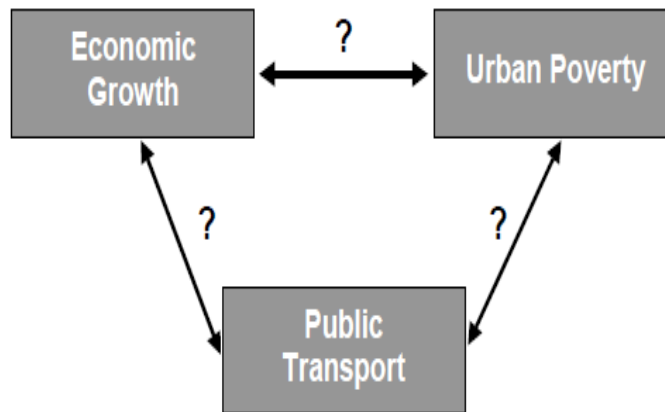
### **2.1 City's Modernization Project**

According to Safier (1993), "Cities are the most complex, dynamic and powerful systems for generating and transmitting wealth and well being for very large numbers of people that have so far been evolved by humanity" (p.2). As societies become increasingly urbanized, decision making and spatial viability make cities more and more complex. Moreover, he added that cities are places where great differences and determined poverty can effect boundaries. The characters are sharpened by the contemporary globalisation that restructuring the layouts of urban life (Safier, 1993). These layouts are very large scale and capital intensive. Therefore urban lands and settlements are shifting on the basis of globalization.

Cities are changing years by years. The sighted tranformation from traditional city to metropolitan cities are more likely to become by the effect of the city growth. This means the transformations in technology, increasing population in 20th century and vehicle developments have directly affect the social and physical conditions. Besides, people's way of living was ineavitable to change. The effects of rapid in cities, people are producing and travelling between places. So that new metropolitan cities were begin to form much more bigger and have more transportation infrastructures. These were the consequences of change in social systems like transition to capitalism.

Safier's definition of "city's productivity form" as an outcome of accomodating and servicing very large numbers of people. In addition to that, the transformation of physical land comprising processes of housing production and infrastructural interventions. It can be analyzed as multi dimensional way both for public-private-social collaborations and urban infrastucture (1993). Hence, this multi dimensional way of thinking makes all road extensions, new expressways and iner-city underground railways are served for business life activities. The most developing countries has the maximum urban transport plans with the support of economic

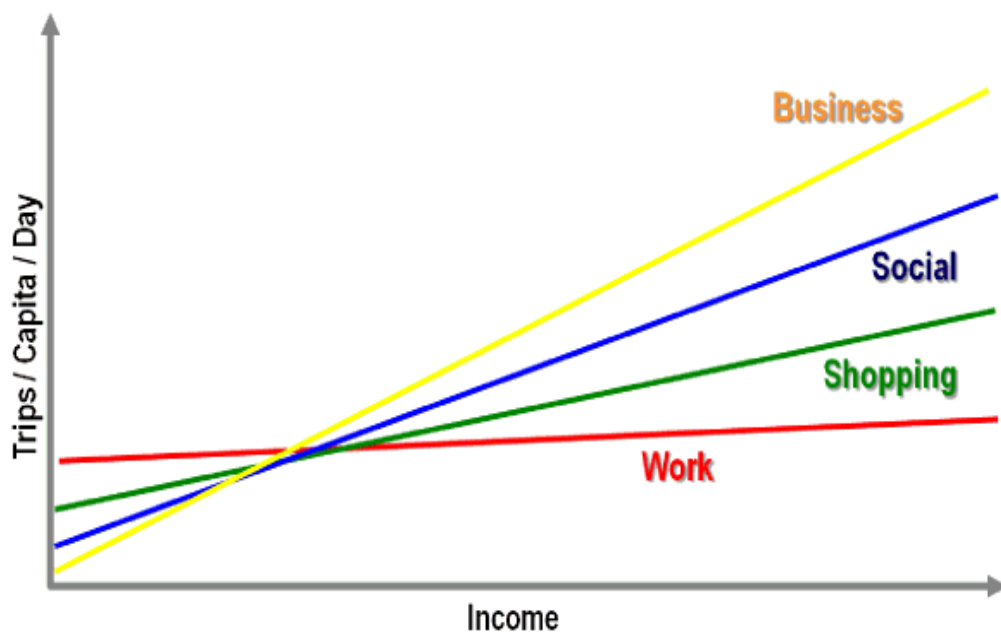
growth. As can be seen in the Figure 2.1, it is a way to understand the urban economic growth which has been boosted by a suitable transport infrastructure emerging in new jobs, new sources of income in the service sector of transportation (Kalthier, 2002).



**Figure 2.1 :** Economic Growth, Transport and Poverty Interdependencies  
(Kalthier, 2002).

The general level of awareness of economical consequences on cities makes the daily routines of citizens more and more complex. That is why the population levels are increasing. It may indeed come up with a triple daily density than the population itself. This leads to new spaces and grounds for citizens including different types of programs. The world has changed both physically and mentally as a result of the developments brought by the industrial revolution. It was inevitable that the way people live would undergo a rapid and revolutionary change due to the innovations of this era, which affected not only how people worked and produced things, but also how they lived and traveled between locations. The cities expanded into their surroundings, forming what are now today's metropolises. In 20th century the economical modes of living affected by daily routines. Developments in transportation are key factor to change city patterns. According to of Gehl and Gemzoe (2001), "Trade from open booths was gradually moved to small shops along streets and squares, then to supermarkets, and finally to big shopping malls, usually far from the heart of the city" (pp.113-120) . They are the nodes of interchanging and exchanging, linking between the people in the street and the local economy. This can be more clear where the income and transport demand coming together.

The Geography of Transport Systems, formally known as ‘Transport Geography on the web’, represents that based on income level there are variations in the urban transport demand by purpose. As in Figure 2.2, work related trips tend to have little flexibility since they are the most essential movement. Trips related to less essential purposes, such as shopping, social interactions and business when income increase. So that, the mobility of people in higher income range has a wider variety of non-work related trips (Rodrigue et al, 2009).



**Figure 2.2 :** Income and Urban Transport Demand (Rodrigue et al, 2009).

These economical factors remind the issue of capitalism. David Harvey (1985), makes capitalism based comments for the frame of urban process and urban experience. He mentions that the focus point on money, space and time is important to discover the urbanization process (Table 2.1). According to him, finding meanings for urban experience, developing its alternatives and handle the meaning of it; the way thinking about the other things in the city is important (p.165). It is clear that city is a process of experiences, flexible accumulation through urbanization.

**Table 2.1 : A “Grid” of Spatial Practices (Harvey, 1985).**

	<b>Accessibility &amp; distancing</b>	<b>Appropriation &amp; use of space</b>	<b>Domination &amp; control of space</b>
(experience)	Flows of people, transport and urban hierarchies	Urban built environments social spaces of the city	Private property in land, state & administrative divisions of space
(perception)	Social and physical measures of distance; map-making	Personal space; symbolic representation of space	Forbidden spaces
(imagination)	Media	Places of popular spectacle (streets, squares, markets)	Monumentality & constructed spaces of ritual

## 2.2 The Analysis of the City Infrastructure

“Space is neither absolute, relative or relational in itself, but it can become one or all simultaneously depending on the circumstances. The problem of the proper conceptualization of space is resolved through human practice with respect to it” (Harvey, 2006, p.275).

### 2.2.1 Infrastructure

The growing complexity of today’s view for public realm is the answer of relations in the city. Gandy claims that the term “public term” is raised in relation to both landscape and infrastructure, is set in the developing relationship between politics and the urban ground. Therefore, the ambition of the public realm keeps the term infrastructure appear. The term “infrastructure” has been consumed since the 1920s to allude for the basic physical and organizational structures such as roads, required for the material and organizational aspects of modernity (Gandy, 2011, pp.58-59). As the cities grow, need for infrastructure is formed. This is not an end product, infrastructure also develops and changes its capacity year by year. The reason is that citizens want to move and they need more construction and more layered infrastructure. Infrastructure was modelled by modernist architects. Their approach is making a plan and understanding the capacity of a clear idea would bring order to the



chaos of the metropolis. Besides, the word ‘infrastructure’ is defined in 1927, Oxford English Dictionary; “To understand the technical systems that support a society roads, bridges, water supply, wastewater, flood management, telecommunications, gas and electric lines as one category, it was first necessary to see it fail” (Varnelis, 2012). These definition of supporting systems all together is rely on the city’s transformation in architecture indeed. Allen claimed that architecture in city is not an alone power to managing the process, it works with the structures. Accordingly, Allen proposed seven propositions for urban infrastructure. First of all, infrastructure can be thought to prepare the ground for the future structures to create conditions for activities. Rather than working on tender specific constructions sites, infrastructure construct the site itself. Therefore, the geography is the infrastructure’s medium. Secondly, convenient and flexible modes of infrastructure work for the time and are open to change. Thirdly, infrastructural work recognizes the collective nature of the city and allows for the participation of multiple authors. While infrastructure gives direction to future work in the city, it creates a directed field where different architects and designers can contribute. Moreover, infrastructure works strategically encourages tactical improvisation. As the fourth statement, he declared that infrastructures accommodate local contingency while maintaining overall continuity. This comprehensive approach seen in the design of highways, bridges, canals or aqueducts. Regardless, infrastructure’s default condition is above all pragmatic. Fifthly, infrastructures organize and manage complex systems of flow, movement, and exchange. They provide a network of pathways, system of locks, gates. This is the reason of infrastructures can have an utopian view for enabling new freedoms. Sixthly, infrastructural systems work like artificial ecologies for managing the flows of energy and resources on a site. Lastly, Allen defines infrastructure as an allowing design of typical elements or repetitive structures, facilitating an architectural approach to urbanism (2005). These infrastructure properties allow to think cities in a manner of blurring levels, functions and activities. That is why the thesis is going to analyze the underground projects innovatively in a new approach. At the same time, infrastructure is a part of urban landscape. Intentionally, extended understanding of landscape to embrace the connections and exterior of spaces, an array of incidental spaces will exist. The spaces that have appeared into the intersection of landscape and infrastructure range from designed spaces. On the other hand, diversity of imaginary and virtual explorations of urban space made by this range of material

intersections (Gandy, 2011). Within a vision of interaction between landscape and infrastructure, the urban spaces or urban structures are tactically located to take advantage of public spaces. As Krieger (2010) mentions, urbanism has elements like dispositions as urban pattern, the public spaces, transit and highway corridors. Definitely, the city gives priority to these elements whereas few things are more important than the others. As can be seen by any form of contemporary settlement, than well-functioning transportation systems.

Shannon & Smets 's definition of 'transport infrastructure' as an outcome of public authorities' growing and unmistakable interest in infrastructure, primary field of investment across the globe is quite remarkable. In addition to that, urbanization process increase by the help of the private capital. They discuss the infrastructure becomes visible as the keystone which the urbanization can be grafted. The significance of mobility and transportation is unexceptionally placed. They also points out that the build-up of infrastructure is no longer an issue that is recognized as an alien from its environment. The (re)working process of movement interpreted by the landscape and infrastructure merging with each other (2010). New urban design theories also an interpretation of this relation. A thoughtful synthesis of every layer make the infrastructure more legible.

Infrastructure connects with new parameters of architecture, landscape, urban settlements and living environments. Likewise, infrastructure absorbs all these parameters' social and inspiring levels with engineering matters. In addition to that, if infrastructure has the relation with the architecture, mobility and landscape; it stimulates more forms of interaction with the landscape. "In that respect, designing transport infrastructure today comes down to making it part of an integrated project" (Shannon and Smets, 2010, p.9).

Where the city continues to spread out, being aware of the public transportation is an issue for promoting the growth of reclamation projects. The project by Terry Farrell Architecture Office called Kowloon Station is an example that telling the infrastructure and ground level relation respectively. They proposed a concept like a focus point of the area that relates public and private areas with the transportation.

The design of Kowloon Station provides for passenger interchange between two separate railway lines, airport check-in for Hong Kong International Airport, public and private road transportation. Each element is linked by a central concourse which is, in turn, linked by a major atrium to the air rights development above. The atriums' sculptural roof forms the station entrance and focal point of the developments' central square whilst providing natural day-lighting to the concourse below [Url-18].

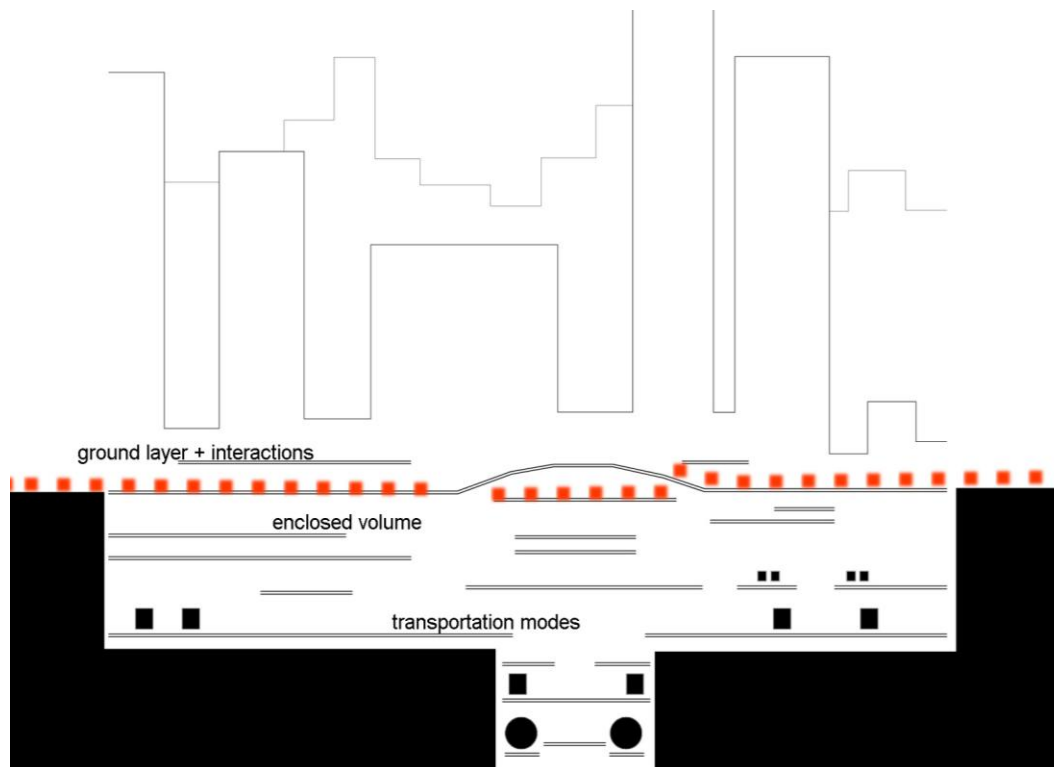
The concept of this huge reclamation project is mixing the functions and use the public transportation as a key element. There is one million square meters was laid out around large pedestrian landscaped squares that surrounded by highrise buildings [Url-18]. According to Shannon and Smets, the station works like a huge public platform with layers under the ground. It is like an interchange between separate rail lines and all transport modes like bus, car, coach linking in the mezzanine (2010, p.17) .



**Figure 2.3 :** Kowloon Station View [Url-18].

The strategy of inclusion aims to integrate all kinds of transportation modes. By constructing a pedestrian platform in ground level, the accessibility for ground is done. This is the access point of all both static functions in the site like housing, offices, hotels and dynamic ones like transportation and commerce. As seen in the Figure 2.4, station's place in between the above and below is a choice to integrating huge, inorganic public space with the underground. This feature makes it a hub. The

first and second levels contain a pedestrian network of shops, public spaces and footbridges linked to the surrounding buildings (Tiry, 2003, p.33).



**Figure 2.4 :** Kowloon Station Urban Section Analysis (Yardim, 2012).

As such , the features of the projects give the idea of relating the public space with the transportation infrastructure. In CityLAB’S design ideas competition WPA 2.0 (Working Public Architecture), projects aim to reach that infrastructure is the site not only where work is beginning to appear but also where the public finds its contemporary material expression and thus where design is most needed. Cuff (2009) defines the infrastructure as a contemporary discourse. Its meaning comes from the economies and social networks.

According to Cuff, modernists understood infrastructure as playing role of a framework for urban form. WPA 2.0, a design competition for finding innovative ways that infrastructure might serve as a way to revitalize cities. The WPA 2.0 has four assumes:

- Infrastructure is the heart of the next generation’s public sphere.
- Infrastructure should not have a limited agenda. Single-use models should yield to hybrids and multiple programs.

- Robust infrastructure should become a local amenity, with the goal of creating more livable, sustainable, and dynamic communities.
- WPA 2.0 necessitates systemic rethinking on the part of policymakers and the public.

As such, transportation infrastructure can be defined as a rethinking and reexisting of urban land by different systems. In Team 10 Primer, Smithson equating the road system with stability, access and community. Giving sense to the community by urban motorways designed from the urban structures (p.37). On the other hand, Bertaud (2002) states the physical components of urban transport are constituted by spatial networks. For instance, networks collect and distribute people, water, sewerage, storm water and solid waste across metropolitan areas. However, if they define a dominant mode, a bus network for instance, they can also define the type of land use and street pattern that would allow to minimize capital and operation cost (p.11). Shannon and Smets (2010) make the statement that, infrastructure supporting a continuous movement by creating an urban dynamic and awakening movement to the limits of its own capacity or the tolerance of the settlement.

As Stan Allen (2005) remarks that, architects can show their own imaginative and technical thoughts about infrastructure. There are questions about the organization and functions of traditions of everyday infrastructures (p.52). In other words, large-scale urban projects and infrastructure relating with the architecture by interpreting traditional tools. Moreover, this relation is not only the means of architecture and infrastructure, it is in the concern of material practices, ecology and engineering. Dalalex (2006) highlights the infrastructure as an aesthetic attribute and graphical identity of the cities. It is much more the primary condition of the cities. As a result of that idea, infrastructure is the character of urban space while it behaves a reflexive tool that affect urban mediascape. He suggests there exist a shift from old fordist infrastructure and the new post-fordist infrastructure having the the potential of new concept of the infrastructure. This change is an answer for economical developments in city. Old infrastructure like railway terminals are on top of hill projects where the new infrastructure is inside the city itself. They are distributed, decentralized in the city. The reason of that is the global market focus and the variations of the local sensibilities. Therefore, architects have the role of shaping infrastructure of cities today. Moreover they have the chance to transform the build fabric with using the

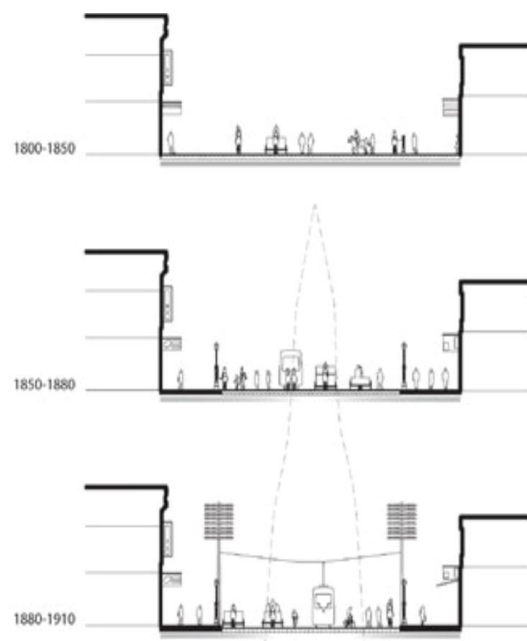
infrastructural design. Nowadays urban projects are meant to be built like an infrastructural meaning. They are big in size by integrating the city with the other sides. Dalalex (2006) defines the architects' interest for infrastructure as an attention for links between buildings and objects. So, it shifts from thoughts to material forms. This infrastructure going to be an interface between an outside and an inside like a porous frontier surface.

The strategy of going deeper for the infrastructure and architecture relation, roles of public and private sectors could be included in the discussion. As Haynes (2010) points out, mixing the public/ private/ quasi-governmental and individual behavior considerations in the evaluation of infrastructure leads the projects have more equity, efficiency and effectiveness considerations. He introduces this evaluation like multiple roles of the public and private sector in the area of public infrastructure (p.33). Going beyond stylistic or formal issues, infrastructure offers a new model for practice and a renewed sense of architecture's potential to structure the future of the city. Infrastructure, its relation with the globalized city is another matter to think about. Allen argues understanding architecture by the help of infrastructural urbanism which is the way of looking the large scales that escaping suspect notions of master planning and the heroic ego of the individual architect. He highlights the infrastructure works constructing not only specific buildings on sites but also the site itself. So that the ground conditions is prepared by infrastructure for the future (p.52-57). The structure is simultaneously a retaining wall for the facilities in the sites. City's urban topography may allow the site infrastructure design, but the conditions of the urban structure is also an issue for ending product in the city. Corner (2006) points out that cities are seen to be busy with the technology of high density buildings and transportation infrastructure. He observed that, urban infrastructure is a new stage for future and, it emphasizes on more design side of the constructions. This going to change urban surfaces' relations with the variety of events in public realm (p.31). Yet, today, the perception of infrastructure seems to be largely broken from the design of architecture. However, as mentioned above, beginning from the big scale urban design projects the infrastructure routes dominating the city and the design process of structures what is calling public.

### 2.2.2 Mobility experience

According to Ascher (2005), mobility has different definitions and properties with respect to experiences. It is the life style of 21st century. Today, mobility is a crucial point of economical and social developments in cities. Movement is prerequisite condition of every move. For instance; there exist movement in accommodating, working and educating. This need of mobility of daily routines has right to increase in today's world. Furthermore, transportation getting more and more suitable, easy and economical. So that, the mobility's importance is so significant in the individual's day time. They want to transfer from one point to another which is also their right. In another words, this movement has the quality of pleasure and user-friendly mode. Besides all of these, if mobility has the value, then it should take consideration into economic, social and environmental factors of city (pp.11-19). Such a concept makes the city experimental in a way that all urban patterns can be formed by the help of mobility. Ascher mentions that social identities have a connection with the mobility experience. The moving of individuals and groups of people also affect the others. So that everyone in the city are experiencing mobility (2005). The resulting activities of people creates patterns in the urban space. In this way, Bertolini (2006) describes the growing variety of mobility which interacts with individual needs, desires and constraints. "Mobility may thus encompass immobility, physical movement at different spatial scales and virtual mobility, and be instant, daily, weekly, seasonal or life cycle based" (Bertolini, 2006, p.320). The creation of infrastructure places the mobility concept in the position of directing the process. A contemporary sense of the society is thought with the mobility together. Houben (2003) states that the people experience the changes of the city by travelling along roads and railways. She says that today mobility is about people deriving a sensory experience from their everyday mobility. Mobility can think about a daily pursuit of modern society just like housing, work and recreation. The relation with the city and the movement leads us mobility. Finizio introduces his thoughts about moving freely and easily as the ability of mobility. His term 'mobility' is an interface between architecture and transportation. It relates technology, ecology, environment and people in a sense of efficient and minimal relationships. He defines new concept of this according to the users' needs of movement. He points out that system of mobility that integrated with territory provides a new status symbol (2007, p.260).

The desire for personal mobility seems to be unstoppable; indeed, people should have the opportunity to travel more than they do now, rather than less. Mobility means access to opportunities for employment, health care, recreation, and social interaction (Wall, 1995, pp.22-28). Lerup uses mobility term as one of the basic human needs to explain his thoughts about the globalized world. He says that mobility is a key to a high standart for living. Another important issue introduced by Lerup related with the mobility, when more transportation routes are being expanded and connections are being improved, the speed is increased in the society (2004, p.12). Today, the tradition of transporition changes in terms of the connections in the network. As Skaife (2011) mentions, there is a real change from the model of mobility also. General trend searching for shared system mobility rather than singularly owned personal transportation. It is a question that if the way we transport is changing, the network of transportation is also changing. Besides, changing network of transportation also means reconfiguring the ground can be asked. In Figure 2.5, the drawings describing the major networks of mibility running through a city. The flows of people, of vehicles, and of material can be networks that are used by infrastructural moves. The aim is to emphasize the effects of mobility in the city, if it can have interaction with the architecture. While there is an easy and free move, then the urban structures begin to change in the side of ground thoughts.

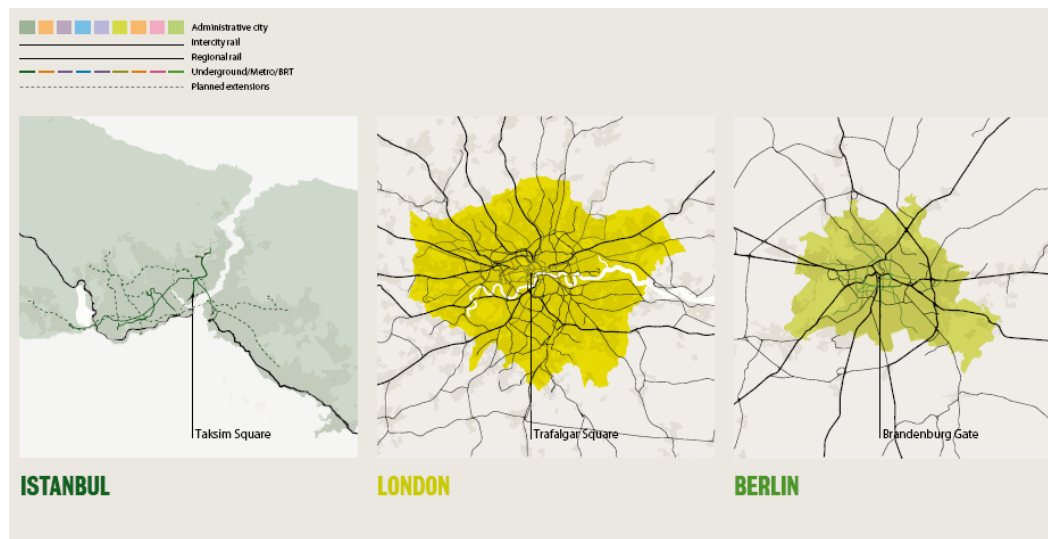


**Figure 2.5 :** Reconfiguring the Ground (Skaife, 2002).



### 2.2.3 Transportation part

According to the report of Urban Age (2009), allowing centralization of economic functions and the accomodation of a growing population on metropolitan rail and bus routes; transportation infrastructure is a crucial driver of urban form and structures. Moreover, where public transportation is not placed regularly then motorways begin to dominate the space that will result in straggling forms of development and over-crowding as private car use persistently runs ahead of road building [Url-25].



