The neighborhood effects of new road infrastructure: Transformation of urban settlements and resident's socioeconomic characteristics in Danang, Vietnam

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ABSTRACT

This study documented the transformation of urban landscape and residents' socioeconomic conditions associated with the development of Nguyen Tat Thanh Road in Danang, Vietnam. The road was newly built along the coastal lines of Danang Bay in 2003, linking downtown Danang with the western part of the city. To better understand the relationship between infrastructure and urban change in developing countries, we conducted in-depth interviews of 400 property owners living in one of the following sites: 1) an area directly abutting on the new road, 2) an area abutting on an existing road but is away from the new road, and 3) an area inside an urban block which is disconnected from all types of vehicular roads. The results showed that road development took place along with a sizable number of urban changes over time, including housing types, building densities and uses, income level, commuting distances, and the type of occupation. The changes were more striking in the area abutting the new road where relatively well-off migrants settled down and capitalized on land rents by accommodating a variety of retail uses—compared to other areas away from the road. However, the area inside the block also experienced small-scaled, parcel-level adaptive reuse of the built environment by the original residents who maintained the livable environment of the residential neighborhood.

1. Introduction

A large body of research shows that capital investment in a city's major infrastructure may act as a catalyst for economic growth and social transformation (Aoyama & Kondo, 1993; Cervero, 2009; Cervero & Kang, 2011; Chandra & Thompson, 2000; Kelly, 1994; Kwon, Kim, & Jeon, 2014; Neuman & Smith, 2010; Padeiro, 2013). Among the studies, Polzin (1999) presented probably one of the most comprehensive list of the impacts of transportation infrastructure on neighborhood change. The study classified the impacts into three categories: the direct, the indirect, and the secondary impact. The direct impacts are those that lead to further urban development and investment in the built environment motivated by improved accessibility and service of an area. Newly deployed public transit, for instance, may enable a market for housing and office development on a site with shorter travel time and better amenities. The indirect impacts involve incremental, catalytic influences of new infrastructure that are mediated by policy change and community responses, such as reduced development costs, tax incentives, relaxed zoning regulations, and increased attractiveness of an area. The secondary impacts include more subtle but fundamental change in individuals' behavior and social perception about an area affected by new infrastructure. The results may manifest the agglomeration of a certain business or commercialization of a residential district associated with the aforementioned impacts.

As noted in previous studies, the effect of improved infrastructure on neighborhood change may have different influences according to the location. The impact of stream restoration and new streets with improved walkability on urban redevelopment in Seoul, for example, varied substantially depending on different locations (Kang & Cervero, 2009; Kwon et al., 2014). However, it is still unclear as to who are affected by these infrastructure-related
developments and to what extent urban spaces are transformed. Especially, empirical investigation of the change in urban space created and maintained by local communities in developing countries—where households in an informal settlement, unregistered workers, independent retail entrepreneurs, individual home builders, and migrants seeking a new source of income contribute substantially to the manner that infrastructure transforms a neighborhood’s urban landscape—was very limited as of today. Here, we attempted to fill the research gap by documenting the effects of new road construction in the city of Danang in Vietnam, focusing on its indirect and secondary impacts on the use and redevelopment of nearby urban space. Additionally, the research included changes in the built environment characteristics potentially associated with the development of the new road.

Danang is a good test bed for investigating the effects of infrastructure within the context of emerging property markets and rapid transformations in the urban spatial structure in developing countries. As the city is located in the central part of Vietnam and its geographical location serves as a gateway for Southeast Asian countries to South China Sea, Danang has become the gate of the new East-West Economic Corridor (EWEC) project which runs across the Indochina peninsula connecting Myanmar, Thailand, Laos, and Vietnam. Whereas a socio-economic condition under a very limited budget for the expansion of urban infrastructure, the development of large-scaled, inter-regional road provides unique opportunities for enhancing the vehicular access to and from the city and greatly improving the living environment of the urban communities.

