

The contrast of transit-oriented development, sustainable urban development and gentrification with a look at the cities of Karaj and Tehran

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Abstract

In urban planning, transit-oriented development is a type of urban development that maximizes the residential, commercial, and recreational spaces within a short walking distance of public transportation. The goal of transit-oriented development is to create a symbiotic relationship between dense urban areas and public transportation usage. One criticism leveled against transit-oriented development is that it leads to gentrification in low-income areas. In some cases, transit-oriented development has resulted in increased housing prices in previously affordable neighborhoods, causing residents with low or moderate incomes to be pushed further away from their workplaces. In this situation, transit-oriented development can adversely affect low-income neighborhoods. The increased awareness of the role of urban transportation has paved the way for achieving a clear political goal and has led to a shift from individual to public transportation choices. This study aims to draw the reader's attention to the negative impact of gentrification caused by this policy by providing evidence from the cities of Karaj and Tehran, urging policymakers and urban planners to consider the other aspect of this policy in urban planning and minimize the harm to low-income groups. The findings raise doubts about the assumption of gentrification resulting from transit-oriented development, questioning some methodological shortcomings in studies related to transit-oriented development.

Keyword:Sustainable Urban Development, Transit-oriented Development, Gentrification

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1-introduction

Sustainable Urban Development (SUD) encompasses three main elements: economic, social, and environmental. Urban policymakers aim to achieve SUD goals in urban planning. Sustainable development is a common objective in many urban development policies across different countries. Sustainable approaches strive for efficient use of scarce natural resources through sound economic practices while considering environmental and social factors. The philosophy of sustainability emphasizes the integration of economic, environmental, and social aspects in performance. Rapid population growth, inadequate service centers, and irregular distribution of services and suitable locations are major challenges in modern metropolises. A metropolis is typically defined as an urban area with a population exceeding 10 million people. The largeness of metropolises implies administrative, political, economic, social, and environmental challenges that require special attention from urban planners, architects, and engineers (Janoschka, 2019). The province of Tehran, as a metropolis with over 13 million people, faces numerous challenges in urban planning. Several studies have focused on analyzing the urban structure of Tehran city (Shirazi, 2013). Pollution (Mohammadiha, Malakooti, & Esfahanian, 2018). Housing Prices (Hosseini, Bahadori, & Charkhan, 2022). Infrastructure (Madanipour, 2006). Gentrification (Etaat & Dabiri, 2016). Migration to Big Cities (Shaker Ardekani, Akhgar, & Zabhi, 2014). Furthermore, one of the stressful factors for large cities like Tehran is the increasing housing prices every year. The housing crisis results in some people losing their homes while others become wealthier (Alexandri & Janoschka, 2018). The history of Tehran's planning indicates that in its early stages, new infrastructures were designed and developed by the government as part of its strategy for revitalization and growth management. The intense profit-driven development following World War II has led to a rapid urban population growth. The deteriorating fabric of the metropolis of Tehran, along with other areas within the city, has been experiencing a downward trend, recession, and decay for several years. This situation has resulted in economic, social, and environmental decline in the central areas of the city. Meanwhile, the original residents have been displaced by new immigrants, small workshops, and commercial warehouses. In Tehran, the revitalization of these areas has been carried out without comprehensive planning, and some of these areas have become the focus of speculators and land profiteers.

2-Lecture review

Transit-oriented development (TOD) is one of the most popular interventions for mitigating the impacts of transportation, making it a vital component of smart and sustainable growth. Urban planning based on compact growth patterns and transit-oriented designs around train stations, light rail, or metro stations is implemented. TOD aims to promote modal shift and reduce dependence on cars while increasing neighborhood livability. It also enhances healthy, safe, and comfortable environments, the quality and aesthetics of public spaces, and expands