**Figure 2.6 :** Transportation System Relations [Url-25].

Moor (2006) claims that there exist a relation between transport infrastructure and urban design needs. Urban design helps to create better pedestrian environment with clear routes to stations. So that, transit ridership and economic viability of transportation systems can increase. All the economical developments relating with the city are taking the contact of transportation. According to him, “Transit stops provide structuring elements for public space and increase activity levels that benefit supporting facilities, densities can be increased, car use can be reduced and urbanity can be enhanced” (Moor, 2006, p.11). Project for Public Spaces (PPS) organization states about transportation, “If you plan cities for cars and traffic, you get cars and traffic. If you plan for people and places, you get people and places” [Url-16]. Their approach is to plan streets for people and places by improving the safety of streets, improving mobility and making local and regional communities more lively.

Ultimately, there is a tension between the approach of developing the transportation systems and a relaxation of the urban qualities by decreasing or levelling the infrastructure. Mulder (2002) argues that a city is a living system reorganizing and rearranging itself by expanding and shrinking. He states that “Four urban functions of working, living, leisure and transport which Le Corbusier once so elegantly deployed in his model of the city can no longer be separated from each other either spatially or socially” (pp.5-7). This is the agreement of living and transportation becoming practically identical. Siddall (1987) described the shift in travel activity that occurred over the years. This shift is defined as the transition to a easy travel habits. According to him in the French antecedent, travail, means exhausting labor or exertion. On the other hand, it is so easy to travel. In this process, he claims that the important place is the midpoint where traveler stops in a space. As a case design idea, a myth in the history of contemporary town planning is La Ville Radieuse can be thought. The project is ‘The Contemporary City for Three Million Inhabitants’ proposed by Le Corbusier for central Paris. The suggestion is a way to increase urban capacity and to improve the efficiency of the city. In post-war period, the ideas in La Ville Radieuse became model for architects. On the other hand, Le Corbusier was so passionate about the proposal so he even suggested demolishing the whole central part of Paris (Montavan and Steemers, 2006).



**Figure 2.7 :** La Ville Radieuse Perspective [Url-18].

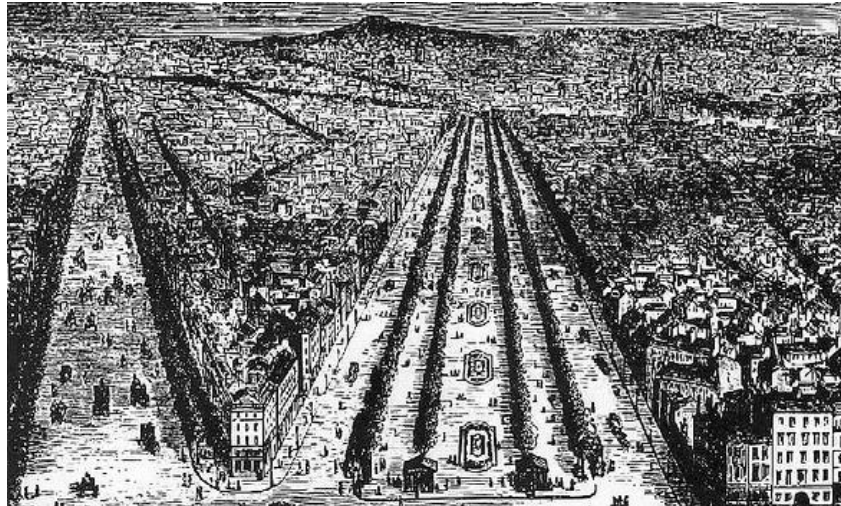
As seen in the Figure 2.7, the important impact in La Ville Radieuse is that every aspect, every layer of the urban structure has its own single function. So that the layers coming together to form a city of the future embodies clear principles of the modernist thought. For instance, the street belong to the car where pedestrians inhabiting in another layer of the section. The implementation of very static and homogeneous spatial patterns reinforce the desire of control contraption. Main plot layouts organized by platonic geometries and secondary veins distinguished from main arteries clearly. As well, the orientation and proportion of built artifacts complements the established order of the human subject (Kwint, 2010).

Networks of transportation is an important formation in making the urban space. It is considered as the relation of transportation modes, their sizes and relations with each other. According to Banister (2005); settlement size, intensity of land use, the location and local accessibility to transport infrastructure and parking provision are the key relationship phases between transportation and urban forms (p.102). White (1999) comments on movement's meaning in his book "Path-Portal-Place". According to him movement means circulation, flow, origins and destinations. Sometimes people are more concerned about the pedestrian traffic but there are other modes near the public spaces. He defines the difference of these two transportation modes as their differences in stationary positions. "Vehicular behaviour can be stationary as when parking is permitted at the place. Stationary pedestrian action is often wide-ranging including sitting and watching or reading, eating, talking, and playing" (White, 1999, p.33). These differences are coming from the transformation of the city and citizens' needs. As Thorne (2001) claims that the role of stations changing in time, they are built or pure function in the past, now they have new roles like ticketing, waiting, shopping, and as transfer areas between transportation modes (p.21). In addition to that, issue of having more public spaces in the transportation levels. In his book "The Structural Transformation of the Public Sphere", Habermas assumed that city's meaning this kind of ordered way. He claimed that streets and squares are transforming by the impacts of transportation stream. He noted, "The resulting configuration does not afford a spatially protected private sphere, nor does it create free space for public contacts and communications that could bring private people together to form a public" (Habermas, 1992, pp.129- 157).

In his book *New Movement in Cities*, Richard (1966) described the transportation environment as a ground level thing. He introduced the movement of pedestrian in ground level and the other modes like bus, tram and trolley bus serving at the same level. He added that for this mixture of vehicles new roads were built but they resulted in congestion in transportation.

Yet, today, the perception of transportation with the relation of publicness is still discussed. Bilgin states in one of his articles about Taksim Square in İstanbul. “Traffic does not mean the sum of the vehicles. If you have lost for the sake of traffic in urban areas; a large part of them are the buildings and huge infrastructures putting around the city for a traffic flow; not vehicles lined up in a row in the morning and evening” (Bilgin, 2012). He asserts that all vehicles are temporary income-pass but the constructions made for transportation or traffic system are permanent night and day, summer and winter still stand. It means when projecting the transportation part, the only thing is not the ways or the modes; the significant part is the urban structures and their relations with the city.

Shannon and Smets declare that “Vehicular movement was intelligently married to pedestrian circulation and augmented by auxiliary programs to act as an instrument that guided rapidly developing parts of the city” (2010, P.52). Baron Haussmann’s famous network of boulevards are extended to include a system of parks, squares and monuments, they brutally imposed on the urban fabric and embedded in it. As seen in Figure 2.8, the vision of urban integrity makes the boulevards’ locations with the use the advantage of topographical conditions, and real estate opportunities. The sectional qualities were very rich in terms of the connections between landscape and utilities below the surface. Besides, the surface of the urban ground were built concurrently and formed a system of transport, promenade, utilities, and power. Haussmann’s boulevards were at the same time, autonomous and cleverly embedded in the fabric of the city (Shannon and Smets, 2010).



**Figure 2.8 :** Baron Haussmann’s Boulevards (Shannon and Smets, 2010).

### 2.3 The State of Urban Transportation related with Ground

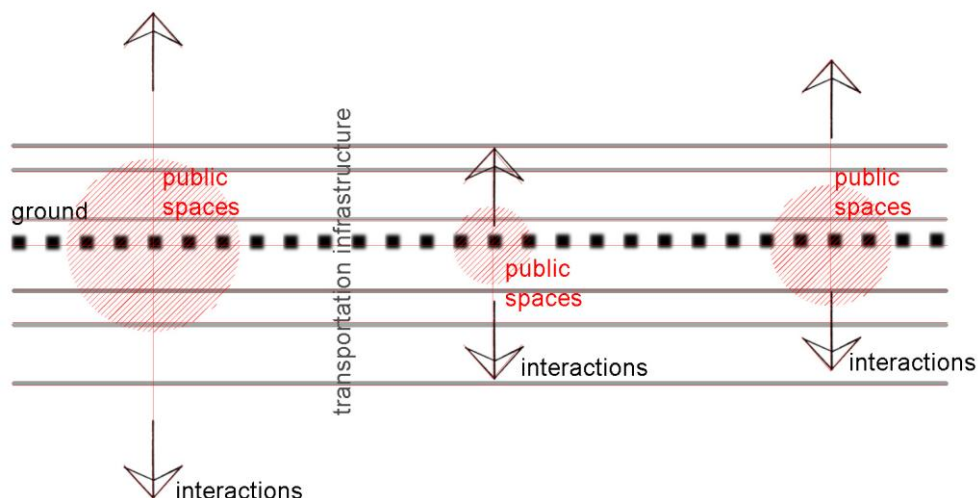
“The past, the present, and the future... Overlap in a messy configuration. Architects can never get and keep control of all the factors in a city which exist in the dimensions of patched-up, expendable, and developing forms” (Chombart de Lauwe, 1958).

Urban transportation has afforded many projects, structures, ground typologies that are built upon civic realm throughout history. General democratization in places regarding with the transportation keeps going from the mid-19th century. It is a way to transform private spaces to new collective open spaces. Modification of spaces like palaces, parks, ballrooms to the opera, station hall, theatre and school (Shannon and Smets, 2010, p.184) . Penn Station (Figure 2.9) is an example of this situation. It has built over a century ago in New York and using as a public space for gathering in all social classes and status. It can be analyzed as a transition zone between the city and the train.

This view of transition zone helps cities to integrate the transformation infrastructure with the urban ground. In short, public spaces linked and thought with the transportation modes and edited by functional passages in society. As seen in the diagram (Figure 2.10), public spaces can shift and scale where the transportation infrastructure and ground interacts.



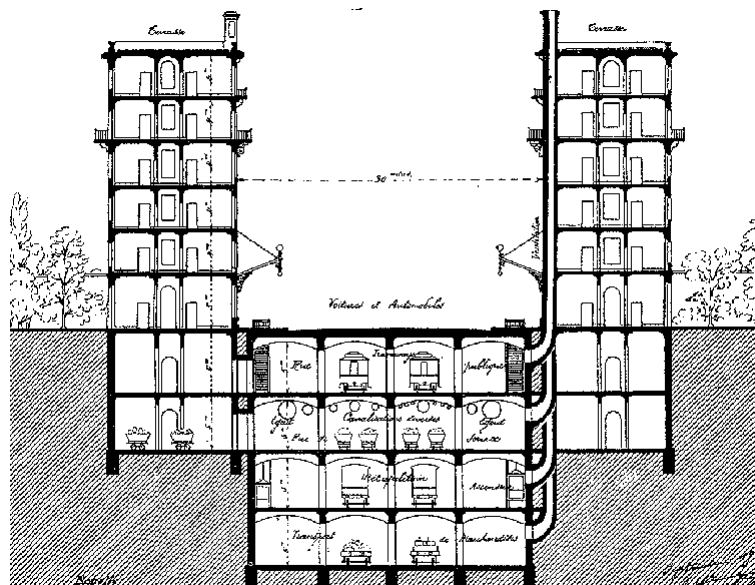
**Figure 2.9 :** Penn Station 1910's [Url-11].



**Figure 2.10 :** Transition Zone Diagram (Yardim, 2012).

The term underground is chance to make urban ground more public. Carmody and Sterling (1993) asserts that design conditions for the relation of above and below the ground using the exterior space and entrance design as key elements. They suggest that the urban structure what it is called a building or an element articulates its location by defining the boundaries clearly. The important services like ventilator shafts, loading docks and fire escape doors for the structure not dominate the view. All entrances having both clear identity recognized from a distance and sense of place. Within these properties, entrance providing a flowing transition to lower levels. By using the entrance, creating a visual connection between the exterior

surface environment and the building interior becomes easy. These visual connections make cities as public lands where everyday routines can take place. The public plazas have levels in all kind of functions respectively. According to Hénard (1911), in our cities of the present day, every large urban community has the centre of intense activity of transportation where buildings placed close together. Conceiving city in which all the streets with heavy traffic would have superimposed platforms. As seen in the Figure 2.11, these platforms has the opportunity taking the pedestrians in and make other transportation modes visible. He assumed that the first platform would be for pedestrians and carriages, the second for the tramways, the third for the various mains and pipes required for the removal of refuse, and the fourth for the transport of goods. As an urban structure there are many levels that called many-storied streets as having many storied house so that traffic problem of the site could be solved or it could be worse.



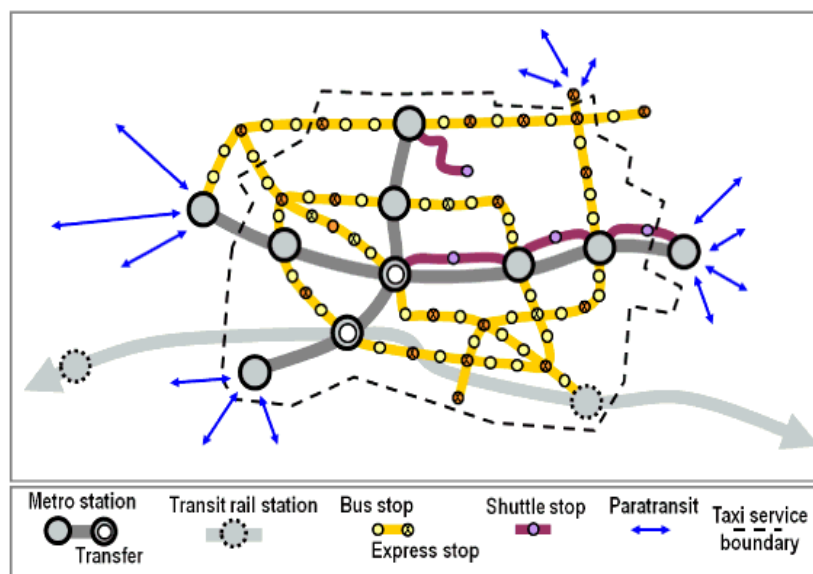
**Figure 2.11 :** Henard’s Proposal for Underground Urban Hub [Url-10].

### 2.3.1 Modes of transportation

Transportation modes have the identity to uniform all functions in their network. City needs multi layered transportation system so that modes can be formed. In the book ‘The Geography of Transport Systems’, it argued that transportation systems are complex structures in big cities. The more involvement of different modes of transportation systems, the more destinations be identified. So that there are a lot of nodes in the network meaning destination or arrival points. Because of the mixed-use



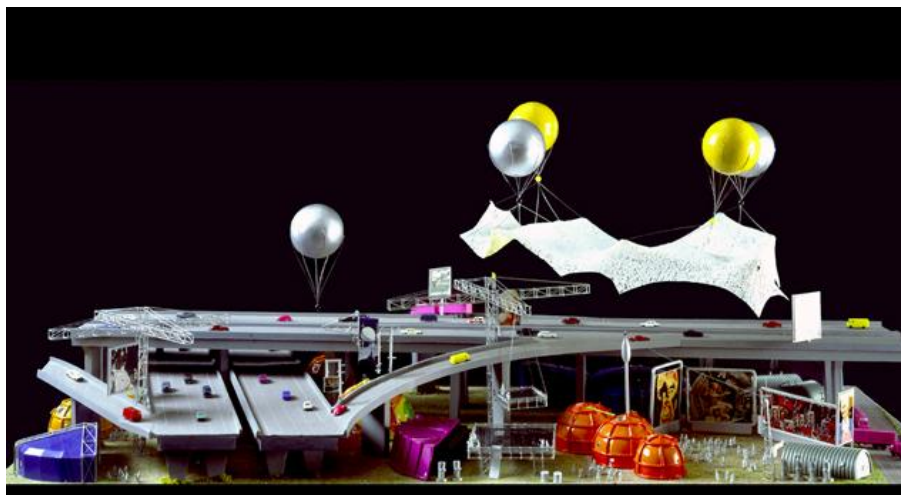
structure of the city, urban transportation system has not only carry daily routine movement of citizens but also the production, consumption and their transportation activities (Rodrigue et al, 2006). The image of transportation is presented with its multi-layered properties and the relations of the modes. According to Rodrigue et al, the components of urban transportation system can be listed by defining their factors of capacity, frequency, flexibility, costs and distance between stops. The geography of transportation system can be seen in the Figure 2.12. The “metro system” heavy rail system, often placed underground in central areas with fixed routes, services and stations. The “bus system” can be described by scheduled fixed routes and stops serviced by motorized multiple passengers vehicles. The “transit rail system” composed of tramways operating in central areas and passenger trains mainly developed to service suburban areas through a heavy or light rail system. Moreover “shuttle system” composed of a number of privately owned services using small buses or vans. Shuttle routes tend to be fixed, but can be adapted to fit new situations, servicing numerous specific functions. Paratransit system serves as a flexible and privately owned collective demand-response system composed of minibuses, vans or shared taxis commonly servicing peripheral and low density zones. Lastly, “taxi system” comprising privately owned cars or small vans offering an on-call, individual demand-response system and has no fixed routes (2006).



**Figure 2.12 :** The Geography of Transport Systems (Rodrigue et al, 2006).



Generally, the transportation system is resolved in the city's dynamic parts. There exist more superpositions than other sites. So that all transportation modes have the chance coming together. Developments in cities make the transportation more dynamic by having more lines. This concludes in modeling the system. At the same time modes give character for the ground. The modes can be walking, driving, bicycling and public transportation. The levelling is much more suitable for public modes like subways, tram, bus and the sea transportation. These transportation modes have relation with the surface much more. They interact with the ground like going to inner or upper layers. These characteristics of each mode make the city infrastructure more complicated. It is an interesting view to see this dynamism of modes of transportation in a city form. The "Instant City" project (Figure 2.13) by Archigram reacts with the idea of a 'travelling metropolis' which gives the taste of metropolitan dynamism. The important thing is the network of facilities which makes the space, city or ground dynamic respectively (Cook et al, 1999).



**Figure 2.13 :** Instant City Modes of Transportation [Url-1].

Cook et al, (1999) summarize this research project based on the conflict between local, culturally isolated, centres and the well serviced facilities of the metropolitan regions. The content of 'Instant City' investigates the effect of metropolitan dynamics into the mobile facility carrying centers. It takes possible configurations of its section with the forms such as towers as in building operations, air structures and converted commercial vehicles (Figure 2.14).



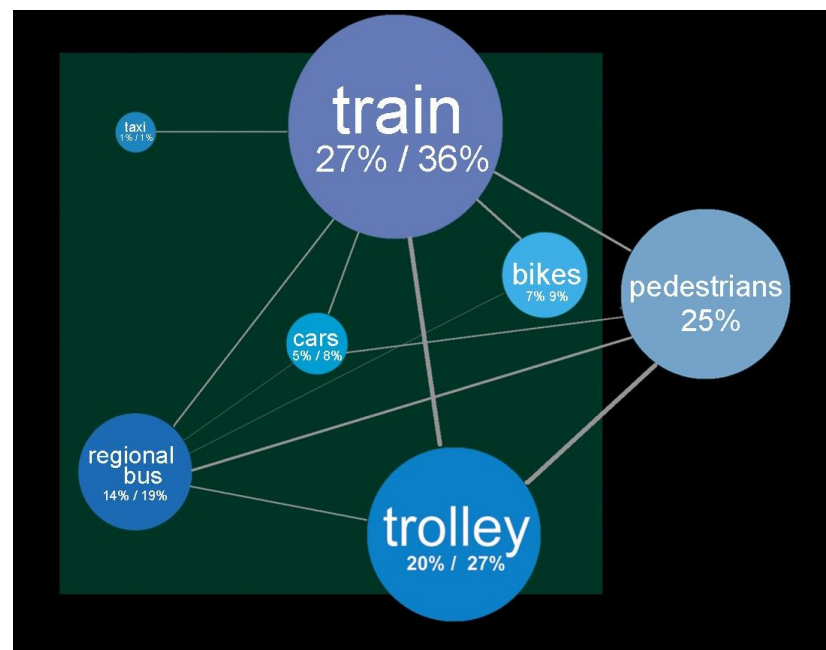
**Figure 2.14 :** Typical Configuration of Instant City [Url-1].

The view of the urban section became inseverable from the collages of Instant City. Therefore, analyzing the levels make the dynamism comes out from the surface. All the transportation modes became the city part itself. Looking another levelling section in relation with the transportation modes, Arnhem Central Masterplan (Figure 2.15) is an example of planning both placed above and below the ground. The programme including transfer hall, underground parking, bus terminal, two office towers, bicycle storage, railway platforms [Url-24].



**Figure 2.15 :** Image of Arnhem Central Master Plan [Url-24].

Un Studio developed the conceptual design as station articulating the advantages and disadvantages of various operations regarding the infrastructural connections in relation with number of important functions. This new terminal makes use of a unique free form concrete shape to provide passengers with a smooth transition between different modes of transport (Figure 2.16). Arnhem Central, with a total surface of 100,000 squaremetres consists a transfer hall with underground parking, a bus terminal and office towers. The project is fundamentally an urban densification exercise. “The enormous diversity in scales and user functions requires a methodological approach that can accommodate the hybrid nature of the development. Fully realized the connective aspiration as well as create a contemporary urban milieu on the site” (Bos and Berkel, 2011, pp.66-73). In the Arnhem Central transport hub in the Netherlands, there exist a large urban plan development composed of diverse elements. The masterplan incorporates office space, shops, housing units, a new station hall, a railway platform and underpass, a car tunnel, bicycle storage and a large parking garage.



**Figure 2.16 :** Arnhem Central Functions Diagram [Url-24].

Un Studio states transportation related projects have set of requirements, a methodological approach that accommodates with the hybrid development of nature. As seen in the Figure 2.17, this planning process allows the program and elements of design, melting in each other.

In Arnhem Central Masterplan, the transfer hall is the central piece of it by linking different programmes and levels.

As well as commercial areas and a conference centre, there are functions working as a linking hub between these transportation modes. The city centre, the parking garage, the office plaza and transfer hall are the urban structures which shelters for the facilities and waiting areas for the trains, buses and bus station [Url-24].



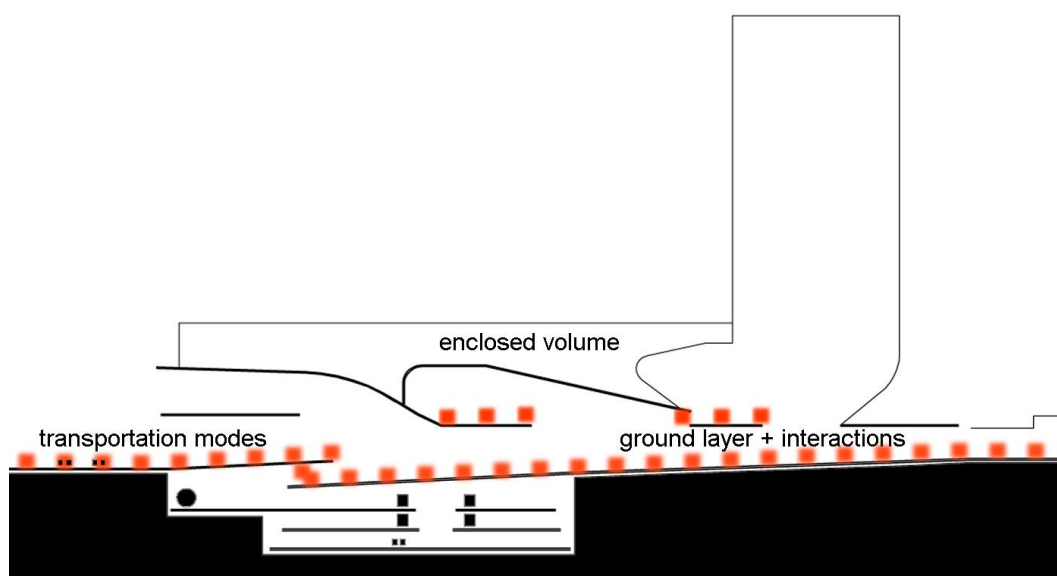
**Figure 2.17 :** Inside Levels of Arnhem Central Station [Url-24].





**Figure 2.18 :** The Willem Tunnel of Arnhem Central Station [Url-23].

According to Un Studio's interpretations on Arnhem Central station area, masterplan has the Tunnel of Willem formed also (Figure 2.18). The intersection of different traffic systems enhances the pedestrian approach and accessibility for all facilities. This new identity can be seen in the sectional analysis (Figure 2.19). Movement is an important data of masterplan. By analyzing types of movement on location includes the directions of the various trajectories, their prominence in relation to other forms of transportation on the site, duration, links to different programmes, and interconnections.



