

OLD ELEVATORS AS A GREEN MEANS OF TRANSPORTATION AND INDUSTRIAL HERITAGE RESOURCE. THE CASE OF REINA VICTORIA ELEVATOR AND EL PERAL IN CERRO ALEGRE AND CERRO CONCEPCIÓN, VALPARAÍSO, CHILE

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Abstract

The main objective of this study is to explore how old elevators turn out to be a green means of transport, as well as being a cultural resource, given their industrial heritage. The Cerro Alegre and Cerro Concepción elevators are selected as a case study, since (1) they are still in operation, (2) they are used daily as a means of green transportation to link the hill with the plan and vice-versa, (3) they are a cultural tourism resource in both hills, (4) both hills are the richest in heritage and cultural tourism in Valparaíso and their elevators are part of their cultural, heritage and alternative transportation offer.

The methodology is carried out through a historical analysis of each elevator, together with an architectural analysis of where each one of them is located to verify the contribution they have in the sustainability of the place, by reducing pollution, facilitating life in the neighborhood, reducing transportation costs, and providing security.

It is concluded that the old elevators turn out to be a green means of transport, in addition to being a legacy of industrial heritage that facilitates heritage and cultural tourism in the area, giving a sense of belonging and community to their local neighbors.

Keywords: Industrial Heritage, Old Elevators, Green transportation.

1. INTRODUCTION

The objective of this study is to explore how old elevators turn out to be a means of Green transportation, as well as being a cultural resource, given their industrial heritage.

Valparaíso is a port city, it is the capital of the V region of Valparaíso in Chile, at a geographical level it is characterized by presenting a natural amphitheater shape, it is located in a bay and is surrounded by hills, the place of residence of the majority of the population, made up of approximately 300,000 people. While, between the foot of the hills and the sea, the Plan is formed, which contains the administrative center,

commercial and financial sectors, while the seafront is occupied by the port. Its architectural richness was developed at the end of the 19th century, and the historic center was declared a World Heritage Site by UNESCO, becoming the third Chilean site protected by the organization.

Most of the residences are found in the hills of Valparaíso, from shacks built in a very rudimentary way, to mansions of various architectural styles, pedestrian walkways accessible from the funicular, or so-called public elevators. There are 42 hills in Valparaíso and they have urban and social characteristics that are different from each other, each one has its own streets and access stairs and many have or had an elevator that establishes the connection between the residential area and the Valparaíso Plan.

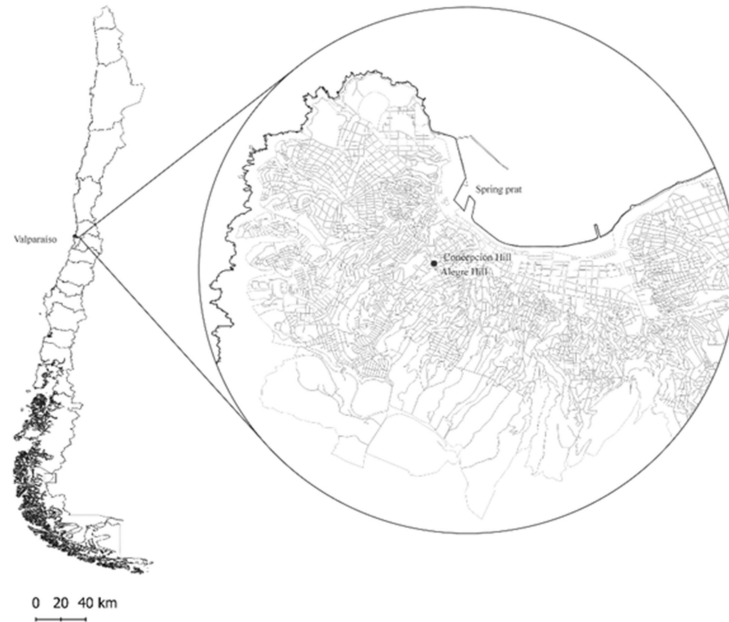


Fig. 1. Map of Valparaíso in Chile:

Alegre and Concepción Hills. Own elaboration

The Valparaíso elevators were built together with the appearance of funiculars in the world, especially in Europe, the first elevator was inaugurated on Cerro Concepción in 1883, originally it was made up of two wooden huts that worked with water counterweight thanks to steam generated by a boiler today works by electric propulsion. The Reina Victoria elevator was built in 1902 and heads up Cerro Alegre from Cummings Street, reaching a height of 35 meters. The rails are supported by the same hill and are secured by sleepers, initially the mechanism was by water scales, and currently it works with an electric motor. Currently, lifts give the city a social, tourist and historical value and constitute an architectural heritage to be preserved.