From a historical perspective, the city emerged as one of the major urban places in Indochina around the time French troops were stationed there in 1858. Under the French influence, modern infrastructure came to be engraved on the surface of the city around the late nineteenth and the early twentieth century. For instance, a gridiron layout was formed in the city’s urban districts like Thach Thang and Phuoc Ninh during the period, which was later linked with the city’s hinterland through a railway line. The Danang Airport was constructed under the French colonial rule in the 1930s and was used by the French Air Force during the Indochina War (1945–54) and later by the United States during the Vietnam War (1959–1975). After the establishment of the Socialist Republic of Vietnam in 1976, Danang experienced many changes. Among them, the economic reform of 1986—called Doi Moi—had a substantial impact on the growth of the city. With the enactment of the Law on Foreign Investment in the late 1980s and the Law on Private Enterprises in the 1990s, the city emerged as the largest city in the country’s central region, which is comparable to Hai Phong and Can Tho. Additionally, the city’s urbanized territory has increased substantially over the years, where urban areas increased from 6.5% of the city’s total area in 1975 to 11.3% in 2003, and then to 17.9% in 2009 (Linh, Erasmi, & Kappas, 2012).

The physical development of the urban area was followed by large-scale expansion of road infrastructure. For instance, Nguyen Tat Thanh Road was one of the major public investments in the city. The four-lane road with a width of 40 m was constructed along the Danang Bay, connecting downtown area and Danang Port with the city’s hinterland through a railway line. The Danang Airport was constructed under the French colonial rule in the 1930s and used by the French Air Force during the Indochina War (1945–54) and later by the United States during the Vietnam War (1959–1975). After the establishment of the Socialist Republic of Vietnam in 1976, Danang experienced many changes. Among them, the economic reform of 1986—called Doi Moi—had a substantial impact on the growth of the city. With the enactment of the Law on Foreign Investment in the late 1980s and the Law on Private Enterprises in the 1990s, the city emerged as the largest city in the country’s central region, which is comparable to Hai Phong and Can Tho. Additionally, the city’s urbanized territory has increased substantially over the years, where urban areas increased from 6.5% of the city’s total area in 1975 to 11.3% in 2003, and then to 17.9% in 2009 (Linh, Erasmi, & Kappas, 2012).

The physical development of the urban area was followed by large-scale expansion of road infrastructure. For instance, Nguyen Tat Thanh Road was one of the major public investments in the city. The four-lane road with a width of 40 m was constructed along the Danang Bay, connecting downtown area and Danang Port with other regions to the west. More broadly, the road is part of the extensive East-West Economic Corridor (EWEC). The project was financed by Asian Development Bank and Japan Bank for International Cooperation, among others. Official construction of the road began in early 2000 and the road opened in March 2003 (Fig. 1). In terms of building form, a large number of tube houses—a narrow, street-facing multi-floor house that is called Nhà ống in Vietnamese or ‘neo-tube house’ in contemporary terms—have been developed along the road (Fig. 2). The prevalence of the tube houses along Nguyen Tat Thanh Road was partly due to the local government’s planning strategy balancing between the preference of the inhabitants and the city’s limited budget. Publicly acquired lands were subdivided into small, linear parcels along a newly-built road and then sold to the people who either invested in a single parcel with a minimum area of 100 m² or multiple parcels according to the investor’s financial capability.

With the development of the road, the city came to experience a heterogeneous mix of original residents, newly migrating rural populations, and urban populations from nearby cities and districts. Parcel-level redevelopment and renovation activities took place frequently by the communities, along with remarkable occupational change of the residents and emerging commercial ventures in response to the catalytic effects of road infrastructure. However, this change should not be merely attributed to improved accessibility enabled by new transport infrastructure. Although Danang does not have a city-wide mass transit system, the average commuting time was reported to be no more than 15 min, according to World Bank (2011). The exceptionally short travel time is due probably to the widespread use of motorbikes in the city and a high degree of job-housing and retail-housing balance embedded in the urban structure. Therefore, the presence of a new road may involve more fundamental socioeconomic transformation, such as community restructuring and cross-area migration, beyond the immediate impact of reduced travel time.

Against this backdrop of developing countries, this research posed the following hypotheses. First, the development of a major transport corridor, such as Nguyen Tat Thanh Road in Danang, seemed to have attracted an influx of new communities from outside into the nearby area. The migrants, who are likely to be risk-taking entrepreneurs, might have played a major role in the redevelopment of urban space in the neighborhood. Second, an area away from the new road is likely to experience minimal change in the built environment compared to an area abutting on the new road. The inner part of the blocks, for example, is likely to accommodate far fewer number of migrants because little policy incentive or zoning deregulation was introduced to the area with the opening of the new road. Additionally, the original residents remaining in the inner-part of the block might be less willing to leverage the opportunities associated with the road. In the following section, description of the study area and research methods will be presented.

