Integration of Intermodal Transport Stations as a Tool for Urban Renewal in the City of Baghdad

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Abstract: The recent population growth, urban expansion, and high standard of living witnessed by most cities, including Baghdad, have made the provision of integrated urban transport systems a major challenge for those in the transport sector. To address the central issues related to urban renewal, growth and land use in cities, and the importance and impact of integrated intermodal transport systems on the design and urban renewal of cities, it is thus important to investigate the role of integrated stations in achieving the urban development and renewal of the city and to determine the most important comprehensive indicators in the field of integration of such systems in order to develop tools for urban renewal and growth.

This paper offers an analytical and evaluation method to assess the potential for redevelopment of major intermodal transport stations and the opportunities for space and urban renewal that might follow such redevelopment. The methodology was implemented in the redevelopment of Berlin Central Station and the comprehensive plan for road transport for the Emirate of Abu Dhabi 2030, and may thus offer a basis for assessing and evaluating the city of Baghdad in terms of transport and developing future plans in this area. However, it required the development of correct scientific frameworks for the integration of multi-modal urban transport stations (systems) as development tools and attractions, and to have a positive impact for the city. This led to the research problem of investigating the "lack of sufficient perception of the impact of the complementarity of intermodal transport stations and their role as a tool in the urban renewal of the citybased on the assumption that integrated intermodal transport stations are large and multi-functional facilities, consisting of several integrated smaller systems, operating in a single overarching system such as a city at a scale that allows them to act as a tool in the process of urban renewal by promoting positive interaction with the surrounding environment.

Keywords: Transportation stations, intermodal transport, transportation systems integration, urban renewal, urban development.

1. Introduction
Transportation systems are major components of any city and may offer an effective indicator for the entirety of the city’s development and the quality of life there. It is also one of the most important ways of differentiating a given city from others across the world, as transportation is the engine of urban life and has supported the prosperity of cities throughout history, as suspension or irregularity of transport lead to weak or non-existent commerce, tourism, and industry.

Ease of transfer between various modes of public transport within dedicated stations can make a significant contribution to the mobility that may provide by the transport industry, encouraging the development of integrated transport station solutions. In the future, integrated transport should offer multiple ways to make public transport more enjoyable and exciting, highlighting the importance of promoting interchanges between different modes of transport as the main feature of modern transport stations.
The development of an integrated transport system requires the activation of intermodal transportation, promoting the optimum utilisation of time and resources while reducing costs to achieve competitiveness; this further requires a shift towards the use of informatics, and the provision of trained personnel with the necessary competence to develop, implement, and continuously improve the system. Transportation infrastructure is one of the dominant elements in both cities and open landscapes, with the ability to redefine the coordination of urban and natural sites; in particular, railways can be part of a "landscape plan" based on local cultural patterns where their development is achieved through general planning [1]

2. Integrated intermodal transport stations

2.1 General concept

Intermodal transport is the transportation of choice of the 21st century; the idea refers to the facilitation and encouragement of interaction between people, services, and various modes of transport based on "the concept of transporting passengers and goods on two or more different modes of transport, and it includes all parts of the process, including the exchange of information, the efficiency of linkage and coordination" [2]. Modern airport terminals, for example, have transformed into complexes for the interchange of transport modes, with easy movement between different modes of transport a priority. The complexity and diversity of land uses in modern airports and the growth of integration between these and other types of transport developed after the airports were linked more effectively with the nearby cities, allowing them to integrate their modes of transportation with the cities they serve [3] The integration of systems in such stations enhances the experience of travellers and the sense of familiarity with place by connecting travellers with the city on the one hand and various resources such as hotels, exhibitions, and business centres on the other; it also offers a transitional space, which is important for mental equilibrium [4].

