

Public spaces and ecological structure: An opportunity to create a city. A case study from Bogotá

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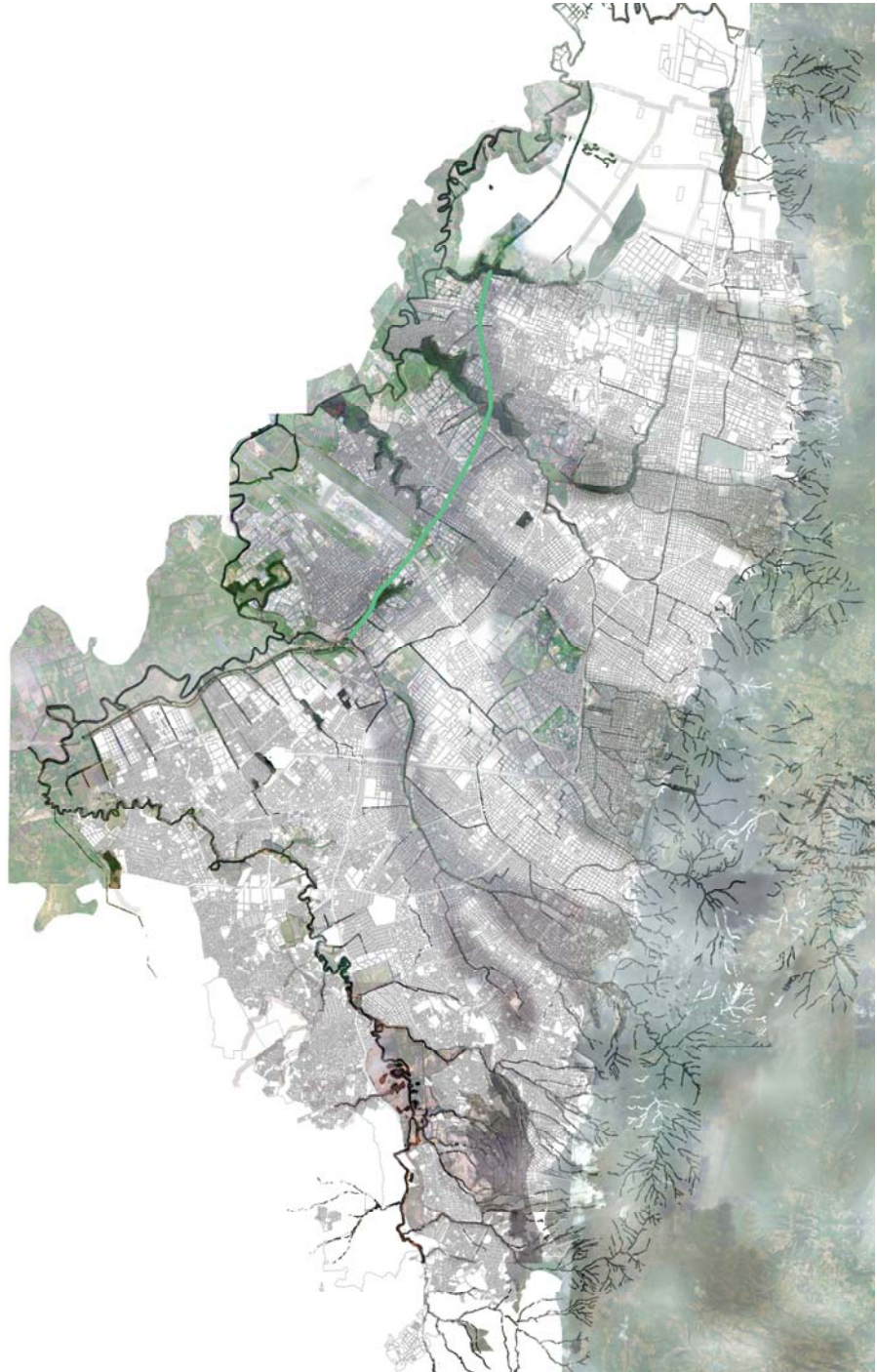
Abstract

This article explores how a change in the aesthetics of urban planning, which is always subject to the demands of motorists in the growing cities of Latin America, can constitute an opportunity for ecological connection, increased mobility, and social and economic integration, as well as become a catalyst to international competitive potential for the city and an opportunity for local economic growth. This article discusses the prospects that are opened to the city by reconsidering the construction of a high traffic carriageway and transforming its outline into a grand-scale metropolitan park, preserving the integrity of three natural wetlands.

