

# REGENERATE CITIES THROUGH UNFOLDED THEORY: HOLISTIC APPROACH TO URBAN LANDSCAPE

## Abstract

This article is based on the “Unfolding” theory (Almeida, 2022), a potential model for regenerating the city, focused on the case study “Oporto Subway.” Such infrastructure has reshaped the territory through the “dematerialization” method, applied in the underground.

The city of Oporto was confined to its natural limits (Douro River and Atlantic Ocean) and built (peripheral cities), but needed to expand beyond borders, without hurting its identity. It was an urgent need.

The absence of an infrastructure capable of moving between the several nodes of the metropolitan area and the scarcity of virgin territories able to absorb such needs, represents one of the problems present in our territories.

Through the implantation of the subway in the metropolitan area, it was possible to connect the city to several centralities. With such infrastructure, designed at different levels in the territory, it was possible for Oporto to gain a new breath and another dynamic. The city regenerated itself and continues to transform silently, without damaging its history.

Cities are transformed, centralities and metropolises are generated, and simultaneously “wasteland places” (Solà-Morales, 2002, p.104) appear, “disaggregated” from the territory mesh (Koolhaas, 2011, p.19).

The “Unfolded” theory aims to connect all the elements that design the city, and appeals to history, contemporaneity, infrastructures, and natural landscapes.

It reforms the application strategy, and shapes the “inputs” according to the study case. It crosses subjects such as art and technique, through a social perspective, able to refute the issues, originating flexible models that regenerate the city(ies).

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## Keywords

City, subway, unfolding, void, model

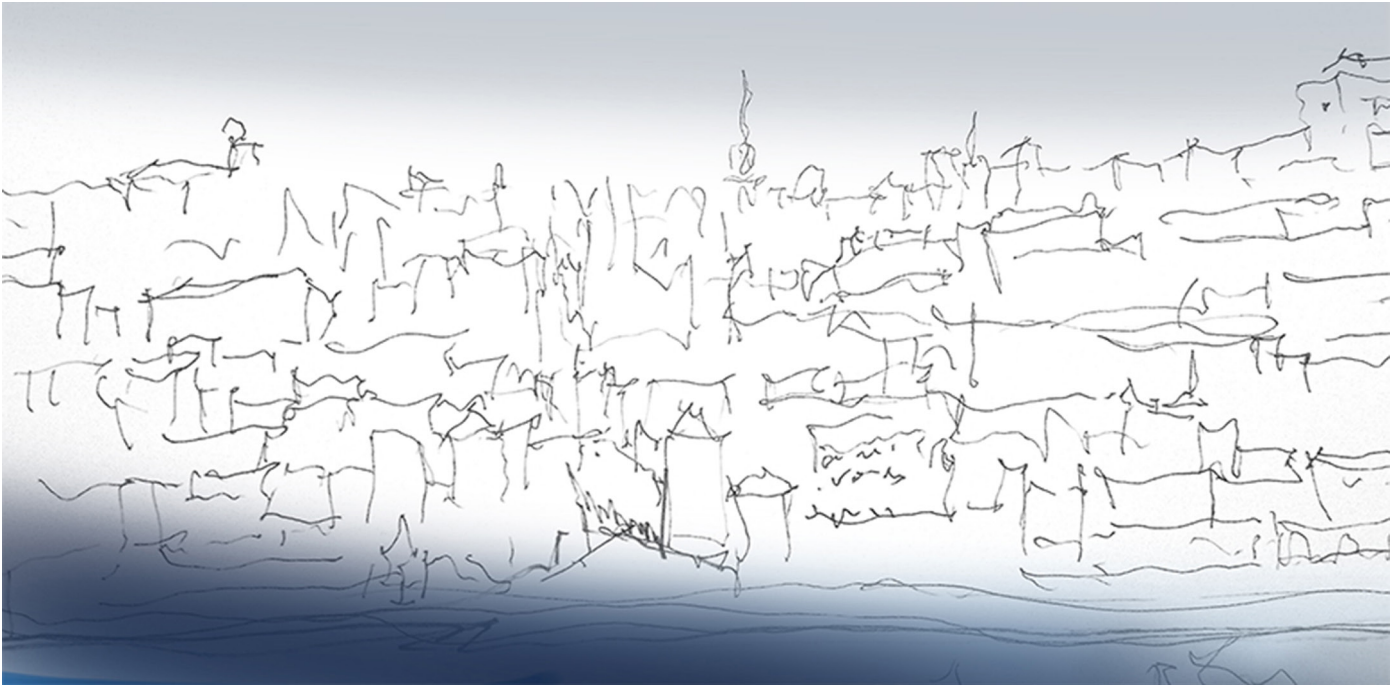


Figure 1: A sketch of Ribeira of Oporto (1879-1897). (Source: D. Chumbo Almeida.)

