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Exploring Urban Design Criteria For High Speed Rail (HSR) Station Through the Design Studio Experience – Case of Pendik/Turkey

Sedef Özçelik Güney
Gebze Teknik Üniversitesi Mimarlık Fakültesi, Mimarlık Bölümü

Saniye Karaman Öztaş
Gebze Teknik Üniversitesi Mimarlık Fakültesi, Mimarlık Bölümü

Tayfun Salihoğlu
Gebze Teknik Üniversitesi Mimarlık Fakültesi, Şehir-Bölge Planlama Bölümü

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Abstract
In recent years, the application of modern transportation modes to the current routes changes the urban layout. As a part of these transformation modes, the HSR applications promise various transformations on the urban space. In this context, rearrangements of axes, the facilities on these axes and the urban space in the surrounding of these facilities put forward an important design problem. Pendik, a large district on the Southern Istanbul periphery; the recent application of HSR Station has started to transform its centre into an intercity transportation node since its opening in 2013. In accordance with the new role, reorganization of HSR hub and its surroundings provides an experimental teaching in the design studio. Due to the exploratory nature of Architectural Design Studio, the content analysis approach is conducted. The integration of the learning experience in the urban design scale was crucial. The reports collected systematically from the students during the semester were coded with respect to content analysis. Both the final design decisions' and the field-specific evaluations' levels of relevance with the literature were interpreted. Among the design criteria compiled from the literature; security, connections between places, pedestrian's ability to use the space easily, diversity of activities and users, and integration of urban texture with the HSR station have emerged for the project site. Research results have shown that content analysis can be a consistent and systematic method in guiding designs in the interface of architectural and urban design project topics.

Öz
Mevcut ulaşım akslarına modern ulaşım biçimlerinin uygulanması sonucunda, mevcut kentsel düzen çeşitli şekillerde değişmektedir. Bu uygulamalardan biri olarak; Yüksek Hızlı Tren (YHT) İstasyonlarının, etrafındaki kentsel mekânı dönüştürücü etkisi bulunmaktadır. Bu bağlamda, kentsel aksların, bu akslardaki tesislerin ve bu tesislerin yakın çevresindeki kentsel mekânın yeniden bir uyum içerisinde düzenlenmesi öne çıkan bir tasarım sorunsalıdır. Pendik YHT İstasyonu da açıldığı 2013 yılından bu yana Pendik kent merkezini şehirlerarası bir ulaşım düğümüne dönüştürmeye başlamıştır. Aktarma noktası ve çevresinin üstlendiği yeni role uygun bir şekilde organize edilmesi deneysel bir tasarım stüdyosu süreci sunmaktadır. Kentsel tasarım ölçeğindeki bu öğrenme deneyiminin mimari tasarım stüdyo eğitiminin keşfedici doğası ile bütünleştirilmesi için içerik analizi taktiğine başvurulmuştur. Öğrencilerden dönem içerisinde sistematik olarak toplanan raporlar, içerik analizi ile kodlanmış hem sonuç ürünün hem de alana özgü değerlendirmelerin makalede derlenen literatür ile örtüşme düzeyleri yorumlanmıştır. Derlenen tasarım kriterleri içerisinde; güvenlik, mekanlar arasındaki bağlantılar, yayanın mekanı kolayca kullanabilmesi, aktivitelerin ve kullanıcıların çeşitliliği ile ulaşım düğümü olan YHT istasyonu ile kentsel dokunun entegre

Introduction

Intercity HSR projects, which are generally larger-scale national or regional decisions, have spatial, social, economic, and environmental impacts on the route they are located. These spaces are aimed for meeting the demands of the local people. They also should be shaped according to a large-scale project they encounter. HSR projects diversify and transform due to the needs of the passengers travelling between the cities. Since the increase of HSR projects all over the world, searches for integrating this mode of transportation into planning have increased. It is seen that general urban design criteria are still a useful tool in studies on HSR station and surrounding built environment design. Although the order of importance varies by the other features of the study area; topics such as security, connections between places, pedestrian's ability to use the space without difficulty, diversity of activities and users, and integration of urban texture with the HSR station stand out in the design of HSR and its setting.

After the HSR station was completed in 2013, Pendik became an important start, end, and transfer point for Istanbul's connection with other important cities nationally. Since the main function in the space and its users were beginning to change, a spatial transformation process started and continues to meet the changing demands from the Pendik city centre.

The issue and site inspired GTU, department of architecture, second-year design studio as it is a current and important design problem. The purpose of this study is to discuss the level of superposing the criteria for the design of HSR station with its surroundings in the literature and the undergraduate second-year students' evaluations. Since the subject requires an approach from the urban design scale, the site analysis stage has worked differently than the classical architectural design studios. To discover the perception of space beyond the architectural scale, evaluation reports were collected from the students at the points where the meetings with the students reached a significant level. Collected reports were coded and evaluated by content analysis method, which is a qualitative research method explained in the following sections.

Theoretical Framework

HSR projects have positive contributions on the competitiveness of industrial sectors, urban agglomeration and regional col-

laboration systems because of the increase in accessibility and integration between the cities and the regions *(Albalate & Bel, 2012, 6-8; Sanfeliu & Ganges, 2016, 2; Inan & Demir, 2017, 100)*. In addition to the regional benefits of these projects, TOD *(Transit Oriented Development)* strategies, which are observed on the project route, especially in the stations where the stations are located, can positively contribute to the reduction of traffic problems and the functioning of the urban systems by regulating the distortions in the residential workplace relations in the cities *(Shi, 2016, 172; Sanfeliu & Ganges, 2016, 3)*. HSR stations and nearby areas, which are large-scale urban uselses, provide a transition between different modes of transportation and in areas such as China *(Changchun Railway Station North Area; Heshen Qiau Station Area)*, Spain *(Zaragoza Valladolid)*, UK *(London: King's Cross and St. Pancras Station Area)*, Germany *(Berlin Central Station Area)* France and US *(New York City: Penn/Moynihan Station Area)*. They are transformed into different forms of attractive spaces *(Peters, 2009, 3-4; Xu et. al, 2012; Sanfeliu & Ganges, 2016, 3)*.