Key words: Bogota, Town Planning, Ecology, Social Integration, Mobility, Compact City, Ecological Structure.

Background

In 1961, under the premise of regulating urban growth and creating a system for the circulation of the increasing number of cars on the roads, a road plan was formulated which, with a few adjustments, still rules in Bogotá.¹ Following the classification formulated by Le Corbusier in the Master Plan that was elaborated a decade before for the city, there are two roads that run primarily from south to north, designated as V-1 longitudinal ways in the text of the Municipal Agreement and its corresponding plans.² At the time, the proposal intended to connect the city with national roads to the north of the country, the Atlantic Ocean, Venezuela, the Southern and Western Colombian regions, as well as the Pacific and Ecuador. The plans of the Agreement only include the road network. They omit the wetlands, streams and gorges that cross the plateau of Bogotá and constitute a vital element of its structural territorial environment. It is understandable that at the time these factors were not important to urban planners. They were viewed as obstacles that could either be eliminated or overcome through the use of canals, pipe work, levees or other engineering



The Longitudinal Avenue of the West (Avenida Longitudinal de Occidente) and the Ecological Structure of Bogotá, The Eastern Hills and The Bogotá River Connection.

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techniques. There was no appreciation of these elements and their roles as regulator of water levels, and much less as providers of biological diversity. At the time, the city still occupied a relatively small surface area in comparison to its territory, its population was less than 20% of its current size, and the actual urban impact on the territory was minimal compared to what it is now. Back then, there was no reason to warn against the dangers of regarding the diversity of natural life as inexhaustible.

The western-most route of these two roads, named the Longitudinal Regional Avenue (Avenida Regional Longitudinal) in the Agreement, crosses over the wetlands of La Conejera, Tibabuyes and Capellania, and passes over the head of the Jaboque wetlands. It was a kind of bypass road, that, in letting traffic pass over the fields to the west of the city, managed to prevent the traffic coming in from other parts of the country from affecting the traffic within the city centre.

In proposing the route over the wetlands, the planners were continuing a pragmatic tradition. Since the founding of the city, its streams and creeks were seen as a way to expel waste towards the river Bogota. With population growth and industrial development, the natural ecosystem soon exhausted its capacity to take on the burden of contamination and began to die. Without stopping to think of the consequences, the city paved over the streams of water in favour of roads for cars. Even now, after a few decades where the importance of distinguishing between disposing of rain water and wastewater has been recognised, the notion of taking advantage of natural water channels to construct roads is one that still persists.

The name of the road project was changed to Longitudinal Avenue of the West (Avenida Longitudinal de Occidente), retaining its V-1 character. Its construction was delayed by decades but a trench with a width of 100 metres was reserved to accommodate it. In the mean time, the city continued to grow, extending westwards up to the point where it surpassed the belt of reserved land and many residential neighbourhoods grew on either side of it. Eventually the nature of communal living led to this space being used as connecting paths, for transient markets and informal football grounds.

In the 2011 elections for the mayor of Bogota the construction of the avenue was defended by the majority of the mayoral candidates. They argued that the growth of the motor vehicle fleet, at a disturbingly high rate, would make the road indispensable in alleviating congestion. They proposed a high speed road with electronic tolling systems and managed through a concession, enabling the cost of the road works to be funded by private investment. One of the candidates added the proposal of converting it into an axis of the city's expansion with large residential developments to the north and south of the city, oblivious of the fact that these are the flood areas of the Bogota River. The candidate who eventually won the election offered not to build the road with the justification that the wetlands that it would traverse should be protected. This captured the favour of a public which is becoming increasingly aware of environmental problems and increasingly disillusioned by the corruption often tied to large contracts in public works.

