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Pabla Amigo discusses a missed opportunity to build collective space in the current management and construction system of metro tunnels.

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The growth of cities and communication axes leads to a growth in the number of residues. (Clément, 2007:13)

The first lines of the Metro de Santiago, also known as the metropolitan railway, were built through the “open pit” and trench system, which primarily consisted of opening the street to build the infrastructure [Fig. 01]. During the construction period, the affected sections of the streets remained paralyzed, impacting businesses, services, and disrupting urban traffic flow [Figs. 02-03]. Once this operation was finished, the street was covered and it resumed functioning without showing significant traces of the construction method. This was because the built infrastructure remained solely underground and did not intervene nearby sites.

As the city of Santiago grew and densified, the paralysis of its main roads and its operation became less and less viable. Due to this and the implementation of new technologies, starting in 1997, Metro de Santiago changed its method of underground construction for both lines and stations [Fig. 04]. The New Austrian Tunneling Method (N. A. T. M.), began to be used to build stations and interstations through shafts and tunnels, avoiding the...

Construcción pique Cuevas + instalación de faena Línea 3. / Cuevas shaft construction + installation of line’s 3 site office. © Archivo Metro de Santiago

Estado actual pique Casilda Línea 5. / Line 5’s Casilda shaft current status. © Pabla Amigo

Estado actual pique Einstein Línea 2. / Line 2’s Einstein shaft current status. © Pabla Amigo

Estado actual pique El Roble Línea 2. / Line 2’s El Roble shaft current status. © Pabla Amigo
This system involves the expropriation or occupation of land adjacent to the network to access the main tunnel through a lateral shaft [Fig. 05]. As a result, the construction only intervenes in specific points without the need to occupy the entire surface of the street, as was the case with the “open trench” system [Figs. 06-07].

The surface of the expropriated sites, or public areas used as a park and/or squares, is not acquired or used only for the construction of lateral shafts, which have a standard diameter of 15, 18, 20 or 25 m, but are also used for setting up construction sites, so the area required will depend on both factors. It is worth mentioning that, in addition to the shafts required to build the station, additional shafts are constructed between stations—or “interstation”—aiming to reduce construction times. Often, these shafts are later used as for ventilation purposes in the system. As a result, there are two types of shafts: station and interstation.

The change in the construction system has demonstrated its advantages and has also reduced negative impacts during the construction phase. But what happens next? The expropriation of lands is carried out only to build the lateral shafts, which leads to their subsequent abandonment. Although Metro S. A. needs these spaces for the lines’ construction, the impossibility of adapting them for future use results in their remaining unused. Since they are privately owned sites, it is not possible to open them to public space, which is reflected in the presence of a fence that separates them from the city. Likewise, their perforations, which function as a ventilation system once the construction of the infrastructure is completed, limit the free occupation of the land. This contributes to them acquiring the appearance of vacant lots, with weeds growing inside, deteriorating the urban environment in which they are located. In addition, most of these sites are situated at the corners of main avenues where the metro line runs, making their presence in the city evident [Figs. 08-10]. We could then affirm that compared to the open trench method, the street is no longer opened, but sites are opened within the block.

Like the residual metro spaces, which appear in the city as vacant lands or wastelands, there are other spaces of similar appearance that arise due to the change, transformation, and development of the city, and not necessarily as residues of a construction process. Despite this, their morphological appearance and status in the city mean that both types of spaces often fall into the same category. These areas or spaces are commonly known as residual spaces or urban voids. Ignasi Solá-Morales (2002:188), Catalan architect, historian, and philosopher, defines them as

(... inner islands empty of activity, they are omissions and leftovers that remain outside urban dynamics. Thus, they become simply uninhabited, unsafe, unproductive areas. In short, places foreign to the urban system, mental exteriors in the physical interior of the city that appear as a counterimage of it, both in the sense of its criticism and in the sense of its possible alternative.