## Introduction

In the course of the nineteenth century, the massification of territory was constant, socio-cultural and territorial needs were ignored and political/speculative interests were privileged.

The territory “expanded” (Ascher, 2012, p.105) along the urban morphology, several urban centers became closer to each other, and “taller buildings” emerged (Koolhaas, 2014, p.43). The “simulated construction” emerged (Koolhaas, 2014, p.74), without identity to the place where they were implanted.

We defend a qualitative strategy that provides solutions to these problems, and so questions arise:

Can the surface city expand into the underground city and be an answer to the extreme massification of the urban territory? Can the underground be the new space of intervention for the future metropolis, in constant transformation?

According to these questions, we have to consider what possible hypotheses respond adequately to this problem. In the sequence of this need emerges a possible answer — the “Unfolding” Theory, which opens new horizons in search of new answers for the massification/disintegration of the territories, absent of analytical content. According to this observation, we chose to focus our analysis on the opposite concept, dematerialization. We verified that in the discipline of Architecture and Arts, this concept takes shape according to “Excavated Architecture” by Comino (2006).



Figure 2: Oporto City. (Source: D. Chumbo Almeida, 2019.)



Figure 5: Leap into the Void, 1960. (Source: Klein, Shunk, Kender. <https://www.moma.org/collection/works/175904>.)

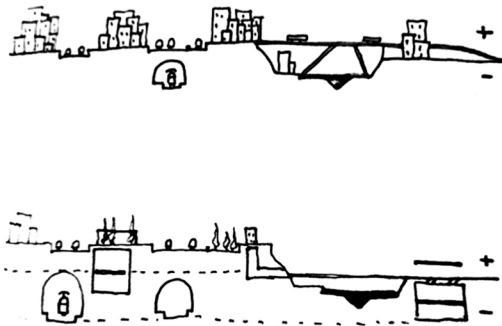


Figure 3: City Section (before and after the Theory). (Source: D. Chumbo Almeida, 2022.)

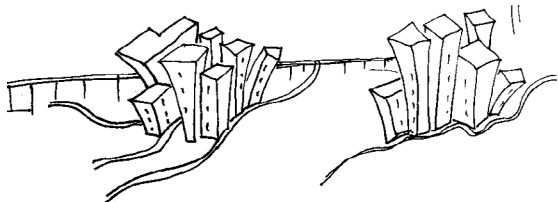


Figure 4: Sketch (city and cities). (Source: D. Chumbo Almeida, 2022.)

Through the comparative method between the discipline of Architecture and Arts, we verified that the concepts, full and empty, reflect the equity between spaces, by the M.C. Escher "sketches." Transposing this planimetric analysis (Art and Architecture), we deduce that the emptiness found in our cities is devalued, without use or function. However, Yves Klein in the arts revolutionized the field of application, investing in the concept of emptiness, "Leap into the void."

The concept of "Void" in our study begins to gain form as a tool, capable of influencing the method of application and apprehension in architectural thought. On the other hand, the concept of "Solid" (mass), nowadays, is the primordial element in urban and spatial composition (massification/problematic) in which technique and shape composition without identity emerges. The "Emptiness" concept takes us to the discipline of Phenomenology, where the "immaterial" space and the fourth dimension confer identity to the place because the senses and feelings (Pallasmaa, 2011, p.11) are appealed, including the movement (Zevi, 1979, p.48) these elements can be experienced and apprehended by Man in the city, in Architecture, otherwise, such discipline would be mere construction. Such critical analysis based on the dematerialization process leads us to verify that "Emptiness" acquires presence in space, through the match between light and shadow, through the shape and the scale of the environment that inhabits it (society and culture).

These elements identify space — the hole, as a place conceived for Man. It's according to this principle that the Blue (IKB 79) of Klein represents in our study case “the immaterial,” the emotion of the senses are applied in the “empty” and in excavated spaces that represents the subway stations by the “unfolded” territory of Oporto.

Crossing these methods, we apply this strategy to the territory as well. We proceed to the elaboration of an inverse critical thinking, applied in the city/space. We resorted to the conceptual tools “full” and “void,” which cast the process of urban composition in Architecture through the drawing method.

It is then that the technique, as a constructive resource, resorts to the symbols and signs used in the discipline, and applies them in the urban underground.