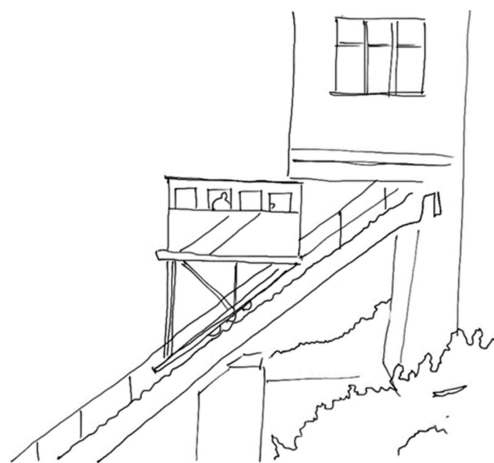


Fig. 2 Sketch of Valparaíso Elevator. Own Elaboration

2. THEORETICAL FRAME

The theoretical framework of this study focuses on the following review focuses for the case of the El Peral and Reina Victoria elevators in Valparaíso: industrial heritage (1), old elevators (2), Valparaíso hills (3), means of transport Green (3).

The set of remains that have a historical, technological, social, architectural or scientific value are elements that make up the industrial heritage, whether they are machinery, workshops, factories, mines, means of transport and all their infrastructure (Concetta & Vargas, 2018, pg. 3). The lifts and funiculars of Valparaíso make up by themselves an integrated system of a current means of transport that represents a unique living industrial heritage in the world (Rodríguez, 2008)

Industrial heritage tourism has gained popularity (Hospers, 2002, p. 397) and is becoming increasingly important as part of a cultural offer in cities (Vargas, 2014, p. 2019), being a useful tool for the restructuring of cities. Regions with respect to the economy (Edwards & Llordés i Coit, 1996; Harris, 1989; Mansfeld, 1992). The Historic Area of the city-port of Valparaíso is considered of industrial heritage value, it is linked to international maritime trade at the end of the 19th century and the beginning of the 20th (World Heritage, sf), being the first and largest port on the South Pacific coast, connecting with the Atlantic through the Strait of Magellan. Those elements of the coastal edge are considered of value mainly, with the presence of equipment of industrial importance (FAU, 2009), port and railway works, as well as fiscal warehouses, customs, the Prat dock and the port station, while the patrimonial value of the locomotive activity is awarded to trolleys and elevators.

The only city in the world that uses elevators not only for tourist purposes is Valparaíso (Pinto, 2011), for homeowners, office workers, schoolchildren and tourists it is a common form of public transport. The elevators in Valparaíso were the second means of urban transport in the city, after the horse-drawn trams or "cars of blood", inaugurated in 1863 and the first to reach the upper part. The connectivity provided was relevant since the difference in height between the plan and the hill has been increasing since the mid-19th century (Castillo, 2019). In this way, the popular sectors that were not included in the plan due to the high value of the land, began to colonize the heights and the ravines, promoting commercial and residential use. Consequently, mobility became a daily aspect of the port community, involving habits and behaviors, the importance that mobility was gaining together with the technological advances that allowed its development, converted collective transport into one of the urban services that defined to the modern city (Maderuelo, 2010), gas lighting, drinking water and electricity were added to the modernization of elevators.

The hills of Valparaíso are home to mostly residences, from shacks built in a very rudimentary way, to palaces of various architectural styles, pedestrian walkways accessible from funiculars, or so-called public elevators. There are 42 hills in Valparaíso and they have urban and social characteristics that are different from each other, each one has its own streets and access stairs and many have or had an elevator that establishes the connection between the residential area and the Valparaíso Plan. Those sectors of the hills of Valparaíso are inaccessible by public transportation and the funicular elevators play the role of connecting the upper part of the city with the plan. Originally an elevator would be built for each hill, this plan was not fully implemented, but more than 30 elevators were completed, of which fifteen remain operational while others are out of service, undergoing repairs or missing, which is a problem socially important mainly for the residents of each hill, especially the elderly and low-income people, since this means of transport was the main way to access their home safely, avoiding slopes and large stairs.