social and economic opportunities. However, transit-oriented development can also potentially lead to gentrification and displacement of low-income groups. Some researchers and advocates have expressed concerns about the social and equitable costs of sustainability-oriented approaches (Rayle, 2015; Revington, 2015). The progress in transportation has reduced the daily travel costs within our city areas, leading people to move towards the outskirts and surrounding areas in search of a higher quality of life. A prominent manifestation of this trend is the emergence of dispersal or sprawl patterns. The dispersion patterns of urban settlements have imposed social costs such as increased traffic congestion, environmental degradation, and hindered spatial and social integration. To address this issue, since the 1990s, there has been a movement towards use patterns as a solution. These land use patterns involve development with higher density, mixed land uses, and pedestrian-friendly urban design. The strategy of smart growth, neo-urbanism, and transit-oriented development are among the approaches that emphasize the promotion of mixed-use development near transit centers. These strategies highlight the importance of enhancing compact development in proximity to transit hubs, aiming to create more sustainable and livable cities (Cervero, 1996). The idea of using transit-oriented development to reduce dependence on automobiles and promote sustainable transportation has received extensive support from planners in recent years. The most prominent policy measures in this regard include reducing demand for transportation by implementing restrictions on car usage through road pricing, parking control, and increasing the supply of transportation by constructing roads, investing in railways, and other transportation infrastructure.

2-1 The concept of sustainable urban development

Without a doubt, when examining the key characteristics of a country's development, attention to criteria such as demographic, social, economic, and cultural features is indispensable. Each of these characteristics is meaningless without components such as birth and death rates, life expectancy, urban and rural population percentages, housing conditions, social circumstances, access to healthcare facilities, and per capita income. However, in recent components, not all scholars agree. Some focus on human welfare (Tata & Schultz, 1988). They consider natural, economic, social, and political systems as comprehensive and all-encompassing conditions. Based on this, the concepts of sustainable development can be sought in the possession of common aspects, such as the aforementioned cases. In the early 1990s, specifically from the Rio Conference, the need to reconsider the global development process with a perspective of sustainable development was accepted; a development that addresses current needs while ensuring the ability of future generations to meet their own needs (WCED, 1987). Sustainable development addresses the confrontation of production, distribution, and consumption patterns that are incompatible with nature, leading to resource depletion and environmental degradation. It only approves a development process that improves the quality of human life within the capacity of supporting ecosystems. One of the fundamental infrastructures necessary for increasing the social welfare level of any country is the presence of efficient and safe transportation within that country. Today, transportation-related issues such as environmental pollution, congestion, accidents, etc., have made the provision of safe and efficient transportation one of the most important challenges for most developed and developing countries. The improvement of people's living standards, the increase in the value of time, and the problems associated with providing transportation

infrastructure such as high land prices, time-consuming implementation of transportation projects, and the increase in road fatalities have prompted policymakers to seek solutions to transportation challenges and address these problems through methods other than traditional approaches. In major cities like Tehran, environmental pollution and traffic congestion, like in most large cities around the world, are of great concern. Contemporary urban lifestyles and work patterns are increasingly dependent on mobility. At the same time, the negative impacts of mobility through transportation on nature and society are significantly increasing, leading to societal protests against this issue. Today, urban planners are faced with a difficult dilemma: how to reconcile the essential role of transportation in increasing the well-being and health of cities with its adverse environmental effects on nature and society. In addition to transportation, another important factor in cities is land use. In 1960, the urban population accounted for 34% of the world's total population, while in 2018, this urban population increased to 55%. This unprecedented growth trend continues in most developing countries, as peripheral urban areas become the most desirable regions for development. It is expected that by 2050, this ratio will increase to 68%, with nearly 90% of this increase occurring in Asia and Africa (Nation, 2018).