2.2 Integration in transport

Integration in terms of transport stations refers to the integration of systems planning, design, and practical implementation to allow users to reach various destinations smoothly and easily without interruptions or unplanned stops. This helps create a harmonic relationship between systems, allowing them to work with each other in a smooth and homogeneous manner. An integrated transport scheme must, however, be part of a broader process of building beneficial partnerships between all levels of government, as an integrated transport system must be developed during the preparation stage, and each specialisation must be subject to the application of the principles and processes thus jointly established to reflect the area’s needs and priorities, and the aspirations of the local community in order to provide a sustainable transportation system [5]. An integrated transport system of this type includes the infrastructure network and a range of associated services; no mode of transport can work in isolation within the integrated network, and the combination of modes requires the provision of complementary services, as each person’s situation requires different types of trips. A combination of private and public transport options thus allows intermodal systems to provide opportunities to take advantage of strengths while avoiding weaknesses [6]. Integrated transport schemes also provide a means to assess the real impact of transportation applications on society, offering opportunities to deal with most issues arising on a larger scale. This means that integrated transport planning processes can improve local decisions in line with the broader goals of society to achieve the maximum possible benefits from transportation in terms of the economy environmental impact, and health and social development [5]. The procedural definition (integrity) of this study is the process followed to achieve integration between a multiple transport modes (systems) seeking to work together (aviation, railways, metro, buses, cars, bicycles, etc.) that may be linked according to specific levels and conditions in specific situations to complement each other’s requirements. Bachman highlighted three levels that govern complementary relationships between systems [7]:

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• **Physical integration**: where systems are compatible with each other, they may be linked in a variety of ways. Physical integration thus basically refers to the ways in which systems and components participate in space and the degree of harmony they have with each other within those positions. Physical integration in transport systems may refer to their interactions within a single space or within the system in general, or even to the interactions between one group of systems and another, as they correspond to and integrate with each other; at a minimum, they must not conflict with each other.

• **Visual integration**: visual systems of various building combine to create a formal image. This is the true embodiment of the general expressive idea of building, and the method by which components participate in the overall accumulated image is determined by laws of visual integration such as colour, size, shape, and location; these are common factors through which systems obtain their desired visual effect, and thus some complementarity in formal and expressive characteristics is necessary to develop visual integration.

• **Performance integration**: this is related to the common functions of systems. Where physical integration represents participation in space and visual integration represents participation in image creation, this represents participation in the functionality of the system [8].

2.3 **Transportation problems in Baghdad**
The ongoing urban expansion of the city of Baghdad and its heritage of incomplete transportation systems that have not accommodated these developments have led to delays in access, lack of development, and inadequate urban growth for the city. This requires serious consideration of appropriate solutions to address these challenges, and as integrated public transport has become a key part of the plans for developing sustainable transport across the world, the re-planning of integrated intermodal transport for the city of Baghdad has become an urgent necessity. The continuous increase in the number of cars in Baghdad has had a negative impact on the speed of vehicles across the city; cars currently remain the only means of transport for many people throughout the city due to the lack of appropriate and well-advertised public transport. Sustainable public transport means must be provided in order to make the use of cars a complementary option rather than the main means of transport, and Baghdad lacks joint coordination and thoughtful plans for an integrated transport strategy. In particular, private transportation systems operate completely separately from the available public transport systems, and there is no specialised committee responsible for transport management or related projects.

2.4 **Research Method**
The current research is based on a study of trends that can be read as models for contemporary cities, being characterised by complex dynamics manifesting as networks at different levels, including those of urban dynamics, such as the dynamics of functional change, urban renewal, interaction and social integration, and mobility and access. Despite the differences in problems between cities, the basic needs of contemporary societies are similar, including the need for transportation and mobility; thus, it is possible to benefit from urban solutions in other cities and to learn from their approaches and experiences in order to examine the possibility of applying such solutions in proportion to the local needs of Baghdad.

2.5 **Transit-oriented development, city planning and land use**
Transit-oriented development (TOD) offers a basis for sustainable planning, city revival, urban renewal, and pedestrian community revitalisation; TOD has thus spread rapidly in contemporary cities, as governments seek to create safe and comfortable public social spaces that inspire joy and pleasure. In particular, TOD emphasises providing more suitable places to live.