1 The economic reform implemented in Vietnam since 1986 is known as “Doi Moi.” One of the fundamental strategies of Doi Moi was to motivate foreign investment in the country toward the creation of a socialist-oriented market economy. With the rapid growth of urban economy, intensive population migration took place in major cities like Hanoi in the northern part of the country and Ho Chi Minh City to the south. The city of Danang was recognized as the main city in the central region of the country in the late 1990s and was elevated to a municipal city status (Tran, Quertamp Nguyen, Miras, Vinh, & Truong, 2012).

2 The tube house is a type of mixed-use residential building with a very narrow width and a depth of 20–60 m. A traditional-type tube house in Vietnam dates back to the sixteenth century, according to the study by Kien (2008), and the neo-tube house was increasingly built during the post-1980s. Both types share some similarities: each house faces a street and the owner(s) use the ground floor of the house for shops or for renting to other retailers. The residents often live on the upper floors of the building. But there are some differences. A traditional tube house is normally 1–2 stories high and is built on a parcel with a size of approximately 3.5 m × 35 m. Construction materials of a traditional tube house include ceramic roof tiles, wood beams, brick walls, and plaster. A neo-tube house is built to 3–5 floors on a parcel with a size of approximately 4–5 m × 20–40 m. Reinforced concrete with bearing frames form the major structure and building materials include brick walls and plaster.
2. Research methods

The study empirically investigated a neighborhood called Thanh Khe District in Danang as shown in Fig. 1. Here, field surveys and in-depth interviews were conducted, which allowed a closer understanding on how the new road construction impacted the immediate neighborhood, its community lives, and the built environment. The study area was subdivided into three areas for survey purposes. First, Group A was an area directly abutting on Nguyen Tat Thanh Road to the north, including Ton That Dam, Ha Khe, and Yen Khe. This group had the largest proportion of migrants from other districts of Danang. Second, Group B was a local community center adjacent to Tran Cao Van Road with a width of 10 m but was away from Nguyen Tat Thanh Road. The presence of Tran Cao Van Road dates back to the early nineteenth century, forming one of the earliest east-west transport corridors in the city and is now sprinkled with a variety of retail shops. Third, Group C was an area that was not directly connected to any kind of vehicular roads and was located in the landlocked site. The area had the least number of migrants compared to Groups B and C. The above sites had no monumental public space, like a large public park or an urban square (Fig. 3).
A preliminary field survey was conducted between February 25 and March 5, 2014 by the authors, assisted by Nguyen Thi Ngoc Ly (an instructor at Danang University Department of Tourism Management) and her colleague Nguyen Thi Xuan Huong (a translator during interviews). Then, more thorough investigation took place between July 10 and 20, 2014. During the survey, in-depth interviews with more than 600 people were conducted in the study area. Then, we chose 400 interviewees who owned at least one property within Groups A, B, or C. Among the interviewees, 217 people were original residents who owned and continued to live in the study area. The rest, 183 people, were migrants from other districts in Danang or inter-city migrants from other provinces or cities who moved to the study area for various reasons—seeking a new job, running a real estate venture, managing a new hotel, or educating their children in a private institution after the development of Nguyen Tat Thanh Road in 2003. The interview was assisted by eight students from Danang University Department of Tourism Management.

The survey questionnaires involving pre-2003 and post-2003 socioeconomic conditions and the built environment characteristics were shown in Table 1. The survey included the status of property ownership, occupation, personal/household income, the location of jobs, the mode of transportation and time for commuting, the source of income and the type of business/employment. Additionally, information on the type of buildings they owned, its location, and different uses by floors were also collected. The pre-2003 and post-2003 questionnaires were the same except for: i) physical change of the buildings like renovation and partial redevelopment, and ii) change in the property value after 2003, which applied only to the post-2003 survey. In the last page of the survey, participants' personal information like gender, age, education, family size, birthplace, home address, and the location of an interview site were recorded. Since the pre-2003 survey was largely based on the memories of the interviewees, some incorrect information could have been reported. Additionally, some interviewees were reluctant to reveal their income during the

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survey. When the interviewers asked to document their income levels in the years of 2002 and 2014, for example, only 288 responses out of a total of 400 interviewees were acquired. Despite the limitation, the authors believe that no major misrepresentation was reported in the survey because a group of trained local students conducted face-to-face interviews with the property owners and spent more than one hour per person to verify the quality of the responses. Additionally, survey samples with uncertain response were discarded. Then, the survey results were first reviewed after being pooled into a complete dataset and then were examined separately by the groups of A, B, and C.