2-2 The concept of transit-oriented development

Peter Calthorpe developed the concept of Transit-Oriented Development (TOD) in the late 1980s. While others were promoting similar concepts and contributing to the design, TOD became a staple tool in modern urban planning when Calthorpe published the article "The Next American Metropolis" in 1993 (Calthorpe, 1993). Transit-Oriented Development (TOD) was generally defined as "a mixed-use community that encourages people to live and work in proximity to transportation services and reduces their dependence on driving." Calthorpe saw it as a neo-traditional guide to sustainability, going beyond its form-based definition and becoming a comprehensive theory of community design that promised to address numerous social issues. Calthorpe, being an advocate for environmental sustainability, developed TOD as a response to this development challenge. He also saw TOD as an easily understandable solution for regional growth. Additionally, TOD fulfilled the need for alternative revenue sources for transit agencies (Calthorpe, 1993). According to Calthorpe, Transit-Oriented Development (TOD) has environmental impacts and offers real alternatives to traffic congestion. TOD is envisioned as a central area with a mix of compact residential, commercial, administrative, and public uses, where retail and service shops are located in a commercial core with easy access to homes, within approximately 600 meters or a 10-minute walk from a public transportation station. The uses in the center are generally public, and offices are located in upper floors of buildings. A less dense range of uses surrounds the central core, extending to a distance of approximately 1600 meters. This area may include single-family homes within a range that encompasses parks, small schools, and light industries. Calthorpe's TOD concept includes four essential elements of a transit-oriented development unit: a mixed-use commercial-residential zone, public spaces, and surrounding areas. A study in China has shown that in a comparative analysis between a car-oriented city and a transit-oriented city, the amount of vehicle travel in transit-oriented cities has decreased compared to car-oriented cities (Chen, Wu, Chen, & Wang, 2017). The concept of transit-oriented development refers to a planning approach that promotes the formation of sustainable and well-designed communities, with a focus on transit stations. It involves a mix of residential, commercial, and retail uses, including affordable housing, shopping centers, offices, and other amenities, all located within a 10-minute walking distance from major

transportation corridors. The key features of transit-oriented development include seamless and efficient service delivery, high accessibility to transportation lines, mixed-use integration of residential, commercial, and retail activities in vibrant streets and public spaces designed to encourage walking and cycling. It aims to achieve high and medium densities within an 800-meter radius of transit stations and reduce reliance on private car parking. Transit-oriented development encompasses fundamental ideas for urban design, such as increasing density, mixed-use integration, providing efficient and high-quality mass transportation, and creating pedestrian-friendly environments. In general, it involves the integration of various land uses, including commercial and residential retail, such as different types of housing units at various price points, along with community facilities like childcare centers, schools, libraries, public services, and public parks. In the center of transit-oriented development, there is a transit station around which a dense development has formed, and as we move away from the center, this density gradually decreases. In transit-oriented development, the development is compact and highly dense, and the streets are designed based on an integrated network pattern. In summary, the most important outcome of transit-oriented development is a functional integration between land use and transportation, achieved through the creation of a dense and mixed-use community with walkability and access to transportation hubs. The main benefits of transit-oriented development include increased accessibility and mobility, reduced reliance on automobiles, balanced coordination of various land uses and transportation, reduced congestion and traffic, improved air quality, increased affordable housing, increased property values and housing options around major stations, and the creation of attractive and functional gathering places. The main challenges of transit-oriented development include the lack of balance between the demand for transit-oriented development and existing conditions, lack of consensus on its goals and outcomes, financial difficulties and high risks for developers and investors, community resistance to transit-oriented development, significant costs for providing initial public services, and conflicts with zoning regulations.

2-3 The concept of gentrification

Efforts by governments to revitalize and improve the urban fabric in blighted areas of cities have themselves led to the displacement of low-income and initial residents from these areas. Therefore, the renovations carried out, whether by the private sector (developers and landowners) or by the government, have ultimately resulted in the displacement of low-income households, replacing them with higher-income groups and shifting social classes in cities. This phenomenon is referred to as gentrification. Gentrification, meaning the replacement of low-income groups by residents with higher average incomes, is an unintended consequence and, in most cases, a series of activities aimed at improving housing, the residential environment, and changing the neighborhood units in various parts of a city, including central areas. These activities can be undertaken by the public sector through planned processes or as a result of uncontrolled activities by profit-seeking land and building speculators. Based on global experiences, particularly in most developed countries, addressing the problems of blighted areas in large cities primarily involves direct intervention policies by the public sector, both directly and through participation with people and residents of such neighborhoods. In direct intervention policies, the government focuses on urban revitalization, creating affordable housing units, and providing housing construction loans. In most developed countries, such activities, faced with urban decay and prior planning, have sometimes led to the emergence of gentrification and have received responses within the realm of planning.