Public transport networks are thus essential elements in TOD that work to form sustainable urban areas; transport paths are thus the basic elements of modern urban planning, as these determine the spatial patterns of other activities [9]. TOD is a modern approach to urban areas that relies on developing a systematic network of self-support and effective interaction. When planning the city using public
transport networks, continuous development can be supported based on the quality of vibrant places, whether within neighbourhoods or at the regional level. TOD supports improved living options and urban transport by creating urban neighbourhoods that are within easy walking distance of integrated public transport stations that provide access to a wide range of services as well as lowering transportation costs [10].

2.6 Social inclusion and accessibility
Accessibility is a basic necessity to enable a full range of people to participate in the life of an effective society; access to job opportunities, services, and education are decisive factors in social inclusion, and thus transportation problems and issues with the location of services in a city can negatively affect social inclusion, preventing people from participating in public activities and hampering access to health care, food shopping, and other daily needs [5].

The essence of an integrated public transport system is to provide transportation for passengers from door to door and to thus make the use of public transport easier. Such systems must also take advantage of the characteristics of each mode of transport and be able to connect multiple sites to offer accessibility, however, as well as increasing the possibility of developing an ever-more effective network in the future [11].

Alongside the role played by transportation systems in encouraging social integration and economic activity in cities, they are also the paths that penetrate and link urban structures and determine the course of future urban development, forming a framework that defines the city. In terms of sustainability and its interpretation, Farr described sustainable urbanism simply in terms of “good infrastructure, high-performance buildings that are penetrated and penetrated by sustainable transport” [10].

2.7 Urban space quality (place making)
Urban space quality or place making in city configurations refers to making city spaces attractive for all residents; in particular, place making refers to those spatial design mechanisms focused on creating attractive public spaces throughout the urban environment. These are also important indicators of the integration of transportation with urban planning, as such places help meet residents’ needs and strengthen relationships and ties between individuals in society.

Gehl adopted an approach based on human requirements to help ensure appropriate urban design based on years of research into those aspects of public spaces that are of utmost importance to the human experience in terms of the specification of place; he thus developed a methodology of standards for measuring the quality of space as based on human experience. Much of this work is based on the hierarchy of human needs defined by Maslow [12].

3. Urban Renewal
3.1 Urban renewal strategies
Urban renewal reflects several different concepts according to the developers’ planning orientation, the nature of the problems addressed, and the prevailing ways of life in the relevant area. Formulae for developing new areas outside of cities are more prevalent than those for rebuilding the frayed areas within them, however, as it requires greater effort or deliberation to change existing urban environments through the coordinated adjustment of large scale city areas. To provide for the present and future requirements of urban life, such regeneration usually occurs in or near the city centre [13].

The urban environment is generally exposed to two types of change, the intentional, which is dependent on the knowledge foundations represented by policies of urban renewal, and the unintended, which occurs as a result of dynamic changes in the urban structure and urban fabric that are part of its continuous development.

Urban renewal represents “a change in the urban aspect of the city by means of which old structures and facilities that do not meet the present can be changed at a time when the city as a whole changes in response to economic pressure and social and urban change” [14]. However, cities differ from each other in their urban forms, as these are derived from the natural conditions and the historical and political events of those cities. As the spirit of a place includes its intangible values and distinctive character,
renewal is manifested by the development of unique characteristics of its urban form such as edges, paths, distinct nodes, and landmarks [15].

Strategies for urban renewal thus include

• Acknowledging the participation of society, with residents and service users playing a real role. Based on this, the community-based approach has emerged to challenge solutions based on market forces that have afflicted large urban areas in the past [16].
• Moving from "policies" that adopt specific principles and approaches to implementation to "strategies" that seek to achieve goals in a comprehensive manner through adopting a number of secondary policies.
• Dealing with problems in urban areas in a holistic manner and seeking the inclusion of urban environment variables, which requires the application of flexibility to achieve successful and appropriate solutions that accommodate all such variables.