Major urban changes take place swiftly around the main stations, which are transformed into transportation nodes in general, on the stops after the installation of the HSR route. As the number of people living, working, traveling, and using public spaces around the stations increases, so does the demand for the diversity of activities in the area and spatial transformations are triggered *(Sanfeliu & Ganges, 2016, 3; Shi, 2016, 173)*. Transit-oriented, well designed urban restructuring around rail stations explain well the concept of "urban renaissance" which is one of the main debates of urbanism. Creating iconic urban spaces by the neoliberal urban restructuring tools in the inner city transforms urban spaces into more attractive places to work, live, study or enjoy for entertainment and recreation *(Peters, 2009, 1)*.

The relationship between the construction of the HSR station and the spatial structure around is bidirectional. In a land-use pattern with distinct and quality spaces, the immediate surroundings of station can be transformed into daily travel destinations where passengers travel to assess their leisure time. The construction of the HSR station also increases the motivation of the local authorities to transform the spaces around this station into well integrated and quality urban spaces *(Shi, 2016, 174-175)*. In any case, after the HSR station investment, content of the space is metamorphosed. Through a good design and upgrading of the spatial qualities of the HSR stations immediate surrounding inevitably change, the demand for and the effective use of these spaces increase even more. Large-scale HSR investments result as an opportunity to overcome the existing problems of the urban space.

The urban design carries an important role to get positive outcomes from the relationship between HSR and urban space. There is an expanding literature on the design principles of HSR and TOD stations and their surroundings in urban areas. Trip *(2008, 385-387)* summarises the urban quality elements of the HSRs in the case of Amsterdam Zuidas and Rotterdam Centraal. By the literature review on urban quality issues; he distinguishes two design-related approaches to urban quality; *(1)* design of urban areas and *(2)* quality of public spaces in urban areas. The design of the urban areas includes density, grain, road widths, variety of buildings in terms of size, age and functions, amenities, diversity of urban functions, mixed land uses, accessibility *(specifically for pedestrians)*, liveliness and safety issues as principles of urban design. Quality of public spaces such as station areas is defined by human scale, sense of enclosure and continuity of space, architecture and aesthetics, social safety, control of the public spaces, availability of seating, trees, water features, covered spaces and porches, the possibility of purchasing food and drinks.

Xu et al. *(2012, 763)* suggest four main principles as a guide to the rational planning of railway station area; *(1)* inclusion of commercial and business activities, *(2)* integration of public transportation modes *(high-speed railway, subway, coach, bus, walking*

edilmesi konuları Pendik proje alanında öğrenciler tarafından da keşfedilen konular olarak öne çıkmıştır. Araştırma sonuçları, içerik analizinin mimari ve kentsel tasarım projeleri ara yüzünde tasarımları yönlendirmede tutarlı ve sistematik bir yöntem olabileceğini göstermiştir.

Keywords: Content Analysis, design studio, urban design principles, HSR applications, Pendik.

Anahtar Kelimeler: *İçerik analizi, tasarım stüdyosu, kentsel tasarım ilkeleri, yüksek hızlı tren, Pendik.*

etc.), *(3)* well planned open spaces *(station square, ribbon, green parks, public square)* and *(4)* respect for a pedestrian to enhance permeability and connectivity. Elshater and Ibraheem *(2014, 538-539)* propose a design framework with comprehensive principles from different disciplines such as traffic engineering, universal design, and urban design for Egyptian hubs. It is stated that successful design should include "constant" dimensions such as equality, seamless continuity, wayfinding assistance, security, the safety of movement, strategic parking management, higher land-use intensity, minimization of the ecological footprint and effective partnership. On the other hand, some dimensions are also defined in the study as "variables". They are the higher level of pedestrian priority and experience, mixed uses, attractive public realm, and travel convenience.

U.S. Department of Transportation, Federal Railroad Administration, Office of Railroad Policy and Development *(2011,3)* published a guideline for the high-speed and intercity passenger rail *(HSIPR)* projects. Although every station has its unique design principles according to its local context, culture, and climate; the document states three common principles as optimization of the station location, connections with other transportation modes and developing through urban design. The third principle is mainly related to the purpose of this paper. The guideline recommends a clear hierarchy of public spaces connected by the spatial and visual linkages, diversity of uses for different user groups, local building character supported by the inviting streetscapes and plazas, landmarks and historical markers, architectural design quality, priority to pedestrians, bikes and transits, the hierarchy of spaces, height to width ratios, block dimensions, density variation by uses and locations, paving, lighting, landscape, and signage around the station, safe spaces, kiss-n-ride, park-n-ride, reduction of parking demand as the main design principles of the station areas.

Mayor of London has provided guidance for the design themes and principles of the interchange stations in the capital city *(Url 1)*. Four main themes with a range of principles are defined: Efficiency, Usability, Understanding and Quality. California High Speed Rail Authority and PB's Placemaking Group *(2011, 5-9)* developed an urban design guideline for the California High Speed Project. The guideline includes an urban design analysis checklist for the transit. It is highlighted that land-use, site and building design, streets and parking will all require more detailed attention during station design, with an eye to supporting high quality places and successful TOD.

Jacobson and Forsyth *(2008, 54-57)* reviewed discussions in the literature on TOD area design and developed a framework of principles to evaluate TOD cases in the US. They defined three main themes: process, places and facilities. Processes is mostly related with the preparations before the design and management of the space. Collaboration between different actors in the design process, flexible use of spaces with different activities in different periods, maintenance of the spaces and maintenance functions in the design are the important components of the theme. Places and facilities themes are directly related with the quality of the urban design. Successful TOD area design should include principles such as human scale, public spaces that accommodate a variety of uses and users, strategies to increase safety, allowance to variety and complexity, connections between spaces sidewalks and crosswalks to appropriate pedestrian use, integration of transit to urban pattern, car movement and car parking.