Facing such strategy, we start by analyzing specific cases, where the urban dematerialization, between the surface and the underground are related (connection between layers). That's why our case study emerges, by the Oporto Subway.

According to the analysis field, we focus our intervention in the underground, once the territorial massification is present at the city surface.

Based on this problematic, our hypothesis arises, to give “life” to the urban underground, through the unfolding of the city surface to a “possible” rebated city.

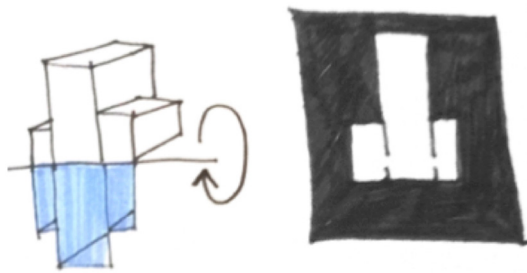


Figure 6: Unfolded Theory. (Source: D. Chumbo Almeida, 2022.)

### Strategy

In the unfolding theory, we resorted to the discipline of Semiotics. The purpose was to identify the communication elements present at the stations — excavated territories. We verified similarly between the surface city and the metropolitan stations (underground). However, the stations have another scale and were conceived and designed for the subway and Man. We can identify streets (pedestrians), squares, bridges, rails, and kiosks, etc., on the underground. According to such analysis “in loco” we can deduce that the “folding” process becomes a reality in the theory.

The “Unfolding” Theory designs a method capable of regenerating territories. The city “folds” to the underground, according to the gaps previously identified, conceives a structure based on a model “type” according to the scale of the places, uses semiotic studies, rethinks the design of spaces, and connects/integrates them into the urban experience.

We intend to rebuild territories at the scale of the culture/ society that inhabit them, providing the balance between built and unbuilt places, through these two urban realities (surface and underground), which gather as a whole, contributing to urban regeneration, where network and metropolitan infrastructures design arteries and connect natural spaces that are possible and pleasant to live in, contributing to the balance of urban design.

### Methodology

With the purpose to conceive this theory, it was necessary to appeal similar theoretical studies and practical cases that could be analyzed as models, able to materialize our thought — the “Unfolding” Theory. So, we resorted to several excavated territories, such as the Oporto Subway, capable of sustaining our initial hypotheses.

This comparative strategy, applied in the case study, allowed us to identify several effective models in the regeneration of the territory, analyzing the impact of the subway and its stations.

### THE SURFACE LEVEL

At the surface, the subway stop designed for the human scale (protection) is an element — “shelter” that lands in the city without harming the surrounding landscape.

### SEVERAL LEVELS

The Oporto Stations develop to the underground (in layers). The excavated space is the one that draws a new urban identity to the city. The ground line “folds” to the underground and the space between the surface and the underground territory becomes a new reality.

### UNDERGROUND LEVEL

The underground level can be more than technical. It is possible to acquire other functions, depending on Human needs, similar to the territory present on the surface.

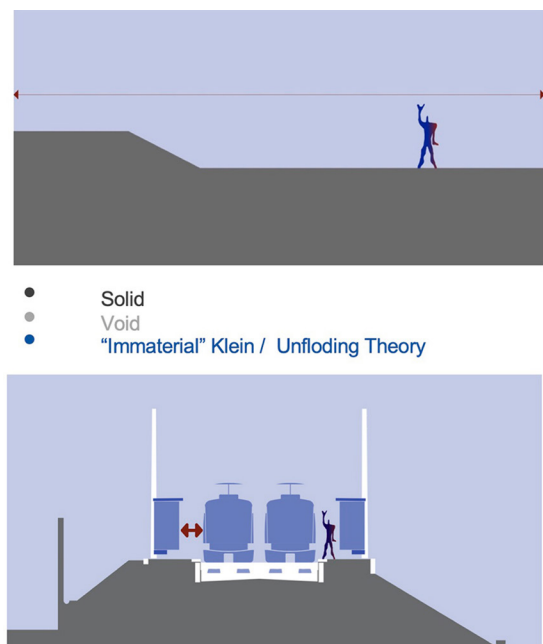
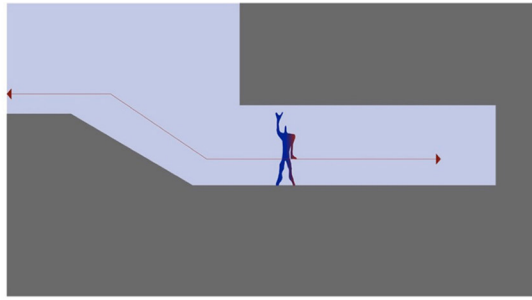


Figure 7: Surface Station. (Illustration: D.Chumbo Almeida, 2019. Source: Oporto Subway (original). <https://www.metrodoporto.pt>.)