Urban renewal deals with the urban structure of cities with poor urban status and a makes the attempt to advance and improve them in several ways. Urban renewal policies are classified into four main types [17]:

• Partial renewal,
• City improvement,
• Comprehensive renewal, and
• Expansion.

Urban renewal is now an integral part of national urban policies, which has led to the gradual implementation of the principles of sustainable development; in theory, this means slowing down urban sprawl, addressing the complex emergent urban dynamics of cities, and activating their economic, social, environmental and cultural functions.

4. Building a methodology for assessing the potential for urban renewal and transformation

4.1 Goals and strategies to achieve integration between intermodal stations and urban environments

Based on the idea of integration, some key goals of station integration can be identified. The first is mediation between transportation and urban needs, within the scope of the station, thus permitting effective urban development and infrastructure management and coordination between concerned actors. This goal is related to the scope of transportation between nodes and the guarantee of a seamless journey within a high quality space [18]. This requires a reduction in linking time and route complexity based on facilitating the interchange between the different modes of transport that meet at the transport node. This first goal is generally achievable thanks to efficient organisation of interchanges inside a station, which in turn requires good functionality and aesthetic options and smooth paths between the station and its surroundings [19].

The second goal relates to the role that a transport station can play in urban centrality and in suburban areas in terms of creating new expressive spaces; this means that such stations must become part of the city [20]. By developing multi-use environments and services in and around stations that can meet the needs of passengers and city users, the needs of local residents can also be supported [21].

Another goal in redeveloping transport stations is to enhance security measures to make stations more liveable. This involves promoting new forms of cooperation between local governments and transportation companies to increase the quality of the stations' environment, to solve any social problems that occur inside the station, and to reduce user insecurity through the correct design of spaces and official monitoring devices [22].

In order to achieve these goals and obtain a higher chance of success, appropriate measures and tools capable of managing transformation and urban development are required. In addition, effective partnerships between the public, private, and community sectors must be facilitated.
4.2 The evaluation grid

After examining the goals and procedures for establishing and developing intermodal stations, an evaluation network was built to support the potential of transformation and urban renewal. This tool allows the organisation of different strategies and provides a comprehensive qualitative assessment of the performance of renewal and transformation. This evaluation network is based on four strategies:

- The Creation of urban and semi-urban centralities (S1).
- Node statement development (S2).
- The promotion of urban security and social inclusion (S3).
- Examining the control and feasibility of the renewal and transformation process (S4).

The evaluation portion of the proposed methodology depends on a grid of the parameters described above and a scale of value scores (0: absent; 1: lacking; 2: existing; 3: excellent) assigned to each of those requirements. These value scores allow assessment of the quality of the measures adopted in terms of increasing the fulfilment each requirement, thus facilitating the evaluation of the implementation of each specific strategy, as shown in Table 1.