3. Results

3.1. Widespread development of tube houses and increases in the rentable space

The study area has experienced a substantial change in the built environment characteristics over the years. Generally, the heights and the footprints of the buildings became greater since the opening of Nguyen Tat Thanh Road. Although super-sized development rarely occurred, the average number of total building floors increased—at least moderately—from 1.5 floors prior to 2003 to 1.9 floors in 2014 [Fig. 4]. The difference became more significant when the interviewees were divided into original residents and newly-migrated populations. Over the years, the average number of total building floors owned by original residents increased by 0.2 floors, whereas migrants reported an increase of 0.7 floors in 2014 compared to the buildings that they owned before 2003. This might be explained by the high proportion of migrants who decided to build a multi-story, mixed-use building in the study area after relocation. In Danang, demolished houses and cut-off parcels associated with road development were acquired by the local government. Displaced households were compensated from a public funding source established by the People’s Committee in the late 1990s.

Then, after the road development was completed, acquired land was sold to new people through public auction. Within the study area, a large number of subdivided parcels were acquired by non-original residents, who then later developed a number of mid-rise buildings. For instance, by 2014, about 9.8% of the migrants came to own three-story buildings and another 6.0% owned four-story buildings in the area. Although the majority of migrants still lived in one to two-story buildings, this was notably different when compared to the original residents group. Nearly 60% of original residents lived in a single-floor residence, and those who lived in buildings higher than three-story only accounted for 2.3%.

Among the multi-story buildings occupied or built by migrants, the tube house comprised the most typical architectural type in the study area. The study area, where tube houses already formed a large part of the built environment by the early 2000s, was characterized with a greater number of tube houses afterwards. Before 2003, 31.8% (n = 127) of the total interviewees owned and lived in a tube house. The rate increased by 12.2% in 2014, amounting to a total of 44% (n = 176; Fig. 5). The percentage of the migrants’ tube house ownership was far higher than original residents. For instance, about 35.5% of the migrants (n = 65) used to live in a tube house before 2003; this increased to 56.2% (n = 103) in 2014. This largely reflected the pattern of housing choice among the people who recently migrated into the study area. Compared to a less-convertible, single-use traditional house, contemporary tube house could host a variety of retail and amenity uses. Each floor of a typical tube house accommodated different uses, often decorated with unique materials and personal fixtures flavored with individual self-expression. At an urban scale, the area’s urban blocks were filled with elongated, linearly layered parcels defined by major roads. This attracted a large number of in-migrants who hoped to build their own tube houses. The parcels, if pedestrian connectivity was greatly improved and land purchase became available in an official market, provided a highly desirable site for the development of contemporary tube houses. The following interview supported this:

Many people want to build or buy a tube house in Danang if they can afford to. I am one of them. I originally lived in an old, non-tube house building. I was born in a rural area. (After migrating to the city), I worked hard as a carpenter to save money. Quite recently, I could own a self-built tube house in the area ... Although the first floor of my house is a family living room, I would have rented it out or used it as my own workspace if my house abutted on a road exposed to many passers-by.

An interview with ○ ○ ○ (46 years old) on March 4, 2014

The development of tube houses has occurred intensively in the area along with the dramatic change in the building uses over the years. Before 2003, the neighborhood remained a residential district with serene living environment for a rather closed community. About 66.5% of the total interviewees (n = 266) said that they used to own a building with residential units only. Whereas some neighborhood retails were located along the perimeter of the blocks, no more than 1% of the interviewees owned a retail or commercial-only building in the area. However, the characteristics have changed substantially over the last ten years. For example, the percentage of the buildings used only for residential purposes decreased from 66.5% to 39.5% (n = 158). On the other hand, the percentage of mixed-use buildings increased from 32.5% (n = 130) to 51.3% (n = 205), and that of commercial-only buildings also increased from 1.0% (n = 4) to 9.3% (n = 37; Fig. 6). In other words, the percentage of the buildings with one or more floors of a non-residential use—such as a hotel, a noodle shop, a pub, a vegetable market, and a karaoke—has nearly doubled from 33.5% to 60.5% over the years. Again, the change was largely driven by the migrants who sought to expand their existing retail network or to test a new type of business through voluntary occupational change. About 72.1% of the migrants owned a building with commercial-only or mixed-use features in 2014, which is a significant increase from 23%
before 2003. Additionally, 33 out of 37 commercial-only buildings in the study area were owned and managed by migrants in 2014. For example, the owner of a six-story hotel at 21 Ton That Dam Road used to work for a travel agent in Hai Chau District before 2003. After being dissatisfied with his job, he bought a site in the study area—which was previously occupied by a residential property adjacent to Nguyen Tat Thanh Road—through public auction. He then built a hotel with twelve rooms on the first five floors of the building and placed his own residence on the top floor.