Preliminary considerations regarding social and environmental issues

The decision not to build the road is very positive for the city for a number of reasons. Among the factors of highest importance is the preservation of the wetlands, for it is unacceptable that the city should be losing any more of this ecological resource. In the early 1950s, an area of almost 50,000 hectares on the Bogota plateau consisted of wetlands; in this day and age, wetlands represent less than 700 hectares of the same territory. Nonetheless, the few remaining wetlands still play a vital role in the regional as well as the continental ecosystem, acting as shelter for several migrant avian species which visit the territories during the cold season in their own hemispheres.

It has to be taken into account that the construction of bridges with 100 metre sections for a road supposes blocking sunlight to the water's surface, even if the normal gauge for a structure such as this were to be tripled. When drawing a section of the bridge and subjecting it to a simulation of the path of the sun over the celestial sphere, it becomes evident that photosynthesis, which is indispensable for pond-life, would not be able to take place. The risk represented to the survival of the

wetlands as shelters for natural life is substantial if they were to be segmented in this way.

Transforming the highway into a longitudinal park is also an opportunity to consolidate the ties that have emerged in the communities that sprung up around the borders of this area. Some of these neighbourhoods were constructed with an inadequate conception of the needs of the people in terms of public life. There are sets of residential blocks which make up a square closed off by bars with only one point of access. Their facades and commerce do not contribute to the activity in neighbouring streets. Older neighbourhoods, almost all of them to the east of the strip, developed around the street as part of the integral structure. Instead of the fence of surrounding the blocks, here we have restaurants, cafes, shops and multiple small businesses and workshops, which offer the opportunity to come into many of the products and services which the shopping mall built up by property developers, with its limited hours of operation and selection of goods, is unable to facilitate: bread, milk and eggs in the early hours of the morning, picture framing, screws and nails, electrical goods repair, bicycle repairs and many other products.

The construction of large highways with tolls will require pedestrian bridges with high staircases and protracted ramps. Property tends to devalue in the areas surrounding such crossings. Also, the crossroads where the highway meets other high traffic ways create a sterile environment to communal living. They become unsafe places which are difficult to maintain and keep clean, and given the sharp social and economic inequality in Colombia, these zones soon begin to harbour settlers from the most marginalized sectors of society. What these neighborhoods, and the whole city, need is a large park as a place of integration, a space open to all citizens on a scale which makes it a metropolitan service that also conveys a powerful message.

Building the highway and destroying the wetlands, on the other hand, signifies a lack of recognition the communal work done by citizens, who have organised themselves to clean and maintain them, protect their

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borders. These citizen groups have also undertaken reforestation projects which have represented, in cases such as that of La Conejera, a re-emergence of local wildlife, the reconstruction of a habitat that had been poisoned by the old policies concerning the disposal of municipal wastewater and the lack of concern on the part of constructors who for years would dump building debris there.

In the Department of Architecture at the University of Los Andes we have worked for many semesters on a proposal to transform the road project into a large metropolitan park situated between the wetlands in La Conejera in the north and the Fucha River in the south. Together with our students we have been looking for arguments that would help the political decision-makers to understand the advantages of preserving the wetlands and the social ties along the fringe reserved by the municipality for the construction of the highway.

The project as an ecological connector

One of the crucial advantages of constructing a park lies in the fact that it would play a role as a ecological connector between the wetlands and the existing parks in the city. This connection would establish an enormous surface of porous land capable of creating woods and artificial drainage systems which would allow for mitigation of the impact of rainwater. At the same time, it would widen

the habitat of birds and facilitate the preservation of species crucial for pollination processes, expand the distribution of seeds and nesting grounds, thus acting as a resource for the preservation of food chains in the region.