Table 1. Application of evaluation methodology

| Strategies | Policies | Requirements | Measures/actions | Scores |
|------------|----------|--------------|-----------------|--------|
| S1: Creation of urban and Semi-urban centralities | Functional integration between stations and the city (Physical integration) | Providing private and public services in order to increase the vitality of the area. | Design multi-use environments to contain congestion; Provide services and facilities that stations currently lack. | 0-3 |
| | Selection of balanced functions inside the stations (Performance integration) | Provide the right jobs and a mix of facilities for passengers and city residents. | High level of travel services and facilities (appropriate level of retail stores compared to node efficiency) | 0-3 |
| | Station identity and level of identification within the urban environment (Visual integration) | Designing the station as a typical urban place for passengers, city users, and residents. | High quality architecture without barriers; Promote local place identity | 0-3 |
| | Interchange efficiency (Performance Integration) | Smooth journeys inside the station while changing between different modes of transportation. | No interference between interchange paths (faster), walking paths (slower), and waiting areas; Effective signage and short distances between interchange nodes | 0-3 |
| S2: Node statement | Good integration of the station with the surrounding areas (Physical integration) | Integration between the station areas and city via beautiful paths. | High pedestrian access to the station; station areas and paths are designed as urban spaces. | 0-3 |
| S3: Promotion of urban security and social inclusion | Mixed modality (Performance integration) | Good presence of transport and direct connections to the station | Public bicycle and car parking facilities; Direct links with the airport and city centre (for external stations). CCTV equipment, security personnel, daytime retail presence, good design of the physical environment |
| --- | --- | --- | --- |
| Increasing passengers' sense of safety throughout the day (Visual integration) | Measures to allow travellers to feel at home | Participatory planning, event and festival promotion |
| Promoting social inclusion (Physical integration) | Social assistance staff and spaces inside the station | Counselling centres and an experimental urban security project. |
| Promoting multi-field planning approach (Performance integration) | Coordination between spatial and urban planning and coordination between general and sectoral planning | Greater coherence between strategic goals, implementation procedures, and urban development policies |
| S4: Control and feasibility of the renewal and transformation process | Promoting common development decisions with urban communities (Performance integration) | Achieving consensus and broad participation from stakeholders in the public and private sectors | Encouraging design / idea competitions; General advice |
| Increasing public spaces and facilities and supporting urban sustainability (Physical integration) | Striking a good balance between private and public assets during development | High negotiation skills for local government; A good balance between public value capture and incentives for private sector owners; Balanced investments |

4.3 Case Studies

4.3.1 Berlin Central station case study:

Berlin Hauptbahnhof is one of the largest interchange stations in Europe, connecting local railways to all major cities as well as to a number of neighbouring European countries. The new central station was established in the historical location of the former railway station in an area that is still developing. It was planned as a hub for transport across Berlin, as shown in Figure 1. It is the largest and most important station in the city, and it is housed within a multi-functional building; the station design thus
accommodates the rapid urban development of the city and traffic movement is of great importance for this intermodal interchange station, which is integrated with the metro network and bus and taxi stations. It has thus become of pivotal importance to the city’s structural development [23]. Achieving a balance between functionality and expressive beauty by transforming the urban landscape of the station and the general city environment has provided maximum flexibility for the various easy and attractive modes of transport, encouraging use of the station and the redevelopment and urban renewal of the surrounding area. The station is constructed on several floors, offering a clearly multifunctional area with secure commercial spaces for offices, restaurants and other logistical services [24].

![Figure 1: Berlin Central station. [1]](image)

**4.3.2 The comprehensive land transport plan for the Emirate of Abu Dhabi 2030 case study:**

The Abu Dhabi plan was developed to provide an effective transportation system to contribute to the acceleration of urban and economic growth, to improve the quality of life in the city, and to achieve an integrated intermodal transportation system. Recent figures indicate that the population of Abu Dhabi is likely to double three times by 2030, and the rate of trips should increase commensurately, by up to five times current levels in that period.

The plan is based around the central area, with less dense residential sectors and the presence of limited markets to provide for the needs of the residents. Options for transportation by cars will be limited to encourage the adoption of public transport (metro, light rail, buses, and ferries), which will be promoted and developed as ideal solutions for travellers. The centre contains government headquarters, academic institutions, technological industries, and the medical sector, so street design and planning must support public transportation options to ensure accessibility.