From the literature reviewed above *(Jacobson & Forsyth, 2008; Elshater & Ibraheem, 2014,534; Sanfeliu & Ganges, 2016,3; Shi, 2016)*, series of urban design principles for the HSR/TOD areas are refined. Principles and its components are rendered and listed as:

- **Human scale / building quality / characteristics of built environment**

  Building heights and volumes, Figure – ground relations,

Architectural design and landscape in order to create sense of place.

- **Safety**

  Lighting,
  Access control,
  Visibility,
  Ease and safety of movement *(no tunnels or very narrow paths for pedestrians)*,
  Abandoned buildings,
  Undefined spaces.

- **Connections between spaces**

  Continuity of routes,
  Barrier free pedestrian paths,
  Position of parking lots,
  Building entrances connected to street network,
  Walking options, more than one route.

- **Pedestrian / cyclist friendly usage**

  Safety of movement,
  Accessibility,
  Pedestrianisation,
  Landscaping,
  Sidewalk dining and other opportunities while walking,
  Crosswalk design to separate cars and pedestrians.

- **Car movement**

  Slowing street traffic by,
  Narrow streets,
  Speed tables, bumps,
  Medians,
  Hiding parking lots from sight of people / appropriate placement of car parks,
  On street parking allowance.

- **Variety and complexity**

  Visual variety,
  Colour use,
  Landscape design.

- **Variety of user*(s)***

  Street furniture,
  Public art,
  Flexible use of public spaces *(allowing different activities in plazas and squares)*,
  Mix-uses such as offices, social spaces, residents, commercial uses together or close to each other.

- **Integration of the different transportation modes such as rail, car, bus, bike and walk in an optimal walking distance to current urban pattern** *(mostly about social hub building design)*

Project Site and Studio Design Attempts

Pendik province is more than 8500 years old and had been the "Southern gate" of Istanbul through the history. Its strategic defensive position was named as "Pantecion *(city wall)*" and continued its protective position throughout the Ottoman era. Pendik was planned by architects and engineers who came from Paris due to the strong relations between the Ottoman Empire and France at the time after three large destructive fires in the 19th century. According to scholars, Pendik is the first Turkish town designed by urban planners. This plan covered the area between the train station and the coastline *(Erkan, 2012, 88)*. While it was functioning as a countryside/summer place in the early republic period, it has become the first stop for the migration wave and population exchanges from Anatolia to Istanbul in the recent years.

In the central Pendik, the suburban train station has been functioning since the Ottoman era. This conventional station was converted into an inter-city High Speed Railway *(HSR)* station in 2013. After its installation, HSR routes amongst Istanbul-Eskisehir and Ankara have become the main national transportation corridor. These routes are also on the Trans European Railway *(TER)*, Trans Asian Railway *(TAR)* and Transport Corridor Europe-Caucasus-Asia *(TRACECA)* lines. Nearly 6000 passengers are transported every day via HSR between Istanbul and Ankara; 46% of the total passengers travel to Istanbul only *(TCDD, 2016)*.

The implication of the contemporary transportation form to the present transportation axes have been changing the urban setting in Pendik recently. Although Pendik is one of the main intersection points for the nationwide transportation hubs and routes, urban structure of that area is not transformed spatially regarding the needs of its new central character.

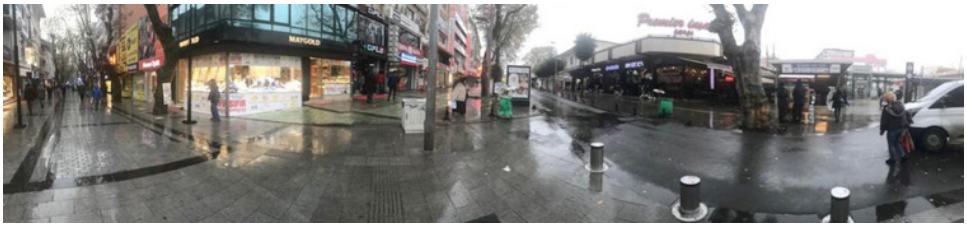

Figure: 1
HSR Station Entrance and Its Surroundings (Özçelik Güney & Karaman Öztaş, 2018).

Because of the central position of the HSR station, it is encompassed with a very dense urban pattern. On the Northern part of the station, there is high-density building blocks, on the Southern part there is a crowded shopping axis, continuing further South to the seaside. The axis ends with a marina and the coast-line road *(Figure 1)*. Facilities around the HSR station are still inadequate in terms of functions such as hotels, travel agencies, shopping, recreation areas, banking, insurance companies, etc. Coherent formulation of the town, necessity of new functions, and reconsideration of the pedestrian axes are crucial.

Thus, the studio topic has been generated as not only a transportation hub but also as the "social hub" which stands for a core venue or a passage connecting different parts of an urban area. The idea was to create a space for intersecting various functions, types of spaces, and user profiles *(Toivonen & Friederici, 2015)*. So, the social hub project plays a "passage and connection" role *(Figure 2)*.

The second year-bachelor-architecture studio tackled the issue from this perspective in the 2017-2018 spring semester. The approaches of the students to the question in the early years of the architecture education were explored. McAllister states that "this stage is a rather complex chapter - "stage 02"- in which the design is complex, and a series of design problems are given" *(2010)*. As the amateur designer spirits reflect fresh ideas; their perceptions

Figure: 2
The Area Studied for The Project (source: authors, http://www.uab.gov.tr/images/faaliyet/c19d85352980eaf.pdf, a. date 14.11.2018.).

towards this dynamic setting regarding the problem and the potentials of the site were explored within the guidance of the "urban design principles" provided in the literature.

GTU second year studio emphasized the importance of the "intuition" that the innate designers possess and how they evaluate the artefacts of the site. It should be noted that "learning is not simply acquiring knowledge and skill; it re-aligns the participants' experience with respect to the competence of that community. The focus on the social aspect of learning is not a displacement of the person. Conversely, the focus is an emphasis on the person as a social participant" *(Fasli & Hasanpour, 2017, 198)*.