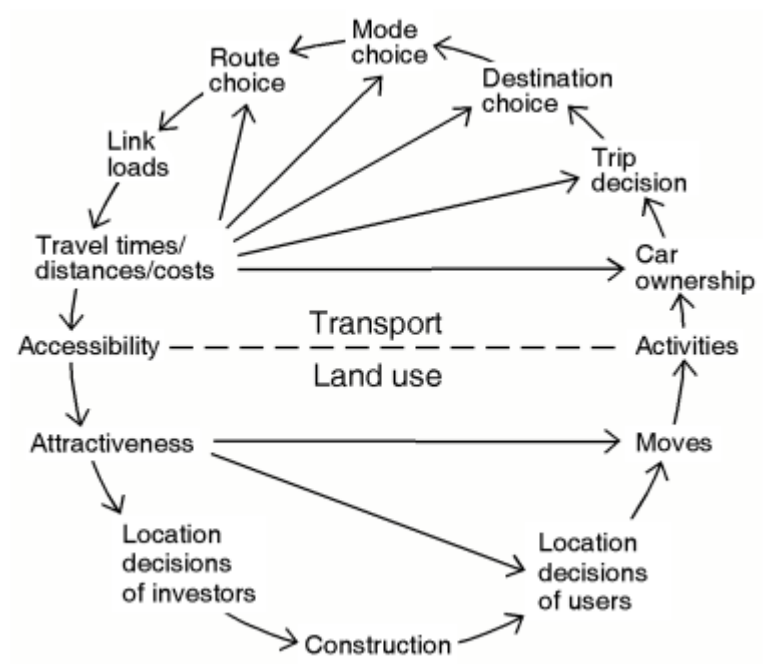
On the other hand, in some less developed countries, urban revitalization has occurred without prior planning and under the influence of land speculators, who have contributed to the emergence of gentrification through their unplanned revitalization operations. Iran is one of these countries where urban revitalization activities are mainly spontaneous, localized, and case-based, and their consequences have resulted in gentrification in some cases. For the purposes of this study, we define "gentrification" as a comprehensive process whereby the socio-economic composition of a neighborhood changes to a greater extent than neighboring areas within a relatively short period of time, as the share of wealthier and skilled workers among residents increases compared to the previous, poorer residents (Brown, 2016). The term "Gentrification" was introduced into the literature of urban and social issues in the context of European and North American cities approximately half a century ago. It represents one of the prominent concerns in these fields. The term "Gentrification," often with passing references, is also noticeable in urban and social texts in Iran and has brought about its own ambiguities. For example, some mistakenly consider it as part of the approaches to urban conservation (such as revitalization or renovation), while others, although recognizing its conceptual differences, are unaware of its alignment with Iranian urban and neighborhood conditions. In this study, in the first step, the authors aim to introduce the concept of gentrification and address the existing ambiguities surrounding this term in Iran. They delve into its history, common definitions, and mechanisms based on the experiences and narratives in developed urban societies. Subsequently, in order to understand the experiences of vulnerable groups affected by gentrification in an Iranian community, a native study has been conducted. This section of the study has been approached qualitatively. Urban planners in Iranian cities also encounter the phenomenon of "Gentrification," which is one of the byproducts of capital attraction and consumption in cities. Gentrification is not a formal collection of policies or a specific designed program or project for intervening in the urban fabric, such as "Regeneration." Rather, it serves as a warning sign of the outcome of a process that results in preparing neighborhoods for the settlement of the affluent and often disregards the pressures imposed on the poor. Since the term carries a connotation of irony from the time it was introduced by Ruth Glass, it is considered a concept with negative connotations in the field of urban issues. However, sometimes in the media, by officials, and even in academic environments in the country, due to insufficient familiarity with its history, dimensions, and embedded warning, it is promoted and advertised as a type of redevelopment project, even if the term "gentrification" is not used mistakenly. The inevitable consequence of such actions can be unintelligent and seemingly successful measures for improving the quality of public spaces, centers, and neighborhoods, while disregarding their consequences, leading to the displacement of vulnerable residents (especially tenants) and their replacement by wealthier strata (Carpenter & Lees, 1995; Hamnett, 2003).