The plan intends develop transportation by creating an integrated intermodal system with a high degree of reliability in which each separate mode of transport operates with high efficiency, as well as being effectively integrated with other modes of transport based on the adoption of modern and advanced technology and standardized traffic signs. Travelers should thus be able to realise that they are within
reach of a bus, tram, or metro service at all points, increasing ease of use and efficiency as much as possible

Figure 2: The comprehensive land transport plan for the Emirate of Abu Dhabi 2030. [25]

4.4 Applying the evaluation methodology to Berlin Central station and the comprehensive land transport plan for the Emirate of Abu Dhabi 2030

The evaluation methodology was applied to the two case studies outlined, with the resulting analysis used for validation of the selected development measures. The redevelopment of the old Berlin Central Station and the comprehensive transport plan in Abu Dhabi both represent relationships between the transportation system and the city and offer a brief overview of some of the many different patterns of urban development available. Berlin Station is a historic transport node in a central location, which has been transformed into a high-density intermodal transport node, creating a massive urban transformation for the entire city. On the urban scale, it also reflects a willingness to develop international relationships due to its acknowledgement of the important roads, railways and transportation lines that serve it. The comprehensive transportation plan in Abu Dhabi, also located in an urban area, reflects a wonderful opportunity to rethink the shape of surrounding areas affected by the phenomenon of urban sprawl by developing new physical and functional settings. It will provide high levels of transportation to meet increasing demand while maintaining high service levels as well as being sensitive to potential competition with neighbouring cities. More details are offered in Table 2.
Table 2. Assessment of the two case studies

| S1: Creation of urban and Semi-urban centralities | Berlin | Abu Dhabi |
|-------------------------------------------------|--------|----------|
| Functional integration between station and city (Physical integration) | 2      | 3        |
| Selection of the balanced function inside the station (Performance integration) | 2      | 1        |
| Station identity and level of identification within the urban environment (Visual integration) | 3      | 2        |
| Total (0-9) | 7      | 6        |

S2: Node statement

| | Berlin | Abu Dhabi |
|--------------------------------------|---------|-----------|
| Interchange Efficiency (Performance Integration) | 3      | 2        |
| Good integration of the station with the surrounding areas (Physical integration) | 2      | 1        |
| Mixed modality level (Performance integration) | 2      | 3        |
| Total (0-9) | 7      | 6        |

S3: Promotion of urban security and social inclusion

| | Berlin | Abu Dhabi |
|--------------------------------------|---------|-----------|
| Increasing passengers’ sense of safety throughout the day (Visual integration) | 3      | 2        |
| Creating a sense of belonging (Performance integration) | 1      | 1        |
| Promoting social inclusion (Physical integration) | 2      | 1        |
| Total (0-9) | 6      | 4        |

S4: Control and feasibility of the renewal and transformation process

| | Berlin | Abu Dhabi |
|--------------------------------------|---------|-----------|
| Promoting multi-field planning approach (Performance integration) | 2      | 3        |
| Promoting common development decisions with urban communities (Performance integration) | 2      | 3        |
| Increasing public spaces and facilities and urban sustainability (Physical integration) | 1      | 3        |
| Total (0-9) | 5      | 9        |

The results show that, with the application of comprehensive and systematic multi-use planning and design, intermodal and integrated transport stations can gradually become tools for the development of the region in which they are located, with the ability to develop and renew surrounding urban areas while achieving the multi-dimensional interconnection of urban space intensely linked to different types of infrastructure.
5. Conclusions

Mobility and transportation systems play a leading role in ensuring high levels of efficiency and liveability in urban systems. Intermodal transport networks are thus essential modern frameworks for ensuring accessibility and reducing pollution and traffic congestion, as well as providing opportunities for urban renewal. Intermodal transport stations play a strategic role in urban redevelopment, helping to provide urban systems and cities that are efficient and easy to live in. It is thus imperative to develop effective tools to simultaneously achieve transportation goals and urban renewal goals.

- Applying strategic planning criteria that permit the integration of the public transport systems with the built environment can help form effective urban areas that allow access to major life activities as well as enhancing the role of public transport within integrated systems in cities such as Baghdad. This can be achieved by adopting a design and planning policy that combines different modes of transport that must developed throughout the city of Baghdad, especially with regard to new growth areas; the adoption of a circular railway system as a basis for mobility throughout the city and its regional surroundings is recommended.
- Achieving an effective link between the different activities and intermodal transport stations allows the city scene to develop by expressing the continuity and growth of urban development. The purpose of urban renewal is to revive cities and preserve urban personality rather than limiting development, despite the need to contain sprawl.
- Integrated transport stations help offer solutions to urban mobility and thus ameliorate various urban design problems by setting standards that raise the level of the residential environment and provide better social services and infrastructure.