Due to its industrial nature, the historic neighborhood of Valparaíso is part of the UNESCO World Heritage Site, similar to the case of the Ruhr Industry Museum in Westphalia (SIG, 2017), made up of several old industrial plants for metals, chemicals and coal that were found in the 20th century in the Ruhr mining area, several of its factories are declared a World Heritage Site by UNESCO, among which the Zollern coal mine in Dortmund stands out. Both cases present the urban pathologies that derive from the industrial crisis: the formation of population ghettos (poor, foreign and unemployed), problems of provision of equipment and infrastructure, environmental problems, among others (Romero, 2009, pg.79)

Although the Valparaíso elevators are not the only ones in the world, they are the only ones used as a means of periodic and public transport and not only for tourist purposes, another case of funicular in Chile is that of the Pio Nono station in Santiago (Government Chile, 2022), which is intended for tourist purposes on the San Cristóbal hill, the station has a neo-medieval style representing a small castle and passes through three stations, among which the national zoo, Plaza México and the native Chilean sector stand out. . On the other hand, in San Sebastián, Spain, there is the Igueldo funicular (Vía Libre, 2002), it saves 150 meters of unevenness and is the oldest in the Basque country, and the third in Spain after the Barcelonans of Tibidabo (1901) and Vallvidrera (1906). The igueldo funicular traction system is located in the upper station

and is driven by a motor with two reduction stages that rotate a pulley that in turn moves the traction cable. The Festungsbahn is another case of international funicular located in Kufstein Fortress (Fortress, 2022), Austria was built in the 17th century and was used to transport food, supplies and artillery to the fortress. Today it is used for tourist purposes and its traction system has been modernized by pressing a button to generate the lift or descent of the funicular.

3. METHODOLOGY

Wondering about the validity of the statement "the elevators of Valparaíso are an industrial heritage resource as well as green", this methodology is divided into two parts. For the first part, a historical analysis of each elevator will be carried out, placing them in time, understanding their current state and their weight as industrial heritage elements, if indeed they are. For the second part, an architectural-spatial analysis will be carried out that will study the physical and programmatic environment in which each elevator is located, determining its green contribution to the community and the context by facilitating neighborhood life, reducing transportation costs, providing security, develop neighborhood identity and promote tourism while not producing pollution thanks to its energy logic.

4. RESULTS

4.1 Historical Analysis

The Reina Victoria and El Peral elevators are located respectively at Cerro Alegre and Concepción. These hills are part of the historic center of the city, forming a unitary sector, urbanized and built largely by English and German immigrants, from the first half of the 19th century, in an organized and planned manner. (x) According to the book "Cerro Alegre: chronicle of the Cerros Alegre and Concepción de Valparaíso", the hills are related to such an extent that "The limits, although clear, do not prevent fluid communication between the two, to the point that at times they might seem fuzzy." These characteristics led them to be declared part of the World Heritage Site by UNESCO in 2003, configuring as a whole one of the most frequented tourist centers in the city, thanks also to its good conservation and active initiative of its residents.

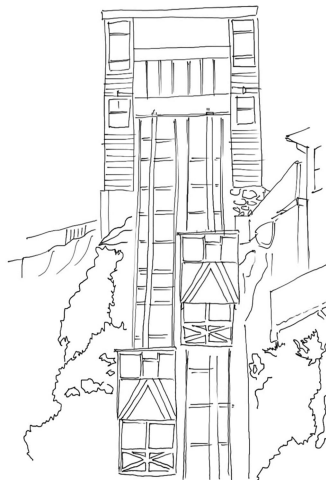


Figure 3: Sketch of Reina Victoria Elevator, Own Elaboration

4.1.1 Reina Victoria Elevator

The Reina Victoria elevator connects the foot of the hill with the average elevation of Cerro Concepción. It was built in 1902 and opened in 1903. By 1998 it was declared a historical monument along with 15 other elevators.

A large number of merchants, businessmen and professionals resided on Cerro Concepción and Cerro Alegre, as well as numerous foreign immigrants, especially English and German. Due to this, important buildings were located in these sectors, such as the German School, the Lutheran Church and the Anglican Church (Estrada, 2012b). In order to this centrality in the Plan and in the heights, it is not surprising that between 1883 and 1905 four elevator installations were built on both hills, including the aforementioned Reina Victoria: El Peral, Concepción and Esmeralda. All around the financial district of the city.

