GENOA – Martina Belmonte, research fellow of the CTBUH directly involved in the research “A Study in the Design Possibilities Enabled by Rope-Less, Non-Vertical Elevators”, went to Genoa to visiting an interesting case study, kindly accompanied by Giuliano Zannotti, project Manager of Leitner spa.

The reason of the trip was to visit the unique urban transportation system able to move both horizontally and vertically: the Ascensore Castello d’Albertis Montegalletto, in Genoa. It comes of a combination between a vertical lift and a horizontal funicular that connects two different part of the cities. In 1929, when the system was opened, there was just the vertical path used to connect Via Balbi with Corso Dogali, located at an altitude difference of about 70 meters. However, the users to reach the cabins from Via Balbi had to walk for about 300 meters within a tunnel, as the system was located into a bomb shelter. In spite of this, the system has always been appreciated and used by the inhabitants, given the rapidity of the service and the considerable low cost of the trip, even though the tunnel’s journey led to some inconvenience, especially during the summer months. Unfortunately, in the 1960’s, the use of the plant gradually diminished, mainly due to public safety issues. The tunnel, in fact, had often been subject to problems of public order and cleanliness. Moreover, in the 1995, the system was indefinitely closed after the 30-year technical lifetime expired.

In the early 2000s, it was decided to overcome the previous problems and reopen the system. It was finally decided that the combination of two different systems (a funicular in the horizontal tunnel and an elevator in the 70-meter shaft) would be the best solution. The design was guided by Poma Italia (now partner of Leitner spa) and the new – and unique – system opened in 2004.

The operation is simple and unique in its kind. There are two cabins – each with a maximum capacity of 23 people – that move alternatively, upward and downward, along the predetermined path. The horizontal path is composed by a rail-line up to the entrance of the vertical shaft. Still in the horizontal path the cabins are pulled by a rope, as in any conventional funicular system. At the end of the horizontal path, there are two vertical shafts, one for each cabin. Once reached the end of the horizontal path the cabin is removed from the rope by opening the jaws and is moved by automated tires within the vertical shaft where there is a moving platform waiting for. Other tires placed on the platform facilitate the displacement of the cab, which is then stabilized on the platform. Once the switching and securing operations are finished, the cabin of the cable car effectively becomes a cabin of an elevator. The two cabins depart simultaneously at the two ends of the track and meet along the vertical shaft. The one-way trip lasts about 3 minutes and the system needs about 10-15 seconds to switch from the horizontal funicular system to the vertical elevator system.

The operation of the system is completely automated, so no driver is needed. Even if the level of uniqueness is evident, the visit – and the consequent study – is fundamental for the development of the research, since that a consistent part of it regards the historical and technical evolution of the transportation system. Therefore, the CTBUH team focused also on those plants that can be considered unconventional, since that has been designed for a specific condition and need and so that proposed unique and new solution and applications.
Caption: The two cabins switching between the vertical and the horizontal path. The orange one is entering into the vertical shaft while the blue one has just left it and it is starting moving along the horizontal rail, as a funicular system.

Caption: The main entrance in Via Balbi, indeed this access leads to the beginning of the horizontal path.

Caption: The cabin moves along the horizontal rail path, it is approaching the entrance of the 300 meters long gallery to reach Via Balbi entrance.