References

[1] Altaee A, 2015, "Integration of railway stations within intermodal transportation system", A thesis Master of Architecture: Baghdad University, P17.
[2] Muller G, (1999), Intermodal Freight Transportation (4th ed). Washington, D.C.: Eno Transportation Foundation and Intermodal Association of North America.
[3] Blow C, 2005,"Transport terminals and modal interchanges, planning and design", Architectural Press, UK, P190.
[4] Barker P, 1997,"Accessible transport systems dream or reality" London, UK & International press, p23.
[5] Eric L and Gary P, 2012 (Guidelines for preparation of integrated transport plans), Published by the Western Australian Planning Commission. pp8, 38, 73,44
[6] Van Nes R, 2002, (Design of Multi-modal Transport Networks – A Hierarchical Approach), PhD thesis de Technische Universitische Delft, The Netherlands, Published and distributed by: DUP Scien, p Vii.
[7] Bachman L, 2003, (Integrated Buildings the Systems Basis of Architecture), Published by John Wiley & Sons, Inc., Hoboken, New Jersey, p2.
[8] Michael Y, 2001 (Construction Technology for Tall Buildings), National University of Singapore, Singapore press, p7.
[9] Rodrigues J, Claude C and Brian S, 2009 (The Geography of Transport Systems), second edition, New York: Routledge, p
[10] Farr D. 2008. (Sustainable Urbanism): Urban Design with Nature. Social Conditions of Urban Design, TU Berlin, John Wiley&Sons, New Jersey, p64,42
[11] Yiu A. 2005. (An integrated public transport system: a case study of Hong Kong), A thesis Master of Arts in Transport Policy and Planning, University of Hong Kong, p8.
[12] Stuart R, and Richard B, 2017, *(Place Making, Value and the Public Realm)*, Member of the European Commission responsible for Environment / European Commission/ Directorate-General for the Environment CBRE INC, P6

[13] Grebler L, 1964 "Urban Renewal in European Countries--Its Emergence and Potential", Pennsylvania University Press, Philadelphia, p13

[14] Chapin F, 1965 "Urban Land Use Planning", University of Illinois Press, Okla, p309.

[15] AlKhafaji S, 2012 “The Characteristics of the Traditional Urban Configuration of Arab- Islamic Cities through Form and Moral Values” Published by *Journal of Engineering*, Baghdad university, **Vol.18, No.10** pp187-207.

[16] Roberts P, 2000 “The Evolution, Definition and Purpose of Urban Regeneration”; p 52

[17] Zetter R, 1982 "Techniques of Conservation", Oxford Polytechnic Working Paper, p60

[18] Bottino F. 2004. “ Rinnovo delle stazioni come occasione di riqualificazione urbana”. In: Boschi F, Pini D, editors. Stazioni ferroviarie e riqualificazione Urbana, Bologna: Compositor;., p. 8-120.

[19] Moretti A, Pucci P. 1995." Progetti di interconnessione. Urbanistica” p: 26-35

[20] Bajard M, Lamarre F. 2007. De la gare à la ville: Arep, une demarche de projet. Milano: Silvana Editorial.

[21] Green gauge 21. “High speed trains and the development and regeneration of cities”. London; 2006.

[22] Newman O. 1972. Defensible space. New York: Mc Millan;

[23] Nizich A, 2009 “Track--Bridge Interaction on High--Speed Railways”: Selected & Revised Papers, Taylor & Francis Group, London. P vii

[24] Gottenmoeller F, 2004. *Bridges cape: The Art of Designing Bridges*, John Wiley & Sons, Hoboken. P 271,273

[25] https://www.ecouncil.ae/Publications/surface_transport_master_plan_ar.pdf.