One of the most immediate impacts of the spread of mixed-use tube houses was capital accumulation through investment in the built environment. On average, the annual personal income had increased from 3964 USD to 7341 USD (by 85.2%) and the annual household income had increased from 8625 USD to 13,083 USD (by 51.7%; Fig. 7). This was largely due to the rise of the property owners’ monthly income generated from increased rentable floor areas. Especially, the upsurge of the income was remarkable among migrants. Between 2002 and 2014, for example, the original residents’ personal income increased from 1875 USD to 2767 USD on average, which was relatively modest compared to the doubling of migrants’ income from 6807 USD to 13,564 USD. The manager of a hotel at 417 Nguyen Tat Thanh Road, for example, used to own three buildings and a restaurant in Hai Chau District in the early 2000s. His annual household income was no more than 5000 USD. In response to the development of Nguyen Tat Thanh Road, he speculated on the chance of buying two parcels in the area and merged them into one to build a mid-sized hotel with a restaurant. Although the site was not directly connected to the new road, he predicted that demand for tourism and dining in the nearby area would heighten. After the completion of the hotel in 2005, nearly full occupancy was recorded. His annual income soared by ten times at about 50,000 USD in 2014. However, such a dramatic increase in the income level of some migrants was a source of dissatisfaction among the Groups B and C interviewees. For instance, a fishermen who was an original resident in Group C felt strong dissatisfaction about new developments largely driven by the migrants in Group A because their close acquaintances lost their jobs and left their hometown due to the development. Another original resident born in Thanh Khe District had a negative impression about the opening of Nguyen Tat Thanh Road.

With the development of a new road, the overall living standard of the community has improved. However, I think most of the economic benefit from road development belongs to the already wealthy owners of the land directly adjoining Nguyen Tat Thanh

![Fig. 5. Change in building type of the study area.](image)

![Fig. 6. Change in building use of the study area.](image)
Road. The new road did not contribute to an increase in my and other retailers’ business profit near Tran Cao Van Road. Or worse. Competition became much more intense as similar types of business began to mushroom in the nearby area. I hope that Tran Cao Van Road is also widened and the nearby land acquired by the People’s Committee and then resold to the original landlords after reasonably subdivided. Then I can build a new, large-sized building.

- Excerpt from an interview with ○ ○ ○ (47 years old) on March 5, 2014

3.2. Proximity effects of road infrastructure on the built environment, uses, and people

The research further investigated changes in the built environment and building uses by proximity to Nguyen Tat Thanh Road. Group A represented the nearest area from the road, followed by Group B and Group C. The heights of the built environment—measured by the average number of building floors owned by the interviewees—showed moderate variations by groups. In 2014, the average number of building floors in Group A was 2.4, which was slightly higher than 1.7 in Group B and 1.3 in Group C. Although some places in Group A were spiked with relatively high buildings like a seven-story hotel, the study area presented a surprisingly flat urban landscape with minor spatial variations in building height compared to other Asian cities. This might be explained through several reasons. A cultural factor might be associated with the property owners’ preference to a specific type of housing, e.g., a low-rise villa and a mid-rise tube house. Especially, the interviewed residents preferred tube houses having both a self-owned residential unit and rentable space close to the ground floor within a single building envelope. The preference was consistent among the interviewees independent of their income level and the place of origins. Additionally, the block pattern of the area was suitable for the development of low-rise buildings than larger, taller architecture due to the narrow width of the parcels and limited vehicular access, unless large-scale merging of land ownerships was undertaken by real-estate developers. Over the last ten years, no merging was reported involving more than three parcels in the area. Additionally, the result was supported by the relatively even distribution of urban development activities across the study area. In total, 91 new development activities were reported in the area between 2003 and 2014. Among them, 40.7% took place in Group A (n = 37), followed by Group C (n = 35) with 38.5% and by Group B (n = 19) with 20.8%.