Regardless of the origin or causes behind the emergence of residual spaces or urban voids in the city, in the case of metro’s residual spaces, an opportunity to activate their urban environment can be perceived. Metro S. A. proposes a solution at the city level, which consists of extending their existing lines and assuming this will leave leftover spaces in the construction process. The construction of lines is the greater good, which means that whatever existed previously in that space must be demolished. This statement highlights the importance of these sites. At the precise moment when the built becomes a void, during the stage of expropriation and demolition, it also becomes an opportunity. The neighborhood where there used to be a construction is benefited by a new condition: integration into the urban network thanks to the implementation of the metro system. This benefit appears at the moment of demolition, as it was demolished to build the lines and stations, and thus, the void becomes the new opportunity: without the implementation of the metro system, that opportunity would not exist.

According to Metro S. A., there are two main reasons why these lands remain as residual patches. In the case of land located near the stations, the problem lies in the amount of surface expropriated for construction (Martinez, 2015). Often more land is expropriated than what is actually required because the planning subsequently changes, and the area that ends up being used is smaller. An example of this was the land expropriated for the construction of the Cerro Blanco station of Line 2, located at the intersection of Santos Dumont and Recoleta streets in the district of Recoleta. The expropriated area was initially intended for an interchange station but, after a change in plans...
regarding its location, expropriated land area was much larger than required for the construction of only the station, leaving approximately 6,000 m² in disuse (Martínez, 2015). In the case of shafts made between stations, the area required for ventilation fluctuates between 20 and 30 m² [Fig. 11]. Therefore, the area expropriated for the shaft’s construction (1,200-1,800 m²) is significantly larger than that required for its subsequent functioning as ventilation.

The problem with occupying these sites lies in the ventilation shafts, as they were only designed as a means to construct metro lines and stations and are not structurally capable of withstanding large buildings. Additionally, these sites cannot be sold because they contain infrastructure owned by Metro S. A. within their surface area, which conditions them to remain as unused spaces.

Metro S.A.’s capacity to manage its land is limited by its line of business, which consists of passenger transport and the construction of the infrastructure required to do so. The state, through Metro S. A., cannot execute any other type of construction or infrastructure that is not related to its main business. Even so, it is allowed to profit from it by leasing its land (Martínez, 2015). In the case of lines 3 and 6, Metro S. A. has investigated new management models for sites with high commercial potential, where larger projects could be carried out. Considering this, the company studied the management model called Over Surface Development (OSD). This model aims to make better use of the infrastructure and land used for the construction of the metro without losing the station’s economic potential. In this line, the possibility of reinforcing the structure of a limited number of stations in areas with potential for economic development has been explored, so that they are able to support future construction, following the restrictions of the regulatory plan. An example of this is the project built by studio Beals y Lyon in the new Plaza de Armas station.

While Metro S. A. does not have the legal authority to freely manage these lands for commercial purposes, it sees an opportunity to generate revenue through their lease. Additionally, Metro S. A., as a state company, has the authority to expropriate at market price. The paradox of this situation is that expropriation, as a concept and a tool of the state, is intended and carried out as a good for public use. After any expropriation, the alienated properties become public areas owned by the state. However, in the particular case of Metro S. A., this does not work in the same way. All those properties necessary to execute the construction of the metro infrastructure are declared of public utility and remain as property of the company.

The relevance of this case lies in the number of spaces and sites intervened for the execution of the lines, as well as in their location and size within the city’s morphology. Approximately 135 perforations have been made for the metro lines in operation, and around 70 are planned for the construction of the new lines, which adds up to a total of 205 spaces intervened. Many of these spaces are in public places, but it is interesting to mention that those that remain abandoned are only in expropriated sites (61 cases), mainly in districts of greater consolidation, and with an average area of 1,200-1,800 m² [Fig. 12-13].