The demographic changes of the past half-century in Iran have often led to the occupation of neighborhoods that have become dilapidated and have lower rental rates. After a while, in the case of neighborhood improvement, it is highly likely that a group of economically disadvantaged residents will leave these neighborhoods for poorer and more marginalized areas. This process of displacement, or more bluntly put, "eviction," in addition to increasing the risk of transferring poverty to the outskirts of cities and poorly organized neighborhoods, which already pose a significant threat to the crises of urban societies today, can disrupt the attachment to place and the origin of adverse consequences. A city that fails to create and maintain a sense of belonging among its citizens will gradually lose its functionality and will no longer deserve their interest and attachment. According to official statistics, a portion of the population in Iranian cities currently lives below the poverty line and is affected by factors

such as high inflation rates. There is a danger that urban policies and interventions may accelerate the power and scope of this phenomenon.

3-Examining the hypothesis of the relationship between transit-oriented development and gentrification

In recent years, researchers and policy advocates have argued that transit-oriented development interventions can lead to gentrification and displacement of low-income groups (Cappellano & Spisto, 2014; Jones & Ley, 2016; Kahn, 2007). Why does gentrification occur in transit-oriented areas or other transportation-rich neighborhoods? Transit-oriented initiatives involve (re)development processes that can change spatial patterns, urban visual settings, and accessibility levels. Housing redevelopment or revitalization can lead to a decrease in housing affordability and socially filter individuals based on their financial capacity to reside in a particular area, thus resulting in the displacement of people. The theory of place can predict such outcomes, and the neoclassical perspective contributes to the creation of a new economic geography in the neighborhood, which is observable in large cities. The complementary perspective to gentrification provides a useful framework for interpretation, known as the "consumption" perspective, which identifies individuals' preferences and the attractiveness of urban life as primary drivers. Urban regeneration and investment based on this idea encourage individuals seeking vibrant and livable neighborhoods. On the contrary, the "rent gap" theory derived from Marxist theory explains the capital investments and subsequent gentrification. The increase in land prices, which may occur due to the implementation of a public transportation project or the announcement of development plans, can start before the project's actual execution. For example, areas located along the planned route of a highway or a metro line may experience price increases prior to project implementation. This process typically occurs regardless of whether a transportation project is present or not (Revington, 2015). Another perspective is the neoliberal perspective, which highlights the significant role of public management in these transformations. Another perspective emphasizes the role of access development in explaining the reciprocal relationship between land use and urban transportation. The Staffordshire County Council's Planning Commission has presented the "Land-Use Transport Cycle" model, as shown in Figure 1, to illustrate this relationship.



Land use-transportation cycle(Wegener, 1995)

According to the figure, land use has a reciprocal and two-way relationship with the transportation network, as it generates a specific type of travel. Changes in land use lead to increased traffic, and increased traffic necessitates actions to improve the situation. Remedial measures to improve transportation conditions often result in increased land values surrounding the network. As the value of a particular land increases, the corresponding land use will also change. If the mentioned changes are minor, the system will accept them and reach a state of equilibrium. However, if the changes are significant, the system may become unstable and collapse, but eventually it will reach a new equilibrium. To ensure an optimal state of the emerged situation, guiding these changes and achieving desirable equilibrium falls under the responsibility of transportation managers and urban land use planners(Commission, 2003).

"The relationship between land use and transportation" constitutes a crucial component of models promoting more sustainable urban forms, described differently as compact cities, smart growth, and new urbanism. These models have a significant impact on informing global land use policies and are seen as a method to address the problems of car dependence and its associated social, economic, and environmental impacts. Integrated land use and transportation policies play a fundamental role in achieving sustainable planning outcomes. Today, some studies have recognized the shift from traditional planning approaches focused on mobility to planning for accessibility. Therefore, from this perspective, accessibility planning is considered a strategy to maximize environmental sustainability in urban areas(Ward, Dixon, Sadler, & Wilson, 2007).Therefore, transit-oriented development has been designed in a way that attracts investment and promotes private development. In this scenario, it naturally tends to lean towards capital-intensive activities and caters to individuals with higher incomes.