It must not be forgotten that in 2000, under the mayoralty of Enrique Peñalosa, there was a proposal for a Land Use Plan (Plan de Ordenamiento Territorial) which marked a milestone in the planning history of Bogotá. For the first time ever an ecological structure of the territory was identified and was proposed as the basis and guideline for future urban development. This is something that Le Corbusier had regarded with sensitivity at the end of the 1940s and proposed in his plan but was later forgotten about entirely. With the new Land Use Plan as a tool, the mayoralty undertook a plan of reinforcing the ties between the eastern hills from which the water and the Bogotá River originate, following the river channels that flow towards the west. The projects included parks and avenues with bicycle lanes.

This provides a logical and systematic framework for the park project. In essence, the park has the potential to connect the south to the Bogotá River by extending it a couple of kilometres along the path of the Fucha River, up to its mouth. In the north the two rivers would meet again along the border line of the La Conejera wetland. Considering that the Bogotá River is the spinal cord of water system of the Bogotá plateau, this proposal

would be a resource in its defence and a contribution to the recuperation project for its waters and floodplains which the city has been very slow to take up.

At the top of 22nd street (Calle 22), there is a point at which the railway track, which enters the city from the west and runs through to its historical centre at the Estacion de la Sabana, interjects with the park. At a small distance east of this crossing, the green strip which would host the highway receives the flow of water from the San Francisco Canal, built eighty years ago by the Bogotá Aqueduct Company (Empresa de Acueducto de Bogotá) to evacuate the waters of the then recently paved San Francisco River which had been converted to Jiménez de Quezada avenue. The municipal administration has proposed building a road over these territories, following in the chain of decisions in favour of auto mobility which has led to so much damage of ecosystems and community life.

The proposal to transform the Longitudinal Avenue of the West into a park allows for a vision of converting this lane into a landscape full of life, encouraging the use of the roadway as a collective system of transport which allows a strengthening of the bonds between the city and the west of the savannah and with municipalities such as Mosquera and Facatativá.

Continuing on along the proposed path for the park towards the north we encounter the wetland of Capellanía. There is little left of it and for this reason it is of vital importance that



The Longitudinal Avenue of the West (Avenida Longitudinal de Occidente) crossing over the wetlands "La Conejera", "Tibabuyes", "Jaboque" and "Capellanía".

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it be preserved. The pressures of the property markets have fenced it in, leaving it confined between buildings whose facades are a mere 350 metres apart. Under these circumstances, the construction of the highway would ensure the definitive destruction of these wetlands. With the proposed park, on the other hand, it could be revived and turned into a highlight along the path of the park. In diverse and successive points along its outline, the park would have a chance to integrate green areas and systems of small parks, constituting a valuable green network for the city.

The project as a driver for competitive potential

The length of the park, including its extensions to the Bogota River to the south and the north, is over 12 kilometres. It would be impossible for any other city to have a public space of this length connecting such key points in its structure. Although this dimension surpasses places as iconic as Central Park in New York, it also has to be taken into account that its width would only be one hundred metres. But it is precisely the longitudinal aspect that allows it to have a crucial presence in the urban and social space as well as fulfil a role of integration. Keeping in mind the differences in urban history and the quality of its surrounding architecture, and referring solely to scale, the project could be compared to important longitudinal spaces in Paris or Berlin. The park set up in recently in New York on old elevated railway lines is less than two kilometres in length. The protracted nature of the park's layout brings with it the creation of a high value expanse in the form of scenery, a place for sport and group recreational activities which, if only for its scale, would become a valuable reference point for South America and increase Bogota's competitive potential in the regional economy.