In October 2012, when the Reina Victoria elevator was reopened, after a state investment, a different trip could be accessed. One in which the tourist immerses himself in little-known facets of the port's history. In

2014, the Dimalow promenade, located in the upper transport station, was renovated. The square has views of the neighboring Cerro Concepción and its Lutheran church of La Santa Cruz. The Dimalow promenade begins at the upper station, with the Casa Vander and Fauna boutique hotels. The first overlooks the square and its north face, which looks at the elevator. In 2016 the elevator was again restored, working to this day. Their cars moved by counterweight, carrying a water tank in its lower part, with the capacity to contain a weight greater than that of the other car. At present its operation changed for one based on electricity

This coincided with the works financed by the now-defunct Urban Recovery and Development Program, with which the municipality not only refurbished the machinery and pulleys of the Reina Victoria, to adapt it to the security requirements of the 21st century, but also recovered its architecture, enabling it to a coffee shop and a gourmet liquor wine cellar. The idea behind the walkway is that lifts are not only a means of transport, but also a point of urban impact that adds value to the environment.

4.1.2 El Peral Elevator

The lower station is located in the Plaza de Justicia, with an access recognized in harmony with its surroundings. In 45 seconds of travel, you reach the high station on the Paseo Yugoslavo, a viewpoint where the Baburizza Palace and other notable buildings are located. It has a high frequency of use, because it connects the urban nerve center that is Plaza Sotomayor with the tourist Cerro Alegre.

The total length of the vertical frame is 55 meters, the arrival height is 40 meters and its slope is 48°. Together with the Concepción and Reina Victoria elevators, it is one of those that connect the Valparaíso Plan with the Cerros Alegre and Concepción (Typical Zone). It is the first elevator that had a steam engine. It provided its service to the foreign colonies settled in them and currently to the sector, whose destiny is to be an educational center - tourist in consolidation. It has a high rate of frequency of use, as it relates the Plaza Justicia as a civic center, with the Paseo Yugoslavo, an urban viewpoint, close to the bay and a great tourist attraction. In the lower station (Plaza Justicia).The access to the station respects the continuity of the building that contains it, as well as its urban environment. Upper station (Paseo Yugoslavo) The station ends at the Paseo Yugoslavo which welcomes both the visitor and different artistic expressions and also those of the Baburizza Palace Museum (Historic Monument) that has a formal presence throughout this urban space on the hill. Its construction responds to a more contemporary language, differentiating itself from the other stations.

4.2 Architectural Analysis

The elevators studied connect the city plan at a relatively low level, but with high tourist content. (Figure 4) Both the Reina Victoria and Peral elevators connect at their upper station with the Dimalow and Yugoslav walks. These, in addition to weaving commerce and leisure programs such as hotels, restaurants and itinerant commerce, have a long view of the city and the sea of the port. The implementation of elevators in these hills allows a connection and empowerment of their surroundings, consolidating not only a means of transport to overcome the abrupt ravines that separate the Plan from the Hills, but also forming a space for interaction between users, becoming a structuring element of the social (Quinteros, 2018)