**Figure 2.19 :** Arnhem Central Station Urban Section Analysis (Yardim, 2012).

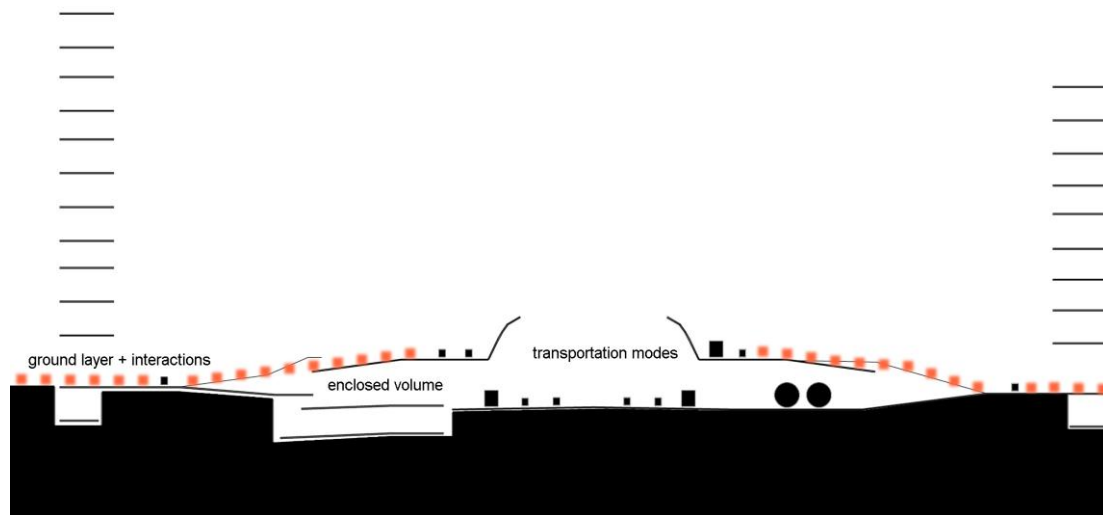
Generally, for collective transportation systems calling public transport, service modes are required as flows having fixed time schedule and routing. Looking through the case study of master plans with transportation care, certain activities have forms while many recreational activities, do not. The interactions generated by relations on layers in the functional networks of activities (Trip, 2007). Multilevel infrastructure deals with mixing different urban functions into the same urban structure in order to create a social blender. Functions such as public transportation, parking facilities and other possible amenities like a flea-market or temporary exhibits come together and impact the urban life. They create borders as they make new connections with these spaces. Possibilities of new urban structures are coming from the existing site conditions somehow. The projects which care the multilevel infrastructure work through the levels of the site. Today this kind of approach changes through more dynamic relations. New sectional variations are searched for the interaction of ground and infrastructure. The ground level takes the public mission in itself at the same time combined with traffic solutions. As an example of this vision Gran Via De Les Corts Catalanes in Barcelona can be shown (Figure 2.20).



**Figure 2.20 :** Gran Via De Les Corts Catalanes (Per and Arpa, 2008).

This is a project to improve the conditions of Gran Via, better known to many citizens as the A-19 motorway, with greater attention to pedestrians than the motorists. It proposes a new section: a projection of the service roads to forms 3.5 metre projections over the central carriageway.

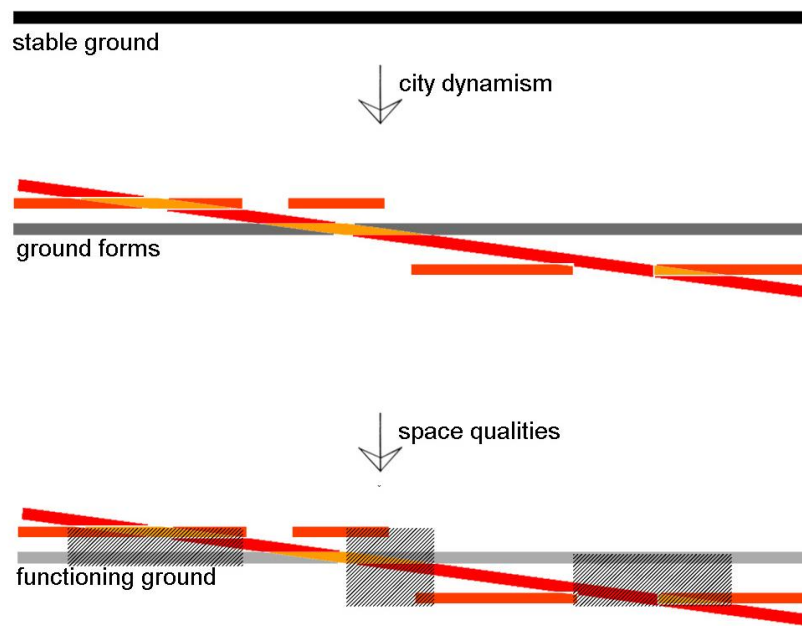
The project area is known as a highway of A-19, is an entrance for the city. The megastructural cut in the territory has been completely reconfigured by Arriola & Fiol Arquitectes to reduce the control of vehicular circulation, link the urban tissue on the two sides of the axis, and create new public space. As seen in section (Figure 2.21), ground level, road installations are implanted in a linear park having inclined sections for managing differences in levels between various routes . Moreover, a tramway is placed under the service road by integrated new developed landscape (Shannon and Smets, 2010, p.100). The public mode coming from the walkways around this proposed public space. The streets and their relations between two sides is a sectional variation of the proposal [Url-2].



**Figure 2.21 :** Sectional Analysis of Gran Via De Les (Yardıı, 2012).

### 2.3.2 Ground perspective

Ground level is the transitional part of the transportation typologies. It has paths and corridors along the fields, has borders and multi-layered sections. The physical importance of the urban ground is that, behaves like a base for the transportation infrastructure. The city's dynamism affects its borders, its pattern and its ways.



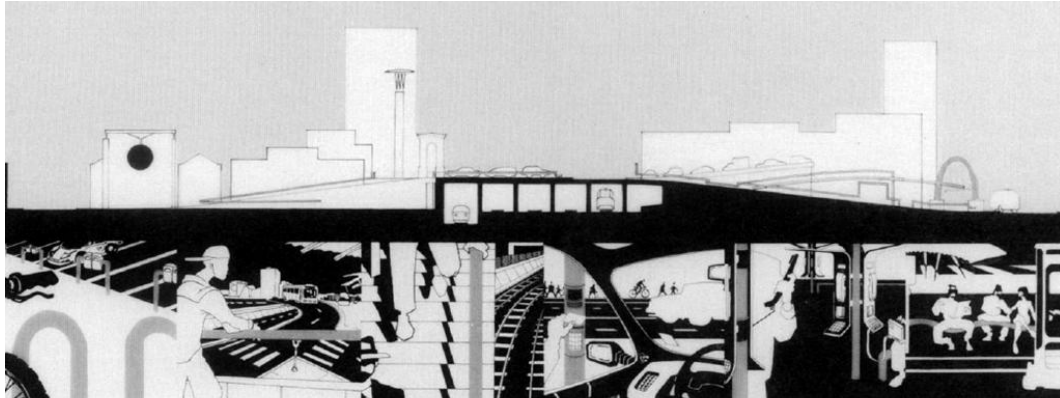
**Figure 2.22 :** Ground Diagram (Yardımcı, 2012).

In the diagram (Figure 2.2), the ground dynamism can be seen. Understanding the ground in the new, dynamic city one should have a look for below and above the ground relations with the infrastructure. Besides, ground has the power to change space qualities. For instance, raising the population in daytime is possible by placing the ground level in different forms. This choice merges for making the ground level more crowded, and make the area of mixed-used functioning. Gehl (2006) claims that people choose to walk through busy street rather than in an empty, deserted street. So they have great variation of experiences along the way and great sense of security. People are sitting in a street cafe and looking people passing. According to him cities are attract people by their life and vitality. The main semantics for the ground is people's living choice. They select to pass the time below or above the ground respectively. Obviously, 'ground' should give different opportunities in different sections.

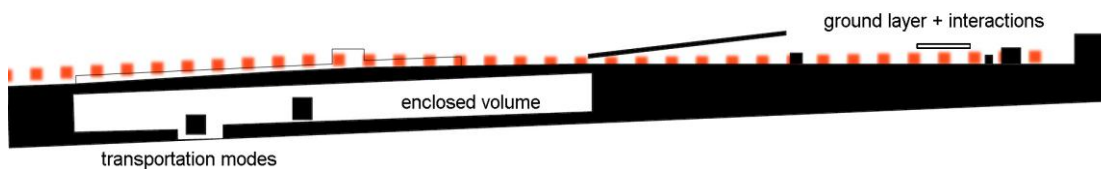
In the competition hold for new American Public Space, four sites were selected as, an entrance or an exit ramp, a parking lot; a street and traffic island, and two street intersections suspended over an interstate highway. Here is the relevant site is 'a streetscape' according to the relation of ground and transportation layers (Figure 2.23). Particular attributions of scale, space and speed generate new urban sites where highway and city interact.



The competition project aimed to equip the streetscape with utility services, street furniture and surfaces for everyday events. By connecting disparate elements in site, they provide shelter for public and private transportation meeting points (Figure 2.24). This continuous avenue seem as an urban infrastructure as modifications for the surface and provides a public space that allows the maximum correspondence between pedestrians and vehicles. (Wall, 1995, pp.22-28)



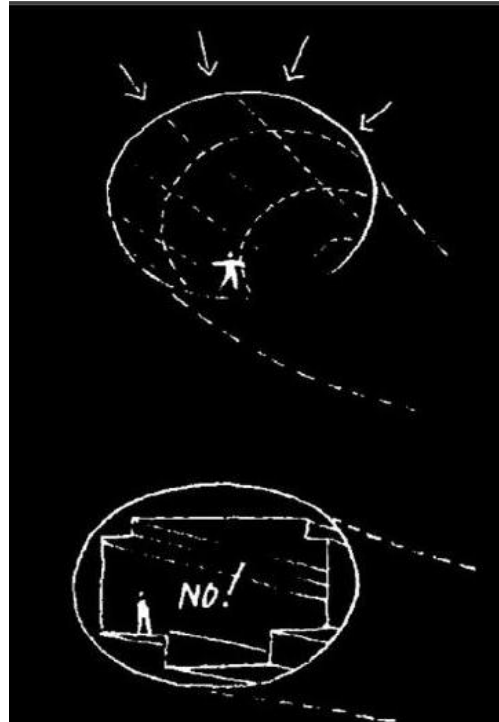
**Figure 2.23 :** Streetscape Connector (Wall, 1995).



**Figure 2.24 :** Design of new American Public Space Urban Section Analysis (Yardim, 2012).

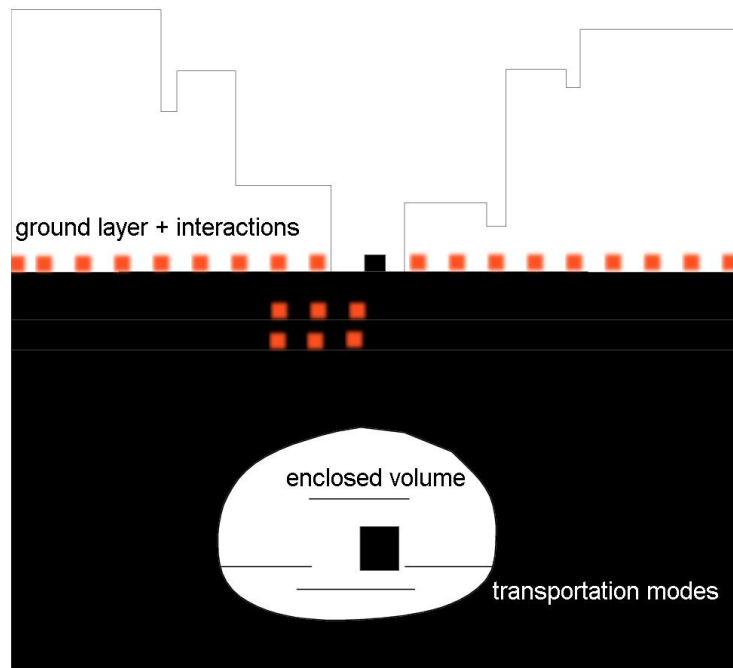
If the ground basically relating with two levels, called above and under, they need to transform their features through the structures. Above the ground, the public life is interesting and charming to us. As Gehl (2006) said, “Cappuccino, freash air and contact with others represent a combination that is hard to beat” (p.73). Looking through ground, air is the reason of publicless everywhere. Besides, in 21st century the underground is a new phenomia of this contaction area. Therefore, that, underground and above the ground has strong relationship that comes from publicless. Public levels of the structures have different connections wth the city and people passing through.

Meanwhile, the ground has interplays with the transportation infrastructure, which makes city livable and functional. This leads the ground as a part of an atmosphere of publicness. By looking urban grounds deeply, it is easy to understand how urban layers and sections of the city be formed. As an example, understanding ground relations from the “Bilboa Metro” can be logical. The curved form of Bilboa (Figure 2.25) is the essential of the structure.



**Figure 2.25 :** The Curved Form of Bilboa Metro [Url-5].

The Bilboa Metro links the region’s inhabitants from coastal villages to city center, industrial zone and the suburbs. The entry points of metro line lead via escalators or glass elevators to spaces large enough to accommodate mezzanines and staircases above the trains. The structures of tunnel for trains is seen in isolation from the purvey of spaces for people. Besides, as seen in the Figure 2.26, these spaces for people are part of a continuous experience for the traveller, starting and ending at street level (Shannon and Smets, 2010, p.28).



**Figure 2.26 :** Bilboa Metro Station Urban Section Analysis (Yardıı, 2012).

This striking experience of moving through in a grand volume is dramatic and it offers flexibility concept. Reflecting the strong traditions in Bilbao, the curved forms of the spaces are so expressive to become enormous designs. It has unusual curved forms allows flexibility for change at street levels and under the surface. Glassy structures called ‘Fosteritos’ are kind of demonstrations of early Art Nouveau Metro entrances of Paris (Figure 2.27). This is a good case how metro entrances relate with the site. The system all together built the environment and its quality [Url-5].



**Figure 2.27 :** Bilboa Metro Entrance and Art Nouveau Metro Entrance in Paris [Url-5] and [Url-8].

## **Public Space:**

Economic movements and activities have the supreme effect on urban grounds. In other words, the life style of people in cities, their purchase power and movement capacity has directly affect the public space. Today public space is a process of structuring the urban enviroment and the infrastructure levels of the city. When interpreting 'public space', the functions of infrastructure and city have to be taken into consideration. More public the relations get, the spaces getting more mobile. They can be structures placing in the city like transitional zones. These complex spaces should have been understood by the governance. To the side, their integration with the public transportation or private cars is the management problem (Dorval, 2011, p.3). According to Llop (2011), when analyzing public space, prooporties became prominent as collective spaces, welcoming places and accessible spaces. Their respond to the citizens' daily needs is important and make the good feelings for the city. To be sure these kinds of expectations from the public spaces are not only related with their characteristics of place but also the interaction with the transportation levels of the land. As a support for this kind of understanding, Transit-Oriented Development (TOD) guide is a relevant source that is a national nonprofit organization determines the successful station area planning. The guide takes into consideration of urban design, place making and the public infrastructure. One of the principle is 'making great public spaces'. This is the most related principle that fits into the interacton of public spaces and transportation spaces. According to TOD, the public spaces around the stations should be pedestrian-friendly and welcoming to transit passangers. Stated that "A successful public space is easy to walk around in, provides comfortable places for sitting, and incorporates shade and landscaping, attractive lighting, water fountains, and public art." According to principle also these kind of public spaces have the additional functions like retail allowing users to purchase coffee, a magazine or newspaper, or a snack. And the most important thing is that, these spaces are welcoming and safe for people who use the station's facilities underground. As the underground functions make the ground more effective, the Hoenheim-Nord Terminus and Car Park Project is an example of not going to under but having a real connection with the ground both physical and logical way (Figure 2.28).



**Figure 2.28 :** Hoenheim-Nord Terminus and Car Park Aerial View [Url-27].

The city of Strasbourg has been developing a new tramline to encourage commuters to leave their cars park outside and then take a tram to the inner parts of the city. Zaha Hadid acclaimed use the surface of folded sculpture to develop a tram station and parking facility. This synthesis between ground, walls, lights and public space is establishing a relation between dynamic and static elements at different scales (Shannon and Smets, 2010, p.88). The structure has a basic programme with waiting space, bicycle storage and shopping [Url-27]. The overall affect of three-dimensional vectors enhanced in the ground by the lines with light, furniture (Figure 2.29). An energetic and an attractive public space enhanced by circulation and functions.





**Figure 2.29 :** Hoenheim-Nord Terminus Public Image [Url-27].

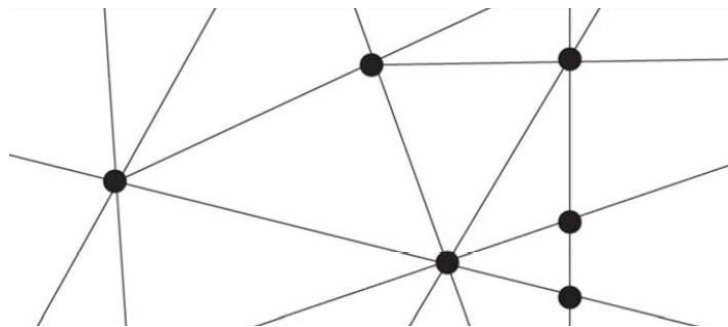
### **Underground Space:**

Considering the public space, the publicless level decreases through the underground. It can be reasonable saying the transformation has reasons like necessity, curiosity and trying to escape from the space, by widening it. This is possible in a very restrictive sense, or by searching to utilize the third dimension, upwards or downwards. The use of underground is a preference in the city. In the concept of ‘artifice of hiding’ Shannon&Smets discuss about the layers of city which goes to the underground and begins to hide. The paradoxical situation occurs here that by hiding all infrastructures underneath the ground, the above ground is in a valuable situation. Therefore, the constructed under world have an interesting relation with the ground level (2010, p.56). These realities change into built-up forms that are called underground structures. Berlin’s new Central Station (Figure 2.30) which presented that Europe’s largest train station has long-distance, regional, and local transport was built on its historical site. The underground system connects in North-south link with the curved railway track running in the west-east line. Moreover, the suburban railway link with the underground line from north to south arrives at this [Url-6].

According to Smets’ node diagram (Figure 2.31), the networking terminology of this kind of urban structures is nodes. As natural points in the network crossing with each other, there exist an internal movement in the network also (2010).

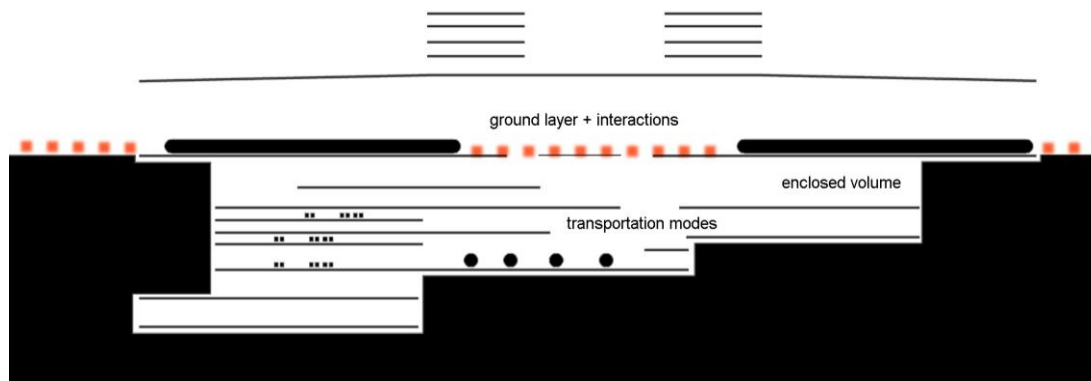


**Figure 2.30 :** Berlin's New Central Station Interior Levels [Url-6].



**Figure 2.31 :** Node Diagram (Smeths, 2011).

As understood from Figure 2.31 “The Urban Section Analysis”, There exists an east-west line is elevated 10 m above street level corresponds to the previous course of the railway tracks. A total of four long-distance railway tracks and two urban train tracks run on four newly constructed urban railway bridges. The traffic of the station has the porpties from the mixed-use functioning . Levels of -2,  $\pm 0$  and +1 have long-distance and regional lines from north to south; underground line, local public transport; individual transport (access road, short-term car park); bicycles and pedestrians; tourist transport (coaches, ships), long-distance and regional lines on the urban railway track and urban railway lines [Url-6].



**Figure 2.32 :** Berlin Central Station Urban Section Analysis (Yardımcı, 2012).

It is interesting to observe interactions and mutual influenced that underground transportation and conventional ground have on each other. There's a lot to hold manipulations on structures to be aware of the public space. In this way, urban areas or open landscapes are the ground forms that differs. Considering the urban settings; the layered system of transportation - burying highways, railroads, parking garages- , makes a large public areas and good qualities in visual aspect of the ground. (Shannon and Smets, 2010, p.56). Even as above and below the ground were reconciled in the city, these layers are also the elements of the site, environment.

### **Urban Layers:**

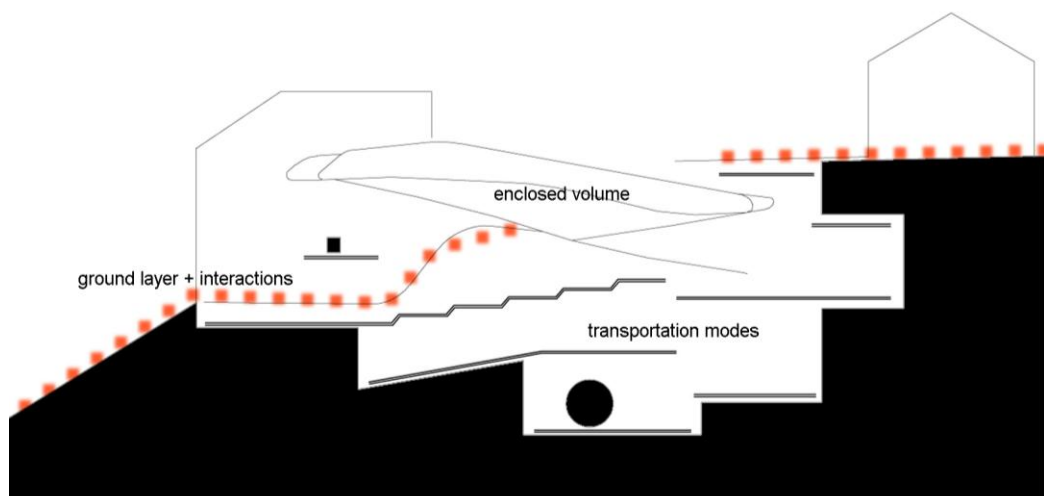
City is not a single line. It has the potential of superpositioning all the layers of living conditions. City is limitless about holding intersections of all experiments that people have. This layering of urban section allows to city make important relations between the layers. In the same way, multi-layered urban surfaces are transformed from the strict borders that are horizontally figured out. The process is merging the qualities of the city layer by layer. Proposing the hard urban edges to the transitional spatial ecotones (Kwinter, 2010). The promise of continuous urban layers is fulfilled in the sections of the city. They gain the meaning of becoming not single lines but together forming sections respectively. These together sections also valid for the rail station, rail lines of cities. As Hadid mentions "The railway reflects the city's continued commitment to the highest standards of architecture and pushes the boundaries of design and construction technology. These stations are the global benchmark for the use of double-curvature glass in construction" [Url-29].





**Figure 2.33 :** Nordpark Railway Stations/Entrances [Url-29].

The stations in Australia have the futuristic design approach taking environmental context (Figure 2.33). Therefore, each of them has their own unique context, topography, altitude, and circulation. The design process has the natural phenomena such as glacial moraines and ice movements. Within the artifice of context, the sections give the idea of being unique in the environment (Figure 2.34). Large cantilevers and small touch down areas make the public realm as much as the site wants.



**Figure 2.34 :** Congress Station Urban Section Analysis (Yardim, 2012).

As seen in the Figure 2.35, when generating each station, the elements of “shell & shadow” contrasting with each other. On top of a concrete plinth, lightweight organic roof structure floats. Moreover, the artificial landscape functions as a relief in which various movements and circulations are inscribed [Url-29].



**Figure 2.35 :** Nordpark Railway Stations “ground and underground” [Url-29].

### **Urban Section:**

Speaking of public space can be a theoretical convention that covers up the section of the city. The ground is more or less public, in terms of using the horizontal sectional layout. White (1999) reveals a space in section, that it is a huge cut through the ground plane. He discusses a vision about the ground, the edges of buildings and configuration of enclosed volume. Urban sections demonstrate the concept of urban public space’s significance. These sections are needed to understand the area in both directions in space. The horizontal and vertical dimensions of the space and their important qualities can be shown in fully sections. Conceptually, these sections exist in between building heights, facades, sloped forms and ground line. They show the shape of space and its relations with the activities in the area take place (White, 1999).

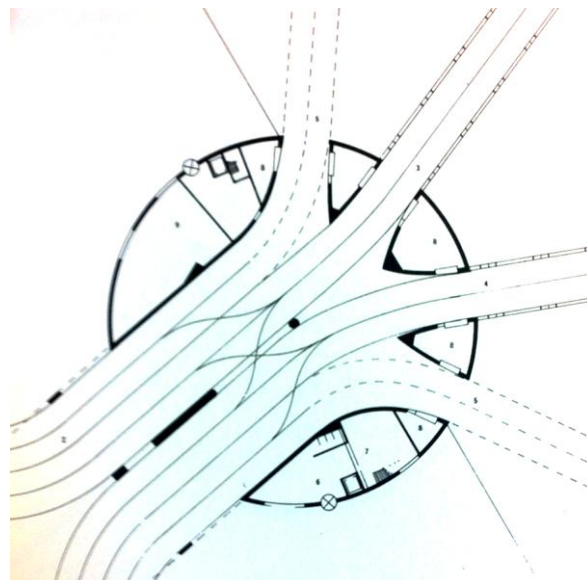
In some specific urban sections, it is the only medium that we can see the boundaries of everyday space including the underground and the city silhouette by recognizing these views as the interaction of different urban layers.