In addition to this, in the investigations we carried out at the University of los Andes we have explored the possibility of taking advantage of the crossings in the road system that surround the park, and located buildings and squares which strengthen the integration of neighbourhoods and promotes this central axis as a system of services for the entire city. The explored programmes include music halls, theatres, science and art museums, libraries, sports

centres and swimming pools, among others. The principal idea behind this is to identify buildings which partially coincide with the path of the park where it would be elevated over these buildings and motor vehicle crossings. With some basic provisions made to the speed of passing cars, these public intersections could be made into safe meeting places and hubs of activity that allow safe passage across the roads by day and night.

A chain of public buildings such as this would allow an enormous increase to the cultural offerings of the city, integrating in more solidly into concert and theatre tours as well as regional and global exhibitions. If we add to this the diversity in avian life and the captivating biological relationships that can be found in the wetlands, Bogota would gain increased opportunities to compete in terms of both tourism and localisation decisions for international companies.

Although it is difficult to calculate these opportunities in numbers, it is an absolute certainty that a park as a meeting point would be preferable to a highway that further segments the city. The park, when joined with investment into the service structure for citizens, would impact the quality of urban life and create social ties that oppose the chains of violence that have formed in Colombia and Bogota.

A park of this scale requires a high population density which encourages the use of the public space. The presence of housing tends to guarantee a certain territoriality as well as healthy and safe communal living that is rich in daily exchanges of all kinds. If out of the 100 metre band, 15 metres are reserved for residential buildings it leaves 85 metres free. The 15 metres constitute a good width for a row of dwellings because it allows an appropriate amount of natural light and guarantees adequate ventilation for the ground floor. Moreover, in stretching from south to north, the facades along the park would receive sunlight in the morning and the afternoons, meaning they would reach suitable temperatures to accommodate the cold Bogota nights. In principle, this 15 metre section demonstrates that construction at a considerable height is possible without compromising the concept

of the park, thus finding a harmonic scale to the use of open space.

Considering that this concerns a piece of land that is already property of the city, this is a magnificent opportunity to construct low cost residences and consolidate the city, avoiding the waste of time and finite resources, not to mention the injustice, of relegating citizens to the outskirts of the city where land is cheaper.

In times when the Colombian government has taken the political decision to address the constant problem of the housing deficit, this strip of land supplies the opportunity to address the issue effectively, providing a public space with undeniable potential. If we assume that the row of houses would follow the park along its entire length, in the same style as Le Corbusier imagined for Argel and Rio de Janeiro in 1930, the foundations would have an approximate length of 12,000 metres. The living space per floor would be 180,000 m². Fifteen floors would allow the construction of approximately 2,700,000 m². If these strips of land accommodated residences exclusively and we assumed they measured 60 m² each in size, 45,000 of them could be built. Of course these are broad figures which would have to be adjusted to account for ventilation and corridors to access doors, but they give a sense of scale and of how much would be contributed towards a more democratic and compact city.

The land being property of the city, it would be appropriate for the buildings to rise up in columns. The headroom should be three floors high or at least 9 metres. This space could accommodate nurseries, shops, cafes, workshops and places of work, generating arcaded galleries and large staircases to link surrounding neighbourhoods to the park. At intervals there would be doors allowing access to the residences. The street will be lively and full of activity. Cyclists, pedestrians and joggers, all citizens who visit the park will have places to meet new residents and with people from nearby neighbourhoods.

If in addition to this, if we take into account the surrounding buildings dedicated to culture and sport described above and the possibility of including additional uses such as offices, hotels and business infrastructure in the

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junctions to large avenues, the park could be an urban project that puts Bogotá in an advantageous position when it comes to competitive potential.

The project as a corridor for public transport

The proposed park coincides with various points in the existing public transport infrastructure. It could connect with the articulated urban bus network in the north with its final stop in the Suba neighbourhood. Equally it could connect to the route that travels along 80th street and at the intersection of the line that goes to the airport via 26th street. Furthermore, as was mentioned earlier, there is an intersection on 22nd street with the old railway line which travels to the centre of Bogotá. Connecting these stations to each other allows for the creation of a ring of public transport for the city and supports the transport system as a whole, giving access to the proposed residences and the metropolitan services along the length of the park.