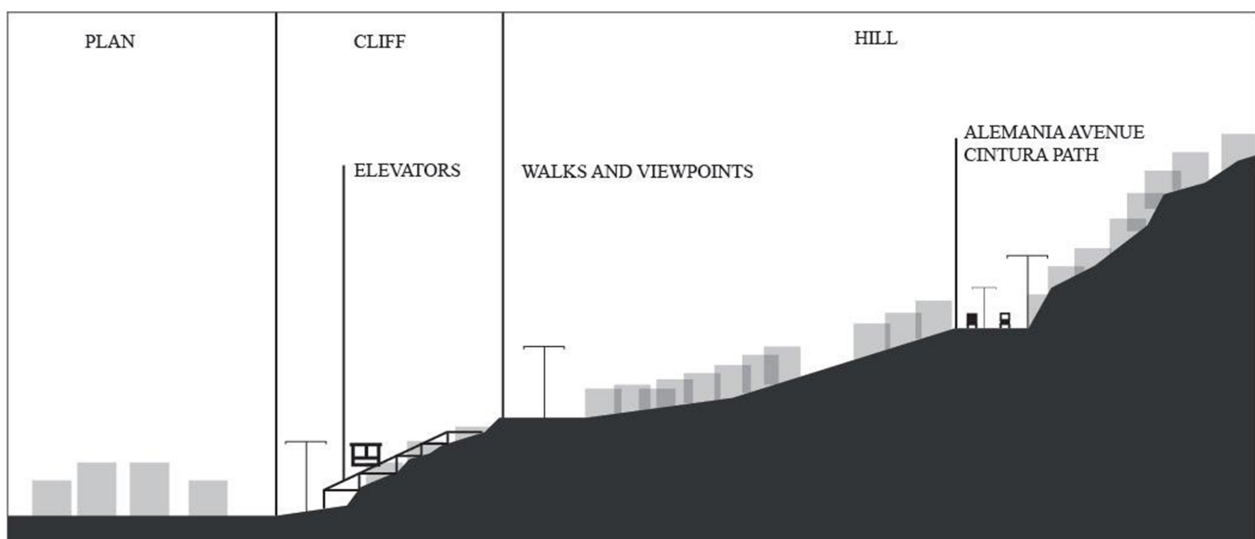


Figure 4: Valparaíso situation of Elevators on hills

The main objective of the executive is the cases in which the elevators connect the center-plan of the city with sectors related to tourism, where the historic center is located and/or programs such as viewpoints, walks, restaurants, hotels and museums.

Elevator Name	Opening Year	Actua state	Programmes sorroundings: Inferior - Superior
Reina Victoria	1903	Operative	Cumming street, foot of hill, bohemian life - Cerro Alegre, Paseo Dimalow, Mirador, Restaurants, hotels, touristic axis.
El Peral	1906	Operative	Sotomayor park, City center - Paseo Yugoslavo, Baburizza Palace, Mirador, touristic axis

Table 1: Superior and inferior programmes of elevators surroundings

The station has a great urban value since it is inserted right at the Elías street break, to give way to access to the Anibal Pinto square. Its construction is transparent, with small windows, in the manner of Buenos Aires houses. Upper station (Cerro Concepción) The station ends in a square, which through a bridge connects to Paseo Dimalow, which has an architectural expression from the beginning of the century. Here the English and German immigrants left the stylistic imprint of their time. Being remodeled, a square was created with children's games, seats, lights and pavement games. (Puelles, 2003)

5. CONCLUSION

The present investigation provided a systematic analysis of literature and history related to the Reina Victoria and El Peral elevators, followed by an architectural analysis considering the urban characteristics of Valparaíso and the qualities of accessibility and connectivity that the elevators provide to the city. This comes at a time when green mobility in Chile is in its infancy, and there are no initiatives in Valparaíso in this regard. In addition, the historical value of the city calls for the preservation of living heritage, of which the elevators are a part.

The cultural richness of the Alegre and Concepción hills was a result of the arrival of businessmen related to the port of Valparaíso and was inhabited by various cultures of mainly European immigrants, the elevators located on these hills being the first to be built. The Reina Victoria and El Peral elevators were part of the economic, cultural and tourist development of these hills, directly connecting the financial district and the port with the hills. Allowing city dwellers and tourists from Valparaíso to explore the hill on foot. What ends up resulting in the streets full of life and history that currently cross the hills of the city.

The heritage value of lifts makes them living heritage, which is used, inhabited and maintained. Which brings many benefits to tourism and also a great responsibility for users, since they are making use of heritage elements. When talking about elevators as a green transport method, it is not only referring to their energy efficiency, but also to the capacity of the industrial heritage to generate neighborhood identity and tourism. What indirectly promotes the care of the city by its inhabitants and responsible institutions. Currently the operation of the lifts in Valparaíso is threatened by the lack of money for the maintenance of means of transport as old as these, and the enhancement of the lifts as green means of transport can help promote the collection of funds that allow not only its maintenance, but also the development of new lift lines that can build a more complete network.

The so-called "passing" trade that arises in the city precisely due to the people who "pass" through the places, when these people form a flow of some measure; forming identifiable "places" in the city; that is generated sometimes by the presence of a bus stop of a certain importance, other times by the entrance of a cinema, etc.; in short, where a number of people must gather around some generating activity and that implies the formation of a place -which many times although it does not "collect" the activity, this is a necessary ton that is imposed on the architectural geography of the place- ; this trade, we say, is present in the elevator terminals, which generate places of passage and meeting both above and below.

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