Nevertheless, this does not mean that the overall size of the buildings remained homogeneous. For example, increases in the area of building footprints were prominent near Nguyen Tat Thanh Road, or in Group A, compared to other areas. With the road development, the parcels in Group A were subdivided in a manner that increased the area and then were auctioned to a new property investor. This was achieved through public-led land acquisition and land readjustment processes which was favorable towards tube house development along the newly constructed road. The adjusted plots were then publicly sold with typical parcel sizes of 125 m² (5 m × 25 m), 81 m² (4.8 m × 18 m), and 72 m² (4.5 m × 16 m). On the other hand, the parcels in Groups B and C remained fundamentally small, ranging from 21 m² to 90 m². Especially, Group C had the greatest number of very tiny parcels—often smaller than 40 m²—with irregular shapes, although some mid-sized parcels did accommodate for tube house development. Additionally, between 2003 and 2014, Group A reported the greatest number of merged parcels (n = 7), compared to Group B (n = 6) and Group C (n = 2). The merged parcels hosted uniquely large-scaled commercial buildings, such as a seven-story hotel with a total floor area of 1750 m² and a three-story restaurant with an area of 560 m² accommodating 135 diners.

The bigness of the parcels in Group A was closely related to the accelerated diversification of non-residential uses. For instance, in 2014, buildings in Group A had a wide range of commercial and retail uses, such as restaurants (n = 24), retail shops (n = 22), hotels/motels (n = 16), offices (n = 10), and cafes (n = 9). A heterogeneous mixture of a luxury hotel, backpackers’ lodging, a large-sized wedding banquet hall, a travel agency, a communication company, an automobile repair shop, and a foreign language institution became increasingly common in the area. In Group B, retail was a representative use (n = 65), like a discount store and a bike shop, followed by restaurants (n = 7), handicraft production (n = 7), and cafes (n = 6). The diversification of building uses in Groups A and B was strongly associated with the physical remaking of the built environment, including renovation of building floors, interior walls, exterior materials, parking space, and extra stairs. Between 2003 and 2014, 45 renovations took place across the properties owned by the interviewees. Among the three groups,
Group A experienced the most frequent renovations—22 cases—followed by 16 renovations in Group C and 7 renovations in Group B. In Group A, the major purpose of the renovation was to improve the use value of rentable space, as well as to enhance the livability of self-owned residential units. This included the optimization of an interior layout for new uses, the expansion of a kitchen space, and upgrading of the water piping system. Here, renovations did not always follow a stereotypical model of having a shop on the first floor and a private home on the second floor. For instance, the owner of a three-story café and a bar in Group A renovated the first two floors as a commercial space and the third floor as a dormitory space for the employees of the café rather than placing his own residential unit. In Group C, renovation generally involved the provision of basic space related to residential use, such as a new storage space or a children’s bedroom in the mezzanine floor of the building.

Among a total of 400 survey participants, 183 (45.6%) were those who newly settled down in the study area after 2003. Among them, the percentage of migrants who settled down in Group A was the highest at about 63.4% (n = 116). The percentage of those who migrated to Group B was 21.9% (n = 40) and 12.2% (n = 22) in Group C (Fig. 8). Diversification of building uses in Group A, as noted above, was at least partly attributable to the venturing behavior of the migrants. The distribution of the people who experienced occupational change seemed fairly even across the groups. For instance, about 32.5% of the interviewees (n = 74) changed their jobs in Group A, which was similar to 34.2% (n = 78) in Group B and 33.3% (n = 76) in Group C. When occupational change of the migrants was analyzed by groups, however, the difference became distinctive. Among 106 migrants who changed their occupations between pre-2003 and 2014, 64.2% (n = 68) belonged to Group A, 25.5% (n = 27) to Group B, and 8.5% (n = 9) to Group C. This implied that a neighborhood abutting on Nguyen Tat Thanh Road attracted a high proportion of migrants with greater job mobility. The opportunistic career change of the residents in Group A included becoming a motel owner, a restaurant and café manager, a retail dealer in construction materials, and a manager of an automobile repair shop. The economic impact of entrepreneurship in Group A included the very high income level of the residents.