Methodology

In this study, content analysis method was conducted due to the nature of design inputs specific to this urban tissue. It is a qualitative method in order to analyse text with the goal of taking a volume of qualitative material and identifying themes and meanings. The main purpose of the content analysis is to organize and simplify the complexity of data into some meaningful and manageable categories *(Patton, 2002, 598)*. According to Marshall and Rossman *(1995, 85)*, content analysis is an analytic strategy that entails the systematic examination of communication forms to document patterns objectively.

Trace *(2001)* indicates that the objective of the content analysis is to get at aspects of meaning by examining the data qualitatively. The method is used to examine how authors or respondents perceive and understand certain issues. And the person analysing the data allows themes to emerge naturally, rather than attempting to impose a preconceived set of themes on the data. This approach ensures that any unanticipated themes are given the opportunity to emerge from the data and that no undue weight is given a priori to any preconceived themes. This scientific approach allows the data to be examined in an objective and systematic order. It also helps to comprehend the messages between the lines in the documents. Content analysis method has several phases such as the determination of universe and the sample, the determination of the data that the analysis will base on, the composition of a categorisation system, coding, and analysis *(Weber, 1990, 21-38; Marshall & Rossman,1995, 92; Patton, 2002, 542)*. In this paper, the HSR problem stated in the studio addressed the universe and the sample. Moreover, the evaluation way *(presenting reports during the crit-desks)* is the data. The categorisation system is extracted from the HSR design guidelines found in the literature. Then the analysis was made with respect to the guideline formulated by both the literature and the unique character of Pendik. Within this frame design reports and exemplary student works are studied.

This study explores the potentials, problems, and coherent design proposals generated by the students and evaluates their point of views in such a complex issue, social hub design problem. Through the content analysis, the data collection tactic was firstly formulated as students being asked to prepare reports for the study area. In order to formulate data collection and systematic order, the reports were collected and evaluated with respect to the design studio teaching program. The reports were obtained from 14 students in between the three phases of the studio period of 14 weeks': *(1)* Urban analysis; a detailed analysis conducted via mapping the functions, topography, demography, and other layers of the city. *(2)* Design discussions– connecting artefacts; includes the interpretation of the urban analysis in order to distinguish the necessary functions within the social hub. *(3)* Architectural intervention; the formulation of the final proposal *(Table 1)*.

A total of 42 reports were collected from the students. Dirigible reading was made in order to signify the intuitive points addressed by the students which were coherent to the "urban design principles" available in the literature. Through the content analysis, problems and potentials related to the project area specified by the

Teaching activity	Topic of the essays collected from students	Data collection interval (within the 14 weeks of architectural studio period)	Number of essays collected
1. Urban analysis	Findings and problems of the site	Week 3	14
2. Design discussions	Potentials of the site were derived from the studio discussions	Week 6	14
3. Architectural intervention	Design proposals described as the architectural interventions	Week 11	14

Table: 1
Data Collection Process Coherent to the Design Studio Period.

students were picked and sorted under the headings of predetermined urban design principles *(Table 2)*. Five students' design proposals reflecting the key problems for the studied area were presented in order to exhibit the coherent application of the students' findings mentioned in the reports. Finally, the findings were discussed *(Figure 3)*.

Results: Findings of Content Analysis and Emergent Themes

The main urban design criteria are studied and re-considered regarding Pendik artefacts based on the literature. As a result of the content analysis, the problems about Pendik according to the project reports of entire 14 students are shown in Table 2. The problems that the students highlighted specific to the project site are mentioned in quotations.

In addition to the problems indicated coherent to the design problems; distinctive axes, being in strong relationships with other routes where various commercial activities, taking place on a crossing line between the seafront and the train station, being a dynamic centre and an important transit point, the intensity of the students with the presence of many different educational places and presence of a marina were expressed as the potentials of the studied area.

Some design proposals that reflect the students' solutions were presented for the prominent problems determined by the content analysis. A student states in the written report about her design proposal:

"Even though the number of the buildings increased with time, the significant axes have not been destroyed and due to the changing state of density, the users' orientations have become a sort of 'capillary flow'. The dynamic area located between the HSR station and the coastline is considered to have a potential in terms of horizontal axes. These axes have lost its active capillary flow. They can be regenerated." *(Figure 2)*.

The lack of "capillary flow" mentioned by the student refers to the alternative "pedestrian/cyclist friendly usage principle" *(Table 2)*; not only as a promenade lines, but also as actively used areas. It should be noted that the secondary walking paths

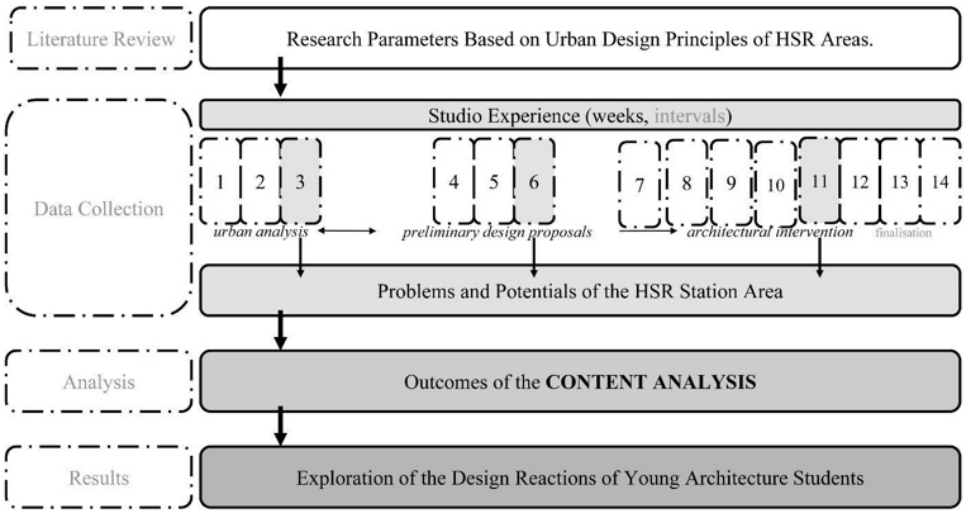

Figure: 3
The Roadmap of the Study (Özçelik Güney & Karaman Öztaş, 2018).