White (1999) highlights the urban sections extending to include the city fabric as relationships to other nearby public areas, qualities of paths to and from the space, and larger patterns of urban places. The relationships with other public areas and the other qualities of paths and forms of space include more public space. It is important that public spaces have not all the sign of entrances or their edges. As a result of that stability, entries into public spaces may or may not be marked with the formal portals (p.41). Even though, when analyzing an urban section, it needs to show characteristic properties for the outside world. This brings the feeling of knowing where underground begins or what is going to happen in there. The urban section which struggles with the city layers, serves as evidence of a comprehensible spatial order of land. According to White (1999), the configuration of the ground plane is highlighted by the section and ground-related information. For instance, analyzing level changes, flat and sloped areas, stairs and ramps, retaining walls, and handrail conditions are practices for asseying urban section. These urban qualities of land can be shown both in the design process and thoughts about the urban structure. In 1989, Koolhaas designed a terminal in Zeebrugge (Figure 2.36) having a utilitarian character by its section. Its ground relation properties and interaction level for road has the value of topographical manipulations. He seems to make a chaos from an order by the help of the integration between transportation and place. They are coming together for functions in Zeebrugge, and roads gain their freedom inside the structure.



**Figure 2.36 :** Zeebrugge Sea Terminal Crossing the Channel [Url-14].

After the opening of the tunnel between England and the continent for stay viable, the ferry companies operating across the channel propose to make the crossing more exciting. Therefore, the terminal structure wanted to have a utilitarian character and become an attraction point (Goulet, 1990). This attraction means injecting a new sign into landscape, resisting easy classification to freevassociate with successive moods the mechanical, the industrial, the utilitarian, the abstract, the poetic, the surreal [Url-14].



**Figure 2.37 :** Zeebrugge Sea Terminal Floor Plan (Goulet, 1990).

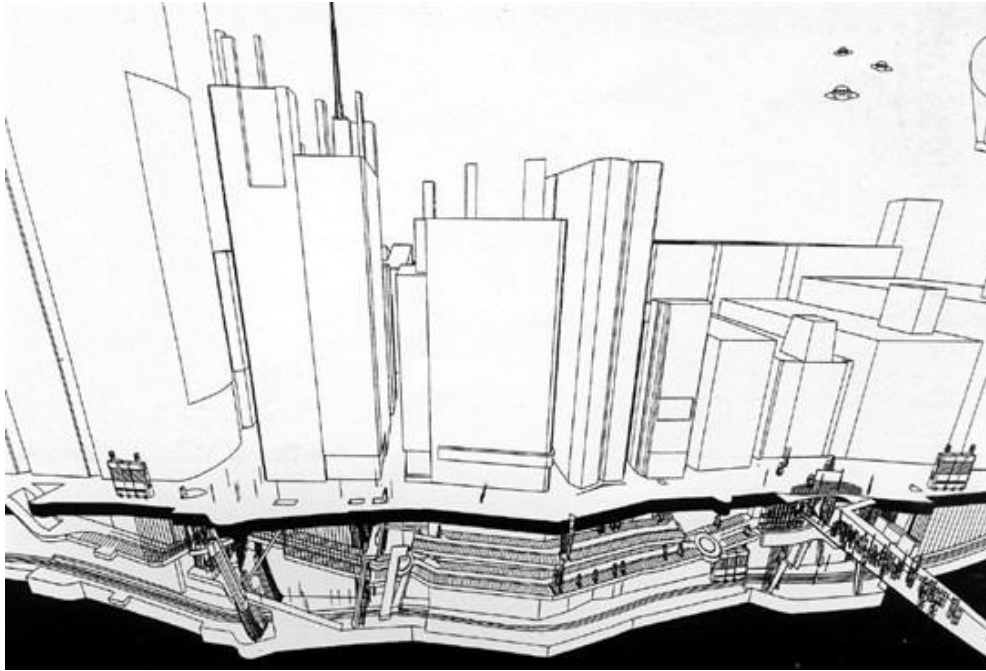
Apart from these becoming an attraction point, Koolhaas intended Zeebrugge Sea Terminal has the relations of transportation modes. As seen in the Figure 2.37, its two lowest floors organize traffic to and from the ferries. Besides, a bus station is projected and pedestrian acces is through a separate external loop. Two floors of parking wind in an ascending spiral culminating in a great public hall, where the panorama of sea and land is revealed for the first time. Then the cone splits into vertical segments; a wedge of offices divides the sphere into hotel and promotional sections [Url-14]. Dealing with the urban section, finding that it may be the leading issue of understanding of relations or it can be mere logical. It depends on the structure's scale in which we look at it. Urban structure combined as different views in the city level. The interactions on ground level and coexistence of transportation are shared by the urban sections responsively.

### 2.3.3 Urban Structure

The relation between transportation infrastructure and ground can be seen having high density parts of the cities. The urban structure of the city reflected this relation in terms of economical, political and social value systems. The structures in between transportation and ground, determined the urban sections. While the process of interaction in structures is still underway, there are many specific ways in which urban design may help to realize it. According to Bertolini (2006), in order to enhance the opportunities for developing a public realm at passenger transportation interchanges design should provide;

- multiple use in activities
- generous possibilities of interaction between inside and outside life of structures
- superior presence of society
- readable and accessible points in exchanging areas between spaces
- an internal structure favouring the overlap of mobility flows in space and time
- connections with the wider surroundings

for a quality relation with ground (pp.328-329). Further, the urban structures have the role of being junction points. In this way, the structures becoming part of transportation modes and relations. They make the layers of the city more visible by their architectural qualities. In presenting this idea, the urban transportation is the key issue for determining the structure functions, levels and their design strategies. Koolhaas (1998) describes the being underground as a matter of creating void between transportation layers. This strategy results in interaction of spaces in urban structures that creating voids can help underground forms as the use of daylight and orientation (p.1166). As seen in the Souterrain Tram Tunnel, a certain sense is an imprisoned city Hague, architecture has a positive effect when applied to the transportation pragmatism. The urban structure consists of a subway-line with 2 layers of parking on top and a station at either end (Figure 2.38). Below the main shopping street, there emerges a workspace.



**Figure 2.38 :** Souterrain Tram Tunnel Sectional View [Url-13].

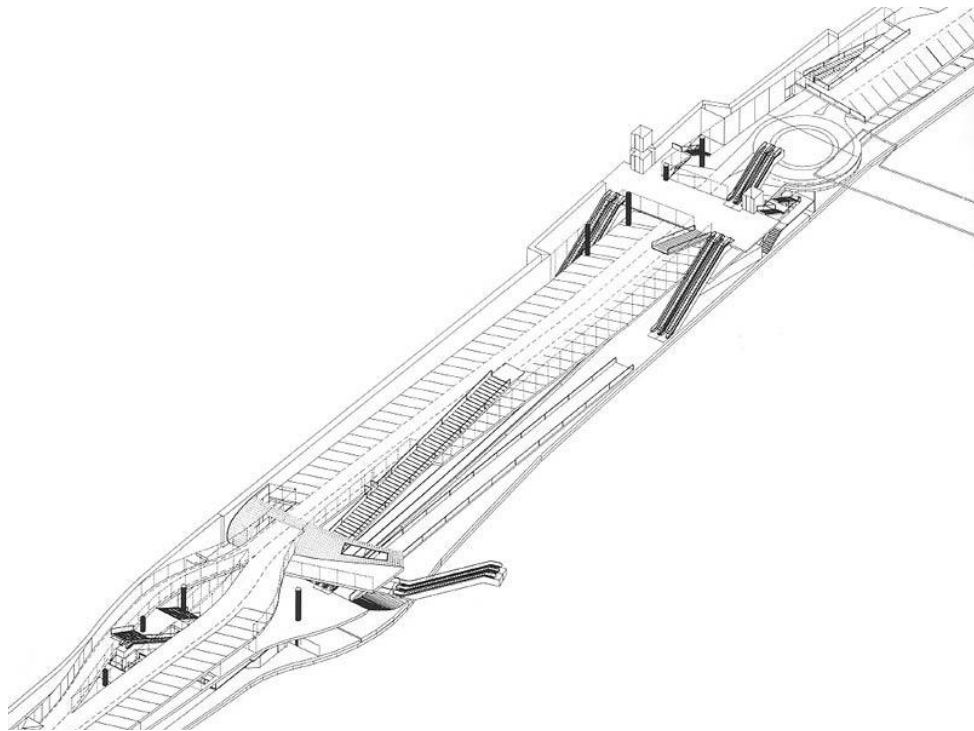
Tramway tunnel, tramway stations, parking garage, poster museum are the functions that having its lowest point 12 meters from ground level of tunnel. Making infrastructure as a building, the digging of a multi-storey tunnel is the necessary addition that makes all other buildings work. The tunnel works as a body of underground connections that serve the city, connecting the separate 'organs'. “The city is turning into a kind of La Defense in reverse, the slumbering and existing are being reanimated by an underworld of interconnecting spaces” [Url-13].



**Figure 2.39 :** Souterrain Tram Tunnel Interior Levelling [Url-13].



Looking through its interactions with the ground level, its surface of the main market street overhauled scoops into facilitate public entry into the underground station facilities (Figure 2.39). For the long sectional manipulation of tunnel, every chance is renewed to modify the height and the width of the space. By connecting physically or visually to other parts of the tunnels program, providing views of the outside the city or sky and linking the tunnel with surrounding shops are the alternatives of this chance. As seen in the Figure 2.40, Souterrain Tram Tunnel has the sectional play and experimental levelling system. While it is an element of infrastructure, it is a building at the same time. As a fluid tunnel, the linearity of the site turned out to be an escape from this long tunnel. And the parking becomes a fluid space, making use of the slopes in the rail and exploiting one of the gives, its enormous length, as an unprecedented quality [Url-13].



**Figure 2.40 :** Souterrain Tram Tunnel Longitudinal Section (Shannon and Smets, 2010).

The physical place of interaction needs levelling because of the program of the structure. As it feels in between a station and ground, becoming layered typology is highly important. The space is a complete with open spaces and transitions in between above and below the ground.

To go still further, what is it that constitutes these urban structures as architectural typology? Over and above functional relations, what has made relation of the levels and layers? This is an interactive play between the ground, above the ground and below the ground. Habernas asked the question “Are transportation infrastructure and superstructure of the city related with the architectural typologies?” (1990, p. 225). The question searches for defining urban public space that have been faced through the sections. Even the urban sections have the change to relate both.

### **Mixing Functions:**

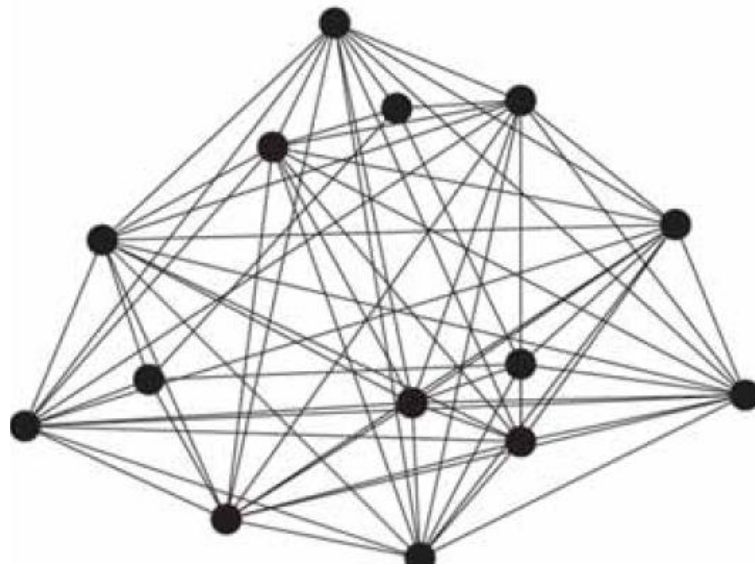
Mixed-use functioned structures of ground and underground facilitate a lot of activity on their own. Especially mixing functions refer to shopping and transportation together. Today; stations, terminals, transit stops are becoming complex shopping-centers whose clients are passengers. According to Shannon&Smets, “The mall, a descendent of the 19th-century arcade and 20th-century department store, has evolved into a large, windowless space of self-contained experiences that creates imagineered and artificially differentiated worlds” (2010, p.200). This transformation in recent years, make the transit city structures as the most crowded and popular places.



**Figure 2.41 :** Transbay Transit Center Master Plan [Url-15].

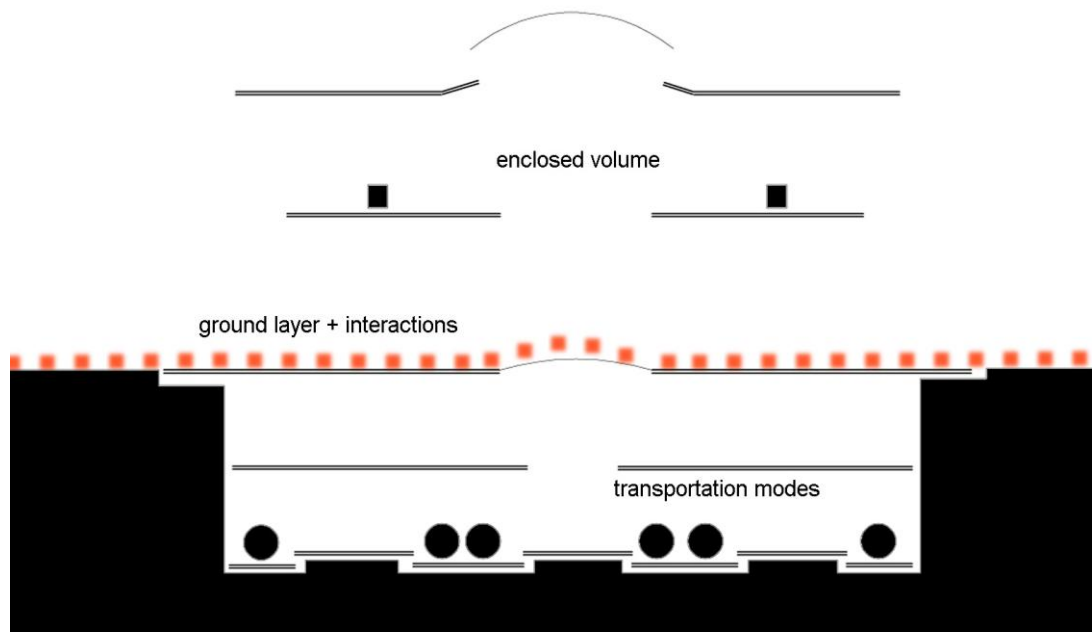


In Transbay Transit Center in San Francisco (Figure 2.41), Pelli Clarke Pelli Architects designed an intermodal bus and rail transit as the attach point of a major mixed-use redevelopment project. Shopping is placed as the major element of this urban renewal and economic transformation. Unexpectedly, the typical mix of retail and office spaces has also interactions with housing units (Shannon and Smets, 2010, pp.201-203). They assert that, often internalized spaces with flow of transporting called hub. As seen in the Figure 2.42, the connections of the hubs have the chance to go everywhere, and connections between them are likely to have connections between transport modes (Smets, 2011).



**Figure 2.42 :** Hub Diagram (Smets, 2011).

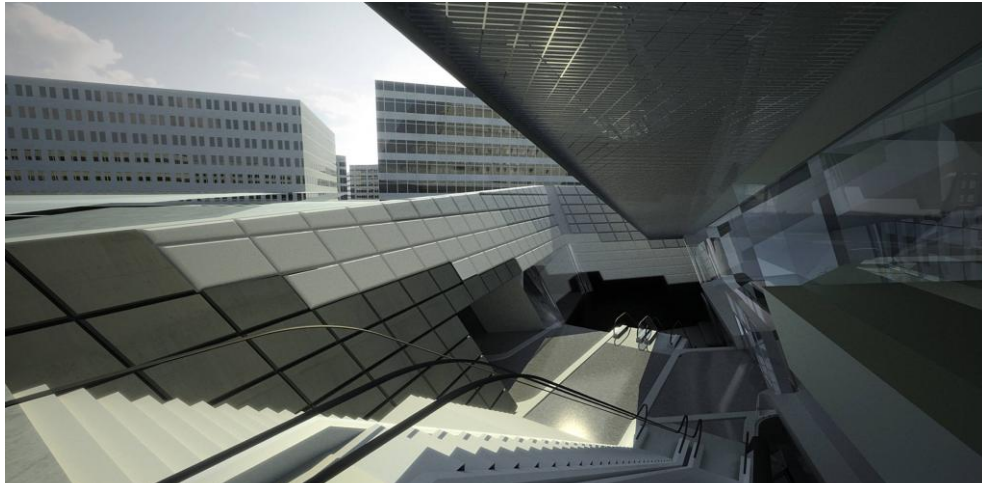
Transbay Transit Center, opening in 2017, linking 11 transit systems and connecting the city to the region, the state, and the nation. The heart of Transbay's design is the rooftop park. Dense with nature and activities, it will have over a dozen entry points, potentially including bridges to surrounding buildings. Active and passive uses are woven into the landscape, including a 1,000-person amphitheater, cafes, and a children's playground, as well as quiet areas for reading, picnicking or simply taking a break (<http://pcparch.com/project/transbay-transit-center-and-tower>). The ground layer of the center serves as primary circulation hub with the feature allowing natural daylight in the building. The main entrance hall includes a public information center [Url-21].



**Figure 2.43 :** Transbay Transit Center Urban Section (Yardim, 2012).

The physical form seen in the Transbay Transit Center urban section imposes the urban structure as a mixed-use space (Figure 2.43). In urbanized settings, transportation infrastructure connects with the other functions more. For these reason mixing the activities is more possible where the levels are integrating with each other and with the ground. Eusko Tren Central Headquarters Project is another example which gives response to the question of ground level and transportation relation in a manner of functioning. Eusko Tren Central Headquarter is an urban intervention of an underground commercial and leisure centre is integrated with car parking facilities by Zaha Hadid in Spain. The challenge of the structure was integrating a new underground station and commercial space to create a new civic landmark (Figure 2.44). For this, both physical needs of the building and new identity of company and its economic growth are thought [Url-28].

As urban strategy existing rail tracks at ground level are to be taken off and renewed with a network of underground tracks allowing the land to return to public use (Figure 2.45).



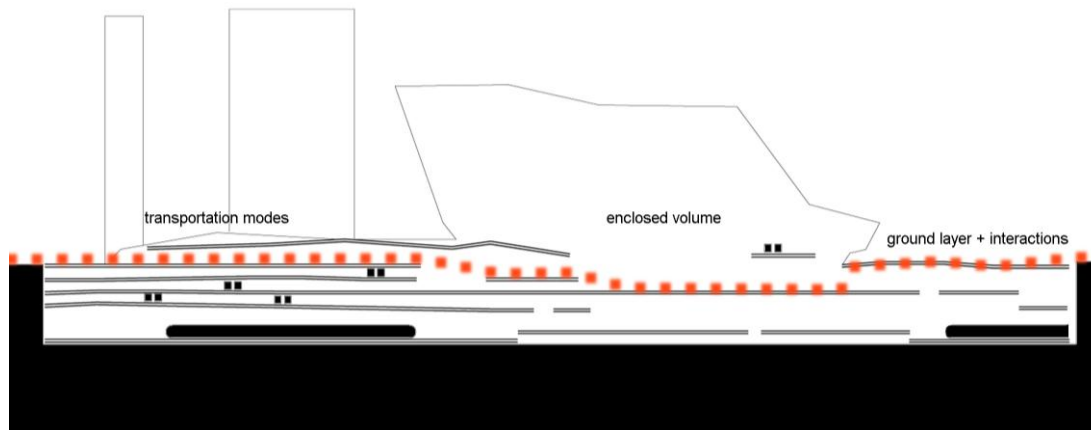
**Figure 2.44 :** Eusko Tren Central Headquarters [Url-28].

There are paths which connect the park and the station directly in the ground level that relating with the commercial space. Within a vision of urban integrity, the public and private spaces was first anticipated and then realised. These areas with a relative frequency of circulation include the private domains adjacent to the planned residential areas [Url-28].



**Figure 2.45 :** Eusko Tren Central Headquarters Site and Section [Url-28].

As seen in the urban section (Figure 2.46), topographic specializations and ground level changes are then retined to create self-separation and permit programmatic connections across the site to the car park, buildings and adjacent streets [Url-28].

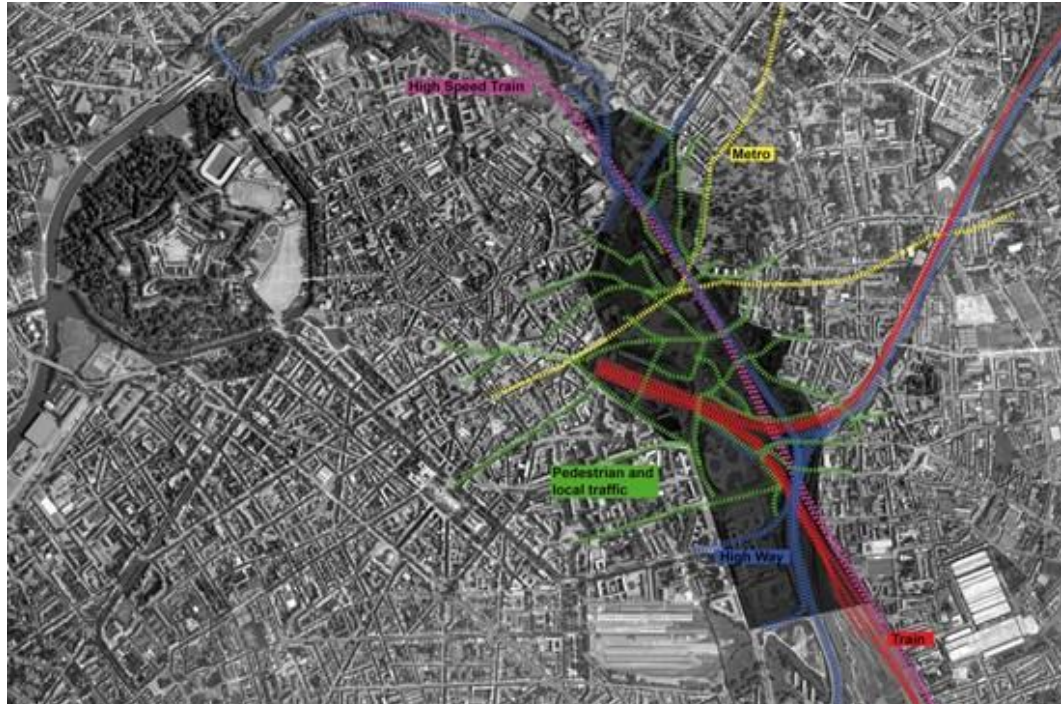


**Figure 2.46 :** Eusko Tren Central Headquarters Urban Section Analysis  
(Yardımcı, 2012).

Integrated development of stations and their urban surroundings is intentionally planned as an impetus to urban redevelopment. They evidently become a desire of collaboratives involving array of professionals like urban planners, urban designers, architects, artists and archaeologists, municipal and regional government, the planning and transport departments, the construction and the transport industry, transportation providers and local institutions. Beneath this process, urban public realm has specific ways to adapt these multi functioning typology into a realm at passenger transportation interchanges. So that providing some design principles that urban design can help enhancing the opportunities;

- multi layers for activities and flows
- abundant moments of interaction in and out of the structures
- high presence of people
- accesible points of different events nd actions
- structure for prefering the correspond of mobility flows
- connections with the surrounding are identified

(Bertolini, 1998, pp.330-331). As sectional richness was explicitly defined by designing the landcape with other enviroment, selecting an example of visible infrastructure project is logical.

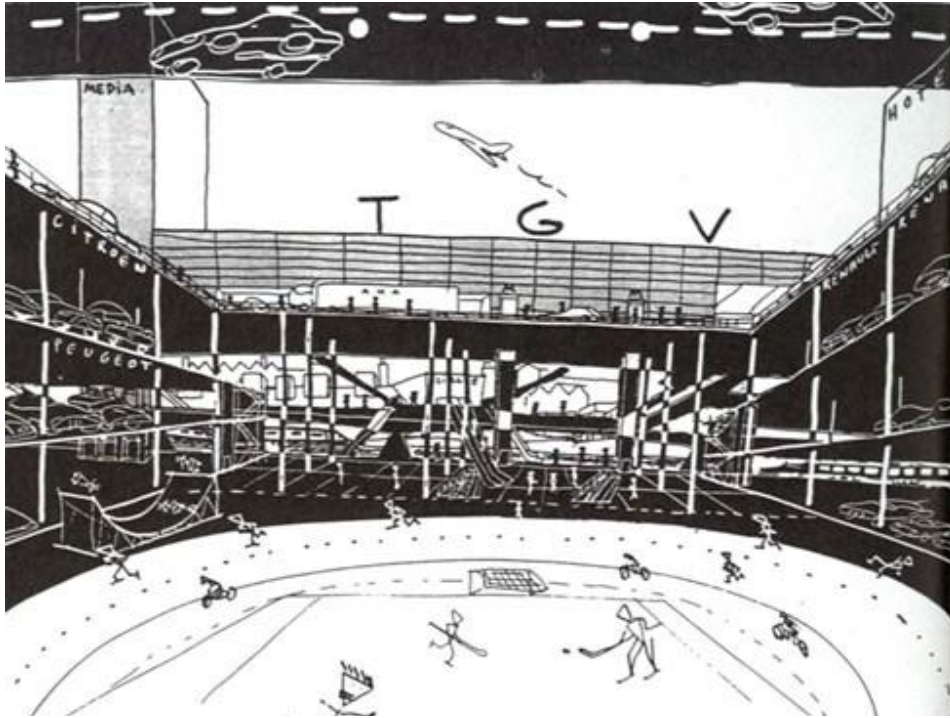


**Figure 2.47 :** Eurolille, A Masterplan of an Entirely New City [Url-12].

As seen in the Figure 2.47, in 1989, OMA(Office of Metropolitan Architects) commissioned to design a masterplan consisting of more than 800,000 square meters of urban activities - a new station, shopping, offices, parking, hotels, housing, a concert hall, congress - built on 120 hectares on the site of the former city fortifications. Public transportation facilities, the layout of the public spaces, the street layout, parking facilities, the conversion of the périphérique (ring road) into an underpass, and the areas between and bordering the elements of the plan are planned to link in the masterplan [Url-12].