- Solid
- Void
- "Immaterial" Klein / Unfolding Theory

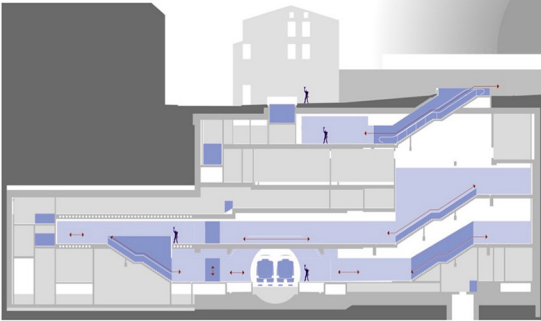
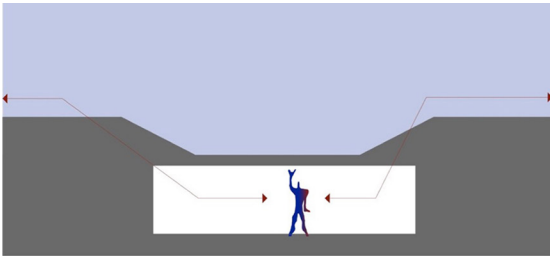


Figure 8: Surface Station. (Illustration: D.Chumbo Almeida, 2019. Source: Oporto Subway [original]. <https://www.metrodoporto.pt>.)



- Solid
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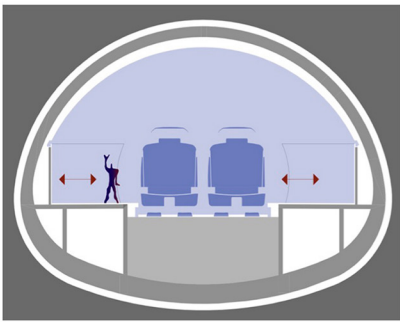


Figure 9: Underground Station. (Illustration: D.Chumbo Almeida, 2019. Source: Oporto Subway [original]. <https://www.metrodoporto.pt>.)

## Results

The theory designs "type models" that can be used in the city. It extends the field of application through the refraction of forms (full and empty), and uses the "excavation" process (Comino, 2006). It also adopts a "semiotic and phenomenological" language for the urban underground, similar to the city at the surface. Consequently, it contributes to the dematerialization and fluidity of places (excavated or constructed) that intersect with each other.

## Conclusion

The "Unfolding" Theory aims to demonstrate that through the inversion method it is possible to regenerate territories confined to each other, provides them identity (socio-cultural and environmental) capable of connecting history and contemporaneity. The theory allows the re-configuration of urban "sections" between the surface, the underground, and the ground level. It connects buildings and non-building places without hurting the urban landscape conceived for the Man that circulates in it – mutation process.

It is possible to connect new spaces within cities and between cities that can no longer expand on the surface. The "Unfolding" Theory can expand to the underground and design other places that can be lived. The method of application and intervention (process) must be analyzed case by case, according to the identity of the place. We defend that the expansion should be judicious and balanced, with the aim of designing sustainable and balanced cities, in which the surface and the underground connect harmoniously with each other and with other cities, without harming the identity of the places.

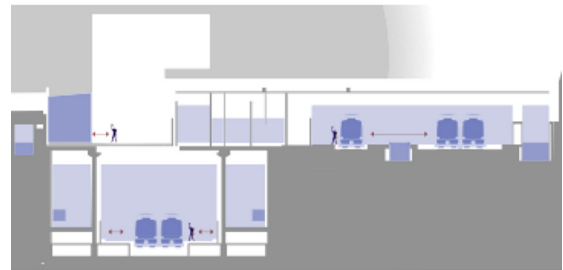


Figure 10: Trindade Station. Unfolded Theory, Section. (Source: Almeida, 2022, p.476. <http://hdl.handle.net/11067/6191>.)

We conclude that the theory in question emerges as a possible answer, not only to the massive densification but also to a balance between spaces, which is reflected in the several layers. It provides value to the subtraction process, applied to the underground, until then forgotten, a place that was only technical, but which can now, become the new major space. Therefore, we opened new guidelines for future research that can be combined between theory and practice.



Figure 11: Trindade Station. (Source: Almeida, 2022, p.476. <http://hdl.handle.net/11067/6191>.)

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