Urban Design Principles	**Human Scale/ Building Quality / Characteristics of Built Environment**	● "Multi-storey buildings" ● "The uncomfortable 'overlapping' feeling" ● "High-density buildings and people" ● "Coterminous urban form" ● "Difficulty to inhale" for the town and the citizens ● "Narrow/tight roads" ● "Ignored human scale" ● "Very dense built form" ● "The lack of urban elements that refer to the Pendik history" ● "Pendik cannot meet the social needs of different groups of users from every kind of age" ● "The lack of landmarks such as monuments, buildings and unique spaces"
	Safety	* "The workspaces such as libraries are not located at noticeable spots" * "People cannot see the sea at all and can only see from a far, and this is a sparse part of reaching the densest corridors" * "Narrow, unsafe and oppressive underpasses" * "The train station which is in the central Pendik is not defined for its environment as well as its own content"
	Connections between spaces	* "The non-continuity and irrelevance between the main axes that organize the connections of the coastline, cultural activities and eating spaces" ● "The walking paths cannot be well-defined because of the dead-end streets" * "The street arrangements break the walking axes" * "There isn't a capillary road net supporting the main roads in Pendik" ● "Due to the defined parking area lacking, parking along the roads creates a barrier effect for the pedestrians"
	Pedestrian/ Cyclist friendly usage	● "The security problems raised on the high-density pedestrian axes where there is also vehicle flow" ● "Disorientation of the crowded pedestrians coming from the transportation axes" * "Inadequate, chaotic HSR underground passage which cannot offer another passage way alternative. On this spot redirection malfunction, doubts on walking paths at the two ends of the underground passageway." ● "Vehicle flow that breaks the continuity of the pedestrian circulation." ● "Delivery vehicles that breaks the continuity of the pedestrian circulation." * "Lack of capillary road net (as a pedestrian alternative) supporting the main axes." * "Lack of control on the intersection of roads and the pedestrian axes."
	Car movement	* "Interbedded pedestrian and vehicle traffic." ● "Narrow (acute) roads" ● "Creating the vehicle/auto park-dominant urban impression"
	Variety and Complexity	* "Lack of green areas" * "Disconnection between the very rare green areas present" ● "The green areas mostly amassed on the coastline" * "The obtrusive urban tissue due to the excessive firm ground presence."
	Variety of use(r)s	* "Poor quality urban equipment." ● "The HSR waiting zone in poor physical conditions." ● "Inadequate and poor-quality social areas" ● "Overloading in the present cafes and restaurants." ● "The inadequate cafe capacities in the Kuş Park (Central Pendik)" * "The limited number of areas for the users and passengers in different age groups" * "Lacking urban open areas/public spaces." * "The absence of a social centre on the axes of main marketplace which can fulfil the needs of high pedestrian density." ● "The studying places such as libraries are not located on noticeable spots" * "All age groups are inadequate in terms of social areas that will collect people under a common value." ● "The rigid lines that separate spaces"
	Integration of the hub to the current urban pattern (mostly about hub building design)	● "The polarization effect of the railway" * "The railway line which divides Pendik into two pieces such as upper and lower sides" * "The HSR station which cannot supply even simple sitting-waiting activities."

Table: 2
The Problems About Pendik Determined by the Students.

nurture and ease off the main axis in most cases. Thus the student proposes a wide main axis with three centres: *(1)* HSR station- capillary flow in order to support the functions related with the intercity trips, *(2)* in-city interactions - a capillary flow for commercial and social interactions and *(3)* a coastline recreation: a re-creative area

Figure: 4
Macro Proposal and Site Strategy for the Pendik from a collage of the student project (Özçelik Güney & Karaman Öztaş, 2018).

for multi-purpose open-air activities which is also the ending point for the Pendik main axis. For this reason, some of the dead-end streets, empty building plots and rarely-used passages were revised and rearranged within the design proposal *(Figure 4)*.

Regarding the outcomes of the content analysis, one of the urban problems is put forward as the integration of the social hub project with the current urban pattern. This issue points out the "connection between spaces principle" *(Table 2)*. In the proposal report, one of the students states:

"There is a human density from underground, HSR, bus and minibus stops towards the centre. At this point, the train line has a polarizing effect between these two areas. When the current situation is examined, insufficient underpasses connect the two separate places which also increase the polarization. These transition elements should be eliminated and designed in a different way" *(Figure 5)*.

As a solution to the stated problem, the existing underpasses were removed in order to eliminate polarization between the two zones and to improve pedestrian flow. The social hub on the railway station and the underpasses were studied at three levels. The ramps that reach these levels constituted the backbone of the project. The lower level was designed in order to function as waiting, ticket sales area for the HSR station users and exhibition areas for the archaeological site located under the railway. At the ground level, workshop areas on excavation were designed and the existing dead-end street was opened to the square in the bazaar. Cafes, restaurants and view terraces were designed at the upper level which is reached by the ramp. A continuous ramp was also designed that also functioned as an eaves for the people waiting for buses and minibuses in the northern side of the HSR station *(Figure 5)*.

The alignment of the vehicles and the main pedestrian axis have also been highlighted as a problem in Pendik. This issue both addresses the "car movement principle" and "pedestrian/cyclist friendly usage principle" *(Table 2)* with respect to the literature. In a student report, the walking paths, their confrontation with the vehicles; the safety/circulation problems are mentioned as:

"An important issue which treads the safety of the pedestrians is the malfunctioning relation between pedestrians and vehicles. The people who leave the underpass come across with the motor vehicles intercepting the walking axis on the Hatboyu Street which is a problem. This interception continues with pedestrian-vehicle confrontation at the intersection of Ihlamur Road and the Dr. Orhan Maltepe Street. The

Figure: 5
Macro Proposal for the HSR Station Connections from a collage of the student project (Özçelik Güney & Karaman Öztaş, 2018).

delivery vehicles that serve for the shops on the ground floors of the building blocks also create similar problems. Another issue that affects the pedestrian circulation inversely is the auto park entrance/exits which are located on the pedestrian paths. For instance, vehicles leaving the auto park on the Piramit Road are redirected towards the Ismetpaşa Street and use the pedestrian route and intervene the walking path. Thus, rearrangement of the pedestrian axes beginning from Hatboyu Street to the coastline is crucial" *(Figure 6)*.