The project is an organization of the infrastructure and presents itself as a junction of various transportation systems. Koolhaas calls the existing infrastructure as "piranesian space", an area 'cut out' of the parking garage (Figure 2.48 and Figure 2.49) which reveals the complexity of the infrastructure by at the same time offering a view of the motorway, over the train station and subway and into the garage. The transportation infrastructure has become a part of architecture in the project. The way integrating both is not only by transportation can go through the building, also the aesthetics of the structure are evocative of infrastructural works such as bridges, overpasses and parking garages [Url-12].





**Figure 2.48 :** Void at the Heart of the Masterplan [Url-12].



**Figure 2.49 :** Public Space View from Eurolille [Url-12].

### **3. BELOW and ABOVE GROUND STRUCTURE TYPOLOGIES**

#### **3.1 Conceptual Framework**

According to the Oxford English Dictionary, a type defines “a characteristic specimen of a thing or a class of things”. On the assumption of that nothing is entirely one kind, so that everything in the world is representative of a type. This approach is a way to rethink existing urban surrounding of transportation levels. By illuminating the roles of the structures, the typology concept can be defined as a spatial performance.

It will be clear from the previous chapter that urban structures are significant as typologies. Their design frame has the correlation with the transportation system that addresses the qualities of urban grounds. Urban space relationship is the experience of analyzing interactions and to fit the typologies. In this context, urban grounds are important tools for overcoming the design process of structures both underground and superstructures above the ground. Therefore, as stated by Whitehand and Larkham (1992), “Most architects were striving to establish a method capable of uniting the urban with the architectural – a corrective tool for the problems of the city” (p.157). The idea looking through the city by urban section is a good way of perception of its transportation and its public spaces. Recognizing that urbanism related issues cannot be designed and controlled in a totality manner but in the concept of projection, steering and managing to grow and change over time. Regarding that, cities and their urban sections are diagrams subjected to a fixed emancipation. Besides the new understanding of urbanism, existing a new vocabulary for the strategies and analysis. The terms; topography, surface, mat, blanket, network, pathway, matrix, emergent, infrastructure, field, cluster, strata, flow, feeder, thread, diagram, map and sprawl (Tschumi and Cheng, p.17, 2003). To make an interaction level with the urban sections and ground, this terminology can help. In addition to that, taking the important parts of the case study sections and their analyses help to improve these “coding and typing” process (Fig 3.2)

**Table 3.1 :** Selected Parameters for Typology Codes (Yardımcı, 2012).

context	architecture
scale	programming
form	action

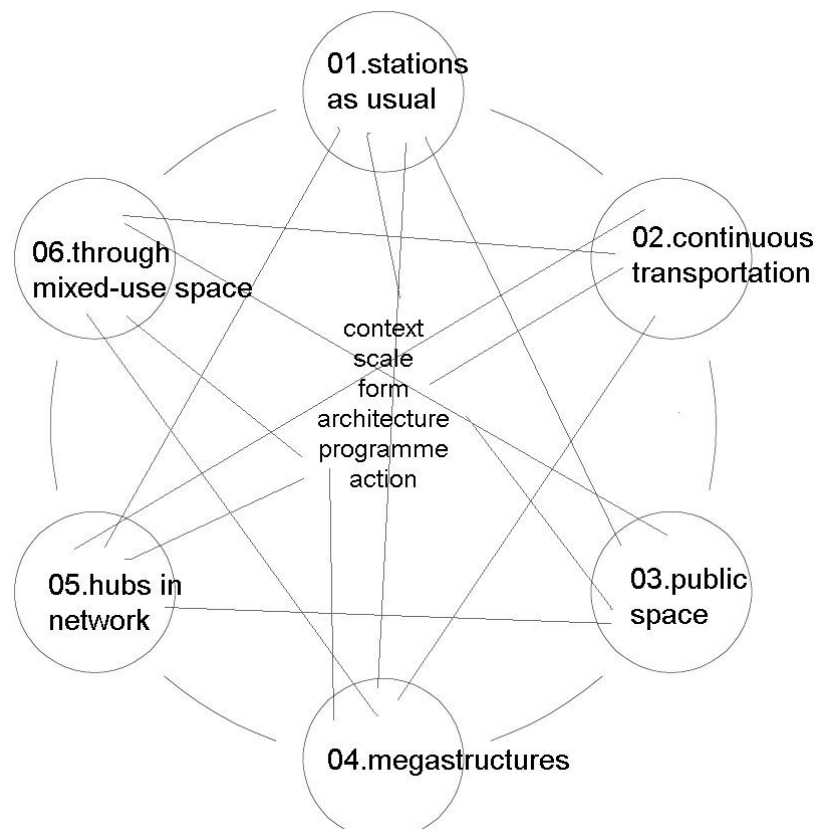
### 3.2 Practical Applications

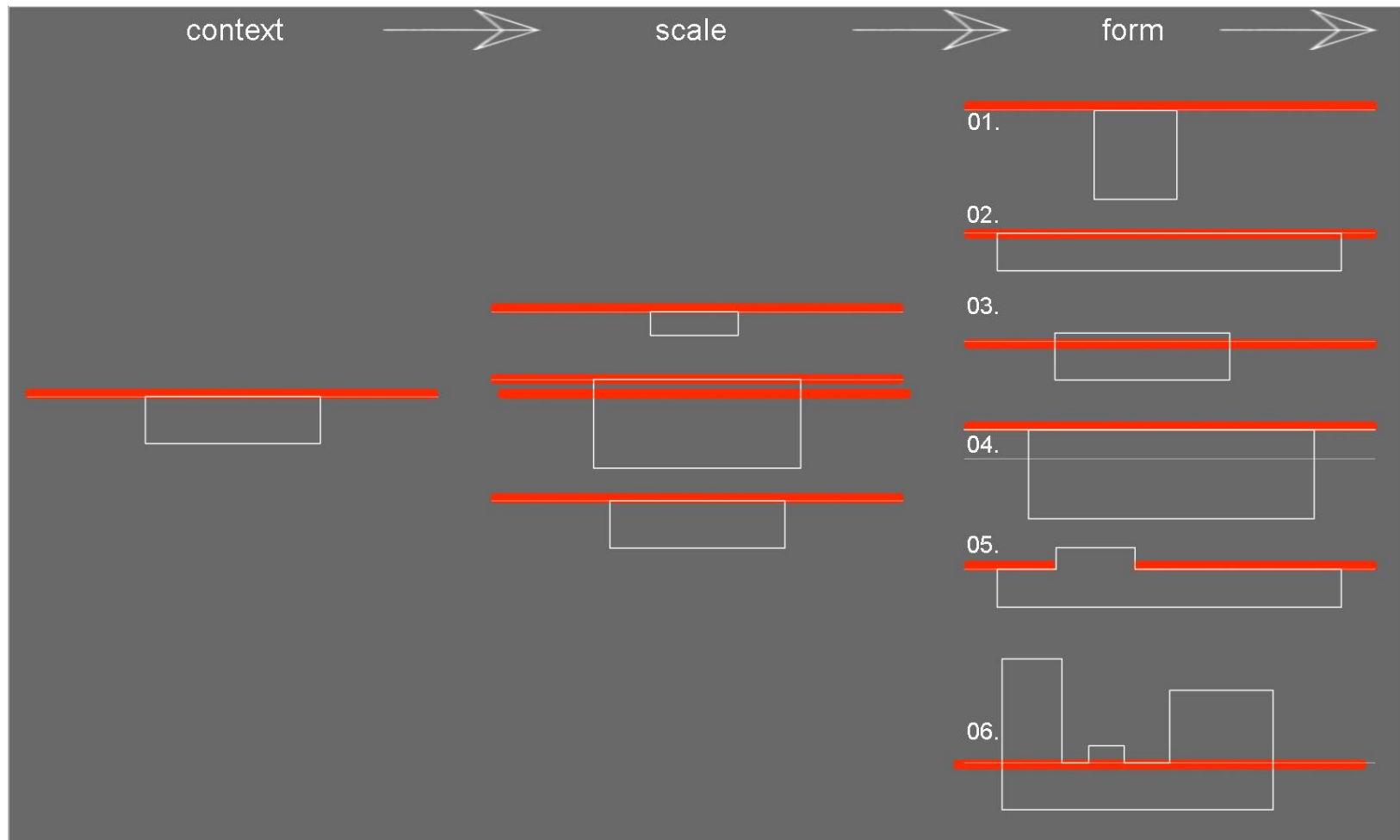
Below and above structures have always been places for citizens to visit, to live or to pass. From this view, with the help of the parameters in their design and relation process, it is a way to represent types of structures. The condition of the system ‘structure’ can adapt it very different forms including layers of the site. Argan claims that types cannot be called as classification modes, they rather than a part of creative process. Taking the series of typologies can be possible by understanding the morphological configurations of the selected structures. Moreover, the hierarchical categories are the second method to make the typological categories. For instance, the urban scale with the configuration of buildings and the building scale with the construction elements (Whitehand and Larkham, 1992, p.157). Typology coding is the answer of how to imagine urban structures of transportation, both their modular design and their interaction with the ground level. In this sense, Rossi (1982) declares that type as analytical tool for architecture and urban form going beyond the idea of type. This brings the legibility for urban structures that everyday citizens pass, live and visit. The important thing is that the transportation modes are intersecting mostly the underground. Especially while examining the relations or typologies of them, ground level transportation is not so much effective on typologies.



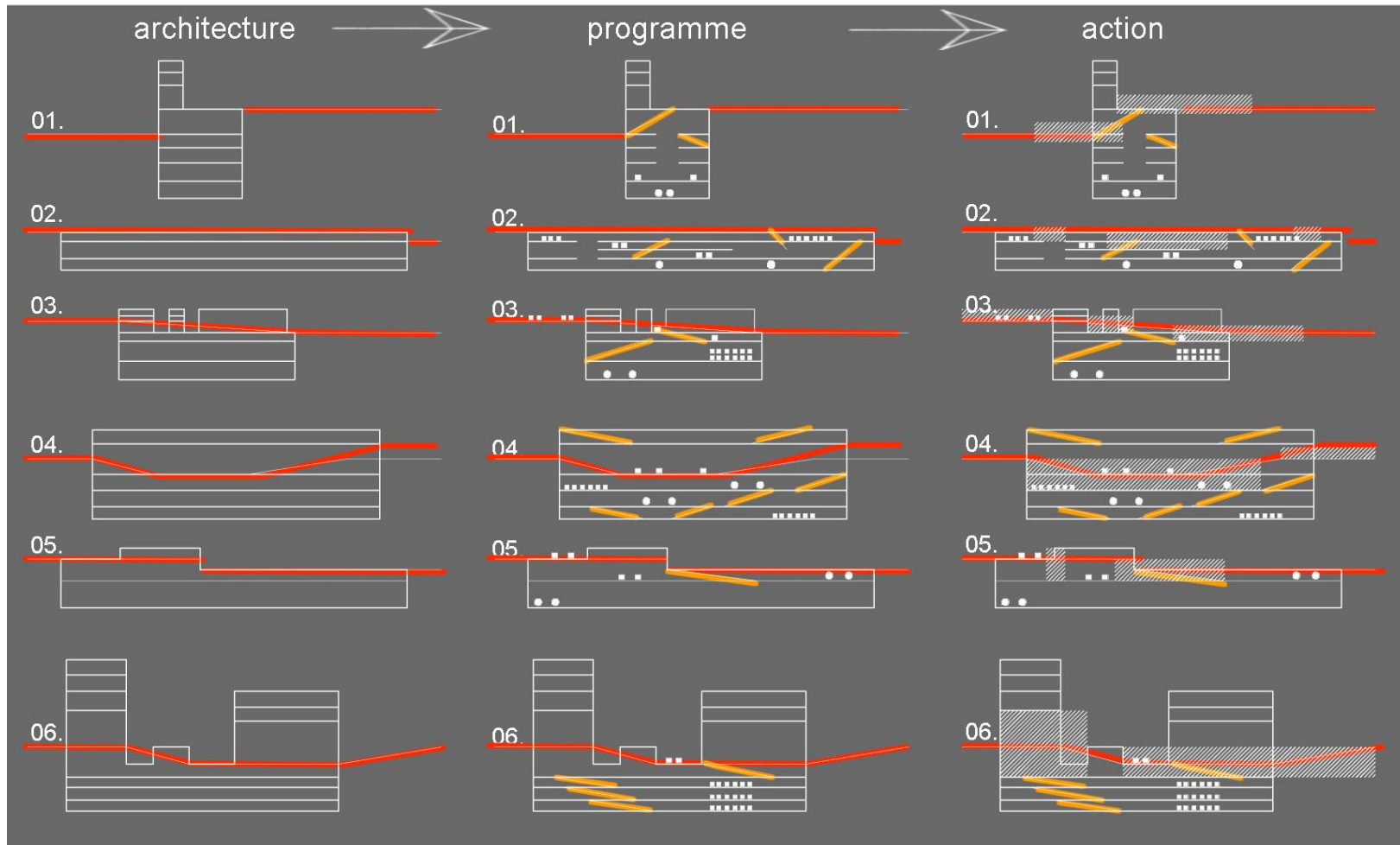
The rule for classification follows a logic of identifying major parameters of urban structures which are intrinsic to the functioning of transportation spaces. These 'paramaters' are shown in the sections of the land. All aspects of the urban grounds are going to define by the sectional analyses. Since these sections are perceived by the legends of the transportation, urban ground and users, they include definitions and examples of everyday urbanism. As seen in the Table 3.2, There appear to be six primary types of urban in between transportation related structures, namely; 'stations as usual', 'public spaces', 'continuous transporation part', 'megastructures', 'hubs in network' and 'through mixed-use spaces'. These codes refer the parameters of the existing typologies. The Figure 3.2 shows the process of developing typology codes. Step by step it contains the context, scale, form, architecture, programme and action.

**Table 3.2 :** Parameters and Typology Codes (Yardıı, 2012).





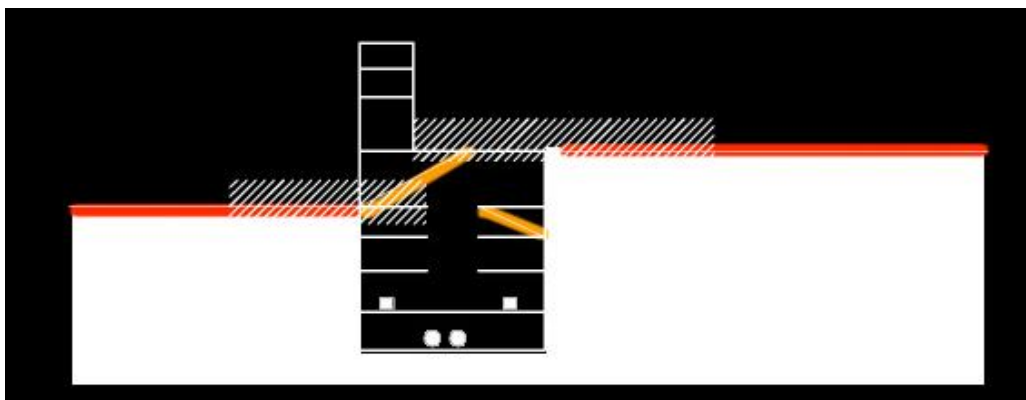
**Figure 3.1 :** Developing 'Typology Codes' (Yardımcı, 2012).



**Figure 3.2 :** Developing 'Typology Codes' (Yardımcı, 2010)

### 3.2.1 Stations as usual:

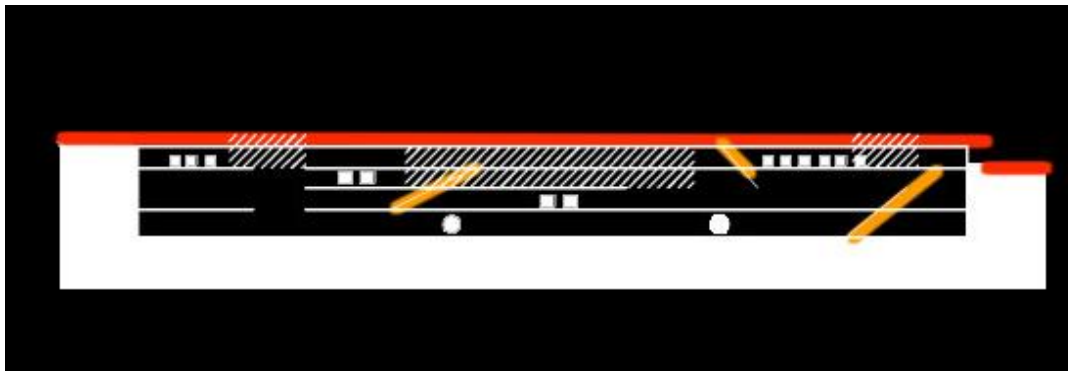
We are living through the transition spaces and we all experience our days in different types of urban structures. Yet a very important shift is that, awering of the ground levels as much as the underground. Today, city's multi-modal passanger interchanges are tranforming from becoming only transport centers. There are offices and shops around railway stations; restaurants, supermarkets and meeting facilities are developed in motorway service areas; pedestrian zones specialize in services oriented toward tourists and other occasional visitors, and hotels, conference centres, commercial and entertainment centres are springing up around airports (Bertolini, 2006). The desire to stop the transportation in points of new functions is the conceptual frame of stations. Stations as usual are the “schematic basis” of modern transprtation life (Figure 3.3). It is interesting to relate Auge's definition of non-place with the stations as usual respectively. According to French anthropologist Auge(1995), multi-modal passanger interchanges are cases of ‘non-places’ rather than public space and they reduce the social relations and sense of identity. This approach argued increasing mobility has allow space as a transit zone, as a station. Then these called non-place experience change the physical enviroment and conditions of city. On the other hand, Bertolini fully aware of the stations as a structure of living. His words “Let us take the case of railway stations. For those who work there, stations are, instead of being non-places, places where socialization and/or conflicts take place, just as at any other workplace” (2006, p.324) is basically a stance for the social life of stations.



**Figure 3.3 :** Principal Section of the Typing Code ‘Stations as Usual’  
(Yardımcı, 2012).

### 3.2.2 Continuous transportation part

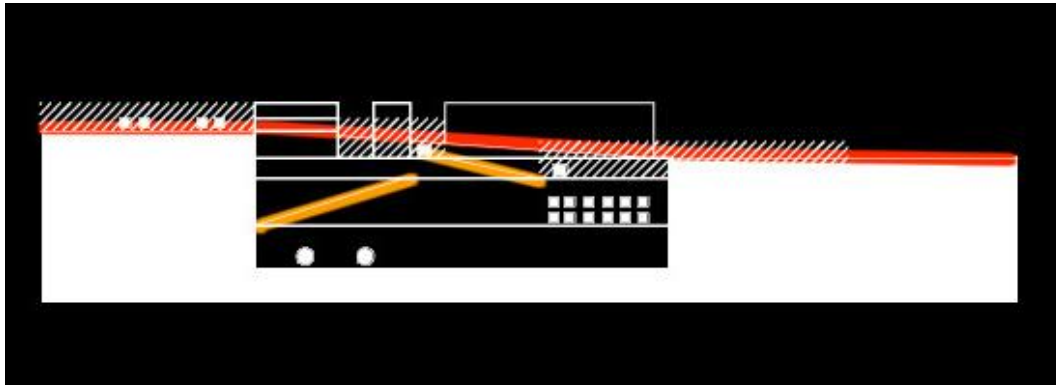
The basic purpose of the transportation infrastructure, in both its theoretical and structure, is to move for new spaces for changing the parameters. Rather than to prefer to go outside or to stay in an enclosed volume, the transportation levels can choose to stay on their own places. The continuous transportation is the type or an approach to make a reference of continuity and mobility (Figure 3.4). As Norberg-Schultz (1985) discussed as an artificial artifact; a station identifies, orients and connects for the society. “The theory of identification suggests that identity consists rather in an interior organization of understood things, and that growing up therefore depends on being open to what surrounds us. We have to know where we are and how we are, to experience existence as meaningful” (Norberg-Schultz, 1985). In a manner of continuous transportation approach, these meanings of experience is important as they are the real space of people. The urban structure has become a world for “underground architecture” to commit services of daily routine. Respectively, these ongoing structures are the faces of urban surroundings. Haapala(1998) states the features of urban structures characterize the interaction of urban environment, urban identity as well as humans. In making a case for continuous forms, it is assumed that the tram goes through the lines and only stop when see the sign.



**Figure 3.4 :** Principal Section of the Typing Code ‘Continuous transportation part’  
(Yardımcı, 2012).

### 3.2.3 Public space

As cities were slowly starting to aware of the importance of the public spaces, the transportation parts of the cities are thought to be public squares when they touch the ground level. As considering the stations are part of urban development perspective, they are not only the transportation nodes but also the urban structures giving life to the public spaces. At this point Shannon&Smets's prospect about infrastructure is important. Chiefly, they see it like a public space and mark the structure like accesible place to almost everyone, and a common itinerary or a collective place. The fact that transportation infrastructure is thought to expand the public realm beyond the boundaries of a single space. Then it gets the public space articulation by aspirations and dignity of contemporary society. Especially, the formation of infrastructure always potentially contains comprehensive urban project (2010, p. 184). In formulating infrastructure as a typology of public space, spatial forms and their offshoots could be thought. In this sense, unique visuals for immediate sensation on the ground is directly related with the public space quality and entrance design of the stations. Therefore, depending on a enclosure volumes and the outer skins in the ground will define the overall layout. They are the only places of connection between surface and underworld. In 2003, International Architecture Biennale Rotterdam publication "Mobility: A Room with a View" considered transportation spaces as "not only space for traffic but also public space, space to spend time in" (p.17). The Biennale exposed projects that having realations between the multi layer transportation system and inhabitants of the city. Trancik (1986) stated that in cities of the past, the designs for streets, squares, parks and other spaces in public realm were integrated with the design of individual buildings. In the modern city each element is the responsibility of a different public or private organization, and the unity of the total environment is lost. Various development and urban-renewal, by and large, put together separately, without an overriding plan for public space. The result is a patchwork quilt of private buildings and privately appropriated spaces (Figure 3.5).



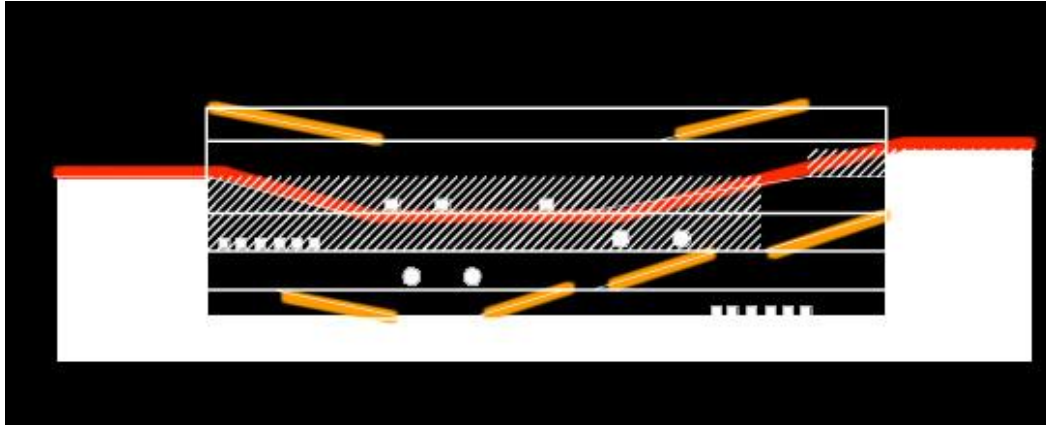
**Figure 3.5 :** Principal Section of the Typing Code ‘Public spaces’ (Yardim, 2012).

### 3.2.4 Megastructures

The term megastructure largely means many functions of a city and defined by an architect Fumihiko Maki in 1964. He defined a megastructure as a large frame in which all the functions of a city or part of a city are housed. Moreover, the megastructure presented having great promises for infrastructure as public investment. Public structures are stimulated by substantial public investment can be made in infrastructures (1964, p.8-13). It has the implementation made by technology calling ‘human-made feature on landscape’. Today the replacement of megastructure by independent systems and their hierarchical levels are the same. It can be called as a dynamic contact that the relation between constitutes of megastructure. In this sense, if there is a contextual and programmatic condition, systems can vary (Shannon and Smets, 2010, p.94). The intersection between megastructures and infrastructure transportation seems a largely urban matter (Figure 3.6). The approach for such a structure is a way to express all the layers of the city. It is inspired the megastructure can continue a pattern of increasing human activity within the city [Url-31].

The megastructure can modify in urban sections and plan medium. Even it appears as a structure, its integration with the context is one of the respectables it has. Banham, who used this term in 1976, declared that the megastructure to be understood as a framework of urban structure needs small units can be plugged-in. Under the sophisticated vision of megastructures, the sections mean intersection of functions, actions and modes of transportation respectively. These huge structures are called big transportation infrastructures. Koolhaas discuss the mega-architecture and

infrastructure of the city. He declares architecture is a medium that transforms by bigness then this accumulation generates a new kind of city. This bigness seem to be an urban and it competes with the city. At the same time bigness often represent the city. In this sense it looks like a city. “If urbanism generates potential and architecture exploits it, bigness enlists the generosity of urbanism against the meanness of architecture” (Koolhaas, 1998, pp.514-515).