In the workshops carried out by the

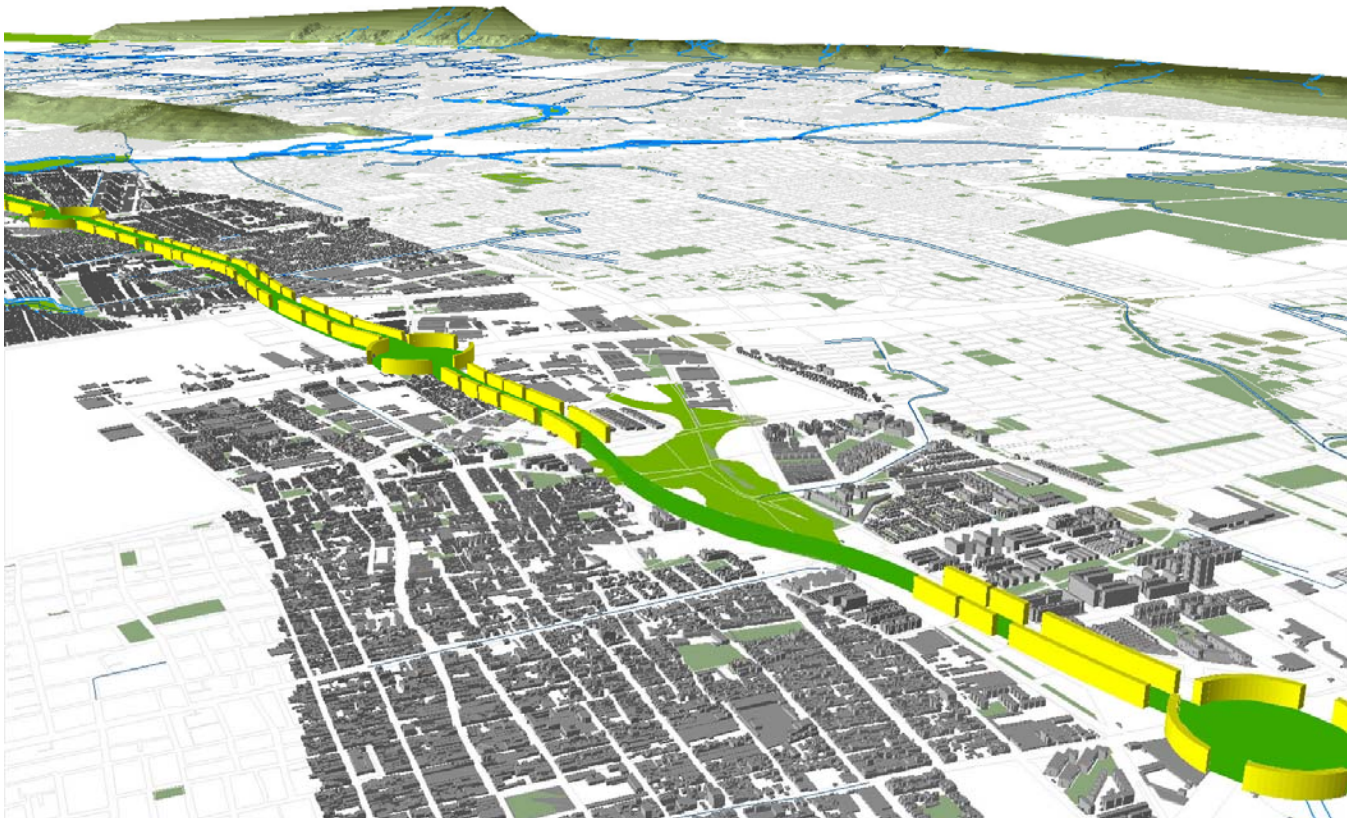
department of architecture at the University of los Andes a few alternative possibilities were studied. Articulated buses would have some advantages in integrating with the existing transport system, but passing over the wetlands would leave too large an environmental footprint. An above-ground railway line would disrupt the path of pedestrians across the park and endanger passers-by.