As a solution, the main pedestrian axis and the streets intersecting them perpendicularly were closed to the vehicles. A ring traffic circulation was proposed in macro scale. In addition to the main pedestrian route, the adjacent street was also arranged as a pedestrian axis. The building plots left between those two paths were considered

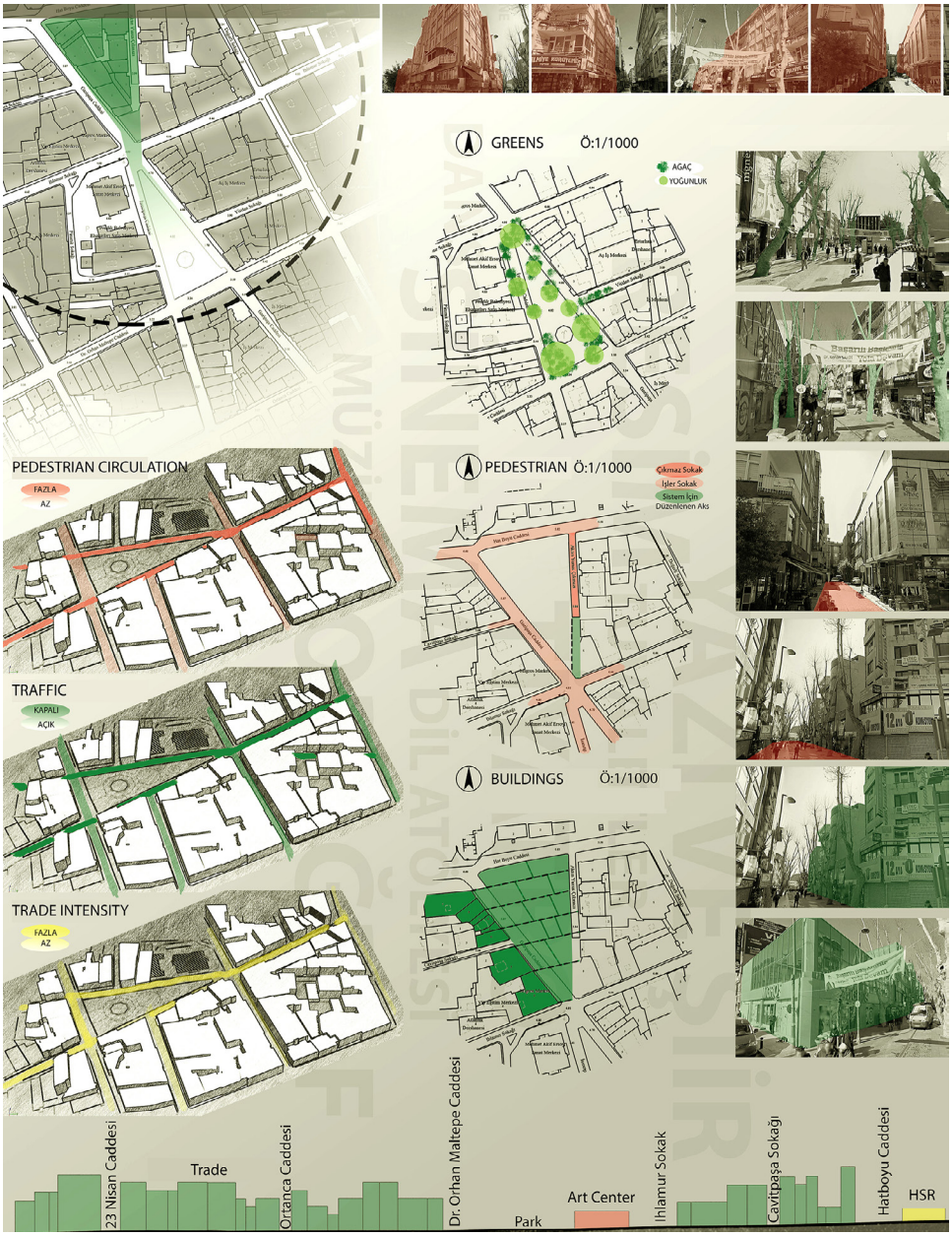

Figure: 6
Macro Proposal for Central Pendik Connections from a collage of the student project (Özçelik Güney & Karaman Öztaş, 2018).

as a vertical/horizontal social zone continuing all the way to the Kuş Park. The layout was formalized with respect to the current Pendik building pattern. The inner courtyards located in the centres of the wards were re-considered as public/semi-public courtyards. The activities and the main functions of the social hub were organised respectively. Moreover, horizontal layering was studied: the ground level - present pedestrian axis level and the one more level below were juxtaposed in the design. Social hub and some functions related with the HSR station were positioned on the "-1 level" *(4.50 height, ascending further to the Kus Park as a very large ramp)*. Thus, the underpass and HSR entrance were combined with the social life arranged around the social hub *(Figure 6)*.

Another challenge that the students confronted was the connection between the main pedestrian axis and the coastline. The coastline gives an "abandoned" impression after the very dense building blocks