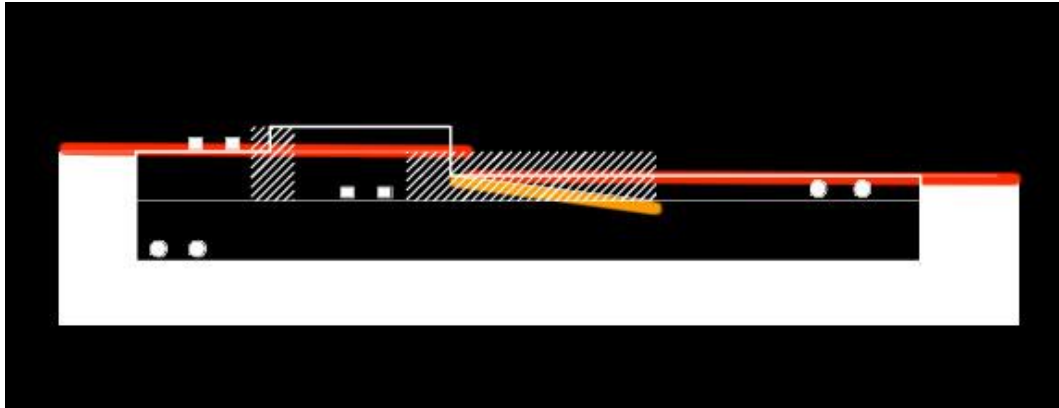


**Figure 3.6 :** Principal Section of the Typing Code ‘Megastructures’ (Yardıı, 2012).

### 3.2.5 Hubs in network

Networks inevitably take the features of both global and local characteristics of the existing landscape. The place, the urban structure or defined as the hub in the network merged from two characteristics and a special arrangement for its own site in its network mapping. The hub inside the network brings out new activities and functions and enriches the place in more public level (Shannon and Smethes, 2010, p.36). At the same time passangers are attracted by the hubs and the other staff that contribute the local economy. These infrastructural networks and the nodes of hubs are the idea of mixing local characteristics in other layers of the site. In addition, all modes of transportation can integrate the hub taking the idea of site forces (Figure 3.7). According to Lynch, the strategic spots are the nodes in teh city. They can be junction places of transportation modes over the paths like moments of shifting or they are concentrations as a street corner hangout or an enclosed square. Such a concept of node is related with the concept of paths and journey as well. Therefore, the polarizing centers of the places are typically named as cores are the variation of the nodes (Lynch, 1960).





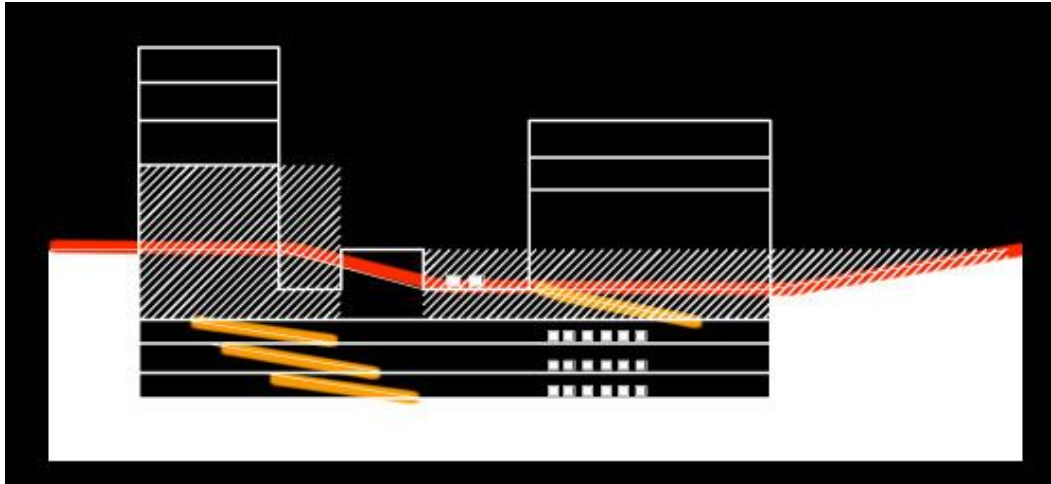
**Figure 3.7 :** Principal Section of the Typing Code ‘Hubs in network’  
(Yardim, 2012).

### 3.2.6 Through mixed-use spaces

Station points considered as a whole. Then, their relation revealed in their physical structure. It is itself a new typology connects and integrates the new spaces. These relations develop multi functions and vibrate environments so that they reduce lengthy tours in citizens’ lives. Connecting with a mixed-use space is a realm which has to relate the society in order to be conceived and understood a specific space. Stations through mixed-use spaces have been a new interpretation of making multi functional decisions.

When people moving by the transportation they want to stop and get into a space where they easily interact different modes of life cycles like shopping, eating, having a cultural performance and staying. This mass approach of citizens created a demand that transportation infrastructure shaping the world of mixed-used architectural structures. The validity of such a typology is achieved if replacement of activities actualized properly. In allowing people come and pass in the space of multi function is an important part of the both vertical and horizontal sections of design schema.

As Trancik referred (1986), while sunken plazas and internalized malls have been threatened like the traditional social function of the street by pushing effect of the verticality, mixing could have seen in the underground (Figure 3.8).



**Figure 3.8 :** Principal Section of the Typing Code ‘Through mixed-use spaces’  
(Yardim, 2012).

#### **4. TRANSPORTATION STRUCTURE ASSESSMENT and GROUNDS in İSTANBUL**

In “Vision 2023”, the 10th transportation forum in İstanbul, the minister of transportation Yıldırım stated that, infrastructure investments have a universal character besides their national scale meanings. By elevating the common consciousness of mankind, every innovation in the field of informatics constructed for humanity walk together. So that disappearance of the limits of time and space; transportation play role in economic and social developments (2009). As the infrastructure has high value for the city’s vision, the structures for transportation changes by the city’s economical and social moves. Transportation cycle for the city is the characteristic definition of İstanbul today. The aspect emerges from significant attempts of İstanbul Metropolitan Municipality vision to explain and understand the city’s potentials. This vision is entirely seems to be reflected with a quality of transportation modes, layers and urban grounds with the backing of population density in the city. In his book “Metabolism of Architecture”, Kurukowa stated that the grounds of city like residence or working spaces change with respect to growth of population and its structure. He referred Le Corbusier that the cities are comprising of living, working and recreational spaces linking each other by transportation. Generally, the most important feature is daily-life spaces having multi fuctional concepts respectively (1977, p.30). This complex structure of city emerges from a discourse which takes its referance fron transportation assessment. In İstanbul, the laws of city are exactly like those mentioned above. The characteristics of İstanbul grounds in relation with the infrastructure is formed by social needs of the city itself. This environment of mixed-used functioning serves the spaces as an input. So that, the rational utilizing of transportation will enhance the quality of the public spaces and will have positive influence on the creation of more harmonious environments. The idea that transportation structures are placed with the public spaces is characterised by choice of event types. According to Tschumi (1996), there is no

architecture as soon as there is no event, program, action. Therefore, the public places are always affect the architecture of the transitional zones of the cities and their relations with the ground both in physically and logically. Together with the actions and events that take place in the social and political realm of architecture ground can be seen as the public space.

#### **4.1 Perception of Transportation in İstanbul**

İstanbul is a city mixing all the location based contours of living and transporting in the one pot. As Cruz (2004) explained, city is the spatial configuration that comes into existence by complex systems of juxtaposed and overlaid elements that inter-affect and interact with each other. The most compelling parts of this urban realm is creating boundaries. Geography, topography, pre-existing man-made conditions, regulatory frames, economic and political situations are modes that regulated in perception in city. It is easier to follow İstanbul's transportation infrastructure looking through the juxtaposed layers. Gerçek (2009), asserted that in İstanbul The Ministry of Transport and the Istanbul Metropolitan Municipality plays a key role in road transport management. Besides, traffic legislation and its implementation are scattered across more than ten other ministries and authorities. This process of decision-making between the ministries would go a long way to improving transport in Istanbul. The rules for decisions, coming from the bodies placed at the supra-national, national, regional and local levels. However, decisions for transportation perspective in İstanbul stil made in Ankara, the capital of Turkey, regardless the master plans prepared in Istanbul. In city centers, transportation transforms the places into more pressed areas. The more transportation demand city, the more public spaces take form. Especially cities like İstanbul, which consist of historical layers top of each other, desire to become public in every squares of city is ordinary. In other words, while public spaces have remained relatively static; new frequencies of transportation have aggravated the problems. The tension between transportation infrastructure and public spaces is most apparent at station points in İstanbul. The complex networks of subway system, ferries, taxis, freeway, trams, buses, trains have been implemented in the last years give pressure on new public spaces. The typologies of interaction aspect of transportation and ground can be seen in every network of İstanbul's transportation system.

By exploring the potential relationships of transportation infrastructure and ground level, it is simple to imagine the urban sections respectively. In perception of İstanbul through urban sections is important. The aesthetic relationship between transportation and urban grounds has been poetically described by urban sections. They are having the quality of not only the layers of transportation but also the layers of history. Especially transportation demands make İstanbul's rapid growth more fast and historical context demands make revaluation of public spaces within modern urban structures. The changing metropolitan needs transportation that considered in context of historical development of layers and the necessity of pedestrian zones.



**Figure 4.1 :** İstanbul and Transportation Modes (İUAP, 2011).

Cities getting modern, economical factors getting better and prevails mobility. In the cities there exists people count in the day time three times more than the population. The population of İstanbul is 14 million then İstanbul's daily mobility is 24 million now, it will become 35 million in future. All the plans, network decisions are made according to these variables. As seen in the Figure 4.1, İstanbul has this network decisions with a lot of modes of transportation. The factor is to make how is the integrated transportation is possible and braething in transportation (İUAP, 2011). Moreover, İstanbul Rail Network Map (Figure 4.2) identifies the modes and the their superimposing relations. The network density seems logically developed all around city.



On the contrary, The Urban Age Programme that is an international investigation of the spatial and social dynamics of cities asserts that around nine cities in the world, İstanbul has not the level of networking of transportation in every square in city. The programme indicates cities offer varying levels of transport infrastructure. The most extensive metro systems have been put in place in London, New York and Berlin, while Istanbul, São Paulo and Shanghai have the smallest public transport network of the nine cities under investigation, leaving many areas without any access to either rail or metro. In İstanbul, 9km has recently been added to the Metrobus (BRT) to increase the system's total length to 50 km where construction is currently underway to expand the existing 76 km-long metro network to 231 km by 2015. BRT operates along a dedicated lane crossing the Bosphorus Bridge between Avcılar on the European side, to Kadıköy on the Anatolian side. The extension will continue the BRT from Avcılar to Beylikdüzü on the European side and is expected to increase the current daily use to 1,170,000 passengers per day [Url-25].

**Table 4.1 : Modal Split (<http://urban-age.net>).**

	PUBLIC TRANSPORT	WALKING	CYCLING	PRIVATE MOTORISED
<b>ISTANBUL</b>	41%	45%	n/a	14%
<b>NEW YORK</b>	56%	11%	1%	30%
<b>SHANGHAI</b>	19%	29%	25%	22%
<b>LONDON</b>	37%	20%	2%	40%
<b>MEXICO CITY</b>	79%	n/a	n/a	16%
<b>JOHANNESBURG</b>	32%	31%	<1%	37%
<b>BERLIN</b>	27%	25%	10%	37%
<b>MUMBAI</b>	36%	56%	1%	5%
<b>SÃO PAULO</b>	32%	33%	1%	29%

As seen in the Table 4.1, in cities, the relation of transportation infrastructure and the ground level publicness can be resolved by the idea of walking. The Urban Age Programme states that proximities created by levels of urban density or access to public transport and private motorized modes are the reasons of walking's domination as a form of transport [Url-25]. All these experiences and interpretations constitute the transportation levels. İstanbul is a place, preserving all meanings of "ground" and its implications in the urban context.

The perception of transportation is a formulation of how the different typologies of structures relate with each other and the ground. Accepting that, there exist a choice between transportation and ground space. It suggests a definition to typology which thinks architectural, urban and spatial scales together (Figure 4.3).



**Figure 4.3 :** İstanbul's Transportation Scale Views (Yardım, 2012).

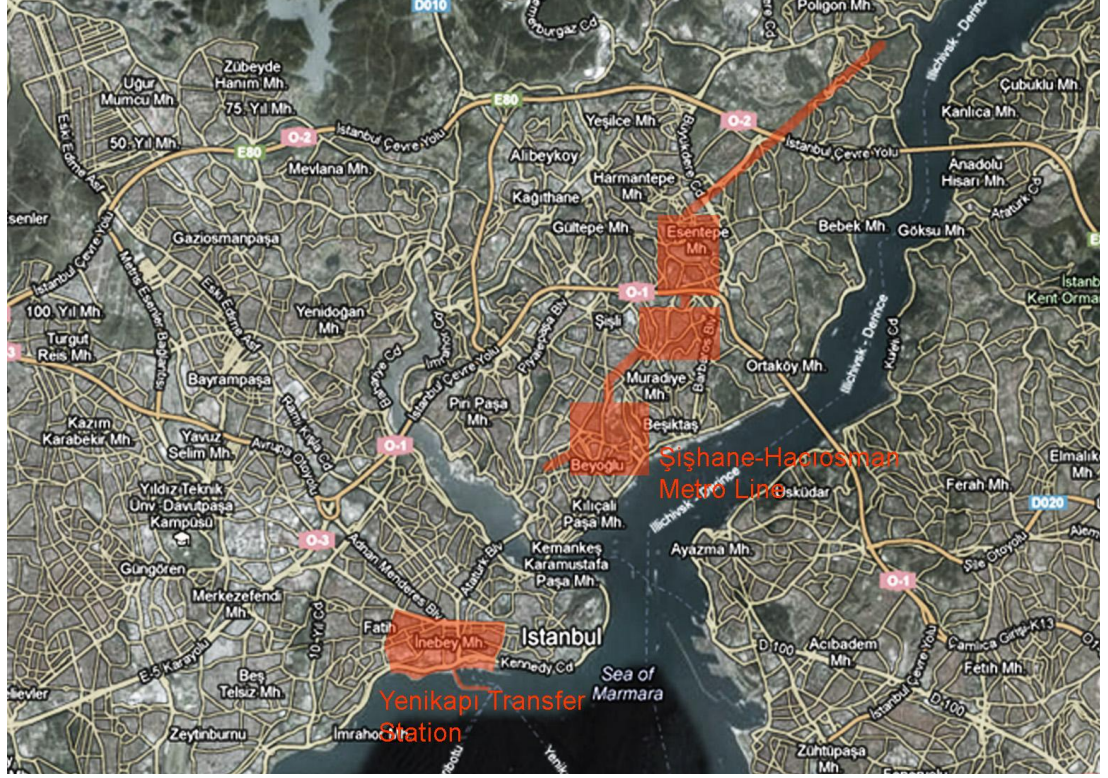
#### 4.2 The Analysis of Different Zones

This special zone section is composed of urban and architectural scale transportation projects in İstanbul. The common denominator of these projects is to deal with the transportation infrastructure and ground level typologies. These urban forms are generated with particular attributes of scale, space, and speed that are both specific and generic. The exciting thing about these urban structures is rather than being complex, they are public or utterly generic in İstanbul's network. They are everyday spaces because the masses of people sharing, experiencing and perceiving in them. Moreover their strategic locations and characteristics make the land more related with them in terms of scale and density.

The view of the cities have grown rapidly, always need solutions and suggestions in design perspective for the basic infrastructural transformations. Like in İstanbul, since local administrations are not financially autonomous, they are gazed upon searches for new resources to implement their decisions. The relations with the political states of the city have loyalty with the private and public sectors to develop projects on the city (Erder, 2009). As can be seen in Figure 4.4, "Zone Location Mapping" diagram introduced below, the cases for showing the relation between ground and transportation in İstanbul have the major quality of being in the networks of city transportation system. Whether they have designed multi-functional or entirely for transportation purposes, these urban structures show the urban section quality as well.



One of them is Yenikapı area and the other zone is the metro line of Hacıosman-Şişhanane. The urban structures have become centers of attraction, when the increasing demands of qualified ground level getting higher. These zones analyzed in terms of leading factors and their priorities of the programming that they have been tranforming large-scale multi-used architectural forms.



**Figure 4.4 :** Zone Location Mapping (Yardım, 2012).

#### 4.2.1 Yenikapı transfer station

Collective transport systems connect and meet with the individual means of transfer presented by entry and exit points of the network for presenting transfer hubs. Pragmatic demands of motion have become contemporaray choreography like an aesthetic of movement. Moreover, the transport network nodes have become places of hyperactivity fields of chance and movement (Shannon and Smets, 2010). Yenikapı is the site that connects transportation systems with the help of both levelling in physical manner and also in cultural and historical way. Moreover, the site of Yenikapı is the waterfront of constant flows that is a major hub for commuters as well as tourist.

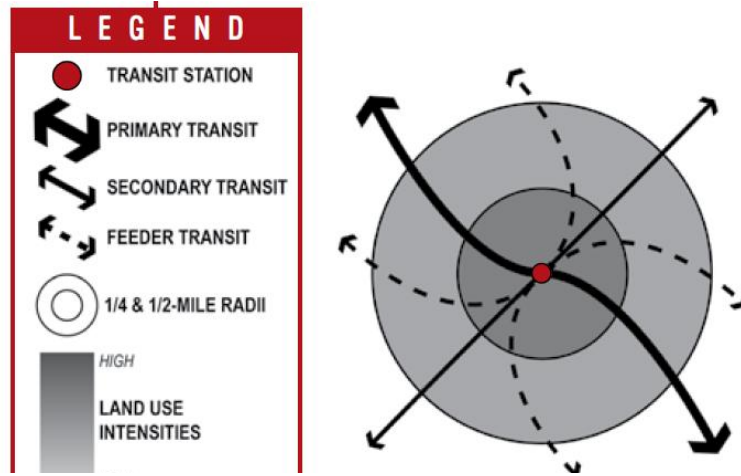
The current conditions of the site include 4 passenger ferry docks, 2 vehicular ferry docks, 2 cruise terminals, 2 tram stops, an international train station, a major freeway and a new subway underneath the Bosphorus. What is exciting about this zone is the competition called “Yenikapı Transfer Point and archaeo-park area international preliminary architecture Project” that takes place in 2011 December and ended up in 2012 April (Figure 4.5). Kadir Topbaş, the city mayor states that Yenikapı Transfer Center is one of the most important points of the transportation system of Istanbul. Every point of city is accessible by rail or public transportation from Yenikapı. So that, urban functions and relationships in territory are important as they renew the site. There is a new idea of centralization by an increase of accessibility to the seaway, airway and highway dynamics of the metropolis. At the same time Yenikapı area considered as an urban development and renewal project at a metropolitan scale. Topbaş interpreted the relation between İstanbul and Yenikapı as “Being an area which will include a multitude of rich functions and relationships, Yenikapı will serve as the ‘new gateway’ of the metropolis in the exact sense of the word” [Url-26].

TOD202(Center for Transit-Oriented Development) declares the station area planning in urban centers. According to principals, urban centers containing a mixture of residential, retail and environmental uses usually at slightly lower densities than in regional centers. As seen in Figure 4.6, by multiple transit options like bus rapid transit, rail and high-frequency regional bus, these centers serve as commuter hubs for the larger region. Moreover, they have mostly historical character and having the preserved buildings and street tissue and networking [Url-17].



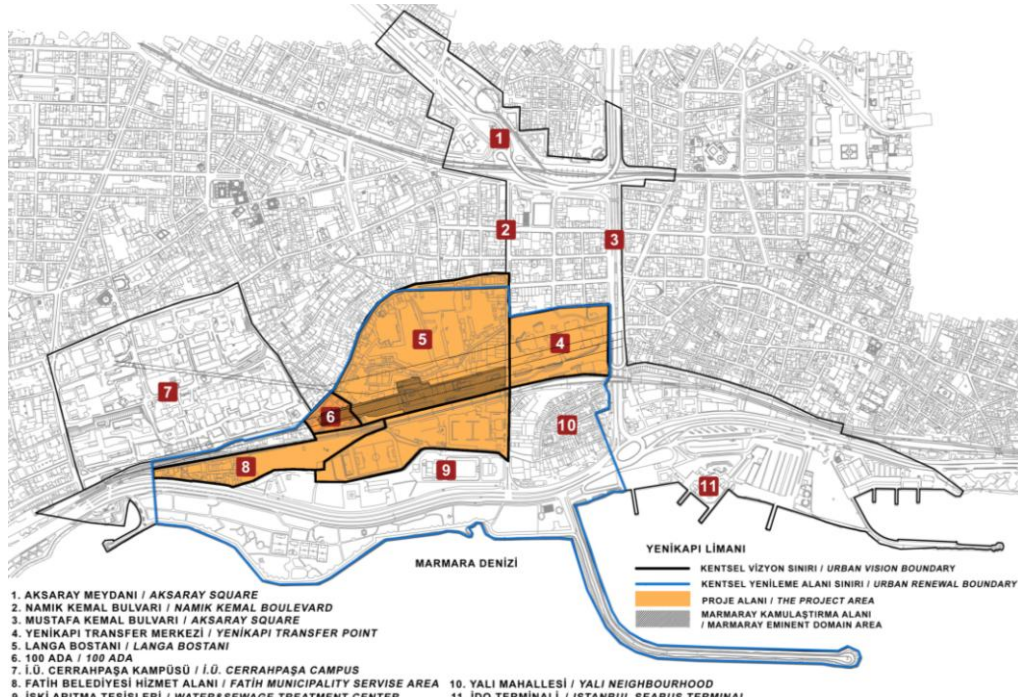


**Figure 4.5 :** Yenikapı Transfer Point Project Area [Url-26].



**Figure 4.6 :** Tod202 Station Area Planning Diagram [Url-17].

Yenikapı can be defined as a hub, in terms of the transportation modes and its high historical character. The city mayor Topbaş states the future impact of centralization is considered by the increased rate of accessibility on a metropolitan scale. He claims that urban vision of İstanbul and design proposal for Yenikapı have the qualities of both urban, functional and historical terms providing the best outcomes for İstanbul and its citizens (<http://www.yenikapiurbandesign.com>).

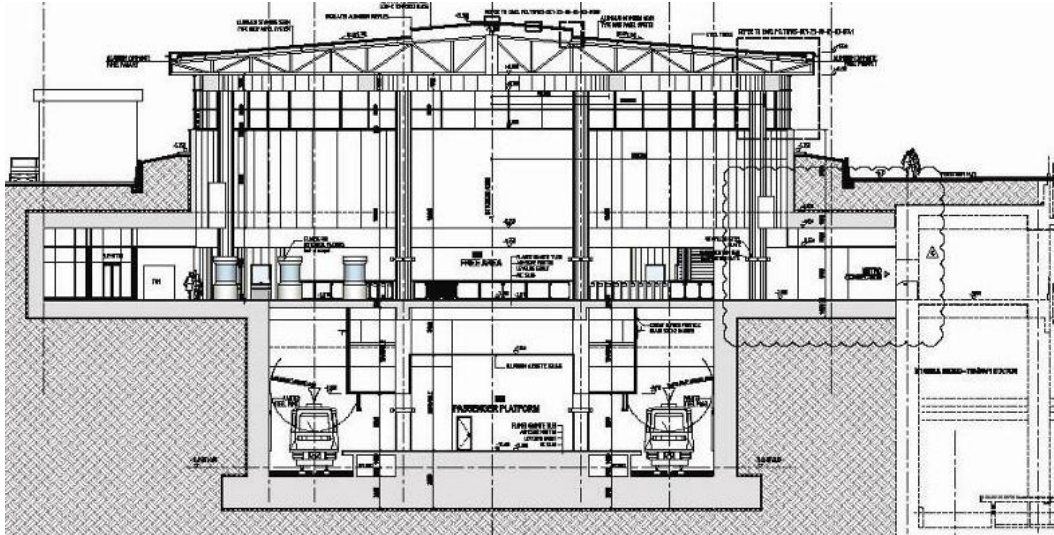


**Figure 4.7 :** Yenikapı Design Area Map [Url-26].

The project area subjected to connect within its immediate proximity by the Aksaray-Airport Metro, Taksim-Yenikapi Metro (which is one of the most important railroad systems for the Istanbul Metropolis and located in Istanbul Historical Peninsula) and the Marmaray Rail Tube Tunnel which connects European and Anatolian sides and Istanbul Sea Bus terminal (İDO) (Figure 4.7). The purpose of the Marmaray transport system is to provide continuous transportation via the rail system from one end of Istanbul to the other by connecting Gebze on the Anatolian side to Halkali on the European side. Yenikapi transfer point will soon become a vital strategic intersection point through which an average number of 1.700.000 people will pass on a daily basis. Due to such important characteristics of the area, the central goal for the project area is to create a contemporary transfer point and promote the importance of the location to both a global audience and to citizens. The intended result will be achieved by redesigning the project locale both as a contemporary transfer area integrated with its surroundings in the city and as an attraction point where the archaeological findings significant for World History and Cultural Heritage can be showcased [Url-26]. These kinds of views give the competition projects motivation of making the interactions between urban scale structures, underground design as well as the ground level public design. This urban design competition was opened and within the context of “Invitation to International Architects for Service Procurement in Relation to Yenikapi Transfer Point and Archaeo-Park Project” the projects of the teams listed. In this research, the projects and conceptual approaches are selected from all candidates’ submissions, looking their high care for urban section. Looking through the site, the Marmaray Station is under construction. The station has the typology of “station as usual” alone in the site (Figure 4.8).