Despite them being strategically located next to metro stations and close to the main roads of the city, there are very few places used by large chains to implement some kind of service. To date, only 20%, corresponding to 13 sites, have been used, or have the potential to be used by these large chains. In contrast, 56% of the sites, corresponding to 30 sites, remain as residual spaces, corresponding to 36% of the total area expropriated. Additionally, most of the spaces that have some kind of use are those located in stations, while the sites between stations are left unused.

The spaces expropriated are those that possess the greatest attraction. The expropriation is a consequence of the change in the construction system, but its residual state is a consequence of the management model used. Despite the great financial effort of the state, through Metro, to build the infrastructure of lines 3 and 6, most of the expropriated surfaces end up in abandonment because the current management model does not include them in the planning. Therefore, the presence of this type of space in the urban environment depends exclusively on the construction of said work, since if no construction had been done there would be no residual surfaces.
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The current construction system for the metro lines is generating abandoned sites and this will continue as long as the current management model remains in place. Thus, it is understood that this is not an isolated case, but rather a problem at the urban level. The extension of the metro lines comes hand in hand with the city’s growth and development, as a response to the increasing demand for transport. In addition, its infrastructure has the potential to favor these sectors with an urban renewal given the high possibilities of densification that results from the proximity to public transport. It is not surprising that real estate speculation increases in places where the opening of a station is planned. It is important to understand that there are opportunities for development in those spaces expropriated for the construction of shafts between stations, which have not been valued or managed by Metro and that today are—or will be after the completion of the construction of the new lines—abandoned, especially in those districts that have a greater percentage of residual spaces due to their density.

From an economic point of view, the investment made to build the stations and metro lines is enormous. It would be more advantageous to act jointly among stakeholders, both from the public and private sectors, and establish budgets to develop these sites. By maintaining the construction through the system of shafts and tunnels, convening the municipalities that would benefit from this good for public use, the ministries of Public Works and Housing and Urbanism, Metro S. A. and the real estate companies, could trigger more fruitful outcomes and rescue the remnants generated from abandonment state. Ultimately, this approach would bring about a change in the financing of interventions and the designation of a responsible party within municipalities for their maintenance —also considering the activation that the new spaces for public use and their respective equipment would imply for the districts.

The opportunity lies in understanding the development potential of these sites. Its repetition in the city opens the possibility of an activation at an urban level. The importance of rethinking the management model lies in the ever-changing state of the city itself, which, as it grows and densifies, increases its demands for transport, equipment, and public space. Therefore, the opportunity to manage these lands could contribute, in part, to make up for the lack of communal or neighborhood equipment and public spaces linked to the street. At the same time, it would be possible to take on the public role that expropriated sites, owned by a state company, should fulfill. ARQ

NOTES
1. Lines 1 and 2.
2. Interstation is the name given to the constructions located between the Metro stations. These constructions are used to accelerate the construction process.
3. There are more perforations shafts than stations built with the tunneling method.
4. Shafts normally used to accelerate the construction of the lines in addition to being required for their subsequent ventilation function.
5. Management model used in other countries that allow the construction of elevated buildings above the stations of their subways.
6. Decree Law 2086: Expropriation for reasons of public utility. Considering: 1. That the precept of article 1, No. 16, of Constitutional Act No. 3, assures all persons the right of property in various kinds over all kinds of goods, corporeal or incorporeal, prescribing in its third paragraph that “no one may, in any case, be deprived of their property, of the property on which it falls, or of some of the essential attributes or powers of the domain, but by virtue of a general or special law that authorizes expropriation for reasons of public utility or social or national interest, qualified by the legislator.”
7. Law 18772: Establishes rules to transform the general management of Metro into a public limited company. Article 10. The real estate necessary to execute works derived directly from the object of the corporation shall be declared of public utility, the Ministry of Public Works for the amount of the expenses incurred by this Service. The company will reimburse the Prosecutor’s Office of the Ministry of Public Works for the amount of the expenses incurred by this Service from the processing of expropriations. These funds will enter directly to that Prosecutor’s Office to finance the respective expenses.

BIBLIOGRÁFÍA