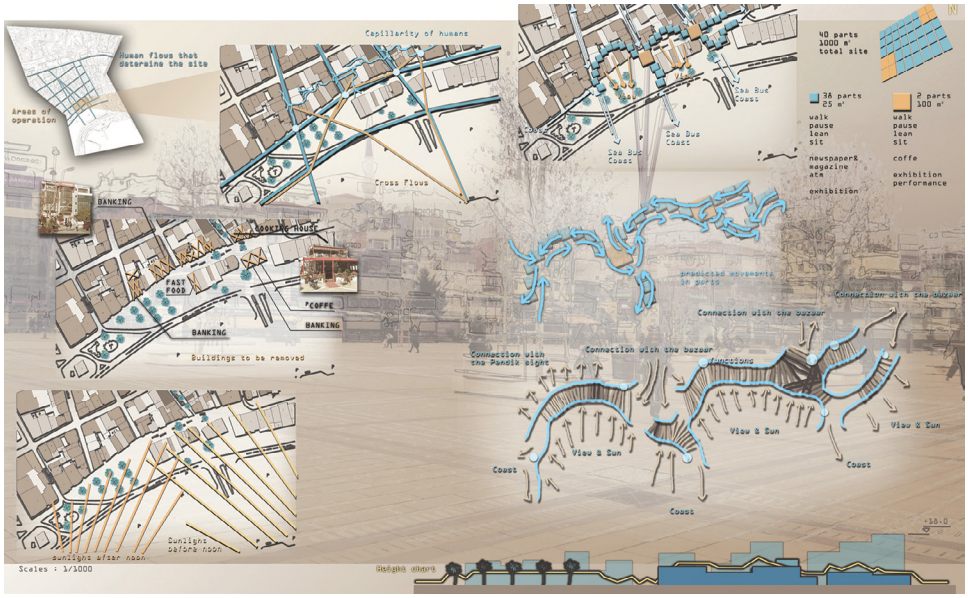

Figure: 7
Macro Proposal for the Coastline Connections with Central Pendik from a collage of the student project (Özçelik Güney & Karaman Öztaş, 2018).

and activities around the marketplace-Kuş Park. This finding refers to "connections between spaces" principle. The project can be considered having two ends: the HSR Station and the coastline. About this issue, a student states:

"Even though there are not too many green areas in the upper and middle sides in Pendik, relatively more green spaces can be seen towards the coastline. This also affects the density of the buildings. The seafronts might provide further ideas for design regarding the connections of the green spaces separated from each other, creation of a new identity for the city in order to attract people every hour of the day, formulation of viewing and a social venue was considered" *(Figure 7)*.

Therefore, the coastline was reconsidered with respect to the other current transportation and recreation activities. The open green area, the cafes/restaurants situated along the coastline traffic axis and the ferry port were disconnected with the main activities. A proposal struggled to connect these different parts of Pendik by creating a "large entrance" on the southern side. Social connections, various user profiles and working/learning activities were gathered in the vast area located on the coastline. A grid scheme was distorted with respect to the walking routes and activities which were located both in the marketplace and on the coastline *(Figure 7)*.

Hammond states that the design and built object should not be taken to be two separate actions that one ends and the other begins. These two are circular processes feeding each other, transforming, and developing simultaneously. Even though the building is an imaginative process, materials and realizing details, the process of transformation of the design ideas into a physical structure is experienced physically *(1980)*. The architectural interventions can be taken as an imaginative action. It is a sort of response to one question raised via analysis and numerous dialogues between the tutors and the students. For instance, a student mentions the absence of working and gathering spaces such as bibliotheca and flexible spaces for temporary exhibitions. The potential of the Pendik urban tissue was considered in this regard. The backyards of the building blocks, some abandoned plots used for parking and narrow passages were rearranged. The main gathering locations were studied, and daily activities were covered in the building program, such as out-of-office working, exhibition, left baggage, having a cup of coffee and quick chats *(Figure 8)*.

The connections between the student projects and the outcomes of the content anal-

Figure: 8
Design Proposal for Central Pendik from a collage of the student project (Özçelik Güney & Karaman Öztaş, 2018).

ysis are crucial in this paper. The abstract and intuitive findings which are controversial to the sharp definitions of specific details, as well as a massive conceptual frame that the design studio seeks, are studied via content analysis method. Therefore, the content of the written reports and proposals create a more profound insight regarding the problem.

Discussion

One of the sub-components of the urban design principles is to meet the needs of human nature by high-quality design. Naturally, the design criteria for the HSR station and its setting have content that focuses on human. What makes the results interesting is the candidates of the young professionals could have been able to get away so early with the common social ideas under the blinding effect of critical thinking of the major projects. Nevertheless, they took action due to the inputs given with the design problem. Moreover; it should be noted that the content analysis method in the scope of this study has the potential to establish a systematic system of the relationship between the theoretical background and the student's studio experience *(Khankzad, 2015, 36-41; Akıncıtürk et al., 2011, 37-38)*.

It should be noted that teaching and learning has been motivated through the entire arguments being pieces of the whole to provide connection of both experimental and conceptual knowledge. Such knowledge is enhanced through dialogue between students and instructors aiming to encourage students to 'think something differently' *(Aydınlı & Avcı, 2010, 100)*. That is why content analysis approach derives renewable, meaningful, and reliable findings from the data provided from such "dialogues".

Concerning the results deduced from the data "Human Scale/ Building Quality / Characteristics of Built Environment" are the urban design principles which are not often put forward in the data. Noting that in such a dense urban tissue as Pendik; human scale, building quality and characteristics of the built environment might be considered to be "normal". Edward T. Hall refers to distances between people in the public space and how it is connected to the living culture of the individual *(1966)*. Data shows that the dense human interaction was considered to be an "inevitable outcome" of the urban setting due to the highly populated character of Istanbul. On

the other hand, "safety" is defined by the students as one of the key urban problems for Pendik. Volume-spatial composition, especially public spaces *(i.e. street spaces, passages, buildings, parks, greenery areas, sports facilities)* is one of the basic elements for safety quality analyses of urban areas *(Blaha, 2013,11)*. In this viewpoint, the narrow, unsafe, rarely used, and oppressive underpasses and roads were reconsidered on students' designs *(Figure 4–8)*.

"Connections between spaces" urban design principle is another most emphasized urban problems. Students mostly refer to the "barrier effect" that the railway creates in Pendik and the division avoiding integration between necessary functions around the HSR station. Inadequate passage axis and "the feeling of being left misguided" are mentioned both in the exemplary design proposals and reports *(Figure 5, 7)*. Parallel to the findings, "cul-de-sac" dilemma between privacy, safety and interconnectedness are also present in the literature *(Cozens & Hillier, 2008)*.