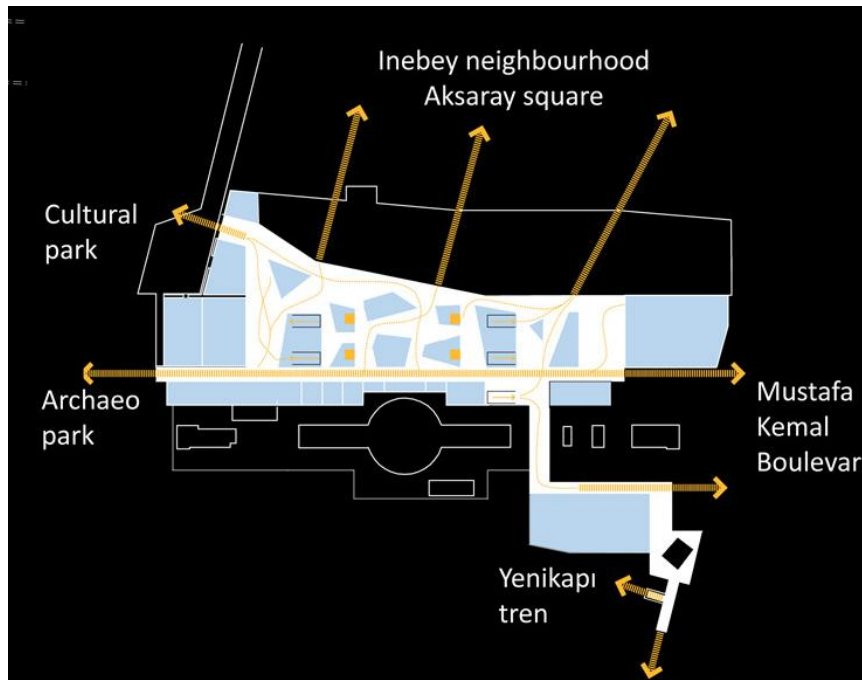
Such an attractive place, the competition projects have the characteristics of urban sections respectively. The sense of awareness for the urban layers in the site can be easily seen.





**Figure 4.8 :** Marmaray Station Section Drawing (under construction) (İBB, 2010).

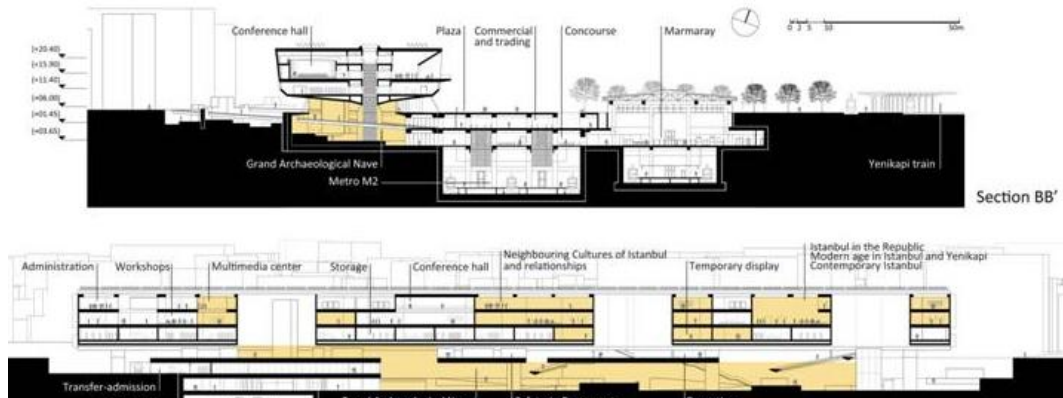
Looking the proposal of “Atelye 70 and Francesco Cellini” (Figure 4.9, 4.10, 4.11), the first thing leaped to the eye is the project’s activation for the direct relationships between the tranfer point and its surrounding. Furthermore, they aimed to include a new commercial area which will be crossed by thousands of citizens each day.



**Figure 4.9 :** Atelye 70 and Francesco Cellini Proposal Approach [Url-26].



**Figure 4.10 :** Atelye 70 and Francesco Cellini Proposal View [Url-26].

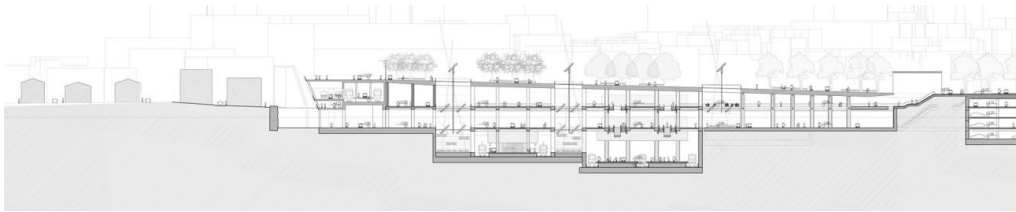


**Figure 4.11 :** Atelye 70 and Francesco Cellini Proposal Sections [Url-26].

“Architects and Han Tumertekin and Hashim Sarkis Studios” proposed a new intermodal hub in Yenikapı. (Figure 4.12, 4.13, 4.14). They asserts that the 1,7 million people transvering through the new intermodal hub every day will require heightened internal guidance as they move between the different modes of transportation, but also discouragement from reaching above ground if they do not need to enter the historic peninsula. With a bazaar like network of shops, the project proposes adequate amenities in the underground world to the commuters linking to the fabric of the city at strategic points and with strong visual connections.



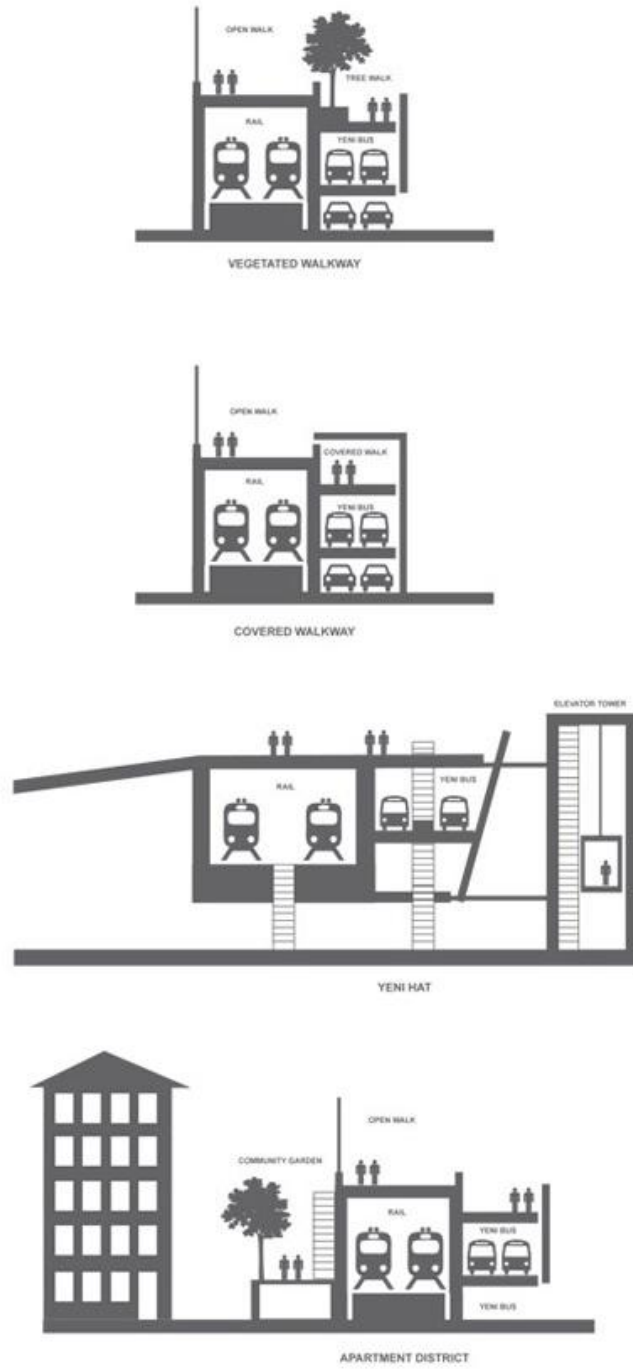
**Figure 4.12 :** Architects and Han Tumertekin and Hashim Sarkis Studios Proposal  
View [Url-26].



**Figure 4.13 :** Architects and Han Tumertekin and Hashim Sarkis Studios Proposal  
Sections [Url-26].

The sectional cares for Yenikapi area is such a relation that infrastructure and landscape relation truly be seen. In the proposal of “Eisenman Architects and Aytaç Architects” team, the most attractive point is the consideration of Marmaray Station’s circulation and access to all sites (Figure 4.15, 4.16). Urban design scheme introduces the project creating a tripartite organization that occupies the two upper quadrants. Moreover, in the section there are three levels associated with the stations: the plaza level, the concourse, and the platforms.

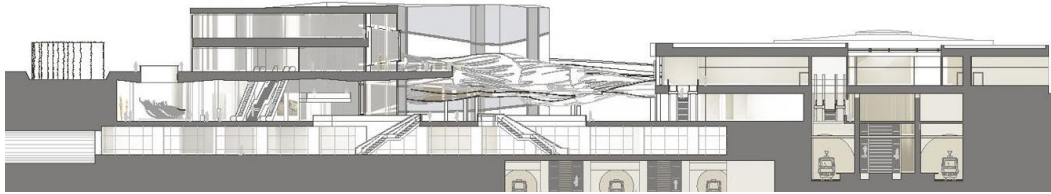




**Figure 4.14 :** Architects and Han Tumertekin and Hashim Sarkis Studios Walkway Permutations Diagram [Url-26].



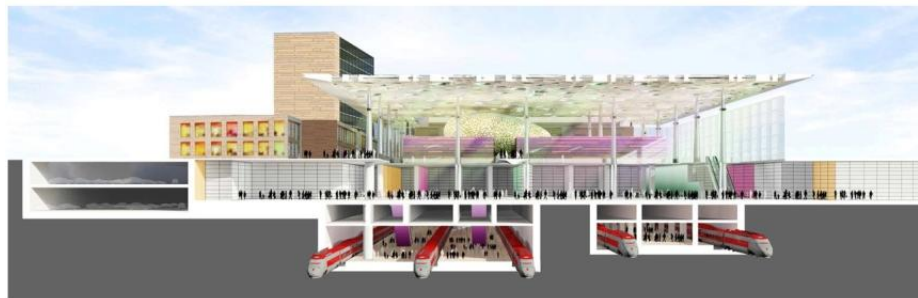
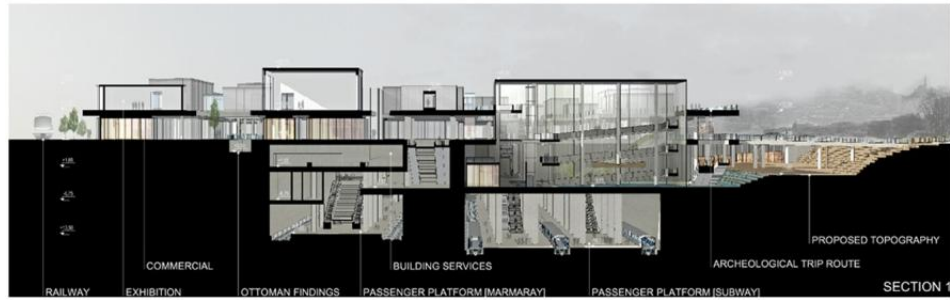
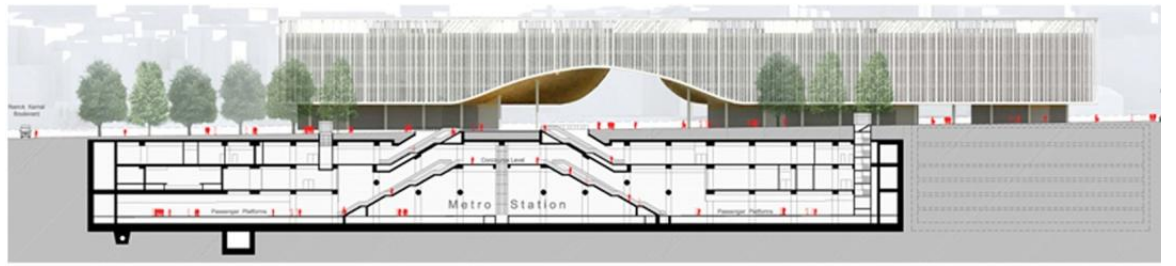
**Figure 4.15 :** Eisenman Architects and Aytaç Architects Proposal View Through Concourse [Url-26].



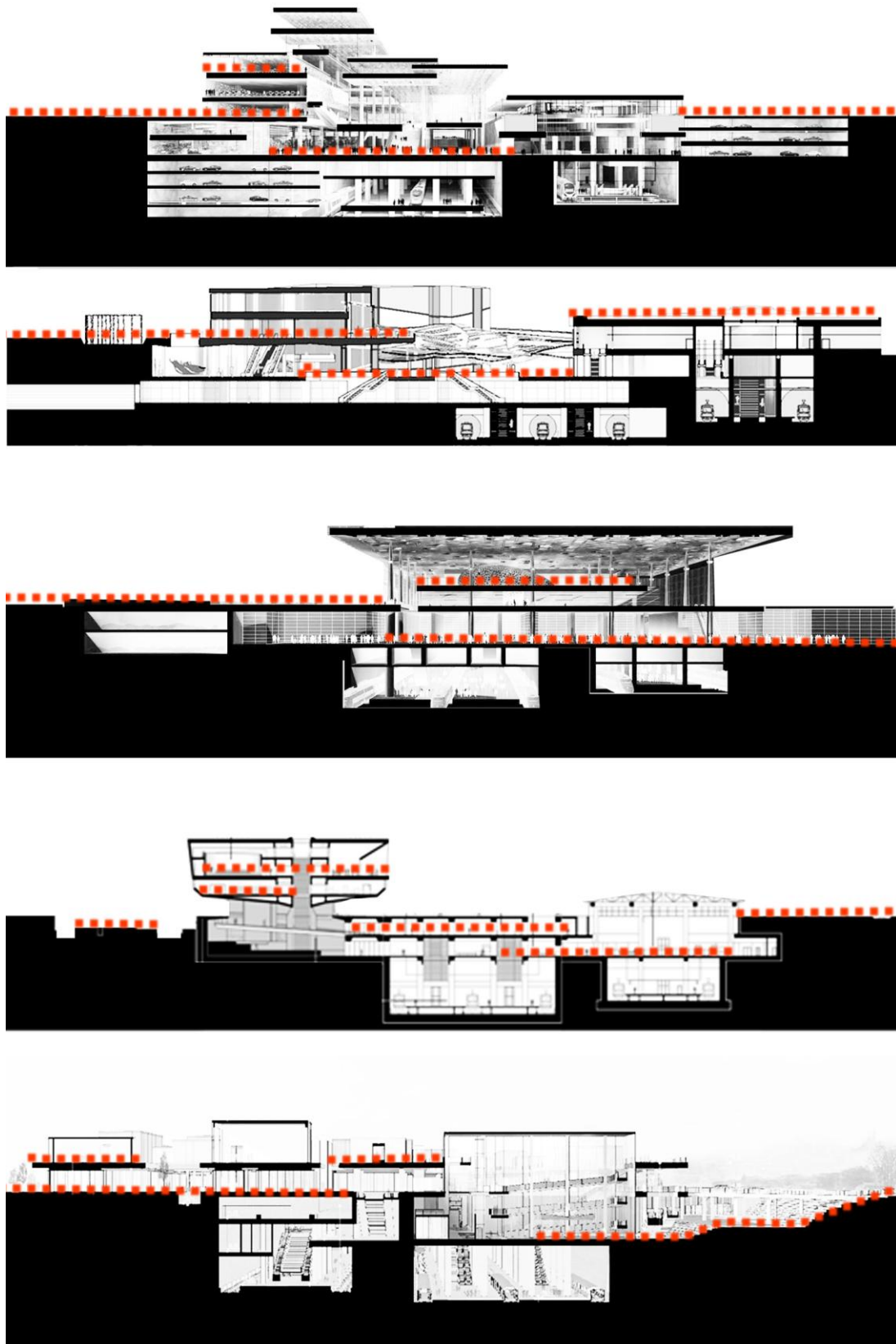
**Figure 4.16 :** Eisenman Architects and Aytaç Architects Proposal Sections [Url-26].

The other participants' thought for the urban sections of the area can be seen below (Figure 4.17). They all aimed to use historical and physical layers for relating the transportation infrastructure and urban structures. In the ground interaction perspective, it has radically seen that the landscape feel the all movements in the site.

As seen in the selected proposals' urban section analysis proposals for Yenikapı, it is easy to understand that approach for the ground is so important in design process (Figure 4.18). As Istanbul is a hybrid place in many aspects, we can see this hybridization in Yenikapı also. This condition constituted by ambitious transportation hub which has to facilitate the connection between the heavy pedestrian and vehicle traffic, with the subway, tram networks and high-speed ferry lines. Moreover, with this urban landscape of intense infrastructure, site gains its own sections respectively.



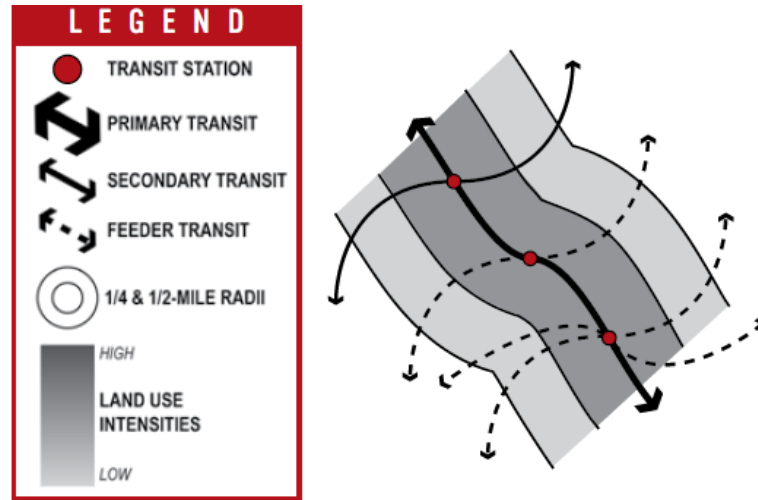
**Figure 4.17 : Other Proposals' Sections [Url-26].**



**Figure 4.18 :** Yenikapı Station Proposals' Urban Section Analysis (Yardımcı, 2012).

#### 4.2.2 Haciosman-Şişhane metro line

As mentioned above in Yenikapı case, TOD202 declares the station area planning in urban centers. It mentioned that mixed-use corridors of the city offer good opportunities for infill and mixed-use development (Figure 4.19). They are a focus for economic and community activities but have no distinct center, though development is usually more intense within a quarter-mile of transit stops networks [Url-17].



**Figure 4.19 :** Tod202 Station Area Planning Diagram [Url-17].

Today transportation infrastructure provides life support system for cities. The transportation management is owned by public. The greater municipality of İstanbul has a number of public companies and foundations like Ulaşım A.Ş. (joint-stock company of transportation). As seen in Figure 4.20, according to them, the route of Haciosman-Şişhane called M2 in railway map in İstanbul, has 12 different transfer points named; Şişhane, Taksim, Osmanbey, Şişli-Mecidiyeköy, Gayrettepe, Levent, 4.Levent, Sanayi, İTÜ-Ayazağa, Atatürk Oto Sanayi, Darüşşafaka, Haciosman stations [Url-9]. In this research by looking the operation information of the metro line M2 (Table 4.2), the density of the line can be understandable. Taksim, Gayrettepe and Levent structures analyzed as their relations with the urban ground.



**Figure 4.20 :** Metro Line M2 [Url-9].

**Table 4.2 :** Operation Information of Hacıosman-Şişhane Metro Line [Url-9].

route length	16,5 km
station number	12
railway car number	124
journey span	27 min.
running time	06:00/00:00
daily passanger number	300.000
daily journey number	394
journey intervals	4 min. (in peak hours)



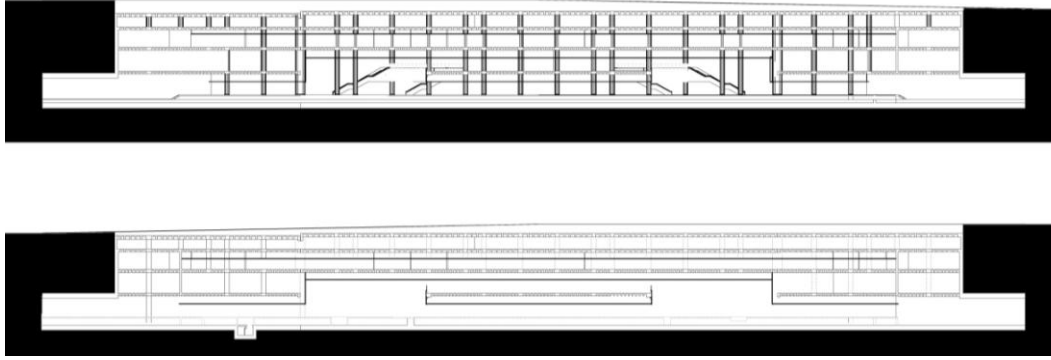
### Gayrettepe Station:

The Gayrettepe station is in the line of Hacıosman-Şişhane, having modes of transportation in a broad level of urban site. The most exact one is the metrobus station in Zincirlikuyu. Therefore all the things affecting the site take their physical appearance from urban structures. As Istanbul Municipality announced the links between Zincirlikuyu Metrobus Station and Gayrettepe Metro Station, the tunnels have begun to develop. According to İstanbul Ulaşım A.Ş.; the project's main importance is to circulate the pedestrian movement easily in Zincirlikuyu area where it ends with also a mixed-use building 'Zorlu Center'. The tunnels are 670 meters long and there exists 231 meters long walking paths in the system. Besides, the system has a major connection between Zorlu Center's public areas and the other transportation modes (Figure 4.21). After the project finishes, a citizen coming from Zincirlikuyu by using metrobus, passes through the metro shortly not getting outside (Appendix A). This system has entegrated with İstanbul metro and controlled standardization [Url-9].



**Figure 4.21 :** Connection Proposal for Gayrettepe [Url-22].

Apart from that, the projects' old station Gayrettepe Metro station has the effect to push the all site. Its section seen in the Figure 4.22, not a complex but a 'station as usual' typology. There exist two main entrances to the station and they are connected with the levels by walking stairs. The existing situation proposed connection with other system and the total area is 9600 square meters.



**Figure 4.22 :** Gayrettepe Metro Station Sections (İstanbul Ulaşım A.Ş., 2012).

In Zincirlikuyu side, there exist alot of different modes of transportation. As seen in Table 4.3, metrobus has the potential of having many stations. Moreover, minibus transportation system is a flexible method of moving people around Istanbul. There exist many types of minibuses are passing through Zincirlikuyu. Although they seem to help the interaction of transportation levels, they are causing a traffic jam. Besides, buses are the workhorse of any transport system, used as feeder systems to metro or metrobus, or to run directly into central areas. The other systems require bus lanes, if they are not to be stuck in traffic (Bain, 1990).

**Table 4.3 :** Metrobus Prooprties [Url-7].

Line Name	Avcılar-Zincirlikuyu Line	Zincirlikuyu-Söğütözü Line
Line distance	30 km	11,5 km
Journey distance	45 min	30 min
Station Number	27	8
Stations	Avcılar-Şükrübey- İBB Sosyal Tesisler- Küçükçekmece-Cennet Mah.-Florya-Beşyol-Sefaköy-Yenibosna (Kuleli)- Şirinevler-Bahçelievler-İncirli - Zeytinburnu Metro-Merter- Cevizlibağ-Topkapı- Bayrampaşa(Maltepe)- Adnan Menderes Bulvarı- Edirnekapi-Ayvansaray- Halıcıoğlu-Okmeydanı- Darülaceze-Okmeydanı Hastane-Çağlayan- Mecidiyeköy-Zincirlikuyu	Zincirlikuyu-Boğaziçi Köprüsü-Burhaniye Mah.- Altunizade-Acıbadem- Uzunçayır-Fikirtepe- Söğütözü

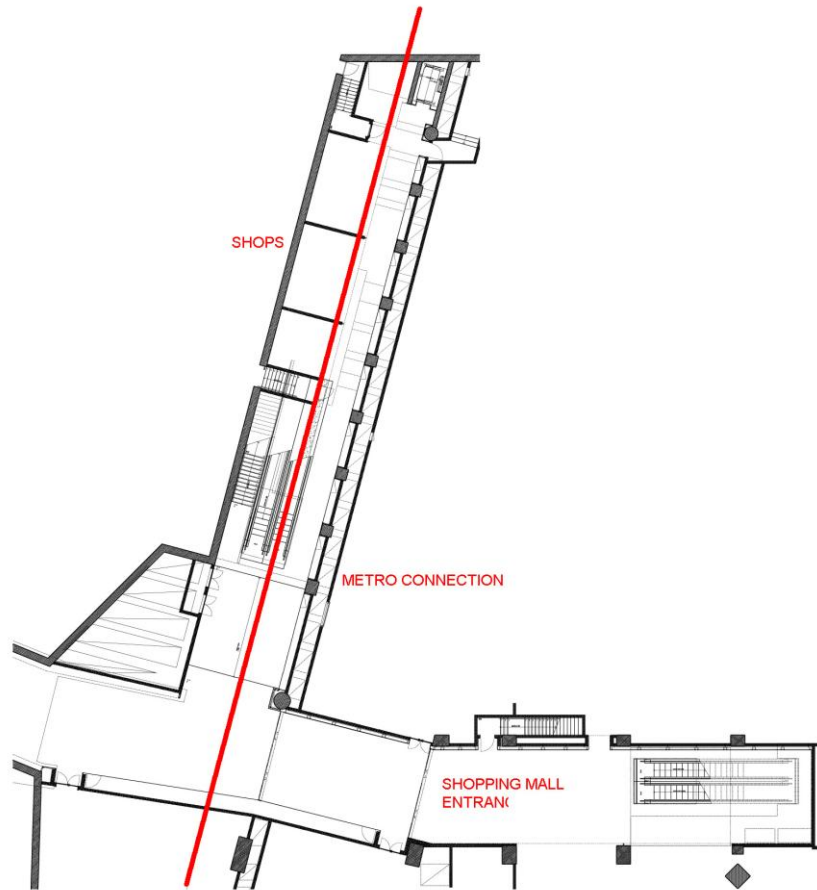


The important part is Zorlu Center which is a competition project done by Emre Arolat Architects and Tabanlıoğlu Architecture. The proposal will change this area's typology as 'through mixed-use spaces'. The Zorlu Center site is just at the junction of the Bosphorus Bridge European connection and Büyükdere axis that connects the city center with the business district Maslak. Just in the center, at the boulevard level is the plaza surrounded by the retail units, that strives for creating an alternative public space (Figure 4.23). The activity stairs direct the public down to the interior retail units, the Bosphorus level, that also has another direct entrance on south. The retail level below has the metro connection and houses cinemas, kids entertainment center, big gourmet market and leisure platforms [Url-30]. The relation of the metro connection part and the public space of Zorlu Center seen in the Figure 4.24. Also in Figure 4.25, the partial section showing the levels of the interaction.