4- Examples of transit-oriented policy and gentrification in Tehran and Karaj

Furthermore, the neoclassical perspective leads to the creation of a new economic geography in neighborhoods. This can be observed in cities like Tehran and Karaj. For example, in a study conducted by Gharamanloo et al. in District 1 of Tehran, it was found that the housing prices in this area are high, and the residents are individuals with above-average urban incomes. The study utilized GIS maps and accessibility indices to demonstrate that the accessibility level in this area is very high (Ghahremanlou, Saffarzadeh, Naderan, & Javanshir, 2022). In another study on the effects of urban revitalization in the Navaab project in Tehran, Shaker et al. examined the process of urban revitalization at three levels: macro, meso, and micro. At the macro level, government and municipal participation and investment play a role in the initial stages of intervention. At the meso level, investors and organizations participate, and at the micro level, public participation becomes involved. Since urban revitalization is associated with increased accessibility, it is generally defined as an increase in access and improvement in quality of life (Shaker Ardekani et al., 2014). Another example in Tehran is the economic-geographic filtering in the Pikan neighborhood, which affects the working class, mostly consisting of employees or manual laborers for the automotive industry in western Tehran. In a study by Farahani and Land, it has been shown that the increase in prices in this neighborhood has led to the inability of this class to afford living there and has forced them to relocate (Farahani, 2013). Gentrification is one of the important issues in Iranian cities, and Karaj, as one of the rapidly growing cities, has also been affected by it. Gentrification refers to the change in land use and construction in areas that were previously used for other purposes. In this process, areas that were previously residential, commercial, or industrial are transformed into areas for administrative, commercial, or residential purposes. In Karaj, the process of gentrification is also ongoing, leading to a change in land use in certain areas of the city. Areas that were previously used for agricultural or residential purposes have been converted into commercial and administrative areas. Additionally, in some areas of Karaj, old and abandoned buildings have been renovated and developed.

From an advantages perspective, gentrification can lead to job creation and economic growth. The construction of certain buildings and commercial complexes can also contribute to the development and economic impact of the surrounding neighborhoods. However, at the same time, this process may result in the loss of green spaces, changes in the appearance of the area, and increased traffic in the region. Karaj, as a young metropolis that has been part of the Tehran metropolitan area for less than half a century, is among the cities facing the challenge of aging infrastructure (Faraji, Mirehei, & Shareghi, 2017). The social and cultural impacts of gentrification in residential areas are considered one of the most important influential factors on environmental and social sustainability and are being examined. Considering that gentrification is increasing in many residential areas in Iran, especially in the city of Karaj as one of the large and populous cities in the country, studying the social impacts in this process can be used as an important tool for preserving environmental and social sustainability. In the study by Mahdavi, the reason for the ineffectiveness of redevelopment policies is identified as the fact that urban planning is for the people, not with the people, which has resulted in significant workforce displacement to the outskirts of the city (Mahdavi, 2022).

5-counclution

After approximately three decades of support for a largely prevalent transit-oriented development approach to strengthen local communities and promote a shift in travel behavior that helps reduce fuel consumption, gentrification resulting from transportation has recently emerged as a concerning issue. The objective of this article is to examine empirical evidence of such trends in public transportation. This study, following the introduction of initial concepts and presenting studies conducted by both domestic and foreign researchers in Tehran and Karaj, has demonstrated that this development can harm low-income groups and neighborhoods. The intensification of recent price hikes, which have led to the displacement of socio-economic groups from major cities to the outskirts or neighboring cities, has been further accelerated alongside transit-oriented development in Iran. This article addresses one of the negative impacts of this policy, aiming to prevent city managers and planners from merely imitating the development of neoliberalism and adopting a neo-liberal perspective. Instead, they should consider social damages and provide indigenous solutions that account for the socio-economic characteristics of local residents. The study discusses that transit-oriented development is one of the strategies for urban development that promotes coexistence among densely populated urban residents and encourages the use of public transportation. However, one criticism against transit-oriented development is that it may lead to gentrification in low-income areas and contribute to an increase in housing prices in neighborhoods that were previously affordable. This can harm low-income neighborhoods and push residents with low to moderate incomes further away from their workplaces. To prevent such harm to low-income groups, city managers and policymakers must consider another aspect of transit-oriented development in urban planning. This article draws upon evidence from Karaj and Tehran to demonstrate that the hypothesis of gentrification resulting from transit development may cast doubt on research findings.

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