"Pedestrian/ Cyclist friendly usage" and "car movement" urban design principles are inter-connected criteria regarding Pendik urban tissue. Although large-scale transportation investments such as HSRs provide economic, social and administrative integration by facilitating transit transportation between the regions, the problematic of the relationship of HSRs with urban space is constructed on the axis of pedestrian movements and socialization in urban design scale. In the related literature, transportation and transportation-oriented issues such as transportation facilities and vehicle parks are mentioned however, there is evidence in the findings that the principles such as usage and user diversity, human scale, pedestrian and cyclist friendliness, built environment integration, the quality of the built environment are dominant and the HSR station as an important physical component of the city is considered as an urban focus *(Jacobson & Forsyth, 2008)*. By the architecture candidates who are at the beginning of their education, the requirements list and layout proposals for the Pendik HSR station and its surrounding area were considered by designing pedestrian movements in a continuous and comfortable manner as also exhibited in the proposals by increasing opportunities for socialization during this movement, by integrating the HSR station with the urban texture and "existing", and by solving problems in urban fabric *(Figure 4–8)*. It is possible to state that these weighted issues are found to be parallel to the literature *(Elshater & Ibraheem, 2014, 539)*.

In terms of "variety and complexity" urban design principle, fewer statements could be traced and coded regarding the data. Most emphasized issues are linked with lack of green areas around the HSR. The dense and alike urban pattern is current in the study area. This finding puts forward coherent issues with the literature *(Trip, 2008, 385)*. "Variety" regarding colour, tissue, or material is not that much presented in central Pendik where HSR station is located. Nevertheless "variety of use*(r)*s" principle received a very high rate of "variety of users are mostly present" comments that the facilities cannot meet the demands. These demands are mentioned in various means. For instance, public spaces, common study/working areas, libraries, cafes, and facilities serving for education are mentioned regarding the social facilities. On the other hand, poor urban furniture, other equipment serving for the public use and contemporary infrastructure are evident in the data *(Figure 4–8)*. This issue is also mentioned in the design guidelines searched for this study and mentioned in the theoretical part of the paper.

"Integration of the hub to the current urban pattern" *(mostly about hub building design)* design principal findings reveal "polarisation effect" of the HSR station and integration is put forward as a "must" in the data. This is also mentioned in the HSR literature *(Sanfeliu & Ganges, 2016; Shi, 2016)*. Both the design proposals exhibited in this study and others developed in the studio period presented a certain level of struggle in order to connect divided parts of Pendik via a transportation axis. In some projects, this

was traced as the main promenade, a long canopy, or a core study/workstation.

The data reflect the second-year undergraduate architecture students' innate approach to the urban space design problem. The findings discussed here were gathered via content analysis methodology. Thus, a comparison between the intuitive perceptions of young designers and the urban design literature could be made. The design proposals presented above and the statements by young designers show that urban design issues are a part of the daily living praxis in the city. Certainly, literature formulates the urban design knowledge in a systematic order. Nevertheless, this knowledge is gathered from the real-life experiences in the urban setting. It can be inferred that innate or experienced, any person tackling with the urban matters finds out approximate symptoms. Only, urban literature and academic knowledge makes a thorough and systematic understanding of the site – the daily living venue as Tschumi emphasizes *(1996)*. Even though the findings superpose with the literature, it is difficult for the young designer to fully address the problem. In most cases, students' such findings are blur impressions. Therefore, the studio experience urges for academic readings, dialogue between the tutors and the students and lectures delivered by the professionals. It can be suggested that only analysis on the site is not enough but demands a wider perspective.

Conclusion

Noted that architecture education is a long run and continues in the professional life of an architect; the second year in the study is a relatively early phase. The architectural design studio that contains experiment and inquiry on the basis other than learning "commonly accepted knowledge" should target authenticity. The tendency is not to share architectural knowledge by narration but to seek for a platform of probation and discussion. Of course, every urban setting is unique and "by the book definitions" do not always fully define the problems of that particular tissue.

Cases show that new HSR stations in city center have urban change and transformation tendencies. Various design challenges in urban context make these areas suitable candidates for architectural design students. In this context, Pendik with different design inputs such as the coast, transportation modes, mixed building types, user groups, a variety of functions is an area that allows detailed urban analysis. On the other hand, this subject is a current issue for İstanbul/Turkey and needs to be studied in urban design perspective. Therefore, the matter of the architectural design studio was determined as the HSR station and its surroundings. The pedagogical work about this issue reveals that the initial point for young designers is mostly intuitive. The findings that the young designer explores by herself/himself are reflected in the work created. The main point of this study was to highlight the intersections and breakages between the solid urban design literature guidelines and the students' intuitive findings. This paper displays the role of the architectural design studio which places itself between the academic knowledge coming from a large pile of literature and the experiences of an "inexperienced" designer gained from the field. This interface is a rather free and "open to discussion" venue where students have the chance to create their own knowledge about a particular urban setting. The study puts forward that even though some innate findings cannot be put in an academic frame, most data support the urban design literature. The main criteria mentioned above widely tackled by the students. These are the design proposals which mostly reflect the responses coherent to the urban design guidelines.

It should be stressed that the findings in this paper cannot be generalized due to the nature of the content analysis method. However, the impact of the HSR station application to a present transportation route seems almost similar in many cases, considering the literature. Unless a design action is not initiated at the beginning of the HSR implication; the surrounding setting, current functions, and the activ-

ities become inadequate. Thus, the HSR implications should be considered as wide transformations at the mentioned locations and should be programmed coherently.

The study puts forward a new perspective towards the decisions of the transportation hub and its surroundings in the experimental design level. Even though there are a vast number of studies on the local transportation decisions and their reflections on the built environment, this study emphasizes the findings and sensitivities of the young designers on the issue. In this context, content analysis is a useful technique to determine the connection between the students' approaches on the project site and their design proposals. In further studies, the Pendik HSR Station and the coastline link case can be studied at different levels of architectural education and the results can be compared with respect to the changing/unchanging intuitive design decisions. Moreover, other HSR Station implications in Turkey can be studied and further cases can be explored. And it is thought that this methodology also can be used to identify field-specific key issues in different project sites by contacting design professionals and users of the site.

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