Among the 25.5% (n = 83) of migrants who newly settled down in the study area after 2003, 20% (n = 17) decided to migrate to other urban areas. This suggested a bottom-up demand for social stability in the long run, not a return of wealthier residents with entrepreneurship to the area. Many courtyards of the houses in Group C came to be utilized as a multipurpose communal area hosting social activities such as leisurely strolls, resting, parking, children’s playing, handicraft manufacturing, pop-up markets, and informal community gathering. This has generated a highly diversified urban landscape, which on the other hand, can also become a barrier to or at least significantly delay—large-scale urban redevelopment in the area.

3.3. Differences in the privatization of public space by groups

In the study area, streets and sidewalks were frequently used as part of privatized territory, which is often referred to as “pseudo-public” space in Vietnam (Drummond, 2000). Our observations showed that significantly different levels of privatization occurred depending on different locations. In Group A, streets were commonly used as a room for extended operation of private enterprises, such as large restaurants, hotels/motels, and street vendors. For instance, the manager of a restaurant abutting on Nguyen Tat Thanh Road placed large tables, chairs, and flowerpots on the sidewalk, sometimes blocking half of the width of a walkable path, to accommodate a large number of peak-time eaters. As noted in Kim (2012) on the use of sidewalks in Vietnam, the intensity of space use fluctuated substantially due to changing number of consumers over different periods of the day. However, the person or a group who controlled the manner a public space is used did not change much by time. For example, the illegally extended dining places in the sidewalk, once occupied by the tables belonging to a restaurant, was also maintained by the same manager after regular operating hours of the restaurant. Chairs were stacked up and

![Fig. 8. Percentage of the migrants who moved to the study area between 2002 and 2014 by groups.](image)
flowerpots were relocated in the late evening but the space was still under the control of the same manager. In other cases, illegal street vendors occupied the corner of major streets in order to sell drinks, snacks, or locally-caught fish. Although some vendors’ cart took up part of the sidewalk connected with the entrance of a nearby retail, little conflicts were observed between the vendors and the nearby retail owner. On the other hand, illegal parking of motorbikes and automobiles was a major source of nuisance. Although some of the ground floors of the buildings had room for parking, among other uses, very little parking space was reserved for retail tenants and visitors in Group A. Although temporary parking often occupied part of the roads or the sidewalks, micro-scale built environment characteristics like the small-scaled crossings, well-maintained trees and tables, and street lamps largely generated walkable atmosphere in the area (Kim, Park, & Lee, 2014). In other words, private use of public space in Group A was largely characterized by the extension of private enterprises or functional demand like parking and storage. Despite the fact that the usage and the number of occupants of public space changed by time, unpredictable social use or change in the subject controlling the space was rarely observed in Group A.

In Group B, private utilization of public space took place in a similar manner with Group A. However, several personalized activities were also frequently observed in the area. For instance, there was a retail owner who placed an outdoor table in front of his restaurant to attract hungry customers. However, compared to the above restaurant manager who served customers only, the owner and his family members in Group B often ate their meals on the table, sometimes sharing the space with other customers, making conversations with them, and in general used the space for off-time relaxation and leisure activities. Some internal streets in Group B were packed with motorbikes. The place accommodated parking demand not only from adjacent places, but also from retails and houses in Groups A, B, and C. In many buildings, height difference between street level and the ground-floor level of the buildings was eliminated so that motorbikes could easily move around the inside and outside of the property. In Group C, the use of vehicles was very limited due to the narrow width of the alleys (≈ about 1.5–2 m). A highly intricate, intimate atmosphere of the district was formed, with a large number of people informally sitting in front of their houses and talking to their neighbors across the alley. Many awnings and shades were installed to host social interactions and personal activities like having meals and taking a nap. Switching of the users as well as the uses of the public space was frequently observed in Group C, compared to Groups A and B (Fig. 9).