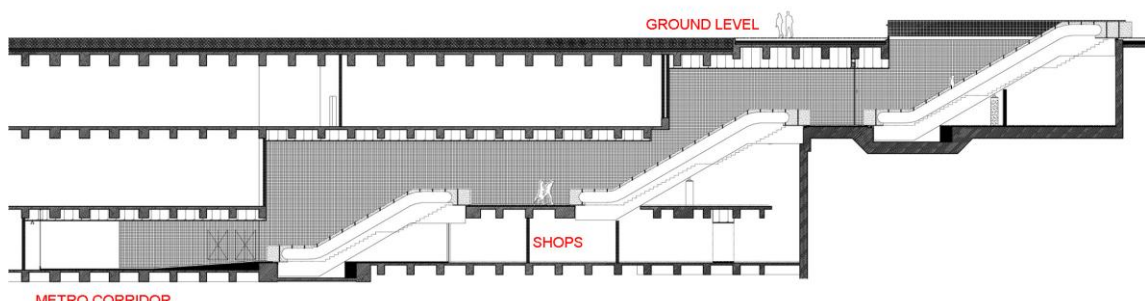


**Figure 4.23 :** Zorlu Center Section (Emre Arolat Architects, 2012).

Zincirlikuyu is a transportation center with all these sectional qualities. The importance of the sectional variations can be seen through all transportation modes. All the experiences from metro line, metrobus or any other mode, constitute the public realm. It is in this sense that urban levels forms the quality of a space (Figure 4.26)



**Figure 4.24 :** Zorlu Center Partial Plan (Emre Arolat Architects, 2012).



**Figure 4.25 :** Zorlu Center Partial Section (Emre Arolat Architects, 2012).

Zincirlikuyu Metrobus Station "continuous transportation part"



Gayrettepe Metro Station "stations as usual"



Zorlu Center Entrance "through mixed-use space"

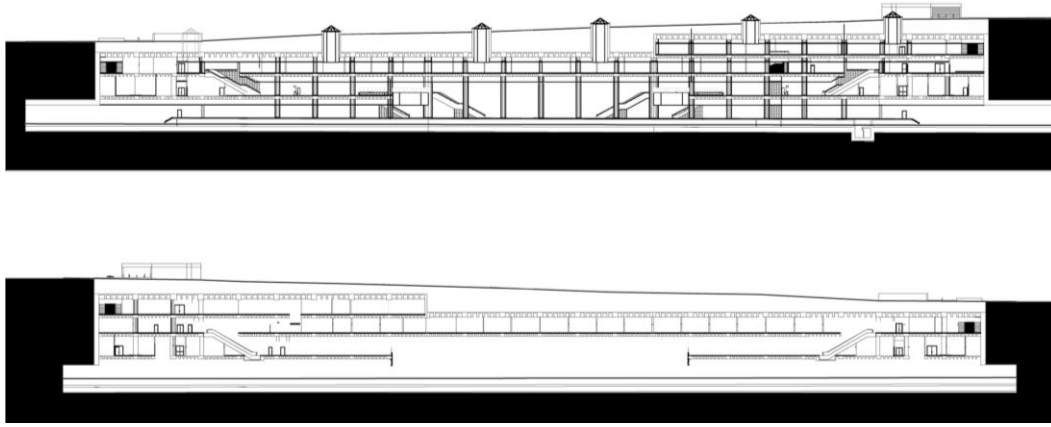


**Figure 4.26 :** Different Typologies in Gayrettepe (Yardım, 2012).

### **Levent Station:**

After mid 1990s, since the Zincirlikuyu-Levent part of the Büyükdere axis was almost completely filled up, Maslak area started to be congested with office buildings and plazas (Özdemir, 1999). In 2000, by the Taksim-4.Levent metro line, transportation public network was enhanced and the urban quality became more suitable for different functions (Figure 4.27). It means, mixed-used structures began to develop for public needs. For instance, Metrocity Shopping Center was constructed in 2000 as a sign of this transformation. In 2007, another mixed-use structure Kanyon Shopping Center, designed by Tabanlıoğlu Architects and Jerde Partnership, was constructed in the area.

Its design approach of public space becomes a new attraction point for citizens as well as they can contact shopping mall by using metro. Coming to 2012, new construction of mixed-use structures displaying on the line top of the Levent metro station. As Metrocity and Kanyon has the relation with metro, then new concept of underground mall is designed called ÇarşıPazar between them (Appendix A). Authorities give importance for creating some kind of public tunnel in between (Figure 4.28).



**Figure 4.27 :** Levent Metro Station Section (İstanbul Ulaşım A.Ş., 2012).

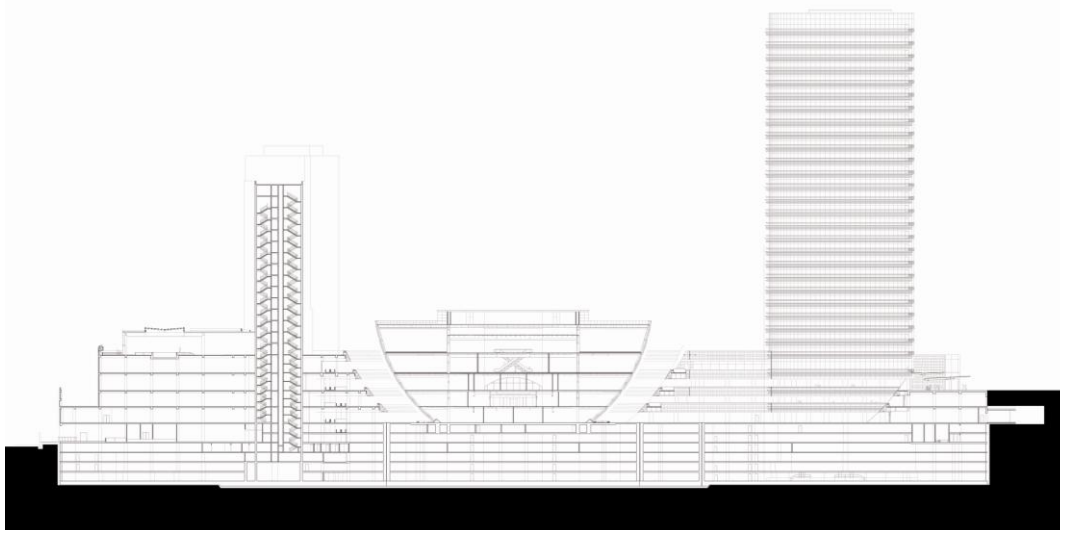
These are all the typology of transforming ‘station as usual’ to ‘public spaces’ and ‘through mixed-use space’. This relationship between shopping centers, residences, offices and transportation is highly related with the sectional decisions.



**Figure 4.28 :** Connections in Levent [Url-4].

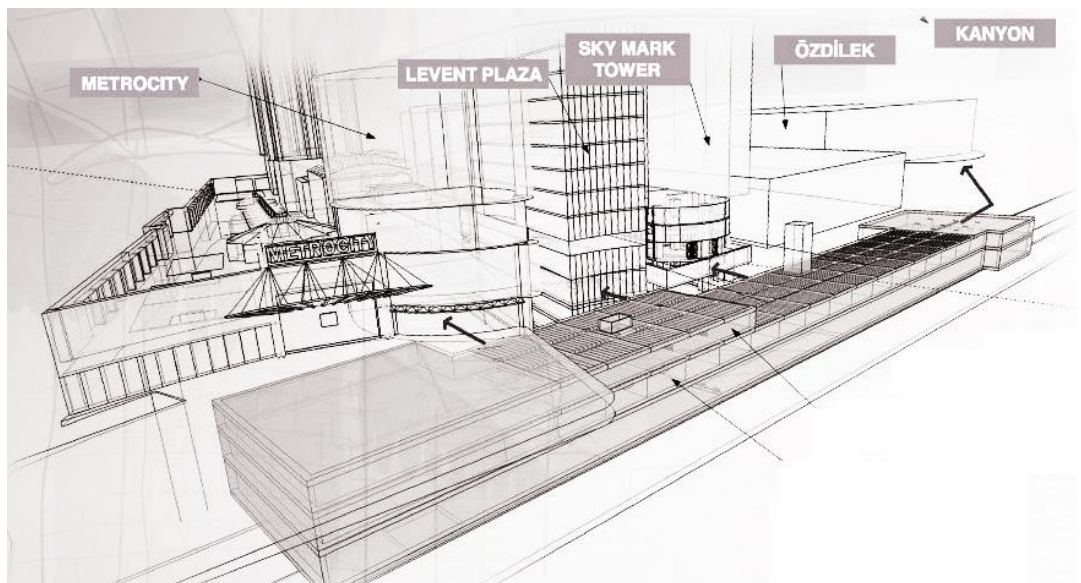


Showing similar inclinations with the Metrocity, Kanyon Shopping Center is a mixed use center with its urban space. Apart from the having public effect by public urban form, the project has the areas and levelled streets (Figure 4.29).



**Figure 4.29 :** Kanyon Shopping Center Section (Tabanlıoğlu Architects, 2008).

The new typology connects two existing malls called ÇarşıPazar (Figure 4.30). The architectural expression is influenced by the existing malls that have connections with the metro station. So that, the shopping transition called “ÇarşıPazar” is passed by 150.000 people in whole day [Url-4].



**Figure 4.30 :** ÇarşıPazar Section [Url-4].

An overall development aim of Levent Metro Station is to create a mixed-use environment with the shopping malls and the layered relations. At ground level, the entrances can be seen but nothing more. The typology of the station assumed as a station 'Through Mixed-Use Spaces'. On the other hand the new constructions of mixed-use structures, some spaces in the ground work as a "Public Spaces". The entrances of the transportation levels are declared as 'Stations as Usual'. The Levent district is developed such a way that pedestrian spaces both open and underground have the functions like shopping and eating.

## 5. CONCLUSIONS AND RECOMMADATIONS

Imagine yourself putting together all your favourite memories in an unending and loosely fitting jigsaw in such a way that you could always wander back through them, indulging and enjoying them at will. In such a way that they can be endlessly rearranged or juxtaposed. Ultimately, the effect becomes faintly exotic. The old favourites are tweaked by new playmates, the half-memories overlaid by more recent experiences. Strange new mixtures of fact and fantasy filter through. New-but perhaps only conjectured-memories emerge out of the scrambling process. Now imagine yourself starting to manipulate these memories and hybrid memories, starting to infiltrate the experienced with the could-be-experienced and, as the adrenaline surges, the might-be-experienced and even beyond: to the if-only-they-could-be-experienced. (Cook, 2003)

This thesis has begun to explore how transportation infrastructure relates its features within the context of ground level by focusing on some specific aspects of the broader theme. As cities get more dynamic and complex, the transportation modes increased. To this end, following the introduction, cities' alteration in transportation and ground level interaction is examined. Chapter two aims to provide an overview of modes of transportation, ground perspective and urban structures of city layers. The focus is the variations of the parameters with each case project. The understanding of transformations, the urban section analyses are useful for the layout. The form of each project has been analyzed in terms of their motivation of interaction between ground and transportation infrastructure. The outcomes of the urban sections of these projects that documentation of the ground level and different enclosed spaces. By analyzing the conceptual framework in third chapter, the below and above ground structure typologies have the identity about the ground, the public level.

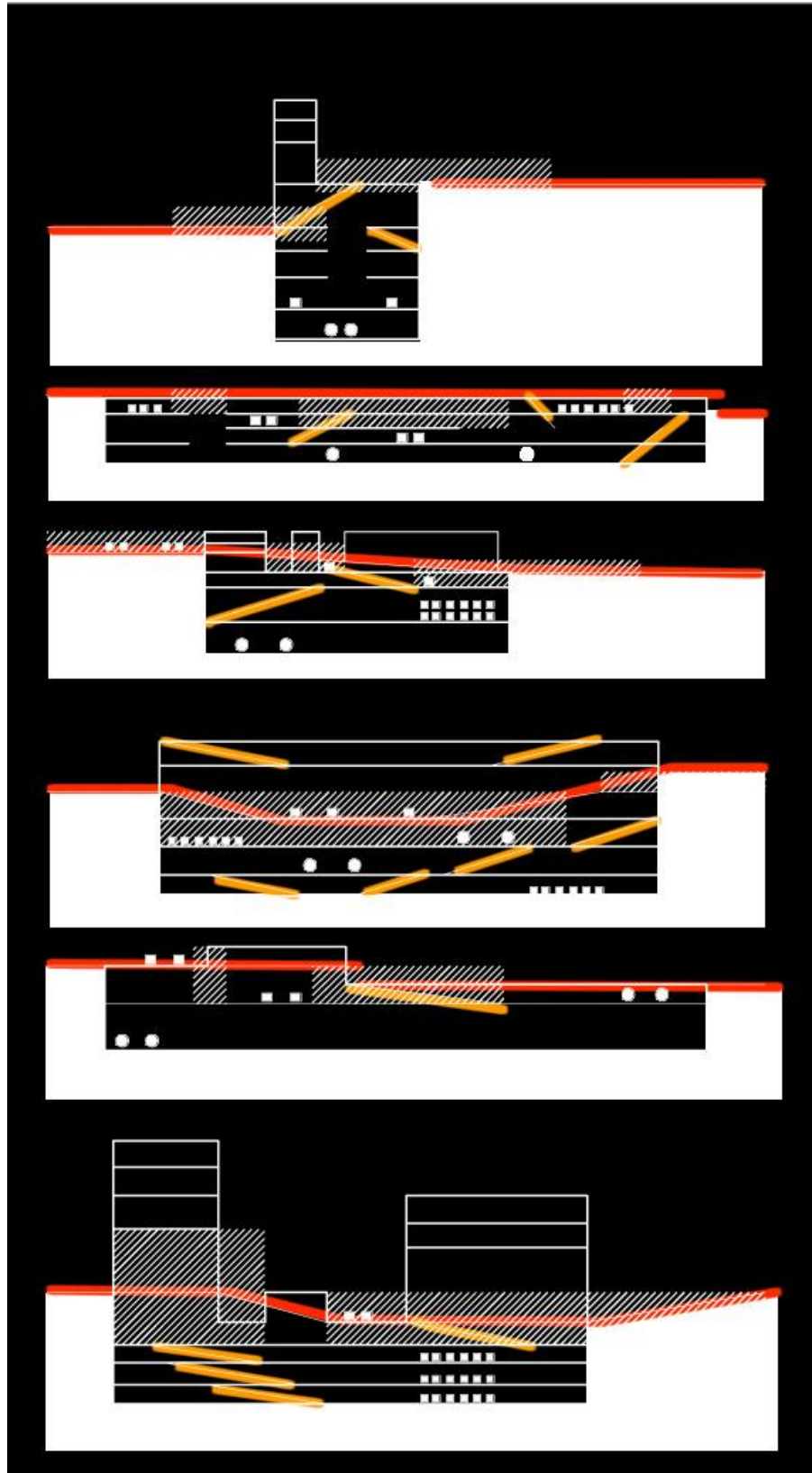
In this research, the architectural diagrams showing the urban sections are the most effective way to tell the analysis of space. These sections are including the layers of the site as they show the relation of the ground with these layers. Furthermore, in the

third chapter, drawing the conceptual framework of the urban sections by the help of case studies, the six typology codes emerged. The types of ‘urban in between transportation related structures’, namely; ‘stations as usual’, ‘continuous transportation part’, ‘public spaces’, ‘megastructures’, ‘hubs in network’ and ‘through mixed-use spaces’ (Figure 5.1). These codes are refers the parameters of the existing typologies. They are such a summary of what is done in the networks of transportation.

The understanding of a transportation network typically acts as a model for development. Yet it frequently sets off a reaction among the interaction of ground level and the underground structures. To analyze the relations, interpretations in projects are accompanied. Depending on the comparisons of examples, it usually makes sense how the sectional variations make the urban level topography in social and physical manner. Fourth chapter relates the role of transportation infrastructure with the selected areas of İstanbul. Both transportation and regeneration projects has taken into consideration. Connections and relationships are principally defined in that respect. The selected zones have different characters. Therefore, it is a way to see defined typologies in their design approaches. By doing so, their impact on İstanbul and effectiveness on their sites makes the perception of interacting of ground and transportation respectively.

Meanwhile, underground structure is a thing that allows citizen to understand the environment by looking through the ground level. Following such reasoning, the urban sections are well considered for people understanding the value of outer ground as much as they need the transportation. As Güvenç (1996) mentions, when it is called daily life in city, it represents a kind of ground allowing spaces are interpenetrating each other and new possible relations. Urban structures make these paths in topographical ways. Therefore, ground is the concept that all levels of arguments attached by daily routines. Besides, metropolis is defined by ground-underground world that makes urban structures. Important thing is the definitions of interaction levels with the underground.





**Figure 5.1 :** Urban in between Transportation Related Structures (Yardim, 2012).

Today, with the perhaps the exception of the highly complex modes of transportation in cities, their stations don't care much for the urban spaces. Transportation layers make use of existing spaces and occupy underground or ground level with only the entrances. Alternatively, the shopping mall entrances or mixed-use complexes can also a way to connect the ground with these urban structures. Such an attitude generally makes the interaction thinking in a box. It may seem paradoxical to mention architectural qualities of the transportation structures relation to urban design. However, the typological approaches for the underground levels and their consequences make the public real. According to Sennett (1996), public realm is a materialized space. It houses physical spaces such as square and street within an urban or rural environment. It is the spirit of the city. In fact, the desire to feel the all structure is inherent in many types of stations. In some cases like Yenikapı, it experienced that the relation of below and above the ground makes the city, urban design and the landscape is much more accepted. The creation of the transportation infrastructure and the ground level interaction is going to be more analyzed and excogitated way. A contemporary sense of the urban section assist by aligning the infrastructure in a way that underlines the spatial features for citizens.

Besides all the typological approaches and the selected zones of İstanbul, the outcome is the mapping about the European part of İstanbul. It is named as 'typology mapping'. As seen in the Appendix B, this mapping examines the most qualified stations by the help of typological approaches that have been determined in the research. Transportation and regeneration projects has taken into consideration by means of connections and relationships are principally defined in that respect. Therefore, it is a way to see defined typologies in their design approaches. By doing so, their impact on İstanbul and effectiveness on their sites makes the perception of interacting of ground and transportation respectively.

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- Url-34** <[http://www.haber365.com/Haber/Istanbul\\_Metrolari\\_Para\\_Basacak /](http://www.haber365.com/Haber/Istanbul_Metrolari_Para_Basacak/)>, date retrieved 10.02.2012.
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## **APPENDICES**

**APPENDIX A:** Newspaper Clippings

**APPENDIX B:** Mapping



## APPENDIX A

**Milliyet.com.tr**  
03 Mayıs 2012, Perşembe  
Gündem  
04 Ekim 2011 - 10:07

### Metro ve metrobüs yaya yolu ile birbirine bağlayacak

Gayrettepe metro durağı ile Zincirlikuyu metrobüs durağı 231 metrelik bir yaya yolu ile birbirine bağlanacak. 26,5 milyon liraya mal olacak yaya yolununun maliyetini Zorlu Holding üstlendi.

Tavsiye et 6 Beğen 6 Tweet 0 +1 1 Share Pin it Yorum: 9



İstanbul Büyükşehir Belediye Başkanı Kadir Topbaş, Zorlu Holding Yönetim Kurulu Başkanı Ahmet Zorlu ile Gayrettepe metro istasyonu ile Zincirlikuyu metrobüs durakları arası yaya bağlantı tüneline incelemelerde bulundu.

Tünelin basın mensuplarıyla gezilmesinin ardından konuşan Topbaş, İstanbul'da göreve geldikleri günden itibaren ulaşım yatırımlarına çok önem verdiklerini ve gerçekleştirdikleri 44 milyar liralık yatırımın yüzde 55'ini ulaşım alanında yaptıklarını belirterek, "İstanbul'da, ulaşım ciddi mesafeler aldık. Yoğun trafiğin yaşandığı noktalarda metro gibi yer yer altı çözümleri ürettik" dedi.

(a)

### İstanbul Metroları Para Basacak



**Bulunduğunuz haber:**  
İstanbul Metroları Para Basacak  
Tarih: 17 Mart 2011 - 20:50

**TURYAP'ın İstanbul Büyükşehir Belediyesi'ne bağlı Ulaşım A.Ş.'yle yaptığı anlaşma çerçevesinde 22 metro istasyonundaki 292 kiralanabilir alanla ilgili çalışmalar hızlandı. Turyap, metro istasyonlarından yıllık 5.5 milyon lira geliri Ulaşım A.Ş.'ye garanti etti.**

İstanbul Büyükşehir Belediyesi bünyesindeki Ulaşım A.Ş.'ye ait 22 metro istasyonunda 292 adet kiralanabilir alanı geçen kasım ayında ihaleye açan Turyap, metro istasyonlarındaki çalışmalarına devam ediyor. Metro istasyonlarının altında Real Estate Bazaar, Eco Brands ve Eco Bazaar olmak üzere 3 markayı hayata geçirecek. Buna göre Levent metro istasyonunda ekolojik gıda ürünleri ve hazır giyim alanında ünlü markaların daha ekonomik fiyatlı ürünleri yer alacak. Gayrettepe istasyonu ise bir emlak fuarına dönüşecek. Turyap'ın yıllık 5.5 milyon doları Ulaşım A.Ş.'ye garanti ettiği projenin 10 yıl devam etmesi planlanıyor.

İstasyonda ekolojik pazar  
Real Estate Bazaar, Eco Brands ve Eco Bazaar konsepti hakkında bilgi veren Turyap Yönetim Kurulu Başkanı Azmi Sarıbay, şunları söyledi: "Eco Bazaar'da Mısır Çarşısı anlayışıyla organik ürünler açık pazar konseptiyle yer alacak. Metrocity, Levent Plaza, Eria Tower, Özdilek ve Kanyon alışveriş merkezlerinin geçiş noktaları olan koridorda kurulacak Eco Brands'de ise ünlü markaların yanı sıra no name (markasız) kiracılar da bulunacak. Levent istasyonundaki toplam kiralanabilir alan 4 bin metrekare olacak. Real Estate Bazaar ise Gayrettepe istasyonunun altındaki 5 bin metrekarelik koridorda gayrimenkul ile ilgili ihtiyaçları tek çatı altında toplayacak."

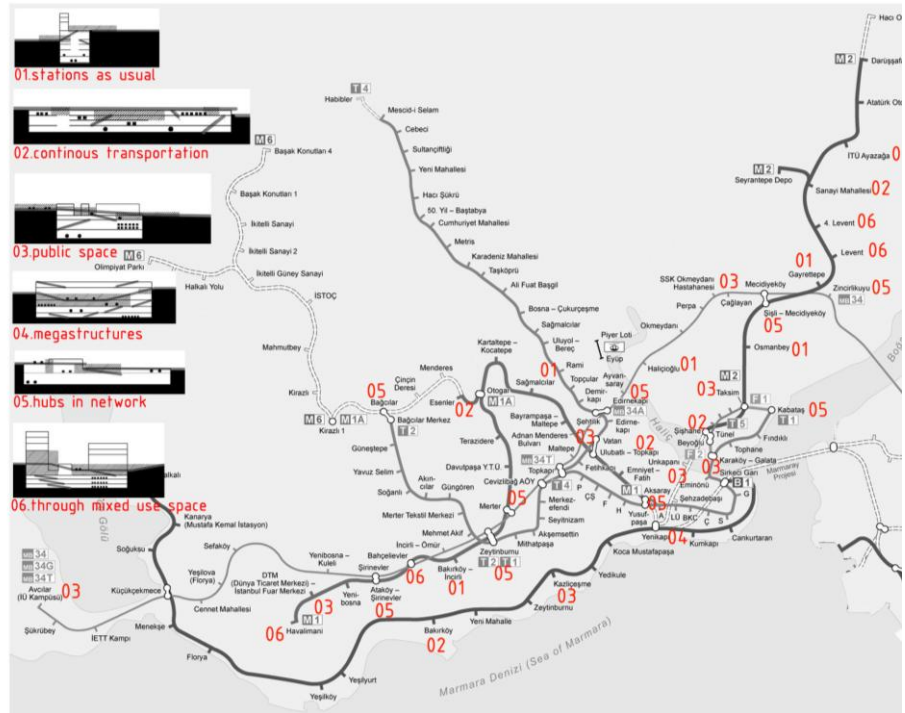
Metrekaresi 100 dolar

(b)



**Figure A.1 : Newspaper Clippings: (a) [Url-33]. (b) [Url-34]. (c) [Url-32].**

## APPENDIX B



**Figure B.1 : İstanbul Typology Mapping (Yardı, 2012)**





## **CURRICULUM VITAE**



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**B.Sc.:** Middle East Technical University, Architecture (3<sup>rd</sup> place)

### **Professional Experience:**

Emre Arolat Architects, *architect*, June 2010 – October 2011

Tabanlıoğlu Architects, *intern architect*, June 2008 – September 2008

### **Rewards:**

Arciprix Turkey *Mansion prize*, 2009

Çuhadaroğlu Stage Design Competition *3rd degree* , 2007

Three High Honor and Four Honor in METU, 2004-2009

### **List of Publications and Patents:**

The city of lost vision: A manifesto for Ankara , *Metamorphosis and the Textual City Workshop*, Ankara, 2-8 October 2006