However, a suspended monorail system, on the other hand, would solve various problems: its limited height allows it to pass over the wetlands without creating a harmful obstruction of sunlight over the water, maintaining a sustainable temperature in the waters and allowing biological processes to continue unharmed. By being elevated it also avoids crossing with important avenues, thus bypassing the cost of resources usually involved in junctions with high traffic roads. In addition to this, as previously mentioned, there would be elevated sections of the park over road crossings and public service and cultural buildings. These could serve as appropriate positions to build monorail

stations, allowing for improved mobility in surrounding neighbourhoods by providing spaces for bicycles, and connections for pedestrians and taxis.

Moreover, the park would also have a designated bicycle lane along its length, integrating itself with the vast existing bicycle lane network in Bogotá and allowing for practical connections that could be used by the ever increasing number of citizens who choose to cycle to their places of work on a daily basis.

With this densely populated stretch of residences, services and workplaces interconnected with the city's public transport network as well as its own monorail system, it would generate a strip of economic activity to rival the one on the eastern border of the city. It is there, against the eastern hills where most places of work and study are currently located in Bogotá, causing a great deal of congestion and progressive reduction in general mobility due to the fact that most of the population has to travel into that sector of the city on a daily basis.



Scheme of the Proposed Corridor.

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The project as an economic opportunity

The proposed residences, as has been explained above, could represent the construction of slightly over 2,700,000 m². This figure would then be combined with those of the community centres, theatres, museums and other cultural metropolitan services as well as business infrastructure, hotels and other services. In total this could represent a construction volume of above three-million square metres, which, when applying the average exchange rate from 2012 and assuming a construction cost per square metre of 1,000 dollars, would result in economic activity with a value of three thousand trillion dollars, generating direct employment for a vast amount of people for a number of years and stimulate the construction industry and its related professions.

Surely then, proposing the construction of a highway in order to exploit it privately for two or three decades and having it for the future without paying for the works involved, but having paid for the land, can't be considered a good deal for the city of Bogota nor its citizens when compared with the possibility of making this a pivotal urban project for the city. One of the benefits of a project of this scale would be gained through the funding needed to implement the park project, which would certainly cost less than a highway with bridges over the wetlands and inconvenient crossings at various levels where the highway meets the avenues. It is precisely at these points that the city has reserved spaces of 350 metres of diameter in order to ensure there is enough space to facilitate interchanges and bridges.

These spaces would again present an opportunity to construct housing with a width of 15 metres, but this time formed in a circle. With this radius, the ring-shaped foundations would have an axis of approximately 900 metres, which would equal a floor space of 14,500 m² per floor. If the building were 10 floors high, this would generate 290,000 m² of construction to house hotels, company headquarters, businesses and even institutional premises. The perfectly round interior would have a diameter of around 300 metres. It could be heavily vegetated as the avenue below

would be forked, going around the outside of the building allowing the area to stay filled with soil to host plant life and absorb rainwater. It would be a grand cylindrical plaza, with large gateways multiple stories high allowing access from the park, capable of hosting various events such as Sunday markets, flower shows, exhibitions and other urban activities. These plazas could also be used to host various sporting events as the large space would be able to hold any sports field. The form and shape of these spaces would make them reference points within the city and would accentuate the overall value of the park.

The most valuable asset that Bogota stands to gain from the project is the ability to exemplify a way in which public space and the ecological structure of a territory can be integrated to create a city.

¹ Agreement 38 of August 11, 1961, issued by the Council of Bogota under the mayoralty of Jorge Gaitán Cortés.

² Agreement 38 of August 11, 1961. Agreement Glossary: "The name V-1 is given to regional connection paths whose characteristics allow the transit of a high percentage of commercial vehicles; these generally limit the circuits of district sectorization."