4. Discussion

The development of Nguyen Tat Thanh Road had significant impacts on the transformation of community characteristics in Thanh Khe District. Especially, a sizable number of migrants who attempted to expand their retail network away from the original place or to initiate a new business like lodging, dining, manufacturing, motorbike repairing, and language tutoring attempted to expand their retail network away from the original place or to initiate a new business like lodging, dining, manufacturing, motorbike repairing, and language tutoring. However, due to various institutional barriers including land acquisition and development were significantly lowered under favorable urban policies. These included the local government’s systematic management of land acquisition, compensation and resale of subdivided parcels, the low construction costs of tube house development carried out by local builders, and the high demand for rentable space in the area due to continued urbanization. Most importantly, the supply of mid-to-large-sized linear parcels accessible from the roads was quite limited in the city, which continued to push up the profitability of tube house development in the area.

Increases in the number of migrants with entrepreneurship did not replace most of the original residents, nor did it fundamentally change the livable environment of the neighborhood. A large number of tube houses with commercial and retail uses in the area were also adaptively modified to serve as residential space for the family members of a property owner or young employees who could not afford to own their own houses. With minimal merging of parcels for large-sized development and a high proportion of remaining original residents, the inner part of the blocks away from the new road was perceived as an attractive residential area with serene, intimate living environment. The area was increasingly surrounded by amenity places, affordable restaurants, and cafes with the opening of the new road. Its walkable environment remained intact, with no thoroughfares cutting through the internal urban fabrics. Therefore, the second hypothesis proposed in the Introduction—an inner block will have experienced minimal physical change—does not seem to be supported in the study area.

In Danang and elsewhere in Vietnam, investment in road infrastructure was espoused as a crucial policy vehicle toward the goal of rapid economic growth by local governments. An inflow of massive foreign capital accompanied by domestic property investment around transport corridors is one major aspect of the growth model. Indeed, many Asian investors from South Korea, Japan, and China were involved in property development in Danang. For instance, a construction company in Korea, called Daewon Cantavil, decided to invest 250 million USD for the development of Daphuoc International New Town in 2006. The project included land reclamation along Danang Bay—an eastern endpoint of Nguyen Tat Thanh Road—with an area of 210 ha and a residential complex, a golf course, and a hotel. Another example is the Golden Hills Project with an area of 400 ha, planned to be built in the Cu De River Basin to the northwest of Danang. A Vietnamese private company, called Trungnam Group, has announced an investment plan of 1.6 billion USD for the project. The site will host a variety of programs, such as recreational amenities, a residential complex with tube houses and villas, a golf course, a marina, an amusement park, and an international school. Work on the development of infrastructure is currently underway and a global architectural design firm Skidmore, Owings & Merrill LLP (SOM) is involved with the project. Additionally, private developers from Hanoi and Ho Chi Minh City also began to invest in the development of large shopping malls and supermarkets in Danang. The local government of Danang is planning to create the bus rapid transit (BRT) system by 2025 in order to facilitate the growth of the city with mitigated traffic congestion and to improve health issues caused by air pollution.

However, since the above projects depend heavily on a large amount of capital investment from outside, the process of development has fluctuated substantially—sometimes delayed for several years in the middle of development like Daphuoc International New Town—due to market change and uncertain expectation of property sales. Additionally, the benefit gained from large-scale infrastructure development became a source of dissatisfaction among some community members as mentioned in the earlier section. Despite greatly improved road conditions, little improvement was made with the amenity of sidewalks and street furniture in Nguyen Tat Thanh Road. The construction of the road was largely financed through foreign investment. Long-term maintenance and
adjustment of the road environment, if not incorporated into the original financing plan, could be neglected due to the limited resources of the public sector. Although the development of Nguyen Tat Thanh Road involved the provision of sidewalks planted with street trees, deterioration of public space was fairly rapid. The private use of sidewalks and street corners was prevalent, as shown previously, which lead to the rapid obsolescence of pavement. Additionally, illegal blocking of a walking path was frequent by motorbikes. Therefore, urban policies promoting the provision of additional parking space and maintaining the quality of the privately used public space need to be implemented in the near future.

This study empirically investigated the impacts of a new road on

Fig. 9. Typical plan and elevation of the streets in Groups A, B, and C (Group A: Nguyen Tat Thanh Road 419-435 and Ton That Dam Road 6-32; Group B: Tran Cao Van Road 439-452; Group C: Tran Cao Van Road K368/15–31; drawn by Daewoong Choi).
the urban landscape and residents in a Southeast Asian city. In future, the relationship between road development and the changes in the surrounding area may be statistically investigated and furthermore, policy implications for regional development plans require consideration.

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